REMEDIAL INVESTIGATION REPORT

Floragon Property - Former Dip Tank/Bear Creek Area
Five-Acre Study Area
Molalla, Oregon

DEQ ECSI File No. 0009

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1 INTRODUCTION

PNG Environmental, Inc. (PNG) prepared this Remedial Investigation (RI) report on behalf of Avison Lumber Company (Avison Lumber) for the approximate five-acre study area (subject site) located in Clackamas County, Oregon (Figures 1, 2A, and 2B).

The RI study area comprising this site is currently vacant but was historically associated with a much larger lumber mill and forest products manufacturing facility covering approximately 105 acres; these facilities operated between the 1940s and early 2000s. The subject site is currently owned by Floragon Forest Products (Floragon). As a prior owner of the larger 105-acre mill facility, Avison Lumber took over RI activities at the property in early 2010 under a letter agreement administered by the Oregon Department of Environmental Quality's (DEQ) Voluntary Cleanup Program (VCP). Since that time, the majority of the 105-acre property has been remediated to the satisfaction of the DEQ, such that remaining environmental review is limited to the five-acre study area which is the subject of this RI Report (Figures 2A and 2B).

1.1 PURPOSE

The purpose of this RI is to characterize the magnitude and extent of contamination at the five-acre study area, which includes the former Dip Tank Area and the portions of Bear Creek located at the Floragon property. The results of this investigation are intended to satisfy DEQ criteria for completing the entire RI phase of work, and to provide the basis for preparation of Feasibility Study (FS) and final remedial action planning for this site.

The site is being investigated in accordance with Oregon's environmental cleanup statues and rules (see ORS 465.200 et seq; OAR 340-122 et seq) under an agreement with the DEQ. The FS will be developed based on the findings of this RI, with the goal of implementing a protective site remedy that will satisfy applicable regulatory criteria.

2 BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

The five-acre study area covers portions of seven tax lots, located north of South Molalla Forest Road and west of South Molalla Avenue (Figures 2A, 2B, and 3). The site is described as follows:

- Address: 250 W. 7th Street, Molalla (Clackamas County), Oregon.
- Former Dip Tank Area: Latitude 45.1397°, Longitude -122.5829°
- Bear Creek Upstream Site Entry: Latitude 45.140505°, Longitude -122.580591°
- Bear Creek Downstream Site Exit: Latitude 45.141924°, Longitude -122.590175°
- Clackamas County Tax Map Numbers 52E17 and 52E17A, Township 5 South, Range 2 East, Section 17:

Site Area	Tax Lot	Parcel Number	Acres (total parcel size / study area size)
Portion of former mill occupied by Bear Creek (Includes Reaches 1 and 2)	0200	01107359	10.83 / 0.11
Portion of former mill occupied by Bear Creek (Includes Reach 3 and a portion of Reach 4)	0102	05002348	9.74 / 0.35
Portion of former mill occupied by Bear Creek (Includes a portion of Reach 4)	0290	01107368	3.23 / 0.16
Portion of former mill occupied by Bear Creek (Includes Reach 5 and area below Beaver Dam #2)	2480	01107956	1.77 / 0.20
Portion of former mill occupied by Bear Creek (Includes area below Beaver Dam #2 and a portion of Reach 6)	2490	01107974	24.07 / 0.20
Portion of former mill fronted by Bear Creek (downstream of beaver pond and including Reaches 6 and 7)	2400	01107947	16.23 / 1.07
Former Dip Tank Area	0101	01107340	5.95 / 3.19
			TOTAL = 5.28 acres (RI study area)*

Note:
* The 5.28 acre RI study area includes all of Bear Creek at the site (Reaches 1 through 7) and the former Dip Tank Area. Within this RI study area, Phase 3 RI tasks focused on upstream portions of the creek (Reaches 1 through 5) and the former Dip Tank Area, together covering 3.96 acres.

2.2 ZONING AND USE

A portion of the site is located within the city of Molalla, Oregon and is zoned for heavy industrial use (HI). Tax parcels located in Molalla city limits include 01107974, 01107359, and 01107331. Other portions of the site are located outside Molalla, and are in unincorporated Clackamas County, Oregon. Unincorporated portions include tax parcels 01107947, 01107956, 01107368, 05002348, and 01107340, and are designated for rural industrial use (RI). Site zoning designation is presented on Figure 2C.

The site is currently vacant with the following main features:

- The former Dip Tank Area is covered by asphalt pavement with exposed concrete foundation slabs remaining at two former mill building locations (see Section 2.3). These buildings were demolished and removed by Floragon in 2005. The former Dip Tank Area covers a total of 3.19 acres.
  - Three stormwater catch basins and associated conveyance piping are located in the former Dip Tank Area and appear to discharge to the north at Bear Creek. No other underground utilities are known in the former Dip Tank Area.
- Site-wide, Bear Creek flows approximately 3,200 feet from east to west across the former mill site, with recent Phase 3 RI efforts focused on the upstream 1,300 feet in open creek areas designated as Reaches 1 through 5 (Figure 3; see Section 3 for a description of Phase 3 RI tasks). The site's upstream "bank-full" coverage totals 0.8 acres. Note that the 1,300-foot Phase 3 RI study area does not include closed, culverted sections of the creek which cover an additional approximately 450 feet (total length of Reaches 1 through 5, including culverts, is approximately 1,750 feet). Downstream of Reach 5, Bear Creek exits the former mill property for approximately 450 feet before flowing back onto portions of the former mill property that are immediately adjacent to the Upland Northern Parcel NFA area. Excluding the off-site portion, the downstream bank-full area of Bear Creek totals approximately 1 acre over approximately 1,000 feet (across Reaches 6 and 7).
  - The creek is culverted in segments and otherwise dominated by non-native invasive vegetation, particularly for upstream areas at the site between Reaches 1 through 4. Reach 5 of the creek is affected by recent beaver damming activities and includes riparian area which became established since industrial operations ceased at the site. Wetlands and Waters Determinations have been conducted on the site for Bear Creek Reaches 1 through 5 as part of overall site characterization activities as discussed in Section 3.2 (SWCA 2015 and 2016).
  - Downstream from Reach 5, Bear Creek exits the Floragon property for approximately 450 feet before flowing back onto portions of the former mill property (these downstream portions of the creek are immediately adjacent to former mill parcels that received a 2014 No Further Action (NFA) determination from DEQ for that portion of the site). These downstream portions of the creek including but not limited to Reaches 6 and 7, comprise an additional 1,000 feet in length and were evaluated during prior Phase 2 RI efforts conducted in 2012. Details regarding Bear Creek characterization are provided in Section 3.2 of this report.

No buildings are located within the RI study area. West and south of the former Dip Tank Area, vacant industrial former mill buildings and surrounding land including a former log pond area adjacent to Bear Creek were evaluated separately during prior RI activities as

part of a 16-acre “Southeast Corner Area” investigation conducted in 2014-2015 (Section 2.4.2).

Neighboring properties include forest land to the south (across South Molalla Forest Road), a rural residence with farm/pasture use to the west, and industrial land formerly owned by Floragon as part of the parent mill facility to the north. Agricultural land is located east of the site across South Molalla Avenue. Vicinity land use primarily includes a mixture of commercial, industrial, and residential properties.

2.3 SITE HISTORY

The operational and environmental characterization history of the former mill facility, including the five-acre study area, is summarized below. Details regarding historic mill facility operations and investigation efforts are provided in the Phase 1 RI Report (PNG 2011).

2.3.1 Facility Operations

The five-acre RI study area is limited to the former Dip Tank Area and on-site portions of Bear Creek, which are both part of a larger industrial 105-acre property as illustrated on Figures 1, 2A, and 2B. Lumber-related manufacturing occurred at the 105-acre property beginning in the 1940s and was largely discontinued by 2009. The mill site was owned and operated by Avison Lumber until 1998-1999 when it was purchased and operated by Floragon.

From approximately 1970 to 1986, Avison Lumber applied a water-based pentachlorophenol (PCP) solution on lumber for anti-fungal purposes prior to shipment in containers. It was later discovered that this solution may have contained manufacturing impurities including a family of related chemicals called chlorinated dibenzo-p-dioxin and chlorinated dibenzofurans, commonly referred to as dioxin. Lumber was prepared for shipping by being dipped into one of two tanks containing the water-based anti-fungal solution. These dip tanks were located in the southern portion of the site which is a focus of this RI. The PCP solution was switched in the late 1980s to a detergent based anti-fungal solution.

No buildings are currently present within the RI study area, but remnant concrete building foundations remain at the former Dip Tank Area parcel. These buildings were designated as “Re-Saw #2” to the west, and “Drying Kilns #2” to the east. The two dip tanks were located at/adjacent to these buildings, as illustrated in Figure 4.

Most of the 105-acre property’s mill buildings have been demolished although vacant buildings constructed in the 1990s and related to Floragon’s former “glue-lam” manufacturing operations remain in the southern portion of the property, south of the former Dip Tank Area near Molalla Forest Road. Northern portions of the former mill facility were sold following the “North Parcels” NFA determination in 2014 and are currently being used for industrial purposes. Recently, another operator has moved onto a portion of the northern area and has paved a large section for industrial use.

2.3.2 Environmental Investigation and Remediation Actions Summary

A series of environmental investigation and remediation activities were performed at the mill facility starting in the 1980s, and included early assessment by Avison Lumber and the U.S. Environmental Protection Agency (EPA) Region 10. Initial investigation identified contamination at the mill site, but concluded that it was not significant enough to require further action by EPA. DEQ identified the mill site as a low priority for further action based

on these initial findings. The site is listed in the DEQ Environmental Cleanup Site Information Database as ECSI Site Number 0009.

In order to address DEQ requirements, site-wide RI activities were renewed in 2010 across the 105-acre mill property (Section 2.4.) Following risk assessment and focused remediation on the northern portions of the mill property covering approximately 84 acres in 2013-2014, subsequent investigation efforts have focused on remaining southern portions of the former mill site where low levels of phenols and hydrocarbons are present in soil and groundwater around two former dip tanks, well away from offsite residential development. Work and risk evaluations conducted in 2014-2015 demonstrated protective environmental conditions at a 16-acre portion of the mill property's southeastern margins.

This RI Report documents the environmental characterization of the remaining five acres of the former mill site (i.e., remaining 5-acres following investigations that addressed the 84-acre and 16-acre portions of the mill property), particularly dioxin which are present in shallow Dip Tank Area soil beneath pavement surfaces, and within shallow Bear Creek sediments. Characterization of the localized distribution of these chemicals of interest comprise the five-acre RI study area.

Initial Investigations and RI/FS Work Plan

The first known environmental assessment was completed at the mill site in 1981 or 1982 by DEQ. Since that time, multiple additional studies have been completed to characterize site conditions. Initial investigation work detailed in the RI/FS Work Plan (AMEC 2009) includes the following related documentation.

- DEQ Pentachlorophenol (PCP) Contamination Interoffice Memo (DEQ 1982).
- Beak Consultants Chlorophenol Investigation (Beak 1983).
- DEQ PCP/TCP Degradation Interoffice Memo (DEQ 1984).
- EPA/Radian Site Inspection (USEPA 1985).
- Scientific Resources, Inc. Water Sampling (SRI 1987).
- Ecology and Environment, Inc. Investigation (Ecology and Environment 1988).
- Seminole Environmental UST Decommissioning Activities (Seminole 1997a, and 1997b).
- GeoEngineers Phase I Environmental Site Assessment (GeoEngineers 1998).
- Braun Intertec Subsurface Investigation (Braun 1998).
- NW EnviroSearch, Inc. (NWES) Phase I Environmental Site Assessment (NWES 2004).
- NWES Limited Waste Disposal & Soils Cleanup and Native & Fill Soils Assessment, Log Yard and Former Mill 4/5 Parcel (NWES 2006).

Investigative findings for this 25-year period were evaluated and incorporated into the development of the 2009 RI/FS work plan prepared by AMEC. The RI/FS work plan was prepared with extensive DEQ input to identify site-wide areas of concern (AOCs) and to develop a comprehensive list of chemicals of interest (COIs) that were evaluated during subsequent phases of RI work (Section 2.4).

2.4 REMEDIAL INVESTIGATION ACTIVITIES (2010 – 2015)

Following DEQ approval of the 2009 RI/FS work plan and as authorized by Floragon and Avison, a series of investigation tasks were developed and implemented between 2010 and 2015 in order to address Oregon's environmental cleanup law regarding contaminant characterization and risk assessment. Each phase of investigation added to a comprehensive understanding of site conditions by addressing the identified data gaps such that the focus of subsequent efforts could be narrowed and refined. The most recent Phase 3 RI investigation element (Section 3) is intended to resolve the few remaining RI data gaps and complete the investigation/characterization phase such that the FS can be completed in support of adopting a final site remedy.

2.4.1 Phase 1 Remedial Investigation

In accordance with the 2009 work plan, extensive site investigation efforts were conducted across the 105-acre mill property in 2010. The Phase 1 RI evaluated site-wide conditions and indicated that limited and localized environmental impacts were present at certain portions of the former mill property. In general, the greatest concentrations of primary COIs (chlorophenols, dioxin, and petroleum hydrocarbons) were identified at the former Dip Tank Area, former Log Pond Area, and former Hyster Shop Area. Bear Creek sediments and soil associated with a ditch and related catch basins located in northern portions of the site contained relatively low dioxin concentrations requiring further evaluation. Potential contaminant transport was determined to require additional study as part of future (i.e., Phase 2) supplemental RI characterization efforts.

The Phase 1 RI included baseline human health and ecological risk characterization tasks which established likely contaminant receptor and exposure scenarios, and provided context for potential environmental exposure to the identified COIs.

The Baseline Human Health Risk Assessment (HHRA) determined that there was a potential for unacceptable occupational worker exposure at the site, driven by the potential for soil direct contact and incidental ingestion of dioxin from exposed soil at specific locations. No other chemicals or media resulted in unacceptable risks for human receptors at the industrial site. The 105-acre mill site was divided into two main exposure units based on configuration, past operational use, and current conditions. These general exposure units included (1) the Upland Area (where no unacceptable risks were identified) and (2) the combined Dip Tank and Hyster Shop Areas. Unacceptable risks were calculated for future occupational and construction workers having direct contact with localized dioxin-contaminated shallow soil beneath the paved former Dip Tank area (as well as localized catch basin sediments at a separate maintenance area known as the former Hyster Shop).

Level II ecological risk-based screening indicated that unacceptable ecological risks may exist due to potential direct exposure to site-related chemicals in surface soil and groundwater located at the former Log Pond, Hyster Shop and Dip Tank Areas, Bear Creek sediment, and North Drainage Ditch soil/sediment. Further ecological assessment during the Phase 2 investigation was recommended to evaluate contaminants of potential ecological concern in groundwater and sediment at these specific areas.

2.4.2 Phase 2 Remedial Investigation

A series of supplemental activities generally referred to as Phase 2 of the RI were conducted to address data gaps identified during the first phase of RI work. These Phase 2 activities were conducted between 2012 and 2015, and resolved most of the RI data

gaps such that the majority of the 105-acre mill property could be eliminated from further environmental concern. Based on Phase 2 RI and risk assessment findings, the DEQ issued an NFA determination for the 84-acre Northern Parcels Area in March 2014 (DEQ 2014) and a separate NFA is currently pending for the 16-acre SE Corner Area (NFA anticipated in 2017) (DEQ 2015a).

Investigation tasks conducted in 2012 focused on sediment contaminant characterization including (1) on-site portions of Bear Creek, and (2) surficial soil/sediment materials within the site's industrial North Ditch, and among related catch basin and drainage pipe features located near the Northern Ditch and former Hyster Shop areas. The sediment characterization effort focused on dioxin, since other COIs including non-PCP chlorophenols, polynuclear aromatic hydrocarbons (PAHs), and metals were generally concluded to not present unacceptable risks based on the Phase 1 RI risk assessment (Section 2.4.1). Preliminary stream flow analysis for on-site portions of Bear Creek was conducted during seasonal high (spring 2012) and low (summer 2012) flow periods to provide the basis for evaluating sediment transport conditions in this environment. Investigation and risk characterization findings were presented in a data summary report (PNG 2012).

Based on the 2012 sediment and streamflow characterization efforts, PNG evaluated protective dioxin exposure conditions for a range of potential receptors exposed to soils (applicable to downstream off-site residents exposed to creek flood events and adolescent trespassers entering the subject site) and creek sediments (for downstream adolescent recreational creek users and adolescent trespassers on the site). Findings of this risk characterization effort indicated that dioxin concentrations identified in site creek sediments do not represent unacceptable risk to anticipated off-site residential users or trespassers (TAS 2012).

During 2013, PNG evaluated seasonal surface water and groundwater conditions and confirmed groundwater discharge to Bear Creek at the site. The 2013 findings were consistent with previous expectations regarding groundwater-surface water interactions previously reported by Beak (1983). Contaminants in groundwater were delineated and characterized based on Phase 2 RI findings.

Groundwater quality samples collected from the network of shallow and intermediate-depth monitoring wells were useful in defining the nature, extent, and distribution of groundwater contamination in proximity to the former Dip Tank and Hyster Shop Areas (including the former Log Pond located west of the Dip Tank Area). Contaminants of interest included PCP and other chlorophenols and petroleum hydrocarbons, as well as volatile organic compounds at the former Hyster Shop Area. Where detected, none of the contaminant concentrations in groundwater exceeded their respective DEQ Risk-Based Concentrations (RBCs) for applicable exposure pathways at the site. In particular, no PCP was detected above the laboratory method reporting limits (MRLs) in the groundwater samples collected during the 2013 monitoring events. In consideration of the offsite residences to the north and east of the former Hyster Shop Area, RBCs for volatilization to outdoor air and vapor intrusion to buildings under residential scenarios were also evaluated. These residential RBCs for groundwater were not exceeded.

Transport mechanisms and pathways which have likely influenced contaminant distribution on the surface and in the subsurface consist of overland storm water flow across the surface and into storm water collection features (i.e., Bear Creek) and infiltration into the subsurface and subsequent advective/diffusive transport via groundwater flow. The extent of identified contaminants in the subsurface, including PCP and dioxin, has been limited due to the relatively immobile characteristics of these

contaminants (e.g., low water solubility, relatively high adsorption character, etc.) coupled with the low-permeability/high organic carbon content characteristics of subsurface media. The extent of PCP impacts appears limited to shallow soil and groundwater in the immediate vicinity of the former Dip Tank, and PCP was not observed to be migrating toward or discharging to Bear Creek at this time. Vertically, contaminant transport towards the deeper regional drinking water aquifer was also not observed and is not expected considering the limited source area extent, relatively low concentrations observed, and the predominately lateral groundwater flow in the study area (PNG 2013). Due to this overall setting, dioxin are not regarded as a COI in groundwater and were not evaluated except in soil and sediments as detailed in Section 3.

Northern Parcels

The northern 84 acres of the 105-acre Floragon property were evaluated during RI activities between 2010 and 2014, where investigation work identified localized, relatively low levels of common urban and site-related contaminants (primarily dioxin, hydrocarbons, and zinc) among soils and sediments which had collected in the stormwater conveyance system and a related ditch that served this area and the adjacent former Hyster Shop Area. Figures 2A and 2B illustrate the 84-acre North Parcels Upland Area. Human health and ecological risk assessment enabled the development and implementation of a focused remediation effort (Figures 5 and 6) that resulted in DEQ's No Further Action determination for this portion of the site in March 2014 (DEQ 2014).

- Upland Soils: COIs have either not been detected or were identified at low concentrations across Upland Areas on the Floragon site. Where identified, COIs were determined to be present at levels below applicable soil RBCs.
- Stormwater Runoff: Catch basins located in paved former yard areas west and northwest of the former Hyster Shop discharge to the North Ditch at its southern origin. In the same general location near its origin, the North Ditch also receives direct runoff and discharge from adjacent off-property industrial facilities and roadways. One catch basin within the Upland Area (sample AB-37) is known to discharge to Reach 2 of Bear Creek at a location just north of the former Dip Tank Area (creek sediment sample location SED-1; see Figure 3). Bear Creek was excluded from the Northern Parcels Upland Area assessment and NFA determination and is being evaluated separately as an element of the Phase 3 RI activities (Sections 3 through 6 of this report).
- Groundwater: The shallow water table at the site is present at depths ranging from 2.5 and 7.5 feet below ground surface (bgs), and is above an extensive aquitard. This shallow water table zone is distinct from the regional drinking water aquifer which occurs at depths near or below approximately 100 feet bgs. Shallow water groundwater discharges to Bear Creek at this site. However, contaminants of concern present in groundwater are localized and not expected to migrate to any surface water features or regional drinking water resources. Limited future migration of the contaminants of concern detected in groundwater is supported by the limited migration since PCP-based wood treatment was discontinued in the later 1980's. The limited extent of contamination in groundwater is consistent with the relatively low mobility character of the contamination (e.g., relatively low solubility, relatively high adsorption, etc.) and relatively low concentrations detected.
- Human Health Risk: The HHRA (EES 2014b) concludes that no unacceptable human health impacts are anticipated from occupational contact with the ditch or

catch basin sediments or groundwater. Receptors were identified as current and future occupational workers and trespassers, future construction workers, future trench/excavation workers, and future maintenance workers whose duties would include cleaning out and maintaining the catch basins in the Uplands Area.

- Ecological Risk: Under current and reasonably likely future site conditions, potential ecological risks were associated primarily with dioxin in shallow ditch soil/sediments, with the highest potential for adverse effects localized along the eastern property boundary.
- Focused Remedy: Based on RI findings and risk characterization conclusions and as coordinated with DEQ, Upland Area drainage features including catch basins, related underground piping connections, and "hot spot" portions of the North Ditch were cleaned out in October 2013 and January 2014 (Figures 5 and 6). Removed sediments and stormwater were transported off-site to approved waste disposal facilities. A cluster of catch basins located southeast of the former Hyster Shop and around the AB-37 location (AB-37-1, AB-37-2, and AB-37-3) were determined to discharge directly to Bear Creek, and these catch basin features and related drain lines were also cleaned in October 2013 (Figure 5).
- Upland Area NFA: Following the completion of Upland Area storm system and ditch sediment cleanout, DEQ concluded that residual chemicals of interest in the Upland Area do not pose an unacceptable risk to human health or the environment, and issued an NFA Determination for this portion of the mill site in March 2014.
- Current Use: Since DEQ issued the NFA determination, much of the northern area has subsequently been redeveloped by others for use including log sorting, chipping and related wood processing activities.

16-Acre Southeastern Corner Area

During 2014 and 2015, a group of four contiguous tax lots/parcels located at the mill site's southeastern corner were evaluated under the RI and determined to be suitable for independent assessment and NFA consideration (PNG 2015a, DEQ 2015a). This 16-acre "SE Corner Area" is located immediately north of South Molalla Forest Road, and west of South Molalla Avenue (Figures 2A and 2B). Although the 16-acre SE Corner Area straddles Bear Creek and adjoins the former Dip Tank Area where contaminant concentrations and receptor scenarios exceed risk-based criteria, evaluation of the 16-acre area specifically does not included these portions of the site (i.e., does not include the 5-acre Phase 3 study area). RI and FS activities are being conducted separately at the five-acre Bear Creek and former Dip Tank study area as described in Sections 3 through 6 of this report.

Investigation work at the 16-acre SE Corner Area identified localized, relatively low concentrations of common urban and site-related contaminants. These contaminants include dioxin in shallow soil beneath a paved area as well as PCP and hydrocarbons in shallow groundwater. In order to characterize shallow dioxin concentrations near the boundary between the 16-acre SE Corner area and the former Dip Tank Area, additional soil samples were collected in July 2014 to the west and south of the Dip Tank Area. Each of the two sampling areas was comprised of five-point composite samples collected within the upper one foot of soil beneath existing cover/pavement surfaces. These samples were designed to evaluate potential future occupational exposures at this portion of the 16-acre parcels as this area was being proposed for industrial redevelopment. These sampling locations ("Composite Area 1" and "Composite Area 2") and associated dioxin/furans results (401 and 2.5 picograms per gram [pg/g] TEQ, respectively) are shown on Figure 7.

Published RBCs for occupational direct contact and construction worker exposures are currently 16 and 170 pg/g, respectively (DEQ 2015b).

A *Focused Risk Evaluation Summary* (EES 2014a) and subsequent discussions with DEQ acknowledged that potential human health risks at the 16-acre SE Corner Area are governed by possible non-residential direct-contact exposures to dioxin in shallow soil which is located beneath a limited portion of the existing pavement surfaces. This area is represented by the "Composite Area 1" soil data. DEQ determined that acceptable risk criteria will be demonstrated by maintaining the existing protective pavement cover in the one-acre area represented by Composite Area 1 (Figure 7).

Avison Lumber and Floragon completed the following tasks during September-October 2015 to satisfy DEQ's criteria for establishing protective measures at the 16-acre SE Corner Area (PNG 2015a):

- Repaired the existing pavement surface in a one-acre area north of Building #1, where sub-pavement fill soils represented by the Composite Area 1 sample contain dioxin at a concentration of 401 pg/g. The existing asphalt concrete pavement in this area was cleaned and re-surfaced with a protective asphaltic chip-seal cover that is compatible with continued commercial/industrial use of the 16-acre parcel. This chip-seal resurfacing was completed in late September 2015.
- Established limited access to the adjacent former Dip Tank area by the installation of fencing across the shared boundary between these two areas (completed in October 2015). Other existing features such as remnant building foundations to the east and west, perimeter brush and ditches to the east, and other fenced site areas elsewhere to the north, all contribute to limited vehicle and pedestrian access between the 16-acre SE Corner Area and the relatively small former Dip Tank Area.
- Prepared a written restrictive covenant defining and limiting this specific area to commercial/industrial use, with protocols for inspecting and maintaining a protective pavement covering across the specified one-acre area.

As with the North Parcels Upland Area, human health and ecological risk assessment enabled the development and implementation of protective measures that resulted in DEQ's Staff Memorandum recommending an NFA determination for this portion of the site (DEQ 2015a).

2.4.3 Phase 3 RI

Following extensive site characterization and risk assessment efforts over the entire 105-acre former mill site (including NFA determinations for the 84-acre Northern Parcels Upland Area [DEQ 2014] and the 16-acre SE Corner Area [pending]), remaining investigation data gaps for the 5-acre Bear Creek and former Dip Tank Area were limited to the evaluation of the following COIs:

- Dioxin.
- Arsenic.
- Volatile organic compounds (VOCs).
- Semi-volatile organic compounds (SVOCs).

Findings for this 5-acre study area are described in Section 3 of this report.

3 PHASE 3 REMEDIAL INVESTIGATION

In accordance with a DEQ-approved work plan, Phase 3 RI activities were conducted at the Floragon site during 2014 and 2015 (Appendix A; DEQ 2015c). The purpose of this RI work was to further delineate the magnitude and extent of contaminants in Bear Creek sediments and former Dip Tank Area soils at a five-acre study area of the Floragon Mill property (Figures 8 through 15). Based on the findings of Phase 3 RI work as supplemented by the risk assessment update (Section 6), the overall RI goals established by DEQ have been addressed to the extent that the FS and final remedial action planning for this portion of the site can be completed.

Sediment and soil sample data for this study area are shown on Figures 8 through 15, and summarized in Tables 1-1 through 7-2.

3.1 PHASE 3 RI STUDY AREA

3.1.1 Bear Creek Sediments and Dioxin Screening Criteria

Environmental issues for Bear Creek are primarily focused on ecological receptors for which DEQ has proposed site-specific numeric criteria based on mammalian toxic equivalency (TEQ) exposures to dioxin in creek sediments. Human health exposures are also considered in the site-specific risk assessment, although the ecological risk criteria are regarded as being protective of human receptors. Details are provided in Section 6.

Acknowledging the relatively poor habitat quality of the creek on the Floragon property, and the small area and exposure inputs available within the home range of the weasel, RBC criteria for this mammalian receptor were developed by DEQ as follows:

- Preliminary Remediation Goal (PRG) = 20 pg/g: A calculated soil dioxin PRG of 12 pg/g was adjusted by DEQ to 20 pg/g using sediment concentration to dose regression (Appendix D). The 20 pg/g PRG was considered by DEQ to be protective of sediment-exposed ecological receptors.
- Remedial Action Level (RAL) = 120 pg/g: DEQ indicates the basis for establishing this RAL is that eliminating exposure to areas of dioxin concentrations exceeding 120 pg/g will lower the overall ecological receptor exposure among site creek sediments to a reasonably protective level intended to approach the PRG.

Previous RI data, collected prior to 2014, was from11 sediment transect sample locations representing an approximately 3,000-foot length of Bear Creek where it flows across the Floragon site (Figure 8). Contaminant delineation using the Phase 1 and Phase 2 RI data provided a general understanding of dioxin distribution at the Floragon site provided a basis for RI development.

Sediment conditions located within downstream portions of the site creek (below the SED-8 sampling location) indicated dioxin concentrations generally below the 120 pg/g Remedial Action Level. Initial phases of the RI (Phase 1 and 2 during 2010–2012) identified three creek sediment samples located upstream of the SED-8 location where dioxin concentrations marginally exceeded DEQ's 120 pg/g RAL. Dioxin concentrations among those three samples ranged from 165 to 413 pg/g as shown in Figure 8.

Additional sediment sampling was conducted during Phase 3 of the RI in an effort to provide more detailed characterization of Bear Creek sediments approaching or exceeding the 120 pg/g RAL at the Floragon property. The additional efforts were intended to provide more representative delineation of both chemical and physical creek

characteristics extending from the SED-8 location upstream to the property boundary adjacent to South Molalla Avenue.

3.1.2 Former Dip Tank Area Soils and Dioxin Screening Criteria

Among site soils, the greatest dioxin impacts were identified beneath pavement within one apparently isolated location adjacent to a former lumber dip tank, where in 2010 a concentration of 2,221 pg/g was measured in sample AB-06 at a depth of six inches bgs. Among three other shallow soil samples collected from this general area in 2010, dioxin concentrations ranged from 43 to 328 pg/g. Catch basin sediments sampled from this area at the same time (AB-19A and AB-19B) contained dioxin concentrations from 109 to 1,115 pg/g. Perimeter composite soil samples collected in 2014 during characterization of the 16-acre SE Corner Area indicated dioxin concentrations of 2.5 pg/g to the west and 401 pg/g to the south of the former Dip Tank Area (Section 2.4.2). Deeper soil samples were not analyzed for dioxin during this phase of the evaluation, but the vertical extent of soil contamination is expected to be limited due to several factors. These factors include the surficial nature of the source(s) and releases, shallow groundwater with predominant lateral flow in this area, and the affinity of dioxin for adsorption to the soil (i.e., limited migration with groundwater due to preferential retention on the soil matrix) (Section 5). Figure 9 illustrates initial dioxin data (2010 – 2014) for soils within and adjacent to the former Dip Tank Area.

Non-creek environmental issues in the former Dip Tank Area focus on where shallow soil impacts by dioxin represent (1) unacceptable human health risks based on potential occupational direct exposure, and (2) source control implementation to prevent potential contaminant migration to Bear Creek. No significant ecological risk factors have been identified within the paved former Dip Tank Area except as related to creek source control. Based on the recent risk evaluation for the adjacent 16-acre SE Corner Area (EES 2014a) and discussions with DEQ, occupational direct contact RBCs governing dioxin concentrations in Dip Tank Area soil (under pavement) may be as low as 16 pg/g, with corresponding “hot spot” concentrations of 1,600 pg/g. In the context of stormwater source control and potential contaminant migration to the creek, the 16 pg/g upland soil RBC for occupational receptors would be protective of a 20 pg/g mammalian PRG for dioxin established by DEQ for Bear Creek sediments (Section 3.1.1). Other occupational and trespasser receptor scenarios (Section 6) will be adequately protected by the application of the most stringent 16 pg/g direct contact RBC and associated hot spot reference concentration of 1,600 pg/g for Dip Tank Area soils.

As with Bear Creek sediment delineation, additional Phase 3 RI soil sampling was necessary to address the remaining RI data gaps for characterization within the study area.

3.1.3 Groundwater

RI findings indicate that COIs across the site, and specifically within the study area, are localized. Contaminant migration in groundwater is not expected to be a concern considering the subsurface characteristics of the site, as well as the generally low mobility of the contaminants of concern. The RI concludes and DEQ has acknowledged that there are no indications that the local drinking water aquifer is in contact with or otherwise threatened by site contaminants. Although the shallow water table discharges to Bear Creek in this area, site contaminants have not been identified in groundwater as it approaches the creek and future migration is not expected to be a concern (Section 4).

3.1.4 Surface Water

The Conceptual Site Model (CSM) indicates that Bear Creek surface water is not substantially threatened by environmental issues related to shallow soil and groundwater impacts at the Floragon site (Section 5). Site surface water is adequately protected because stormwater discharges to the creek from on-site sources are primarily limited to surface water runoff from paved areas and no active manufacturing operations have occurred at the site near the creek since 2006. Wetland and waters determinations have been conducted to characterize Bear Creek conditions at the site (SWCA 2015 and 2016). Factors mitigating the threat to Bear Creek surface water include:

- The greatest potential source of impact to site surface water is migration of contaminated Dip Tank Area soils into the creek. Contaminated soils in this area are paved and the potential for direct contact and runoff across exposed areas is therefore unlikely.
- No other sources of contamination are known or expected to exist in this area.
- COIs, where present in groundwater are not expected to migrate to the creek.
- Except during winter flood events when creek flow overtopping the banks is observed, creek conditions are generally low energy and not erosive.
- Catch basin and related conveyance/discharge piping at the Dip Tank Area is expected to contain a limited quantity of sediments and mitigate potential future impacts.

3.2 BEAR CREEK SEDIMENT INVESTIGATION

Multiple sediment sampling events have been collected throughout on-site portions of Bear Creek during RI efforts dating to 2010. Most recently, Phase 3 RI sampling was conducted during November 2014 (within Reach 3 of the creek where the site's greatest dioxin concentrations in sediment had previously been identified) and October 2015 at the site's remaining portions of Bear Creek (referred to as Reach-1, -2, -4, and -5).

For the Phase 3 sampling effort, a total of 17 transect sample locations (SED-200 through SED-211 and AB-25-0 through AB-25-5) were used to supplement prior samples so that characterization data would be established at approximately 50 to 100 foot intervals within the creek study area. Because of the presence of dense fill and debris, available sediment data is generally limited to the top one foot of the creek bed in most locations (see discussion below). Dioxin data and sediment sampling locations are illustrated on Figures 10 and 11. Investigation details are provided and attached in a separate Phase 3 RI data summary technical memorandum (Appendix A).

3.2.1 Sediment Sampling

PNG implemented the DEQ-approved Work Plan investigation activities and collected sediment samples using the following approach:

In order to obtain representative physical and chemical data that incorporates a degree of spatial variability, three individual "A/B/C" sediment samples were collected from a transect across the creek bed at each of the 17 sampling locations, for each of two depth intervals where possible (0-1 and 1-2 feet below the water/sediment interface). Samples were collected from near the transect edges ("A" and "C"), with the "B" sub-location collected from near the center of the creek bed. PNG collected and containerized all individual samples separately. For each A/B/C transect, the analytical laboratory split

each sample such that aliquots of equal mass were mixed into a single composite sample for a given location and depth.

Additional creek sediment thickness and distribution data were collected using a soil probe at approximately 50 foot increments within the creek basin study area. Sediment thickness was measured after sampling activities to minimize disturbance to the sampling areas.

Bear Creek conditions observed during RI efforts were generally consistent among sediment sampling locations, and similar to previous sampling events. The creek banks are for the most part bounded with rip rap and thick vegetation. Surface water in Bear Creek was typically one to three feet deep (deeper in several locations), extending up to 25 feet wide during the October 2015 investigation. Sediment deposits were comprised of approximately six inches to two feet of silty gravel, underlain by very dense gravels. Woody and other debris within the sediment deposits was encountered at various depths throughout the study area. Sampling refusal occurred at the dense gravel interface with the overlying sediment deposit.

No obvious signs of chemical contamination such as hydrocarbon sheen, discoloration, or stressed vegetation were observed in any of the sediment sampling locations. Typical transect cross sections for the study area (Reach-1 through Reach-5) are presented in the *Phase 3 RI Report Technical Memorandum* (Appendix A).

3.2.2 Sediment Analytical Testing Results (Dioxin)

A total of 25 composite sediment samples, including one duplicate sample (dioxin only), were analyzed for dioxin and furans by EPA Method 1613B, and conventional parameters including grain size distribution, bulk density, moisture content, and total organic carbon. Standard testing for total and leachable metals by EPA Method 6010 was also conducted among selected samples. Individual split samples from each discrete sampling location were archived at the analytical laboratory.

The 2014-2015 creek data provide a useful supplement to the overall sediment investigation for this site. Investigation findings confirm dioxin concentrations in creek sediments are moderately elevated above the DEQ Remedial Action Level (120 pg/g) within a localized zone at the site, limited to defined areas within Reaches 1 through 5. Dioxin in creek sediments, where identified above the 120 pg/g RAL, are limited primarily to shallow fine-grained sediments within the upper one foot of the creek bed. These higher TOC concentrations reflect the heavily vegetated nature of the creek as well as the relatively low energy creek flow conditions that limit erosion and mobility of the fine-grained sediments (relatively low energy flow conditions resulting from beaver dams culvert flow restrictions, heavy vegetation, etc.).

Sediment analytical results are summarized below and illustrated on Figures 10 (all RI data) and 11 (showing the Phase 3 RI study area at Reaches 1 through 5). Sampling and analytical details are provided separately in Appendix A. Key findings and observations for the study area are summarized below.

Reach 1

Reach-1 (Figure 11) represents upstream sediment conditions where Bear Creek enters the Floragon property. South Molalla Avenue, a major local roadway, crosses Bear Creek immediately adjacent and upstream up this eastern property boundary, and roadway runoff and drainage ditches discharge directly to the creek at this location. Also, surface

water runoff from other commercial and residential properties discharges to the creek upstream of this reach of the creek.

Sediment sample AB-28 was collected in 2010 from the Reach 1 area near the most upstream Floragon property boundary. Sampling data is limited at location AB-28 to shallow sediments (0-1 foot depth), where dioxin were detected at a concentration of 165 pg/g. To delineate the extent of dioxin in Reach-1 sediments, Phase 3 RI transect locations SED-211 and SED-210 were established sequentially downstream from AB-28 at approximately 50 foot intervals.

- Shallow sediment samples collected from SED-211 (105 pg/g) and SED-210 (45 pg/g) identified dioxin at decreasing concentrations with distance from AB-28. Only one deeper sediment sample has been recovered in Reach 1 to date, with dioxin detected in the 1-2 foot deep sample from SED-211 at a concentration of 84 pg/g.
- Reach 1 dioxin concentrations exceed the PRG of 20 pg/g in all three samples collected during the Phase 3 RI. Among all RI data collected to date at Reach 1, only the most upstream sample (165 pg/g at AB-28) exceeds the RAL of 120 pg/g.
- Dioxin concentrations in sediment samples from Reach 1 are greatest near the upstream boundary where local drainage features and Bear Creek enter the Floragon property. Multiple potential offsite sources of dioxin are present along the drainage features that discharge to Bear Creek at this upstream location.

Culvert 1-2

Bear Creek flows into an underground culvert at the downstream end of Reach 1. Composite sample SED-1 (Figure 11) was collected in 2012 from sediments at an exposed small culvert junction near the middle of this section, between Reaches 1 and 2. The dioxin concentration of 19 pg/g at this SED-1 location is below the 20 pg/g PRG. Shallow sediment samples have also been collected immediately upstream (SED-210 at 45 pg/g) and downstream (SED-209 at 151 pg/g) of this culvert.

Reach 2

Reach 2 begins where the creek exits a culvert, approximately 250 feet downstream from Reach 1. Prior sediment dioxin data from Reach 2 was collected in 2012 at location SED-2 (46 pg/g). In 2015, PNG further delineated dioxin in Reach 2 sediments at locations approximately 50 feet upstream (SED-209) and downstream (SED-208) of SED-2 (Figure 11).

- Dioxin were detected in shallow sediment samples SED-209 and SED-208 at concentrations of 151 and 41 pg/g, respectively.
- Deeper sediment samples collected from the same locations at depths between one and two feet show decreasing dioxin concentrations with depth at SED-209 (25 pg/g) and SED-208 (9.6 pg/g).
- Among all Reach 2 sediment samples, dioxin concentrations exceed the 20 pg/g PRG in all three of the shallow samples, and in the one deeper upstream (SED-209) sample. Only the shallow upstream sample (151 pg/g at SED-209) exceeds the 120 pg/g RAL.

Culvert 2-3

The creek flows through a short buried culvert for approximately 50 feet between Reaches 2 and 3. Shallow sediment samples have been collected immediately upstream (SED-208 at 41 pg/g) and downstream (AB-25-0 at 71 pg/g) of this culvert (Figure 11).

Reach 3

Initial RI sampling in 2010 identified dioxin (413 pg/g) in shallow sediments at the AB-25 (Figure 11) location, near the center of this approximately 350-foot long reach of Bear Creek. Supplemental characterization efforts were conducted in November 2014, when five additional sample transect locations were evaluated, all among shallow (0-1 foot) sediments. Deeper sediment data was not obtained in Reach 3 due to gravelly subsurface conditions encountered at depths below approximately one foot.

- Dioxin concentrations ranged between 71 pg/g (AB-25-0) and 485 pg/g (AB-25-3) in shallow sediment samples collected throughout Reach 3, all of which exceed the 20 pg/g PRG. Upstream (AB-25-0) and downstream (AB-25-4) locations within this reach were found to be below 100 pg/g dioxin.
- Dioxin concentrations exceeding the 120 pg/g RAL were identified near the midsection of the reach at locations AB-25-1 (158 pg/g) and AB-25-3 (485 pg/g), as well as the 2010 sample from AB-25 (413 pg/g).

Culvert 3-4

The creek flows through a buried culvert for approximately 100 feet between Reaches 3 and 4. Shallow sediment samples have been collected immediately upstream (AB-25-4 at 96 pg/g) and downstream (SED-206 at 102 pg/g) of this culvert (Figure 11).

Reach 4

Reach 4 represents the longest continuous stretch of open, non-culverted creek identified at the Phase 3 study area, extending approximately 600 feet. Previous shallow sediment dioxin data was collected in 2012 at the upstream end of Reach 4 (SED-3 at 71 pg/g). PNG collected supplemental samples in 2015 at six additional transect locations (SED-202 to SED-207) where both shallow and deeper (where feasible) sediment samples were obtained (Figure 11).

- Including the 2012 and 2015 samples, shallow dioxin concentrations ranged from 32 to 220 pg/g, all exceeding the PRG of 20 pg/g. Among these shallow samples, only one (SED-204 at 220 pg/g) exceeded the 120 pg/g RAL.
- Sampling from the deeper zone (1-2 feet depth) was limited due to the presence of dense gravel and wood debris. Samples were collected in this interval at three of the six 2015 locations, all near the midsection of Reach 4, where dioxin concentrations ranged from 11 to 402 pg/g. The deep sample at SED-204 (97 pg/g) exceeded the 20 pg/g PRG, and the deep sample from SED-207 (402 pg/g) exceeded both the PRG and the 120 pg/g RAL.
- The cause of deeper contaminated sediments at the SED-207 location is not certain, but is anomalous in comparison to all other vertically delineated sampling locations at the site where dioxin concentrations are observed to attenuate with depth. During brush clearing and survey activities prior to Phase 3 RI sampling in 2015, PNG identified an old culvert and associated creek outfall appearing to drain roadway ditches from the adjacent South Molalla Forest Road into Reach 4. This

culvert and outfall is located near the SED-203 location and approximately midway between the SED-207 and SED-204 sample transects (comprising the three locations where the greatest dioxin concentrations were measured at Reach 4). Stormwater runoff from South Molalla Forest Road represents a potential contribution of offsite dioxin from activities such as vehicle emissions, oil application for dust suppression, herbicide use, etc.

Culvert 4-5

The creek flows through a culvert for approximately 50 feet between Reaches 4 and 5. Creek sediment samples have been collected immediately upstream (SED-202 at 32 pg/g) and downstream (AB-23 at 182 pg/g) of this culvert (Figure 11).

Reach 5

Sediment transects SED-200 and SED-201 were established and sampled in Reach 5 to help delineate dioxin impacts previously identified in shallow sediments at upstream (AB-23 at 182 pg/g) and downstream (SED-8 at 43 pg/g) portions of this reach (Figure 11).

- Among shallow sediments, dioxin were identified among the 2015 samples at concentrations between 49 pg/g (SED-200) and 266 pg/g (SED-201). Combined with prior RI data, these results indicate dioxin at relatively higher concentrations exceeding the 120 pg/g RAL (SED-201 and AB-23) for locations within the pooled area immediately upstream of a beaver dam, compared to downstream of this dam (SED-200 and SED-8) where lower dioxin concentrations were observed between the 20 pg/g PRG and the RAL.
- Deeper sediment samples collected between one and two feet at these Reach 5 locations exhibited overall lower dioxin concentrations compared to shallow samples from the same locations, and a similar pattern of decreasing concentrations downstream of the beaver dam. The deep sample above the beaver dam (53 pg/g at SED-201) exceeds the 20 pg/g PRG, but downstream deep sample SED-200 (5.4 pg/g) is below the PRG.

Beaver Dam Areas

Beaver dams are located at the upstream and downstream margins of Reach 5, with a third (offsite) dam located approximately 150 feet downstream of Reach 5 (Figure 11). The age(s) of these temporary dams has not been determined but the dams influence creek flow to at the site. These dams restrict channel flows and velocities. Creek flow velocities are reduced in the ponded areas behind the dams and greater sediment deposits are observed in these areas behind the dams.

- A relatively broad and deep pool has been observed at the upper section of Reach 5, between Culvert 4-5 and beaver dam #1. As expected, Bear Creek appears to lose energy and is depositional in character in this area where shallow dioxin concentrations are relatively high (182 to 266 pg/g). Immediately upstream from the dam at SED-201, dioxin concentrations decreased with depth to 53 pg/g in the interval from one to two feet.
- A second beaver dam is located at the downstream end of Reach 5, approximately 200 feet north of dam #1. The area between dam #1 and dam #2 is brushy and relatively flat in contrast to the deeper, low-energy pool above dam #1. Sample SED-8 was collected from a location immediately upstream of dam #2 in 2012,

indicating much lower dioxin concentrations (43 pg/g) compared to samples collected upstream from beaver dam #1.

- Downstream another 200 feet below dam #2, beaver dam #3 is located adjacent to an off-site pasture area where ponded water is more extensive. In 2012, PNG collected shallow sample SED-4 from an on-site portion of this beaver pond, upstream of dam #3. Dioxin concentrations in SED-4 (8.0 pg/g) were lower than all other upstream samples on the site and support the observed pattern of sequentially decreasing dioxin concentrations with distance from upper portions of Reach 5.

3.2.3 Sediment Analytical Testing Results (Other Chemical & Physical Parameters)

Whereas Phase 3 RI activities focused on dioxin characterization and risk evaluation, supplemental sediment samples were analyzed for other chemical and physical parameters in support of broader characterization goals. Analytical findings are summarized below.

Metals

Analyses for total and leachable metals were performed on five sediment samples (SED-200, SED-201, SED-203, SED-205, and SED-211). With the exception of chromium and lead, metals were detected in samples analyzed at concentrations near or below DEQ default background concentrations (DEQ 2013). Metals results are provided in Tables 1-42 and 1-43.

Among the five shallow Phase 3 RI sediment samples analyzed, chromium was detected at concentrations ranging between 21 and 40 milligrams per kilogram (mg/kg). Two samples (SED-205 and SED-211) exceeded DEQ's default freshwater sediment background concentration of 30 mg/kg (DEQ 2010). Previous RI sampling events conducted in 2010 and 2012 identified chromium among 16 other shallow creek sediment samples ranging from 11.6 to 98.8 mg/kg at an average concentration of 46.5 mg/kg.

Lead was detected in all five Phase 3 RI sediment samples at concentrations between 3.7 and 10 mg/kg, which exceed DEQ's freshwater sediment background concentration of 2 mg/kg. As with chromium, the greatest lead concentration among this sample set was obtained from SED-211, located upstream near South Molalla Avenue. Among the 16 other RI sediment samples collected between 2010 and 2012, lead concentrations were in the same general range (5 to 32 mg/kg) with the exception of the site's most upstream sample (AB-28 at 110 mg/kg), collected immediately adjacent to and downstream from South Molalla Avenue.

Total Organic Carbon and Physical Parameters

Total organic carbon (TOC) and physical parameter testing results are provided in Table 1-45.

Total organic carbon was measured in all of the Phase 3 RI sediment samples (shallow and deep transect composites) at concentrations ranging between 2,000 and 21,000 mg/kg. Shallow and deep concentrations averaged 10,900 and 5,500 mg/kg, respectively. The nine sediment samples collected in 2012 and analyzed for TOC (6,500 to 47,000 mg/kg, averaging 25,700 mg/kg) were all obtained from the shallow (0-1 feet) center-channel "B" sampling location (not the full A+B+C transect).

Physical parameter testing included bulk density and grain size analyses. Phase 3 RI dry densities ranged between approximately 60 and 75 pounds per cubic feet (pcf), compared to the 90 to 100 pcf range measured among the 2012 Phase 2 RI samples. Sediment grain size distribution was also consistent with the physical and chemical testing results, demonstrating predominant sand and gravels at all transect locations but with much greater silt content among the cross-channel Phase 3 RI samples in comparison to the Phase 2 RI data set which was limited to mid-channel "B" samples.

Overall creek conditions are unlikely to have changed significantly between 2012 and 2015. The following general observations can be made regarding Bear Creek sediments at the site:

- TOC concentrations are much greater among shallow sediments in the uppermost one foot, compared to deeper sediments. These higher TOC concentrations reflect the heavily vegetated nature of the creek at the site. This observed trend is consistent with expectations for relatively low-energy, depositional creek flow conditions (i.e., higher energy flow conditions would be expected to erode and remove the generally easy to suspend and transport organic matter/organic carbon).

  Coarse-grained sediments dominate the deeper flowing mid-channel portions of the creek (B samples), compared to channel margins (A and C samples) where lower flow velocities and stream energies result in a greater relative concentration of fine-grained sediments containing organic matter. Despite mid-channel areas having relatively greater sand and gravel content and fewer fines compared to creek margins, the total organic contents are relatively high throughout the shallow zone.

3.2.4 Wetland and Waters Determination for Bear Creek Study Area

Contaminated sediments are located within Bear Creek at levels exceeding RALs established by the DEQ. DEQ has also expressed concerns with regard to source control and potential migration of contaminated soils from the former Dip Tank Area into Bear Creek. Because of these factors and in support of potential future remedial action planning for the creek, a wetland and waters determination was conducted in support of the overall site characterization and ecological risk assessment goals under the RI as summarized below. This jurisdictional determination work was conducted in accordance with rules established under OAR 141-090 regarding wetlands and waters of the state.

SWCA Environmental Consultants (Portland, Oregon) conducted the wetland and waters determination for Bear Creek Reaches 1 through 5 of the Phase 3 RI study area (Figures 10 through 12). The determination work was conducted in two phases between 2014 and 2016, with separate reports summarized below. Each of the two reports identifies Bear Creek as a Water of the State, and concludes that no Threatened or Endangered Species were known or suspected within the Bear Creek study area. This study area is not regarded as Essential Salmon Habitat (ESH), defined as the habitat necessary to prevent the depletion of native salmon species (chum, sockeye, Chinook and Coho salmon as well as steelhead and cutthroat trout) during their life history stages of spawning and rearing. The ESH designation identifies streams supporting species listed as sensitive, threatened, or endangered by state or federal authority, and no such designation is recognized for the study area. The Determination Report and Oregon Division of State Lands (DSL) concurrence documentation is provided in Appendix B.

- Reach 3 was evaluated in 2014 as a priority based on RI status and related discussions with DEQ at that time. No wetlands were identified within the

boundaries of Reach 3. The Reach 3 wetland and waters determination report was issued June 10, 2015 and received concurrence from the DSL on August 24, 2015 under WD #2015-0279.

- SWCA conducted supplemental wetland and waters delineation activities in remaining sections of the Bear Creek RI study area (Reaches 1, 2, 4, and 5) in November 2015. Small wetlands areas were identified and delineated directly abutting Bear Creek in Reaches 2 and 5, as illustrated on Figure 12. This wetland and waters determination report was issued April 7, 2016 and received concurrence from the DSL on June 1, 2016 under WD #2016-0177.

The Wetlands and Waters delineation provides support to RI conclusions regarding ecological receptor characterization for this portion of the site (Section 6.3). With respect to Bear Creek at the site, PNG and SWCA have independently identified poor quality habitat, limited and non-threatened ecological receptors, and limited and non-native riparian area characterization. The Oregon DSL has concurred with this site-specific characterization based on its review of the two SWCA reports for Reaches 1 through 5.

Areas of Bear Creek sediment contamination as delineated in this RI are located within Waters of the State. DSL acknowledgment of this determination has been obtained and is a necessary precondition for future development and submittal of a Joint (DSL/USACOE) Removal/Fill Permit application, which is required before a sediment removal action in the creek could occur. These administrative criteria must be acknowledged and incorporated into future remedy planning.

Creek conditions are subject to seasonally variable water levels which will be an important factor in the evaluation of potential sediment remedy options.

3.3 FORMER DIP TANK SOIL INVESTIGATION

Remedial Investigation efforts dating to 2010 identified the former Dip Tank Area as a source of shallow soil impacts related to historic mill operations (Figures 3, 4, and 9). Most recently, 2015 Phase 3 RI in this area included collecting soil samples from a total of 32 soil borings each advanced to five feet depth. Soil samples were intended to provide vertical and lateral delineation of dioxin across the former Dip Tank Area, particularly surrounding 2010 sample locations AB-19B (1,115 pg/g among drainage feature sediments) and AB-06 (2,221 pg/g in shallow soil). Soil sampling locations and dioxin data are illustrated on Figures 9, 13, 14, and 15, and summarized on Table 2-1.

PNG directed investigation activities and collected soil samples using the following approach (see Appendix A for details):

- In order to delineate known shallow impacts in the former Dip Tank Area, PNG collected discrete shallow soil samples from each boring at depth intervals of 0-0.5 feet, 1.5 feet, 3 feet, and 5 feet below ground surface. In areas covered by foundations, footings, or other remnant features, soil samples were collected immediately beneath such features and at sequential elevations intended to match other locations and depth intervals.
- Samples were collected and containerized separately. The analytical laboratory split each discrete sample such that aliquots were mixed into a single composite sample for a given location and depth. Remaining portions of each individual split sample were archived.
- For each depth interval, four-point composite samples were generated from (1) proximal borings B1-B4 and B9-B12 located within approximately 20 feet of

AB-19B and AB-06, and (2) distal borings B5-B8 and B13-B16 located within approximately 50 feet of AB-19B and AB-06.

- Similar to the AB-19B and AB-06 areas, four-point composite samples were generated at each depth interval from each of the four quadrants surrounding the former Dip Tank Area (borings B17-B32).
- Initial soil analytical testing was limited to the two shallowest depth intervals (0.5 and 1.5 feet) and therefore consisted of a total of sixteen such composited samples. Select deeper samples from three and five feet depth were subsequently analyzed to supplement the delineation, or archived.
- Based on contaminant characterization to date (Section 2.4.2), groundwater sampling was not conducted during Phase 3 RI activities.

3.3.1 Subsurface Conditions

The former Dip Tank Area is covered entirely by asphalt pavement with two concrete foundation slabs associated with former mill buildings. Sub-pavement soils generally consist of approximately three feet of gravel fill with some sand and silt, underlain by silt with gravel and some woody debris. Fine-grained silty matrix was generally absent or minimal among observed gravel fill materials. Moist to wet soil conditions were encountered at depths between four and five feet below ground surface during Phase 3 RI drilling, consistent with observations regarding the water table in this area.

3.3.2 Soil Analytical Testing Results (Dioxin)

A total of 16 composite soil samples plus one duplicate were analyzed for dioxin and furans by EPA Method 1613B in 2015. Based on prior findings, select soil samples from the former Dip Tank Area were analyzed for secondary contaminants including petroleum hydrocarbons by method NWTPH-Dx, semi-volatile organic compounds (SVOCs, including pentachlorophenol) by EPA Method 8270C, and RCRA-8 total and leachable metals by EPA Method 6020. Individual split samples from each discrete sampling location were archived.

RI data indicate one localized “hot spot” with respect to dioxin was identified at the site, with that single sample collected in 2010 at a depth of 0.5 feet at the AB-06 location (2,221 pg/g), adjacent to one of the former Dip Tank features. Current Phase 3 RI data provide useful supplemental contaminant delineation for the former Dip Tank Area. Among the 16 composite soil samples analyzed during this most recent Phase 3 RI, dioxin concentrations in all but two were at or below 63 pg/g, with the two exceptions (172 and 489 pg/g) occurring at the B13-16 composite area surrounding the known “hotspot” at AB-06. Investigation findings confirm dioxin concentrations in former Dip Tank Area soils are in some cases moderately elevated above the lowest applicable DEQ RBC of 16 pg/g (soil ingestion, dermal contact, and inhalation in an occupational setting), but are generally within the range of RBCs for occupational receptors (16 to 170 pg/g).

Therefore moderately elevated levels of dioxin characterized in this former Dip Tank Area are limited to shallow soils that are not expected to experience extensive erosion or migration. The dioxin associated with shallow soil is not expected to migrate appreciably based on their presence beneath paved surfaces preventing erosion as well as the limited potential for leaching to and migration with shallow groundwater.

Soil analytical results are summarized below and on Table 2-1, and illustrated on Figures 14 and 15. Details are provided in Appendix A.

- Elevated dioxin levels (2,221 pg/g) detected at soil sample location AB-06 in 2010 were delineated during the Phase 3 RI by evaluating composite soil samples collected at increasing lateral and vertical distances from this location.
  - Four-point proximal composite samples (B9-B12) collected from within 20 feet of AB-06 contained low levels of dioxin at concentrations of 19 pg/g (0.5 feet depth) and 20 pg/g (1.5 feet depth), slightly exceeding the occupational direct contact RBC of 16 pg/g.
  - More distant four-point composite samples (B13-B16) collected within 50 feet of AB-06 indicated dioxin levels of 489 and 172 pg/g for 0.5 foot and 1.5 foot depth samples, respectively. These detections exceed both the occupational direct contact RBC and the construction worker RBC (170 pg/g) for dioxin.
- Catch basin sediment sample AB-19B (1,115 pg/g dioxin) was collected in 2010 from the former Dip Tank Area approximately 100 feet west of AB-06. Phase 3 RI sampling efforts in the AB-19B area are intended to delineate dioxin impacts if any, to surrounding soils. The Phase 3 RI sampling approach in this area consisted of the same type of four-point composite samples as were collected around the AB-06 location, at distances of approximately 20 feet (B1-B4) and 50 feet (B5-B8) from AB-19B, and at various incremental depths.
  - The shallow proximal soil sample composite collected within 20 feet of AB-19B contained dioxin at 41 pg/g (0.5 feet depth) and 14 pg/g at 1.5 feet deep, with these concentrations straddling the 16 pg/g occupational direct contact RBC.
  - More distant four-point composite samples (B5-B8) collected within 50 feet of AB-19B indicated dioxin levels of 19 pg/g and 6 pg/g for 0.5 foot and 1.5 foot depth samples, respectively. These soil detections also straddle the 16 pg/g occupational direct contact RBC.
- Elsewhere around the margins of the former Dip Tank Area and located at various distances up to approximately 300 feet from AB-06 and AB-19B, four additional sets of four-point composite samples were collected using the same approach. These perimeter composites were intended to represent four quadrants surrounding the known impacts at AB-06 and AB-19B.
  - Northwest quadrant composite (B17-B20) contained dioxin at 51 pg/g (0.5 feet depth) and 63 pg/g at 1.5 feet deep, with these concentrations falling between the 16 pg/g occupational direct contact RBC and the 170 pg/g construction worker RBC. This is the only composite sample among the 16 analyzed not exhibiting dioxin attenuation with depth.
  - Northeast quadrant composite (B21-B24) contained dioxin at 29 pg/g (0.5 feet depth) and 3.6 pg/g at 1.5 feet deep, with these concentrations straddling the 16 pg/g occupational direct contact RBC.
  - Southwest quadrant composite (B25-B28) contained dioxin at 5.6 pg/g (0.5 feet depth) and 0.6 pg/g at 1.5 feet deep, with these concentrations below the 16 pg/g occupational direct contact RBC.
  - Southeast quadrant composite (B29-B32) contained dioxin at 44 pg/g (0.5 feet depth) and 4.7 pg/g at 1.5 feet deep, with these concentrations straddling the 16 pg/g occupational direct contact RBC.

- Other soil samples collected from the former Dip Tank Area during prior phases of the RI (Figure 9 and Table 2-1) indicated shallow dioxin concentrations falling generally within the range observed during the Phase 3 RI sampling, as follows:
  - AB-03 at 152 pg/g (vertically integrated, uppermost one foot of soil beneath the pavement).
  - AB-05 at 328 pg/g (vertically integrated, uppermost 0.5 foot of soil beneath the pavement).
  - AB-08 at 43 pg/g (vertically integrated, uppermost 0.5 foot of soil beneath the pavement).
  - AB-19A at 109 pg/g (solids collected from the base of this catch basin).

3.3.3 Other Soil Analytical Testing Results

Additional contaminants of interest for the former Dip Tank Area were evaluated on a limited basis as part of Phase 3 RI activities. With the exception of dioxin and a minor detection of arsenic (discussed below), no other contaminants were detected in soils at concentrations exceeding the applicable DEQ RBCs or natural background levels, as summarized below and on Tables 3-1 through 7-2. Supporting information is provided in Appendix A.

- Petroleum Hydrocarbons: Chemical analysis for diesel- and oil-range hydrocarbons was performed on shallow and deeper soil samples collected from all composite areas described above (16 samples total). Diesel was not detected in the any of the 16 soil samples analyzed and where present, oil was detected at concentrations ranging between 52 mg/kg and 3,860 mg/kg. For reference, the lowest applicable RBC (construction worker scenario) is 4,600 mg/kg.
- Chlorophenols: Soil samples collected at a depth of 1.5 feet from each of the composite areas were analyzed for chlorophenols. PCP was detected in samples B1-4(1.5) and B17-20(1.5) at concentrations of 0.021 mg/kg and 0.090 mg/kg, respectively; both concentrations being near the analytical MRL. For reference, the lowest applicable RBC for PCP (occupational worker scenario) is 4 mg/kg. In an effort to delineate the vertical extent of pentachlorophenol near the AB-19 area where elevated dioxin were identified, follow-up pentachlorophenol analysis was performed on samples collected above and below the 1.5 foot depth interval at the B1-B4 composite. PCP was detected in the 0.5 foot soil at a concentration of 0.193 mg/kg, and in the 3 foot sample at of 0.017 mg/kg, far below the RBC reference. Deeper impacts are not suspected based on the expected near-surface contaminant source.
- Semi-volatile Organic Compounds: Four composite soil samples each collected at a depth of 1.5 feet from locations surrounding AB-19 (B1-B4 and B5-B8) and AB-06 (B9-B12 and B13-B16) were analyzed for SVOCs. With the exception of naphthalene and phenanthrene at very low concentrations, no other SVOCs were detected in these four samples at concentrations above the laboratory MRLs. Naphthalene and phenanthrene were detected in soil sample B1-4(1.5) at concentrations of 0.0068 mg/kg and 0.0019 mg/kg, respectively. For reference, the lowest applicable RBC for these COIs (occupational worker scenario) is 23 mg/kg (RBC for naphthalene; no published default RBC for phenanthrene).
- Metals: Total and leachable metals analyses were performed on soil samples collected at a depth of 1.5 feet from locations surrounding AB-19 and AB-06.

Among the four samples analyzed, total metals concentrations (including lead) were detected at levels generally expected in Willamette Valley soils (DEQ 2013) or below the applicable DEQ RBCs. A minor exception was soil sample B9-B12, where arsenic was detected at a concentration (9.4 mg/kg) exceeding the default regional background concentration (8.8 mg/kg) and occupational RBC (1.9 mg/kg), but below the construction worker RBC (15 mg/kg). These four soil samples were additionally analyzed for leachable RCRA-8 metals. With the exception of low levels of barium detected in each sample, no other leachable metals were detected among the four soil samples analyzed.

4 BENEFICIAL LAND AND WATER USE DETERMINATIONS

4.1 LAND USE

The study area is currently vacant with anticipated future redevelopment consistent with its industrial use history and zoning. The five acres comprising the RI study area are currently zoned for rural industrial (RI, Clackamas County) or Heavy Industrial (HI, City of Molalla) use, and are expected to remain so in the future. Land use among surrounding properties includes Heavy Industrial to the north (HI, City of Molalla); Rural Residential Farm Forest to the west and south (RRFF5, Clackamas County); and Farm Forest to the east (FF10, Clackamas County). Vicinity land use is similar, with increased residential and commercial/industrial use towards Molalla to the north.

A zoning map for the site and surrounding properties is presented as Figure 2C. Both existing Floragon buildings located south of Bear Creek in the 16-acre SE Corner Area are currently vacant and Floragon is marketing the 16-acre parcels for sale. No future changes in land use or zoning are likely.

4.2 GROUNDWATER USE

Municipal water supply to the Floragon site and vicinity is provided by the City of Molalla. No water supply wells, irrigation wells, or other production wells are known to be located nor are any wells anticipated for future installation at the Floragon site.

The beneficial land and water use determinations conclude that no immediate concerns regarding current or future land or groundwater use have been identified for the Floragon site. Water table groundwater and Bear Creek surface water at the site are not known to be used for irrigation, commercial/industrial purposes, or for drinking. In areas beyond site margins where groundwater is used, the identified water supply wells are sealed within 30 to 50 feet of the ground surface and screened below a clay aquitard in the regional aquifer at depths typically approaching or exceeding 100 feet, as summarized below.

As a supplement to the 2011 Phase 1 RI Report, PNG conducted a well log database search in late 2011 and identified 108 water wells registered within a two square mile radius surrounding the Floragon site. Most of the registered wells (91) were for domestic use with eight used for irrigation (PNG 2013). All nine wells identified within approximately 1,000 feet of the Floragon site were reportedly constructed in a manner intended to draw water from depths near or below 100 feet, and these wells were all sealed within the uppermost 30 feet of the ground surface in order to isolate and exclude inflow from the unconfined shallow zone. RI findings indicate that flow within the unconfined water table aquifer is upwards, with discharge to the ground surface at Bear Creek. Where shallow water table contaminant impacts have been identified at current (Dip Tank) and former (Hyster Shop) Areas of Concern at the site, RI data indicate (1) contaminant concentrations are below applicable RBCs, and (2) measurable contaminant concentrations have not been identified in sentinel wells located near Bear Creek. Based on this characterization, the Locality of the Facility (LOF) is limited to the 3.19 acre former Dip Tank portion of the study area within Floragon property boundaries.

The results of the beneficial water use determination (BWUD) and supplemental research support RI data indicating that shallow groundwater at the Floragon site is physically isolated from the regional drinking water aquifer and registered local water wells are sealed and constructed in a manner intended to draw from the deeper aquifer. The BWUD also evaluated the beneficial use of surface water and, in particular, the potential contaminant migration from shallow groundwater to Bear Creek surface water. This

potential migration and influence on Bear Creek surface water was evaluated during Phase 2 of the RI (Section 2.4.2). Although shallow groundwater discharges to surface water at Bear Creek on the subject site, pentachlorophenol has been detected among any of the monitoring wells located near Bear Creek and contaminant discharges from groundwater to surface water are not expected.

4.3 SURFACE WATER USE

4.3.1 Bear Creek

Bear Creek, a small seasonal stream, originates approximately one mile east of the site and flows into the Pudding River approximately 8.5 miles northwest of the site. Bear Creek enters the site near the southeast boundary of tax lot 01107331 and flows generally westward through the southern portion of the site. Bear Creek exits the site near the northwest corner of tax lot 01107956, then flows to the west-northwest just south of tax lot 01107974 and along the southern boundary of tax lot 01107947 (Figure 16).

Flow in Bear Creek is ephemeral. Although on-site portions of the streambed may retain stagnant water (the intersecting water table) during the dry summer and early fall period, Bear Creek is observed to run dry upstream and downstream of the Floragon site during seasonal low-water periods.

Bear Creek surface water in the LOF is not known to be used for any beneficial uses although the creek traverses a neighboring horse pasture to the west (downstream) of the 4-acre Phase 3 RI study area. Recreational use of Bear Creek is not likely to occur in the LOF although this scenario has been considered and evaluated as part of the HHRA. Human health and ecological risk considerations for Bear Creek and related sediments are described in Section 5.

4.3.2 Storm Water Source Control

Storm water control at the former Dip Tank Area portion of the site (tax lot 01107340) is dictated by overland flow across paved surfaces to two catch basins and a down-slope drainage feature located at the former dip tank area, as illustrated on Figure 16. Catch basins CB-6 and CB-7 control stormwater runoff near Building #1 with underground piping flow directed north into a concrete collection basin which appears to discharge to Bear Creek. Catch basins CB-8, -9, and -10 are connected, with a discharge pipe leaving Catch Basin 10 to the west towards Bear Creek. This pipe is assumed to discharge to Bear Creek; however, results from a dye tracer test (PNG 2011) were inconclusive and its discharge point is currently not confirmed. Overland flow not entering catch basins in this portion of the site appears to flow to Bear Creek. Exposed soils are present allowing subsurface infiltration on the eastern margins of the study area. Future inspection and maintenance of the stormwater features at the study area and on adjacent Floragon parcels is appropriate. Stormwater source control actions will be incorporated into future remedial action planning for the former Dip Tank Area.

4.3.3 Wetlands

A wetlands determination was conducted along Bear Creek Reaches 1 through 5 within the study area as illustrated in Figure 12. Two small wetland areas were identified, totaling 0.17 acres. Site-related contaminants are not anticipated within these two wetland areas. The Wetlands and Waters Reports (SWCA 2015 and 2016) are provided in Appendix B.

5 CONCEPTUAL SITE MODEL

This report section describes the generalized CSM, providing a description of the likely contaminant sources, followed by a description of transport mechanisms and migration pathways and potential receptors. Supporting information is provided in the risk assessments (Section 6 and Appendices C and D).

5.1 CONTAMINANT SOURCES

RI site characterization and associated risk assessment efforts indicate that dioxin are the primary contaminants of concern at the Phase 3 study area. A range of potential contaminants including anti-fungal chemicals, hydrocarbon-based lubricants and fuels and their constituents, and metals, were evaluated during development of the RI, as described in Section 2.4. Dioxin and PCP are generally associated with both the subject site's lengthy history of lumber mill operations (including wood treating) and also with urban (commercial, industrial, and residential) land use in the immediate site vicinity.

Impacted media at the site include soil, sediment, and groundwater. One contaminant source area appears to be located at the former Dip Tank Area where the site's greatest concentrations of PCP and dioxin have been measured. Identified contamination within this localized area is likely from historic surface spills and potential leaks from the former Dip Tank operations. However, no PCP impacts have been identified among Bear Creek sediments and the distribution and magnitude of dioxin impacts observed among creek sediments are not clearly attributed to any specific source or site operation.

Dioxin are nearly ubiquitous in the environment, as demonstrated by numerous relevant background studies not detailed here. In soil samples from across the United States, background TEQs ranged from 0.1 to 186 pg/g for urban/suburban soils and from 0.1 to 22 pg/g for rural soils (Urban et al 2014). According to EPA's Contaminated Site Clean-Up Information (CLU-IN) Web Site:

https://clu-in.org/contaminantfocus/default.focus/sec/Dioxins/cat/Environmental_Occurrence/:

> "The biggest current contributors of dioxin to the environment are combustion sources, such as medical waste, municipal solid waste, hazardous waste, and sewage sludge incinerators; industrial coal, oil, and wood burning; and secondary metal smelting, cement kilns, diesel fuel combustion, and the burning of wood and residential oil. Emissions to the atmosphere from incineration and combustion sources result in wide-spread distribution of dioxin. Hence, dioxin are pervasive and are found around the world at low levels in rural soils, as well as in sediments of otherwise pristine water bodies. Most of the dioxin deposits from wet and dry deposition ultimately become components of runoff that enter rivers, streams, and estuaries directly or through urban stormwater outfalls."

At the Floragon site, the ambient background concentration for dioxin is influenced by a variety of local activities. Previous background sampling at the Mill #1 site (upstream from Floragon site) and observations made previously for the Floragon site RI have identified potential sources in the immediate site vicinity including backyard trash burning, treated lumber landscaping and infrastructure, chemical storage, use of phenoxy herbicides (such as 2,4,5-Trichlorophenoxyacetic acid) industrial activities and runoff, vehicle exhaust, automotive oil/fluids runoff from roadways (including waste oil application to gravel roadways for dust suppression), and known spills from an adjacent municipal sewage pump station. The distribution of dioxin concentrations in Bear Creek sediments is consistent with dioxin contributions from these various urban sources. Dioxin distribution in Bear Creek at the site are generally centered near the relative high concentrations in

Reach 3 around AB-25, but relative "spikes" in concentration both upstream and downstream of Reach 3 appear quite localized and likely to be associated with different contributing urban sources and stormwater outfalls collecting runoff from adjacent roadways which appear not be site-related.

Diesel and heavy oil range hydrocarbons have been identified across the site in soil, sediment, and at select locations including the former Dip tank, Hyster Shop, and former Log Pond Areas in groundwater. Petroleum hydrocarbon contamination identified at the site is likely associated with spills and leaks from the use of vehicles and heavy equipment, equipment maintenance, log/lumber transport and storage, and other industrial use. Groundwater impacts, where identified, are localized and are not known or suspected to migrate to surface waters including Bear Creek, nor other receptors on or beyond property margins. Surface runoff has contributed COIs to site catch basins and the North Drainage Ditch.

Other site contaminants (i.e., metals, PAHs, and VOCs) have been identified in some areas of the site and may be associated with various activities including:

- Site mill operations, and other industrial operations at the site.
- Demolition/decommissioning of site infrastructure by Floragon conducted circa 2005.
- Vicinity commercial/industrial land use, especially near site margins.

Overall, these contaminants appear typically limited in extent and occur at concentrations that are low generally relative to their respective RBCs and are expected to pose a much lower risk to human health and the environment compared to previously described "primary" COIs. All COIs remaining at the site are further evaluated in the risk assessment (Section 6).

5.2 TRANSPORT MECHANISMS AND PATHWAYS

Potential contaminant transport mechanisms present at the site include direct discharge to soils from past operations, tracking of contaminated soil by vehicles, leaching of COIs in soil to groundwater, groundwater flow to surface water, storm water outfall discharge to sediments, stormwater runoff to soils and/or sediments, atmospheric deposition to soils and/or sediments, COIs in soil/groundwater volatilizing to air, and soil and/or sediment erosion during flood events.

In sediments, physical contaminant transport can be upward (advection/diffusion, ebullition), downward (advection/diffusion, burial), or lateral (resuspension/deposition); bioturbation caused by benthic organisms can further displace or mix contaminants. In water, contaminants can move by the same advective and diffusive forces operating in the sediment, by sorption to/from sediments re-suspended by currents or scour events, or via bioturbation (e.g., releases from sediment to the water column).

The relative importance of many of these processes will vary, but appear based on RI observations to be quite limited at this site. At the Floragon site, the main transport mechanisms and pathways which have likely influenced contaminant distribution in the surface and subsurface consist of overland flow across the surface and into storm water collection features (i.e., Bear Creek, North Drainage Ditch, catch basins) and infiltration into the subsurface with subsequent advective/diffusive transport via groundwater flow.

The migration of certain contaminants in the subsurface, including PCP and dioxin, has been limited due to the relatively immobile chemical characteristics of these contaminants. A second factor is the low-permeability nature of the shallow subsurface water bearing

zone. The extent of PCP impacts to groundwater appears to be limited to the former Dip Tank Area, as lateral groundwater characterization indicates the plume does not appear to be migrating toward or discharging to Bear Creek. Hydrogeologic flow characteristics and transport mechanisms were evaluated in Phase II of the RI (PNG 2013).

Within Bear Creek, relatively abundant shallow fine-grained sediments and organic carbon content, coupled with low water velocities (Section 3.2), indicate that the creek at Floragon's property is a low-energy depositional environment. As a result, contaminant resuspension and redistribution due to bed-shear caused by elevated creek flow velocities is not expected to be a significant mechanism for transport. The creek's small size, thick non-native vegetation on the banks and in the creek bed, relatively shallow depths creek cross-section, and general lack of access or use greatly limit disturbance. Reaches 1 through 3 are frequently culverted and covered, with steep rip-rap or armored and brushy slopes that greatly minimize the potential for shoreline erosion.

The expectation of minimal sediment erosion and transport from the onsite reaches of Bear Creek is consistent with the observations of Bear Creek following the high flow and flooding events during the winter of 2011-2012. During these winter flooding events, creek flow exceeded the capacity of the culvert at Molalla Road (i.e., flood water flow over the roadway at this upstream location) and stormwater overflowed the banks of Bear Creek on the Floragon Property. Visual inspection of the creek following the winter storm events and associated flooding confirmed no observations of creek bank or bed erosion. The rip-rap armored sections of the creek were intact and the dense vegetation along the creek bed and banks was not disturbed. These observations are not unexpected considering that the multiple culverts and beaver dams on site restrict creek flow and velocity and peek runoff from severe winter storm events appears to cause creek bank overtopping and flooding rather than erosive creek flow conditions.

5.3 RECEPTORS

Potential human and ecological receptors for the Floragon site are summarized below. The potential receptors are derived based on the site setting, ecology, and beneficial use determinations.

5.3.1 Human Receptors

The site is currently zoned for Rural and Heavy Industrial use and is expected to remain industrial in the future. The former Dip Tank and Bear Creek RI study area is currently vacant with industrial redevelopment anticipated. Based on the site and beneficial land and water use determination, the site's human receptors include:

- Current and future occupational worker.
- Current and future trespasser.
- Future construction worker.
- Future excavation worker.
- Future site maintenance worker.
- No onsite residential or recreational use is allowed by zoning, nor anticipated. The HHRA (Section 6) considered these non-occupational receptor scenarios as part of a very conservative sensitivity analysis with regard to quantifying most unlikely creek sediment transport from the site's "worst-case" upstream locations.

5.3.2 Ecological Receptors

The industrial site is characterized by poor quality ecological habitat. Paved asphalt surfaces cover virtually the entire former Dip Tank area and much of Bear Creek at the site is culverted and covered (upstream) and surrounded by armored embankments and non-native vegetation (downstream). Recent wetland and waters determinations confirmed (1) no threatened, endangered, or sensitive species identified within the study area, and (2) two small wetlands (totaling 0.17 acres) occur outside the areas of sediment contamination (SWCA 2015 and 2016).

Site conditions may support birds and medium-sized mammals because they can live in the small pockets of on-site vegetative cover or in off-site areas, and range out across the site. Thus, terrestrial birds and medium-sized mammals likely to inhabit and/or feed on the site were the focus of the Ecological Risk Characterization with the Great Blue Heron and Weasel adopted as surrogate receptors (PNG 2015b). Site related COIs are present in creek sediments, where benthic invertebrates and the related benthic food chain may be affected.

5.4 EXPOSURE ROUTES AND MEDIA

Human and ecological exposure media and exposure routes are summarized below and further detailed in the risk assessment (Section 6).

5.4.1 Human and Ecological Exposure Media

The media with site contaminants characterized during the RI to which human and ecological receptors could be exposed includes:

- Surface soil.
- Subsurface soil.
- Groundwater.
- Sediment.
- Air.

5.4.2 Human and Ecological Exposure Routes

The most reasonably likely routes of exposure to contaminants originating at the Floragon site are summarized for both human and ecological receptors below. These are derived based on the site setting, ecology, and beneficial use determinations.

- Ingestion, dermal contact and inhalation of particulates from surface and subsurface soil.
- Incidental ingestion and dermal contact with sediments.
- Exposure from air via inhalation is not considered reasonably likely since the COIs are generally not volatile and/or have limited accessibility (e.g., associated with media beneath paved surfaces or inundated year round).

Risk assessment findings are summarized in Section 6, with supporting details attached as noted.

6 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

Throughout development of the RI, potential environmental risks were evaluated for the entire Floragon site for both human and ecological exposures. A baseline risk assessment conducted as part of Phase 1 RI activities evaluated the entire 105-acre mill property (PNG 2011). Subsequent phases of the RI resulted in a refined understanding of site conditions; therefore, the risk assessment focused on various exposure units based on topography, function, and infrastructure/layout. The prior risk assessment findings are summarized in Sections 2.4.1 and 2.4.2 of this report, based on the following exposure units and key documents:

- Bear Creek Sediments (TAS 2012, PNG 2015b).
- Northern Upland Areas (EES 2014b, DEQ 2014).
- 16-Acre Southeastern Corner Area (EES 2014a, PNG 2015a, DEQ 2015a).

During 2015, discussions with DEQ concluded that remaining RI data gaps were limited to the former Dip Tank Area and Bear Creek sediments located on the Floragon property. Collectively covering approximately five acres, this remaining site study area was the focus of recent Phase 3 RI activities including a residual risk assessment for identified receptors. Supporting human health and ecological risk assessment details are provided in Appendices C and D, respectively, and summarized in this section of the report. Section 7 of this report addresses risk assessment uncertainties.

6.1 CURRENT RI STUDY AREA

The RI study area is comprised of two exposure units which include the former Dip Tank area (approximately 3.2 acres) and on-site portions of Bear Creek which, including bank-to-bank dimensions based on the topographic top of the bank, covers approximately 2 acres as illustrated in Figures 2A and 2B. Characteristics of these exposure units are detailed in Sections 3, 4, and 5 of this RI report.

6.2 HUMAN HEALTH RISKS

The site is zoned for industrial use. Occupational workers, construction workers, excavation workers, and trespassers were identified as the reasonably likely human receptors for the (currently vacant) Floragon site study area. Under the current setting, human exposures are unlikely given the site's vacant condition since approximately 2010. However, current occupational and trespasser exposure scenarios are also considered as a conservative assumption. Exposure scenarios for occupational, construction, and excavation workers are defined by DEQ default assumptions (DEQ 2010 and 2013b).

Maintenance workers having periodic but infrequent responsibility to maintain the Dip Tank area pavement/cover/utility systems and storm water control features are not specifically incorporated in the risk assessment. However, duration and extent of contact for both the excavation worker and the construction worker are greater than that of the maintenance worker and therefore protecting those receptors would also be protective of a maintenance worker at this site.

Neither residential nor recreational use of the site is allowable by zoning, nor are such exposures reasonably likely. However, the risk assessment does consider theoretical exposures to these receptors for Bear Creek sediments based on potential for off-site dioxin migration. Potential downstream exposures in Bear Creek would be infrequent at most. Also, the assessment of this potential risk from downstream exposure conservatively uses all site data (including the highest concentrations observed in

upstream industrial Reaches 1 through 5). Therefore, inclusion of this potential risk scenario is provided for reference but presents an extremely protective and unlikely scenario that would tend to overestimate overall risk to site related contaminants.

Contaminants of Interest focus on dioxin as the primary and most likely risk-driver, but other COIs present in the study area were evaluated for initial risk screening purposes. With the exception of dioxin, Contaminants of Potential Concern (COPCs) included a small number of organic compounds and metals which were further evaluated and subsequently eliminated from further concern.

6.2.1 Human Health Risk Characterization Approach

Incorporating all available RI data for the five-acre study area, the site-wide cumulative risk was determined to exceed acceptable conditions for certain exposure scenarios based on a threshold of one in one million ($1E10^{-6}$) excess cancer risk (ECR). Non-carcinogenic health risks were also evaluated using a reference dose or concentration representing an estimated intake rate that is unlikely to produce measurable adverse effects over a lifetime of exposure. Exposures below these reference values are considered unlikely to cause any adverse health effects.

Site-specific human health risks are governed by dioxin, and this chemical group was initially evaluated using the cumulative 2,3,7,8-TCDD "toxic equivalent quotient" (TEQ) concentration values (Section 6.2.2). In accordance with DEQ guidance (DEQ 2010) and current DEQ policy (PNG 2011), in cases where the initial cumulative 10^{-6} TEQ criteria was exceeded, human health risk was determined based on supplemental evaluation of dioxin congener toxicities for individual samples to evaluate specific site locations governing the risk exceedances as follows (and summarized in Section 6.2.3). Under this supplemental approach, unacceptable human health risk is indicated at specific locations where either of the following conditions are identified:

- Risk due to individual dioxin congeners: congener toxicities (TEQ) exceeding an ECR of 10^{-6} for any individual congener, and/or
- Risk due to cumulative toxic chemicals: summed dioxin congener TEQs for any sample which exceed an ECR of one in one hundred thousand ($1E10^{-5}$).

6.2.2 Initial Risk Screening

For the site study area, the following human health risks were identified during initial risk screening, all of which (except for residential and recreational exposures to certain specific Bear Creek sediments) are governed by shallow soil conditions located at the former Dip Tank area. No unacceptable risks to Bear Creek workers or site trespassers were identified. Groundwater is not a drinking water resource at the site or within the LOF, although incidental contact with groundwater was considered for site workers.

Risk characterization results based on this initial screening are summarized in HHRA Tables C3-1 through C3-6 and C3-8 through C3-14, and described below. Based on initial screening, the following receptors were retained for further risk characterization (see Section 6.2.3).

- Occupational Worker: Incorporating all COPCs, the total ECR for this receptor is 6E-06, which exceeds the acceptable limit of one in one million (1E-06) by a factor of six due to Dip Tank soil conditions (arsenic slightly exceeding natural background levels in one sample and dioxin at several locations). Dioxin in soil (ECR = 2E-06) are the primary risk driver and exceeded the regulatory standard

for this receptor. No unacceptable noncancer risks are anticipated for this receptor, with the Hazard Index [HI] = 0.34, which is below the criteria of 1.0.

- Construction Worker: The total ECR for this receptor is 3E-06, which exceeds the acceptable limit by a factor of three due to dioxin in Dip Tank area soil (ECR = 2E-06). No unacceptable noncancer risks are anticipated for this receptor, with the HI = 0.58.
- Excavation Worker: The total ECR for this receptor is 2E-06, which exceeds the acceptable limit by a factor of two due to dioxin in Dip Tank area soil (ECR = 2E-06). No unacceptable noncancer risks are anticipated for this receptor, with the HI = 0.02.
- Offsite Resident: The total ECR for this receptor is 7E-05, which exceeds the acceptable limit by a factor of 60 due primarily to dioxin in Bear Creek sediments (ECR = 3E-05), and also arsenic and (at the single AB-28 location) PAHs. Unacceptable noncancer risks are anticipated for this receptor, with the HI = 2.6.
- Recreationalist: The total ECR for this receptor is 7E-06, which exceeds the acceptable limit due to dioxin in Bear Creek sediments (ECR = 2E-06) and PAHs at one location (AB-28). No unacceptable noncancer risks are anticipated for this receptor, with the HI = 0.23.

6.2.3 Congener Analysis

The initial risk screening indicates that unacceptable risks exceeding the regulatory standard of 1E-06 are possible for several receptors exposed to soils in the Dip Tank area and Bear Creek sediments (see HHRA Table C3-7). Therefore, individual congeners were evaluated as unique carcinogens.

As previously applied by DEQ in this situation, the regulatory standard for individual carcinogens (1E-06) was evaluated for each individual congener, and an ECR standard for acceptable cumulative risk of 1E-05 for multiple congeners applied. This analysis was performed for receptors determined to have cumulative risks governed by dioxin in the ECR range between 1E-06 and 1E-05. The risk assessment (Appendix C) provides congener-specific ECR calculations for the identified receptor scenarios.

Using this approach for both carcinogenic and non-carcinogenic effects, the determination of unacceptable human health risks for the site can reasonably be narrowed, as summarized in HHRA Tables C3-8 and C3-14, and as described below.

Dip Tank Area

- No unacceptable risks to excavation workers or trespassers were identified.
- Unacceptable risk to occupational workers is based on dioxin in soil located beneath existing pavement surfaces at four locations and sediments in two catch basins (see HHRA Table C3-11):
  - Shallow surficial soil (0-0.5 feet) beneath the pavement at AB-03, AB-05, AB-06, and the B13-B16 composite.
  - Subsurface (1.5 foot deep) soil at the B13-16 composite.
  - Catch basin sediments at AB-19A and AB-19B.

- Unacceptable risk to construction workers is based on dioxin in soil at one paved location (AB-06 at 0-0.5 feet) and one catch basin (AB-19B), as noted in HHRA Table C3-12.

Bear Creek Sediments

- No unacceptable risk to any reasonably likely human receptors was identified, with the conditions specified below.
- If sediment transport were possible such that residential direct contact could occur undiminished at the greatest dioxin concentrations as measured near the center and upstream portions of the industrial Floragon site, those exposures would result in unacceptable residential risks. However, the dioxin concentrations resulting in unacceptable risk are limited to well defined, localized sediment locations within creek Reaches 1 through 5, which represent upstream areas on the Floragon site. Sediment samples located downstream from Reach 5 (nearest to offsite residential neighbors and more typical of potential offsite migration conditions) do not represent unacceptable risk levels for this receptor. The observed dioxin concentrations and distribution are not expected to change significantly in the future without dramatic changes to the creek conditions such as:
  - Hydraulics: removal of beaver dams and culverts that restrict creek flow and sediment transport.
  - Heavy Vegetation: actions to disturb or remove the dense vegetation restricting flow and erosion.
  - Increased dioxin contributions from offsite sources.
- Although highly unlikely, recreational use of Bear Creek results in unacceptable risk at one sediment location (submerged and buried at 1 to 2 feet below surface sediments at sampling location SED-207 within Reach 4, an upstream portion of the Floragon site). As with the residential setting, downstream sediment samples more representative of potential offsite migration conditions (Reaches 6 and 7) do not represent unacceptable risk levels for the recreational use scenario.

6.3 ECOLOGICAL RISKS

Other than localized areas in Bear Creek sediments, no unacceptable ecological risks were predicted for the Floragon site (see references above in Section 6). No ecological receptors are anticipated for the former Dip Tank Area due to limited identified contamination, overall poor habitat, few receptors of concern, and the highly disturbed and paved upland surfaces. As previously discussed with DEQ, the site's lengthy history of industrial operations, as well as current and reasonably likely future industrial zoning and land use, represent established and long-term future conditions that are expected to minimize or exclude suitable ecological habitat at this site.

Ecological habitat is present within and adjacent to Bear Creek, but the study area habitat is discontinuous and generally consists of non-native plants and highly-disturbed soil/riparian areas. Recent Wetlands and Waters Determinations were conducted at the site's upstream half of the creek (Reaches 1 through 5) and concluded that no threatened, endangered, or sensitive species were identified, with two discontinuous wetland areas totaling 0.17 acres confirmed in this study area (Figure 12; SWCA 2015 and 2016).

Based on direction from DEQ, the evaluation of potential ecological risks at the study area is based on the assessment of riparian mammals, using the weasel as a representative

species. Considering wetland, riparian and creek habitat surrounding the Floragon site, other potential receptors including predatory birds (using the great blue heron as a representative species) were initially considered for the site risk assessment. Subsequently, ecological risks were determined by DEQ to be governed by mammalian exposures and bioaccumulation criteria.

Acknowledging the relatively poor habitat quality of the creek on the Floragon property, and the small area and exposure inputs available within the home range of the weasel, RBC criteria for this mammalian receptor were developed by DEQ as follows:

- Preliminary Remediation Goal (PRG) = 20 pg/g: A calculated soil dioxin PRG of 12 pg/g was adjusted by DEQ to 20 pg/g using sediment concentration to dose regression (Appendix D). The 20 pg/g PRG was considered by DEQ to be protective of sediment-exposed ecological receptors.
- Remedial Action Level (RAL) = 120 pg/g: DEQ indicates the basis for establishing this RAL is that eliminating exposure to areas of dioxin concentrations exceeding 120 pg/g will lower the overall ecological receptor exposure among site creek sediments to a reasonably protective level intended to approach the PRG.

Using this approach and adopting the DEQ PRG criteria, conditions that are protective of ecological receptors are indicated where creek sediment dioxin concentrations are 20 pg/g or less. Figure 10 illustrates that among 38 samples analyzed throughout Bear Creek on the site, only three sampling locations meeting the PRG criteria were identified during the RI, including SED-1, SED-4, and SED-6.

DEQ established that protective measures must be considered for sediment dioxin concentrations exceeding 20 pg/g, and an active remedy must be implemented where dioxin concentrations in site sediments exceed the RAL of 120 pg/g. The majority of site creek sediment samples have dioxin concentrations exceeding 20 pg/g and therefore exceed PRG and/or RAL criteria on a point-by-point basis. The ecological risk characterization for this site therefore focused on determining the statistical distribution of dioxin concentrations exceeding DEQ's criteria of 20 pg/g and 120 pg/g, and includes both individual (point-by-point) and site-wide (90UCL) considerations.

6.3.1 Dioxin Distribution in Bear Creek Sediments and Residual Risk

The complete RI sediment data set, which includes a total of 30 surface (0-1 foot depth zone) and 8 subsurface (1-2 foot depth zone) samples, was examined to evaluate the 90UCL exposure point concentrations under current conditions and various sample exclusion conditions. Table 1-1 in Appendix D summarizes these findings.

Incorporating all 38 existing surface and subsurface sediment samples results in a site-wide 90UCL exposure point concentration of 138 pg/g. Because the biologically active zone in sediments is typically limited to the uppermost 25 centimeters (10 inches) and no substantial erosive creek conditions have been identified or suspected at the site, dioxin in deeper site sediments are effectively isolated and no ecological exposures are expected to occur below the one foot depth zone (USEPA 2015). Only the surface sediments (sampled at depths of up to one foot) are therefore considered relevant for purposes of this site's ecological risk assessment. Considering only surface sediment samples which are representative of most likely ecological exposure results in a 90UCL of 147 pg/g. On a site-wide basis this 90UCL value exceeds the 120 pg/g RAL by 23%.

Modified Residual Risk Conditions

For comparison to the full data set and to evaluate data distribution trends, the dioxin data were broken out into various generalized alternative residual risk exposure scenarios. The residual risk assessment is based on applying DEQ's recently-established PRG and RAL criteria to site sediment conditions, and will be further evaluated during FS development and consideration of appropriate and protective remedial options for the site.

CONDITIONS ACHIEVING THE RAL (120 PG/G)

Discussions with DEQ indicate that dioxin concentrations exceeding the 120 pg/g RAL are expected to drive ecological risk considerations at the site. Several residual risk scenarios addressing the RAL were evaluated, as summarized below.

- Exclude all samples exceeding the RAL. Excluding the nine surface samples with dioxin concentrations greater than the RAL of 120 pg/g results in a residual 90UCL of 73 pg/g.
- Exclude Reach 3. Exclusion of Reach 3 surface sediments results in a residual 90UCL of 115 pg/g, which is below the RAL of 120 pg/g. Within the site study area, Reach 3 includes a continuous and relatively isolated section of Bear Creek where dioxin concentrations in surface sediments are generally greatest and where there is less uncertainty regarding contribution from other non-site related contaminant sources. This site condition was recognized and addressed in the 2015 risk characterization which was part of a preliminary proposal for focused remediation of this Reach 3 area (PNG 2015b). Due to the presence of relatively high dioxin concentrations within this reach and their influence on predicted ecological risks, surface sediment dioxin distribution statistics were evaluated excluding all six AB-25 related samples collected at Reach 3.
- Exclude locations exceeding 400 pg/g. Excluding all samples exceeding 400 pg/g (Reach 3 samples AB-25 and AB-25-3) results in a residual 90UCL of 108 pg/g, which is below the RAL of 120 pg/g. This represents the simplest and most efficient approach to achieve a residual EPC below 120 pg/g.
- Exclude traditional hot spots of contamination. Since in this risk assessment the exposure model was developed for a mammal exposed to soil, applying the DEQ's generic soil hot spot threshold of 10 may be applicable. Excluding hot spot concentrations exceeding 200 pg/g would result in a residual 90UCL EPC of 93 pg/g, which is below the DEQ RAL of 120 pg/g. Four sample locations have surface sediment dioxin concentrations greater than 200 pg/g including AB 25, AB-25-3, SED201ABC, and SED204ABC. According to DEQ's risk assessment guidance, an ecological hot spot for soil is defined by a toxicity quotient greater than 10 at any given sample location (DEQ 1998). A generic hot spot threshold is not provided for sediment. Based on the DEQ PRG of 20 pg/g, the traditional hot spot threshold would be 200 pg/g.

CONDITIONS ACHIEVING THE PRG (20 PG/G)

DEQ criteria establish a PRG for site sediments of 20 pg/g. DEQ regards this PRG as a protective value to be considered during FS development; an important consideration for the FS is that the PRG is a remedial goal based on protectiveness, and not a specific action level. The PRG was developed by DEQ with various uncertainties and layers of conservative assumptions (Section 7). FS development

will establish protective conditions targeting the 20 pg/g PRG but active remediation is likely to focus on areas of greater contamination.

For this evaluation, the data set was refined to evaluate conditions necessary to achieve the 20 pg/g PRG, which involved iterative elimination of highest concentration surface samples until the 90UCL was 20 pg/g or less.

- 27 of 30 surface samples must be excluded in order to achieve the 20 pg/g PRG, resulting in a 90UCL of 19 pg/g.

7 UNCERTAINTY ANALYSIS

The purpose of the RI is to characterize site conditions and contaminant-related risks such that an effective and protective remedy can be developed and implemented. Throughout this process, numerous phases of data gathering and evaluation are conducted and the RI findings are subject to qualitative and quantitative interpretation. The data collection and evaluation process has been developed in consultation with DEQ and was performed in accordance with standard industry practices in an effort to enable fact-based conclusions that will be used to draft reasonable and protective remedial actions.

Uncertainties in data collection and interpretation are inherent in the RI process. Various elements are incorporated into this process for purposes of quality control and protectiveness, but the context and significance of uncertainties merit consideration as part of the remedial action development.

7.1 RISK ASSESSMENT & STATISTICAL UNCERTAINTIES

Risk assessment is a complex process requiring the integration of contaminant release information, fate and transport of chemicals, toxicity information, and risk characterization. Inherent in each of these steps are varying degrees of uncertainty that may influence the results of the risk assessment process. Uncertainties associated with the different components of a risk assessment can affect the degree of confidence that can be placed on the risk assessment results. Risk assessment uncertainties are detailed in Appendix C (Human Health) and Appendix D (Ecological) and noted briefly below.

- Data Collection and Evaluation: RI and risk assessment conclusions rely on the representativeness of samples collected for any given exposure unit or area of concern, as well as laboratory analytical detection limits and quality control. Assumptions are made in cases where analytical detection limits exceed applicable standards for contaminants of interest and standard protocols regarding these assumptions tend to overestimate contaminant concentrations. These assumptions represent a source of uncertainty when calculating exposure point concentrations. For example, the risk assessment's use of EMPCs using full analytical detection limits for non-detect compounds results in biased-high concentration estimates that result in added layers of protectiveness to predicted risks.
- Exposure Assessment: One of the primary uncertainties associated with the exposure assessment is the determination of how many and how often people and ecological receptors may be on-site and to what extent they are or may be exposed to site contaminants. Assumptions regarding use are expected to overestimate rather than underestimate exposures and, therefore, risks. Also, there are uncertainties associated with the probability of adverse effects in human and animal populations that are highly variable. Site-specific examples include:
  - A point-by-point comparison of the 20 pg/g protective level to individual sampling location data is inappropriate for evaluating bioaccumulation exposures to mammalian receptors that are exposed to prey throughout their home range. The use of site-wide (90UCL) exposure point concentrations is more representative of potential receptor exposures, but this approach still represents a very protective statistical estimate of exposures.
  - Within most (if not all) of the industrial Floragon property, Bear Creek provides poor-quality ecological habitat, particularly at portions of the creek

where dioxin concentrations approach or exceed the RAL. Very conservative assumptions were used in developing the 20 pg/g PRG and 120 pg/g RAL criteria. The use of the weasel as a surrogate mammalian receptor compounds this conservativism. No weasels have been observed at the site, and the poor site habitat and use of sediment as a surrogate for soil exposure at the site are unlikely to support any realistic weasel population. Other ecological receptors (birds and amphibians) were considered and determined to be less sensitive than mammals. There is little or no riparian habitat present in the hardscaped and rip-rapped areas upstream of Reach 4. In addition, the wetland and waters determinations recently conducted at this portion of the site confirmed that there are no threatened, endangered, or sensitive species in the Bear Creek study area (SWCA 2015 and 2016), and that no wetlands are present in areas known to be impacted by dioxin at actionable levels.

  - Estimates regarding the anticipated biologically active zone for creek sediments may be overprotective based on limited receptor exposures and poor quality habitat as noted above.
  - Assumptions regarding human health exposures are almost certainly overestimated for both creek sediments and Dip Tank Area soils. For both of these potential exposure areas under normal (current and future) industrial and trespasser scenarios, actual human contact with contaminated media is unlikely. The residential and recreational creek user scenarios are unlikely as noted in Section 6.

7.2 UNCERTAINTY REGARDING MULTIPLE CONTAMINANT SOURCE(S)

Numerous Bear Creek sediment samples have been collected at the Floragon property and analyzed for dioxin. Each sediment sample is actually a transect composite of three sub-samples collected in close proximity to each other. Dioxin distribution in Bear Creek at the site are generally centered near the relative high concentrations in Reach 3 around AB-25, but relative "spikes" in concentration both upstream and downstream of Reach 3 appear quite localized and likely to be associated with different contributing urban sources and stormwater outfalls collecting runoff from adjacent roadways which appear not be site-related. Section 3 of this report provides supplemental characterization details regarding contaminant distribution and creek flow characteristics.

- Creek Reach 1: Sample AB-28 (165 pg/g mammalian TEQ) was collected at the easternmost upstream reach of Bear Creek on the Floragon property. Sediments sampled at this upstream location are likely to originate primarily from off-site sources. Sample AB-28 is located in a topographically low-lying area, immediately downstream of multiple known stormwater ditch discharges to the creek from both runoff directions (north and south) along South Molalla Avenue. Although the drainage basin area and discharge volume of these multiple roadway ditches have not been considered in our evaluation, the ditches and other local surface runoff represent significant long-term contributions to Bear Creek from many urban runoff sources containing dioxin, including:
  - Vehicle traffic, emissions, and fluids along a major arterial road.
  - Sewage overflows from the adjacent sanitary sewer pump station.

  - Uncontrolled runoff from many local commercial, industrial, and agricultural properties where various chemicals including herbicides and pesticides are used.
  - Yard debris/burn barrel combustion as observed during this RI and by others (KJ 2007).

- Creek Reach 4: Samples SED-203, SED-204, and SED-207 (120 to 402 pg/g) are located within 100 feet of and centered around a stormwater outfall pipe that appears to collect runoff from the adjacent South Molalla Forest Road and shoulder ditches. Anecdotal information indicates that the adjacent South Molalla Forest Road (closest to Bear Creek at the AB-23 location) was originally an unpaved logging haul road (previously owned by Crown Zellerbach Corp.) that was surface-oiled or treated for dust suppression over many decades. Three consecutive sediment samples located immediately upstream from this area and downstream of Reach 3 contain much lower dioxin concentrations (71 to 102 pg/g). The data trend between these sequential sampling points supports contribution from the roadway and indicates no obvious or linear contaminant transport/distribution pattern originating from creek Reach 3 or the AB-25 area.
- Creek Reach 5: Samples AB-23 (182 pg/g) and SED-201 (266 pg/g) are located in a beaver-ponded portion of the creek downstream from SED-207 and within approximately 200 feet downstream from the South Molalla Forest Road outfall. Concentration trends in this area are consistent with those observed at the Reach 4 outfall location, as opposed to transport from the Reach 3 area.
- Creek Reach 6: Sample SED-5 (122 pg/g) is located on the Floragon property, but immediately downstream of a small farmstead owned by a third party (see Figures 8 and 11) and approximately 800 feet west and downstream of SED-201 and AB-23. Samples SED-4 (8 pg/g), SED-8 (43 pg/g), and SED-200 (49 pg/g) were collected approximately 500 to 700 feet upstream of SED-5 respectively. Similar to the patterns described above, the data trend between these sequential sampling points indicates no obvious or linear contaminant transport/distribution pattern originating from Reach 5 (SED-201 and AB-23) or further upstream from Reaches 4 or 3. More likely proximal source(s) for dioxin are located immediately upstream from SED-5, consistent with runoff from other adjacent areas.
- Bear Creek: Site characterization and RI data are consistent with contaminant distribution trends resulting at least in part from multiple urban runoff source contributions, the effects of which are mitigated and localized by low creek gradient and low-energy depositional characteristics which tend to slow down streamflow and minimize sediment transport. PNG's stream-flow analysis indicates this low-energy creek environment is generally not erosive. Dioxin are likely bound to fine-grained carbon-rich sediments and organic matter and are also unlikely to be extensively transported in this low-energy environment. Although the creek periodically floods during high rainfall events, PNG has observed low-energy overbank flooding and low-gradient sheet flows at the Floragon property during these seasonal events, not high-energy erosive channeling. This stretch of Bear Creek is seasonally isolated because sections of the creek typically become dry in summer/fall months, further reducing or eliminating flow in the ponded areas.

The significance of contaminant sources and recontamination potential will be further evaluated in the FS.

8 AREAS POTENTIALLY REQUIRING CLEANUP

Based on RI and risk assessment findings for the study area, groundwater and surface water are not regarded as posing unacceptable human health or ecological risks with regard to site contaminants. No site remediation or further investigation measures therefore appear necessary to address these media.

Where unacceptable risks have been identified, control and/or remediation measures will be required to restore conditions that are protective to human health and the environment. As determined during this RI, site areas potentially requiring remediation include (1) shallow soils at specific locations within the former Dip Tank area based on certain human health risks and Bear Creek source control concerns, and (2) sediments within Bear Creek Reaches 1 through 5 due primarily to potential ecological risks. Details regarding various remediation options and technologies are being developed in the FS.

8.1 Soil and Stormwater Source Control – Former Dip Tank Area

Due to poor quality habitat and generally absent ecological receptors at the former Dip Tank area, likely remediation of this portion of the site will be governed by 1) potential future exposure to dioxin impacts in shallow soil by occupational and construction workers and 2) prevention of offsite migration to Bear Creek. Excavation workers and trespassers could also potentially be exposed to shallow soil contamination but no unacceptable health risks to those receptors were identified.

The Dip Tank area is paved. Current and future exposure to soils underlying the existing pavement is expected to be limited, but potential contaminant exposures and mobilization must be permanently controlled to establish reliable protective conditions. Stormwater discharge to the adjacent Bear Creek is controlled by both overland runoff and a small array of catch basins connected to underground piping which discharge to the creek. Sediments within this drainage system are affected by dioxin and will need to be contained and controlled as part of future remedial actions.

More specifically, additional remediation to be evaluated in the FS will be based on the following areas of concern identified during the RI and risk assessment:

- Dioxin exposure at two relatively highly-contaminated locations (AB-06 soils and AB-19 drainage area sediments) and at adjacent shallow soil locations including the B13-B16 composite area, AB-03 (MW-03), and AB-05.
- Controlling runoff to Bear Creek and establishing permanent stormwater source controls for this area in general and, specifically, for the AB-19A and AB-19B catch basin drainage features and related infrastructure.

8.2 Sediment – Bear Creek

Bear Creek sediments exceed acceptable risk criteria governed mainly by dioxin exposure to ecological receptors at levels exceeding the DEQ Preliminary Remediation Goal of 20 pg/g. RI data and streamflow observations indicate that erosive sediment transport conditions are generally not observed at the site, particularly for areas located downstream of Reach 5, and no significant mobilization or offsite exposure to dioxin is anticipated with respect to Bear Creek sediments or other media. Combined with very protective assumptions and inputs used in the risk assessment, we believe that current conditions are likely to be adequately protective for sediment zones with dioxin concentrations between 20 and 120 pg/g, but remediation planning and FS efforts will likely focus on areas where sediment concentrations exceed the 120 pg/g RAL.

To the extent that supplemental FS analysis can be used to further refine remediation planning efforts, we note that the site's greatest dioxin concentrations in sediments are limited to relatively few locations. For example, sediment concentrations exceeding 400 pg/g were identified at only two locations within the biologically active zone, but eliminating exposure at those two locations has a significant benefit in terms of reducing the site-wide 90UCL exposure point concentration from 147 to 108 pg/g (a 27% reduction, satisfying the RAL in terms of overall site exposures). In order to segregate all sediment surface sample locations where dioxin concentrations exceed the 120 pg/g RAL, 9 of the 30 sample locations would need to be excluded, resulting in a residual 90UCL of 73 pg/g (a 50% overall reduction). The incremental marginal benefit of additional efforts to achieve the lowest defined protective level of 20 pg/g (requiring that 27 of 30 surface sediment locations be excluded and resulting in an 86% dioxin reduction) will also be evaluated in the FS.

Potential future remedial actions for creek sediments will emphasize protective conditions regarding dioxin exposures to ecological receptors but will also be protective of potential human receptors and for other contaminants of concern, where identified.

8.3 Feasibility Study

In accordance with OAR 340-122, an FS is in preparation to evaluate the most appropriate final remedy for the Property. The FS is expected to be completed by early 2017.

9 CONCLUSIONS

This RI characterizes the magnitude and extent of contamination at the five-acre industrial-use study area, which includes the former Dip Tank Area and the portions of Bear Creek. This study area is located within the boundaries of a larger parent property which is currently owned by Floragon. Other portions of the parent property were previously evaluated and remediated during prior phases of the RI. The results of this investigation incorporate three phases of RI work conducted at the site since 2010. They are intended to provide the basis for preparation of FS and final remedial action planning for this site, with the ultimate goal of implementing a protective remedy that will satisfy applicable regulatory criteria and thus enable future commercial/industrial re-use of the subject property.

The current RI Report provides environmental characterization of the study area, particularly dioxin which are present in shallow Dip Tank Area soil beneath pavement surfaces (including stormwater control features), and within shallow Bear Creek sediments both upstream and downstream from the former Dip Tank Area.

Risk assessment of the study area was conducted following final "Phase 3" RI data collection in October 2015, indicating:

- Dip Tank area exposures are limited to non-residential scenarios for various site workers (occupational, construction, excavation) and trespassers. No residential exposure is allowed or anticipated for this site area, and no ecological receptors are expected due to the highly industrialized character and zoning.
- Media of concern for the former Dip Tank area are shallow soils located beneath extensive pavement surfaces, and sediments associated with stormwater runoff to the adjacent Bear Creek. COSs attributed to human health risks are limited to dioxin, via direct contact and ingestion of shallow soils. Unacceptable human health risks exceeding DEQ criteria were identified for shallow soils immediately surrounding the AB-06 location and to its south (AB-03 and AB-05), and among catch basin sediments at AB-19A and AB-19B.
- Bear Creek sediment action levels for dioxin were established by DEQ based on protection of mammalian ecological receptors via bioaccumulation assumptions for their related food web. Other ecological receptors (birds and amphibians) were considered and determined to be less sensitive than mammals. Similarly, no unacceptable human health risks were identified for reasonably likely creek sediment exposures.

Assuming ecological and non-residential/non-recreational exposures to surface sediments are most likely, sediment characterization in Bear Creek at the site indicates that most of the 30 sampling locations have dioxin concentrations exceeding the threshold PRG concentration of 20 pg/g. Concentrations generally decrease with depth in the sediment column and no exposures are anticipated below one foot depth. Sediment dioxin concentrations exceeding the remedial action level of 120 pg/g were collected from locations within the industrial core of the site (Reaches 1 through 5), and at one downstream location (SED-5 at 122 pg/g) where other offsite contributions are likely to have occurred. Action levels established for mammalian receptors at Reaches 1 – 5 would also be protective of human receptors.

RI findings will be incorporated into development of the FS and used to evaluate remediation options and technology screening as a final study area remedy is considered.

10 LIMITATIONS

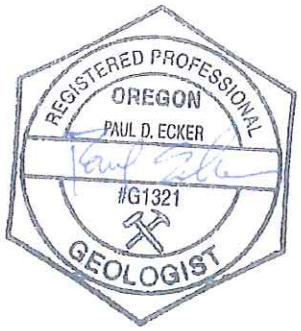
PNG has prepared this report for use by Avison Lumber Company. This report may be made available to property owners and to regulatory agencies. This report is not intended for use by others and the information contained herein is not applicable to other sites.

Our interpretation of subsurface conditions is based on field observations and chemical analytical data. Areas with contamination may exist in portions of the site that were not explored or analyzed.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices and laws, rules, and regulations at the time that the report was prepared. No other conditions, express or implied, should be understood.

PNG ENVIRONMENTAL, INC.

Paul Ecker, R.G.
Project Manager
EES Environmental Consulting, Inc.



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TABLES

Table 1-1

Bear Creek Sediment Results Summary - Dioxin Equivalent Concentrations - Mammalian TEQ (pg/g)

Floragon Property

Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	2,3,7,8-TCDD TEQ with EDLs	2,3,7,8-TCDD TEQ with 1/2 EDLs	2,3,7,8-TCDD TEQ without non-detects
AB-23	0-1	02/02/2010	182	182	182
AB-25	0-1	02/02/2010	413	413	413
AB-28	0-1	02/02/2010	165	165	165
SED-COMP-1	0-1	04/13/2012	19	19	19
SED-COMP-2	0-1	04/13/2012	46	46	46
SED-COMP-3	0-1	04/12/2012	71	71	71
SED-COMP-3 Dup (SED-COMP-99)	0-1	04/12/2012	45	45	45
SED-COMP-4	0-1	04/11/2012	8.0	8.0	7.9
SED-COMP-5	0-1	04/11/2012	122	119	116
SED-COMP-6	0-1	04/11/2012	4.4	4.2	4.0
SED-COMP-7	0-1	04/11/2012	49	49	49
SED-COMP-8	0-1	04/12/2012	43	43	43
AB-25-0COMP (0-1)	0-1	11/20/2014	71	71	71
AB-25-1COMP (0-1)	0-1	11/19/2014	158	158	158
AB-25-2COMP (0-1)	0-1	11/19/2014	115	115	115
AB-25-3COMP (0-1)	0-1	11/19/2014	485	485	485
AB-25-4COMP (0-1)	0-1	11/19/2014	96	96	96
SED-200ABC (0-1) COMP	0-1	10/15/2015	49	49	49
SED-200AC (1-2) COMP	1-2	10/15/2015	5.4	5.4	5.4
SED-201ABC (0-1) COMP	0-1	10/15/2015	266	266	266
SED-201ABC (1-2) COMP	1-2	10/15/2015	53	53	53
SED-202ABC (0-1) COMP	0-1	10/15/2015	32	32	32
SED-203ABC (0-1) COMP	0-1	10/16/2015	120	120	120
SED-203AC (1-2) COMP	1-2	10/16/2015	11	11	11
SED-204ABC (0-1) COMP	0-1	10/16/2015	220	215	210
SED-204AC (1-2) COMP	1-2	10/16/2015	97	95	92
SED-205ABC (0-1) COMP	0-1	10/16/2015	93	91	88
SED-206ABC (0-1) COMP	0-1	10/16/2015	102	102	102
SED-207ABC (0-1) COMP	0-1	10/16/2015	56	56	56
SED-207ABC (1-2) COMP	1-2	10/16/2015	402	395	387
SED-208ABC (0-1) COMP	0-1	10/19/2015	41	41	41
SED-208ABC (1-2) COMP	1-2	10/19/2015	9.6	9.6	9.6
SED-209ABC (0-1) COMP	0-1	10/19/2015	151	151	151
SED-209AB (1-2) COMP	1-2	10/19/2015	25	25	25
SED-210ABC (0-1) COMP	0-1	10/19/2015	45	45	45
SED-211ABC (0-1) COMP	0-1	10/19/2015	105	105	105
SED-211ABC (0-1) COMP Dup (SED-250)	0-1	10/19/2015	102	102	102
SED-211ABC (1-2) COMP	1-2	10/19/2015	84	83	83

Notes:

pg/g = picograms per gram

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TCDD = Tetrachlorinated Dibenzo-p-Dioxin(s)

EDL = Estimated Detection Limit

Table 1-2
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-23, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	2.29	0.00000229	2.3E-06	1	2.3	2.3E-06
1,2,3,7,8-PeCDD	16.9	0.0000169	1.7E-05	1	17	1.7E-05
1,2,3,4,7,8-HxCDD	21.5	0.0000215	2.2E-05	0.1	2.2	2.2E-06
1,2,3,6,7,8-HxCDD	515	0.000515	5.2E-04	0.1	52	5.2E-05
1,2,3,7,8,9-HxCDD	72.8	0.0000728	7.3E-05	0.1	7.3	7.3E-06
1,2,3,4,6,7,8-HpCDD	5,310	0.00531	5.3E-03	0.01	53	5.3E-05
OCDD	24,700	0.0247	2.5E-02	0.0003	7.4	7.4E-06
2,3,7,8-TCDF	29.9	0.0000299	3.0E-05	0.1	3.0	3.0E-06
1,2,3,7,8-PeCDF	21.0	0.000021	2.1E-05	0.03	0.63	6.3E-07
2,3,4,7,8-PeCDF	27.3	0.0000273	2.7E-05	0.3	8.2	8.2E-06
1,2,3,4,7,8-HxCDF	50.5	0.0000505	5.1E-05	0.1	5.1	5.1E-06
1,2,3,6,7,8-HxCDF	55.3	0.0000553	5.5E-05	0.1	5.5	5.5E-06
2,3,4,6,7,8-HxCDF	60.8	0.0000608	6.1E-05	0.1	6.1	6.1E-06
1,2,3,7,8,9-HxCDF	3.6 J	0.0000036 J	3.6E-06 J	0.1	0.36 J	3.6E-07 J
1,2,3,4,6,7,8-HpCDF	1,160	0.00116	1.2E-03	0.01	12	1.2E-05
1,2,3,4,7,8,9-HpCDF	40.7	0.0000407	4.1E-05	0.01	0.41	4.1E-07
OCDF	945	0.000945	9.5E-04	0.0003	0.28	2.8E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					182	1.8E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					182	1.8E-04
2,3,7,8-TCDD TEQ (without non-detects)					182	1.8E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-3
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-25, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	5.6	0.00000556	5.6E-06	1	5.6	5.6E-06
1,2,3,7,8-PeCDD	51.2	0.0000512	5.1E-05	1	51	5.1E-05
1,2,3,4,7,8-HxCDD	65.3	0.0000653	6.5E-05	0.1	6.5	6.5E-06
1,2,3,6,7,8-HxCDD	1,020	0.00102	1.0E-03	0.1	102	1.0E-04
1,2,3,7,8,9-HxCDD	179	0.000179	1.8E-04	0.1	18	1.8E-05
1,2,3,4,6,7,8-HpCDD	10,700	0.0107	1.1E-02	0.01	107	1.1E-04
OCDD	40,300	0.0403	4.0E-02	0.0003	12	1.2E-05
2,3,7,8-TCDF	51.5	0.0000515	5.2E-05	0.1	5.2	5.2E-06
1,2,3,7,8-PeCDF	44.1	0.0000441	4.4E-05	0.03	1.3	1.3E-06
2,3,4,7,8-PeCDF	55.6	0.0000556	5.6E-05	0.3	17	1.7E-05
1,2,3,4,7,8-HxCDF	139	0.000139	1.4E-04	0.1	14	1.4E-05
1,2,3,6,7,8-HxCDF	168	0.000168	1.7E-04	0.1	17	1.7E-05
2,3,4,6,7,8-HxCDF	138	0.000138	1.4E-04	0.1	14	1.4E-05
1,2,3,7,8,9-HxCDF	7.81 J	0.00000781 J	7.8E-06 J	0.1	0.78 J	7.8E-07 J
1,2,3,4,6,7,8-HpCDF	3,950	0.00395	4.0E-03	0.01	40	4.0E-05
1,2,3,4,7,8,9-HpCDF	150	0.00015	1.5E-04	0.01	1.5	1.5E-06
OCDF	3,460	0.00346	3.5E-03	0.0003	1.0	1.0E-06
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					413	4.1E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					413	4.1E-04
2,3,7,8-TCDD TEQ (without non-detects)					413	4.1E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-4
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-28, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	4.13	0.00000413	4.1E-06	1	4.1	4.1E-06
1,2,3,7,8-PeCDD	17.4	0.0000174	1.7E-05	1	17	1.7E-05
1,2,3,4,7,8-HxCDD	26.5	0.0000265	2.7E-05	0.1	2.7	2.7E-06
1,2,3,6,7,8-HxCDD	419	0.000419	4.2E-04	0.1	42	4.2E-05
1,2,3,7,8,9-HxCDD	66.4	0.0000664	6.6E-05	0.1	6.6	6.6E-06
1,2,3,4,6,7,8-HpCDD	4,150	0.00415	4.2E-03	0.01	42	4.2E-05
OCDD	16,900	0.0169	1.7E-02	0.0003	5.1	5.1E-06
2,3,7,8-TCDF	21.8	0.0000218	2.2E-05	0.1	2.2	2.2E-06
1,2,3,7,8-PeCDF	17.9	0.0000179	1.8E-05	0.03	0.54	5.4E-07
2,3,4,7,8-PeCDF	26.1	0.0000261	2.6E-05	0.3	7.8	7.8E-06
1,2,3,4,7,8-HxCDF	53.9	0.0000539	5.4E-05	0.1	5.4	5.4E-06
1,2,3,6,7,8-HxCDF	56.3	0.0000563	5.6E-05	0.1	5.6	5.6E-06
2,3,4,6,7,8-HxCDF	59.1	0.0000591	5.9E-05	0.1	5.9	5.9E-06
1,2,3,7,8,9-HxCDF	3.19 J	0.00000319 J	3.2E-06 J	0.1	0.32 J	3.2E-07 J
1,2,3,4,6,7,8-HpCDF	1,670	0.00167	1.7E-03	0.01	17	1.7E-05
1,2,3,4,7,8,9-HpCDF	56.3	0.0000563	5.6E-05	0.01	0.56	5.6E-07
OCDF	1,480	0.00148	1.5E-03	0.0003	0.44	4.4E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					165	1.6E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					165	1.6E-04
2,3,7,8-TCDD TEQ (without non-detects)					165	1.6E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-5
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-COMP-1, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.297 U	0.000000297 U	3.0E-07 U	1	0.30 U	3.0E-07 U
1,2,3,7,8-PeCDD	2.29 J	0.00000229 J	2.3E-06 J	1	2.3 J	2.3E-06 J
1,2,3,4,7,8-HxCDD	3.81 J	0.00000381 J	3.8E-06 J	0.1	0.38 J	3.8E-07 J
1,2,3,6,7,8-HxCDD	43.1	0.0000431	4.3E-05	0.1	4.3	4.3E-06
1,2,3,7,8,9-HxCDD	7.85	0.00000785	7.9E-06	0.1	0.79	7.9E-07
1,2,3,4,6,7,8-HpCDD	377	0.000377	3.8E-04	0.01	3.8	3.8E-06
OCDD	1,420	0.00142	1.4E-03	0.0003	0.43	4.3E-07
2,3,7,8-TCDF	2.06	0.00000206	2.1E-06	0.1	0.21	2.1E-07
1,2,3,7,8-PeCDF	1.94 J	0.00000194 J	1.9E-06 J	0.03	0.058 J	5.8E-08 J
2,3,4,7,8-PeCDF	6.59	0.00000659	6.6E-06	0.3	2.0	2.0E-06
1,2,3,4,7,8-HxCDF	5.74	0.00000574	5.7E-06	0.1	0.57	5.7E-07
1,2,3,6,7,8-HxCDF	6.14	0.00000614	6.1E-06	0.1	0.61	6.1E-07
2,3,4,6,7,8-HxCDF	12.8	0.0000128	1.3E-05	0.1	1.3	1.3E-06
1,2,3,7,8,9-HxCDF	2.96 J	0.00000296 J	3.0E-06 J	0.1	0.30 J	3.0E-07 J
1,2,3,4,6,7,8-HpCDF	181	0.000181	1.8E-04	0.01	1.8	1.8E-06
1,2,3,4,7,8,9-HpCDF	6.58	0.00000658	6.6E-06	0.01	0.066	6.6E-08
OCDF	139	0.000139	1.4E-04	0.0003	0.042	4.2E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					19	1.9E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					19	1.9E-05
2,3,7,8-TCDD TEQ (without non-detects)					19	1.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the PQL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

PQL = Practical Quantitation Limit

Table 1-6
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-COMP-2, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.352 J	0.000000352 J	3.5E-07 J	1	0.35 J	3.5E-07 J
1,2,3,7,8-PeCDD	4.14 J	0.00000414 J	4.1E-06 J	1	4.1 J	4.1E-06 J
1,2,3,4,7,8-HxCDD	7.19	0.00000719	7.2E-06	0.1	0.72	7.2E-07
1,2,3,6,7,8-HxCDD	111	0.000111	1.1E-04	0.1	11	1.1E-05
1,2,3,7,8,9-HxCDD	18.7	0.0000187	1.9E-05	0.1	1.9	1.9E-06
1,2,3,4,6,7,8-HpCDD	1,090	0.00109	1.1E-03	0.01	11	1.1E-05
OCDD	4,560 E	0.00456 E	4.6E-03 E	0.0003	1.4 E	1.4E-06 E
2,3,7,8-TCDF	5.44	0.00000544	5.4E-06	0.1	0.54	5.4E-07
1,2,3,7,8-PeCDF	4.28 J	0.00000428 J	4.3E-06 J	0.03	0.13 J	1.3E-07 J
2,3,4,7,8-PeCDF	18.8 J	0.0000188 J	1.9E-05 J	0.3	5.6 J	5.6E-06 J
1,2,3,4,7,8-HxCDF	12.2	0.0000122	1.2E-05	0.1	1.2	1.2E-06
1,2,3,6,7,8-HxCDF	14.3	0.0000143	1.4E-05	0.1	1.4	1.4E-06
2,3,4,6,7,8-HxCDF	29.2	0.0000292	2.9E-05	0.1	2.9	2.9E-06
1,2,3,7,8,9-HxCDF	6.31	0.00000631	6.3E-06	0.1	0.63	6.3E-07
1,2,3,4,6,7,8-HpCDF	291	0.000291	2.9E-04	0.01	2.9	2.9E-06
1,2,3,4,7,8,9-HpCDF	10.6	0.0000106	1.1E-05	0.01	0.11	1.1E-07
OCDF	224	0.000224	2.2E-04	0.0003	0.067	6.7E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					46	4.6E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					46	4.6E-05
2,3,7,8-TCDD TEQ (without non-detects)					46	4.6E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the PQL, but above the EDL.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

PQL = Practical Quantitation Limit

Table 1-7
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-COMP-3, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.517 J	0.000000517 J	5.2E-07 J	1	0.52 J	5.2E-07 J
1,2,3,7,8-PeCDD	5.8	0.0000058	5.8E-06	1	5.8	5.8E-06
1,2,3,4,7,8-HxCDD	13.1	0.0000131	1.3E-05	0.1	1.3	1.3E-06
1,2,3,6,7,8-HxCDD	178	0.000178	1.8E-04	0.1	18	1.8E-05
1,2,3,7,8,9-HxCDD	32	0.000032	3.2E-05	0.1	3.2	3.2E-06
1,2,3,4,6,7,8-HpCDD	1,720	0.00172	1.7E-03	0.01	17	1.7E-05
OCDD	7,660 E	0.00766 E	7.7E-03 E	0.0003	2.3 E	2.3E-06 E
2,3,7,8-TCDF	9.22	0.00000922	9.2E-06	0.1	0.92	9.2E-07
1,2,3,7,8-PeCDF	7.95	0.00000795	8.0E-06	0.03	0.24	2.4E-07
2,3,4,7,8-PeCDF	29.2	0.0000292	2.9E-05	0.3	8.8	8.8E-06
1,2,3,4,7,8-HxCDF	17.9	0.0000179	1.8E-05	0.1	1.8	1.8E-06
1,2,3,6,7,8-HxCDF	18.8	0.0000188	1.9E-05	0.1	1.9	1.9E-06
2,3,4,6,7,8-HxCDF	42.3	0.0000423	4.2E-05	0.1	4.2	4.2E-06
1,2,3,7,8,9-HxCDF	10.6	0.0000106	1.1E-05	0.1	1.1	1.1E-06
1,2,3,4,6,7,8-HpCDF	409	0.000409	4.1E-04	0.01	4.1	4.1E-06
1,2,3,4,7,8,9-HpCDF	15.7	0.0000157	1.6E-05	0.01	0.16	1.6E-07
OCDF	294	0.000294	2.9E-04	0.0003	0.088	8.8E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					71	7.1E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					71	7.1E-05
2,3,7,8-TCDD TEQ (without non-detects)					71	7.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the PQL, but above the EDL.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

PQL = Practical Quantitation Limit

Table 1-8
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-COMP-3 Duplicate (SED-COMP-99), April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.347 J	0.000000347 J	3.5E-07 J	1	0.35 J	3.5E-07 J
1,2,3,7,8-PeCDD	3.47 J	0.00000347 J	3.5E-06 J	1	3.5 J	3.5E-06 J
1,2,3,4,7,8-HxCDD	6.22	0.00000622	6.2E-06	0.1	0.62	6.2E-07
1,2,3,6,7,8-HxCDD	107	0.000107	1.1E-04	0.1	11	1.1E-05
1,2,3,7,8,9-HxCDD	16.4	0.0000164	1.6E-05	0.1	1.6	1.6E-06
1,2,3,4,6,7,8-HpCDD	1,050	0.00105	1.1E-03	0.01	11	1.1E-05
OCDD	4,690 E	0.00469 E	4.7E-03 E	0.0003	1.4 E	1.4E-06 E
2,3,7,8-TCDF	6.14	0.00000614	6.1E-06	0.1	0.61	6.1E-07
1,2,3,7,8-PeCDF	4.51 J	0.00000451 J	4.5E-06 J	0.03	0.14 J	1.4E-07 J
2,3,4,7,8-PeCDF	18.7	0.0000187	1.9E-05	0.3	5.6	5.6E-06
1,2,3,4,7,8-HxCDF	14.7	0.0000147	1.5E-05	0.1	1.5	1.5E-06
1,2,3,6,7,8-HxCDF	13.2	0.0000132	1.3E-05	0.1	1.3	1.3E-06
2,3,4,6,7,8-HxCDF	26.6	0.0000266	2.7E-05	0.1	2.7	2.7E-06
1,2,3,7,8,9-HxCDF	8.12	0.00000812	8.1E-06	0.1	0.81	8.1E-07
1,2,3,4,6,7,8-HpCDF	308	0.000308	3.1E-04	0.01	3.1	3.1E-06
1,2,3,4,7,8,9-HpCDF	12.4	0.0000124	1.2E-05	0.01	0.12	1.2E-07
OCDF	229	0.000229	2.3E-04	0.0003	0.069	6.9E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					45	4.5E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					45	4.5E-05
2,3,7,8-TCDD TEQ (without non-detects)					45	4.5E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the PQL, but above the EDL.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

PQL = Practical Quantitation Limit

Table 1-9
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-COMP-4, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.129 U	0.000000129 U	1.3E-07 U	1	0.13 U	1.3E-07 U
1,2,3,7,8-PeCDD	0.586 J	0.000000586 J	5.9E-07 J	1	0.59 J	5.9E-07 J
1,2,3,4,7,8-HxCDD	1.01 J	0.00000101 J	1.0E-06 J	0.1	0.10 J	1.0E-07 J
1,2,3,6,7,8-HxCDD	20.9	0.0000209	2.1E-05	0.1	2.1	2.1E-06
1,2,3,7,8,9-HxCDD	3.1 J	0.0000031 J	3.1E-06 J	0.1	0.31 J	3.1E-07 J
1,2,3,4,6,7,8-HpCDD	201	0.000201	2.0E-04	0.01	2.0	2.0E-06
OCDD	896	0.000896	9.0E-04	0.0003	0.27	2.7E-07
2,3,7,8-TCDF	1.26	0.00000126	1.3E-06	0.1	0.13	1.3E-07
1,2,3,7,8-PeCDF	0.72 J	0.00000072 J	7.2E-07 J	0.03	0.022 J	2.2E-08 J
2,3,4,7,8-PeCDF	2.96 J	0.00000296 J	3.0E-06 J	0.3	0.89 J	8.9E-07 J
1,2,3,4,7,8-HxCDF	1.89 J	0.00000189 J	1.9E-06 J	0.1	0.19 J	1.9E-07 J
1,2,3,6,7,8-HxCDF	2.23 J	0.00000223 J	2.2E-06 J	0.1	0.22 J	2.2E-07 J
2,3,4,6,7,8-HxCDF	4.49 J	0.00000449 J	4.5E-06 J	0.1	0.45 J	4.5E-07 J
1,2,3,7,8,9-HxCDF	1.24 J	0.00000124 J	1.2E-06 J	0.1	0.12 J	1.2E-07 J
1,2,3,4,6,7,8-HpCDF	49.8	0.0000498	5.0E-05	0.01	0.50	5.0E-07
1,2,3,4,7,8,9-HpCDF	1.86 J	0.00000186 J	1.9E-06 J	0.01	0.019 J	1.9E-08 J
OCDF	36.4	0.0000364	3.6E-05	0.0003	0.011	1.1E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					8.0	8.0E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					8.0	8.0E-06
2,3,7,8-TCDD TEQ (without non-detects)					7.9	7.9E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the PQL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

PQL = Practical Quantitation Limit

Table 1-10
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-COMP-5, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.773 U	0.000000773 U	7.7E-07 U	1	0.77 U	7.7E-07 U
1,2,3,7,8-PeCDD	7.36 J	0.00000736 J	7.4E-06 J	1	7.4 J	7.4E-06 J
1,2,3,4,7,8-HxCDD	16.7 U	0.0000167 U	1.7E-05 U	0.1	1.7 U	1.7E-06 U
1,2,3,6,7,8-HxCDD	319	0.000319	3.2E-04	0.1	32	3.2E-05
1,2,3,7,8,9-HxCDD	36 U	0.000036 U	3.6E-05 U	0.1	3.6 U	3.6E-06 U
1,2,3,4,6,7,8-HpCDD	3,210	0.00321	3.2E-03	0.01	32	3.2E-05
OCDD	15,800	0.0158	1.6E-02	0.0003	4.7	4.7E-06
2,3,7,8-TCDF	13.2	0.0000132	1.3E-05	0.1	1.3	1.3E-06
1,2,3,7,8-PeCDF	12.6 J	0.0000126 J	1.3E-05 J	0.03	0.38 J	3.8E-07 J
2,3,4,7,8-PeCDF	45.3	0.0000453	4.5E-05	0.3	14	1.4E-05
1,2,3,4,7,8-HxCDF	33.5	0.0000335	3.4E-05	0.1	3.4	3.4E-06
1,2,3,6,7,8-HxCDF	31.6	0.0000316	3.2E-05	0.1	3.2	3.2E-06
2,3,4,6,7,8-HxCDF	68.5	0.0000685	6.9E-05	0.1	6.9	6.9E-06
1,2,3,7,8,9-HxCDF	19.8 J	0.0000198 J	2.0E-05 J	0.1	2.0 J	2.0E-06 J
1,2,3,4,6,7,8-HpCDF	906	0.000906	9.1E-04	0.01	9.1	9.1E-06
1,2,3,4,7,8,9-HpCDF	29.2	0.0000292	2.9E-05	0.01	0.29	2.9E-07
OCDF	615	0.000615	6.2E-04	0.0003	0.18	1.8E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					122	1.2E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					119	1.2E-04
2,3,7,8-TCDD TEQ (without non-detects)					116	1.2E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the PQL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

PQL = Practical Quantitation Limit

Table 1-11
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-COMP-6, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.2 U	0.0000002 U	2.0E-07 U	1	0.20 U	2.0E-07 U
1,2,3,7,8-PeCDD	0.415 J	0.000000415 J	4.2E-07 J	1	0.42 J	4.2E-07 J
1,2,3,4,7,8-HxCDD	0.698 U	0.000000698 U	7.0E-07 U	0.1	0.070 U	7.0E-08 U
1,2,3,6,7,8-HxCDD	9.89	0.00000989	9.9E-06	0.1	0.99	9.9E-07
1,2,3,7,8,9-HxCDD	1.56 J	0.00000156 J	1.6E-06 J	0.1	0.16 J	1.6E-07 J
1,2,3,4,6,7,8-HpCDD	99.3	0.0000993	9.9E-05	0.01	0.99	9.9E-07
OCDD	449	0.000449	4.5E-04	0.0003	0.13	1.3E-07
2,3,7,8-TCDF	0.719 J	0.000000719 J	7.2E-07 J	0.1	0.072 J	7.2E-08 J
1,2,3,7,8-PeCDF	0.737 J	0.000000737 J	7.4E-07 J	0.03	0.022 J	2.2E-08 J
2,3,4,7,8-PeCDF	1.47 J	0.00000147 J	1.5E-06 J	0.3	0.44 J	4.4E-07 J
1,2,3,4,7,8-HxCDF	1.25 J	0.00000125 J	1.3E-06 J	0.1	0.13 J	1.3E-07 J
1,2,3,6,7,8-HxCDF	1.1 U	0.0000011 U	1.1E-06 U	0.1	0.11 U	1.1E-07 U
2,3,4,6,7,8-HxCDF	2.48 J	0.00000248 J	2.5E-06 J	0.1	0.25 J	2.5E-07 J
1,2,3,7,8,9-HxCDF	0.731 J	0.000000731 J	7.3E-07 J	0.1	0.073 J	7.3E-08 J
1,2,3,4,6,7,8-HpCDF	33.2	0.0000332	3.3E-05	0.01	0.33	3.3E-07
1,2,3,4,7,8,9-HpCDF	1.18 J	0.00000118 J	1.2E-06 J	0.01	0.012 J	1.2E-08 J
OCDF	28.6	0.0000286	2.9E-05	0.0003	0.0086	8.6E-09
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					4.4	4.4E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					4.2	4.2E-06
2,3,7,8-TCDD TEQ (without non-detects)					4.0	4.0E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the PQL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

PQL = Practical Quantitation Limit

Table 1-12
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-COMP-7, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.61 J	0.00000061 J	6.1E-07 J	1	0.61 J	6.1E-07 J
1,2,3,7,8-PeCDD	3.75 J	0.00000375 J	3.8E-06 J	1	3.8 J	3.8E-06 J
1,2,3,4,7,8-HxCDD	5.21 J	0.00000521 J	5.2E-06 J	0.1	0.52 J	5.2E-07 J
1,2,3,6,7,8-HxCDD	149	0.000149	1.5E-04	0.1	15	1.5E-05
1,2,3,7,8,9-HxCDD	16.5	0.0000165	1.7E-05	0.1	1.7	1.7E-06
1,2,3,4,6,7,8-HpCDD	1,010	0.00101	1.0E-03	0.01	10	1.0E-05
OCDD	4,030	0.00403	4.0E-03	0.0003	1.2	1.2E-06
2,3,7,8-TCDF	14.9	0.0000149	1.5E-05	0.1	1.5	1.5E-06
1,2,3,7,8-PeCDF	3.74 J	0.00000374 J	3.7E-06 J	0.03	0.11 J	1.1E-07 J
2,3,4,7,8-PeCDF	23.8	0.0000238	2.4E-05	0.3	7.1	7.1E-06
1,2,3,4,7,8-HxCDF	9.28	0.00000928	9.3E-06	0.1	0.93	9.3E-07
1,2,3,6,7,8-HxCDF	12.2	0.0000122	1.2E-05	0.1	1.2	1.2E-06
2,3,4,6,7,8-HxCDF	25.6	0.0000256	2.6E-05	0.1	2.6	2.6E-06
1,2,3,7,8,9-HxCDF	6.12	0.00000612	6.1E-06	0.1	0.61	6.1E-07
1,2,3,4,6,7,8-HpCDF	192	0.000192	1.9E-04	0.01	1.9	1.9E-06
1,2,3,4,7,8,9-HpCDF	6.15	0.00000615	6.2E-06	0.01	0.062	6.2E-08
OCDF	95.7	0.0000957	9.6E-05	0.0003	0.029	2.9E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					49	4.9E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					49	4.9E-05
2,3,7,8-TCDD TEQ (without non-detects)					49	4.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the PQL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

PQL = Practical Quantitation Limit

Table 1-13
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-COMP-8, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.412 J	0.000000412 J	4.1E-07 J	1	0.41 J	4.1E-07 J
1,2,3,7,8-PeCDD	2.86 J	0.00000286 J	2.9E-06 J	1	2.9 J	2.9E-06 J
1,2,3,4,7,8-HxCDD	6.03	0.00000603	6.0E-06	0.1	0.60	6.0E-07
1,2,3,6,7,8-HxCDD	121	0.000121	1.2E-04	0.1	12	1.2E-05
1,2,3,7,8,9-HxCDD	16.1	0.0000161	1.6E-05	0.1	1.6	1.6E-06
1,2,3,4,6,7,8-HpCDD	1,070	0.00107	1.1E-03	0.01	11	1.1E-05
OCDD	4,810 E	0.00481 E	4.8E-03 E	0.0003	1.4 E	1.4E-06 E
2,3,7,8-TCDF	6.57	0.00000657	6.6E-06	0.1	0.66	6.6E-07
1,2,3,7,8-PeCDF	5.11	0.00000511	5.1E-06	0.03	0.15	1.5E-07
2,3,4,7,8-PeCDF	19.6	0.0000196	2.0E-05	0.3	5.9	5.9E-06
1,2,3,4,7,8-HxCDF	9.95	0.00000995	1.0E-05	0.1	1.0	1.0E-06
1,2,3,6,7,8-HxCDF	9.6	0.0000096	9.6E-06	0.1	0.96	9.6E-07
2,3,4,6,7,8-HxCDF	23.4	0.0000234	2.3E-05	0.1	2.3	2.3E-06
1,2,3,7,8,9-HxCDF	6.96	0.00000696	7.0E-06	0.1	0.70	7.0E-07
1,2,3,4,6,7,8-HpCDF	180	0.00018	1.8E-04	0.01	1.8	1.8E-06
1,2,3,4,7,8,9-HpCDF	6.37	0.00000637	6.4E-06	0.01	0.064	6.4E-08
OCDF	100	0.0001	1.0E-04	0.0003	0.030	3.0E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					43	4.3E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					43	4.3E-05
2,3,7,8-TCDD TEQ (without non-detects)					43	4.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the PQL, but above the EDL.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

PQL = Practical Quantitation Limit

Table 1-14
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-25-0COMP (0-1), November 2014						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.54	0.00000154	1.5E-06	1	1.54	1.5E-06
1,2,3,7,8-PeCDD	9.83	0.00000983	9.8E-06	1	9.8	9.8E-06
1,2,3,4,7,8-HxCDD	13.9	0.0000139	1.4E-05	0.1	1.39	1.4E-06
1,2,3,6,7,8-HxCDD	177	0.000177	1.8E-04	0.1	17.7	1.8E-05
1,2,3,7,8,9-HxCDD	38.7	0.0000387	3.9E-05	0.1	3.87	3.9E-06
1,2,3,4,6,7,8-HpCDD	1,640	0.00164	1.6E-03	0.01	16.4	1.6E-05
OCDD	6,750	0.00675	6.8E-03	0.0003	2.03	2.0E-06
2,3,7,8-TCDF	11.9	0.0000119	1.2E-05	0.1	1.19	1.2E-06
1,2,3,7,8-PeCDF	8.04	0.00000804	8.0E-06	0.03	0.241	2.4E-07
2,3,4,7,8-PeCDF	9.74	0.00000974	9.7E-06	0.3	2.9	2.9E-06
1,2,3,4,7,8-HxCDF	23.2	0.0000232	2.3E-05	0.1	2.32	2.3E-06
1,2,3,6,7,8-HxCDF	27	0.000027	2.7E-05	0.1	2.70	2.7E-06
2,3,4,6,7,8-HxCDF	22.6	0.0000226	2.3E-05	0.1	2.3	2.3E-06
1,2,3,7,8,9-HxCDF	1.06	0.00000106	1.1E-06	0.1	0.11	1.1E-07
1,2,3,4,6,7,8-HpCDF	616	0.000616	6.2E-04	0.01	6.2	6.2E-06
1,2,3,4,7,8,9-HpCDF	23.9	0.0000239	2.4E-05	0.01	0.239	2.4E-07
OCDF	384	0.000384	3.8E-04	0.0003	0.115	1.2E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					71	7.1E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					71	7.1E-05
2,3,7,8-TCDD TEQ (without non-detects)					71	7.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-15
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-25-1COMP (0-1), November 2014						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.45	0.00000145	1.5E-06	1	1.45	1.5E-06
1,2,3,7,8-PeCDD	14.1	0.0000141	1.4E-05	1	14.1	1.4E-05
1,2,3,4,7,8-HxCDD	25.9	0.0000259	2.6E-05	0.1	2.59	2.6E-06
1,2,3,6,7,8-HxCDD	425	0.000425	4.3E-04	0.1	43	4.3E-05
1,2,3,7,8,9-HxCDD	76.1	0.0000761	7.6E-05	0.1	7.6	7.6E-06
1,2,3,4,6,7,8-HpCDD	4,550	0.00455	4.6E-03	0.01	46	4.6E-05
OCDD	19,700	0.0197	2.0E-02	0.0003	5.9	5.9E-06
2,3,7,8-TCDF	28.4	0.0000284	2.8E-05	0.1	2.84	2.8E-06
1,2,3,7,8-PeCDF	12.9	0.0000129	1.3E-05	0.03	0.39	3.9E-07
2,3,4,7,8-PeCDF	14.4	0.0000144	1.4E-05	0.3	4.3	4.3E-06
1,2,3,4,7,8-HxCDF	62.3	0.0000623	6.2E-05	0.1	6.2	6.2E-06
1,2,3,6,7,8-HxCDF	63.8	0.0000638	6.4E-05	0.1	6.4	6.4E-06
2,3,4,6,7,8-HxCDF	46.8	0.0000468	4.7E-05	0.1	4.7	4.7E-06
1,2,3,7,8,9-HxCDF	2.2	0.0000022	2.2E-06	0.1	0.22	2.2E-07
1,2,3,4,6,7,8-HpCDF	1220	0.00122	1.2E-03	0.01	12.2	1.2E-05
1,2,3,4,7,8,9-HpCDF	44.9	0.0000449	4.5E-05	0.01	0.45	4.5E-07
OCDF	773	0.000773	7.7E-04	0.0003	0.232	2.3E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					158	1.6E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					158	1.6E-04
2,3,7,8-TCDD TEQ (without non-detects)					158	1.6E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-16
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-25-2COMP (0-1), November 2014						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.16	0.00000116	1.2E-06	1	1.16	1.2E-06
1,2,3,7,8-PeCDD	10.2	0.0000102	1.0E-05	1	10.2	1.0E-05
1,2,3,4,7,8-HxCDD	19.7	0.0000197	2.0E-05	0.1	2.0	2.0E-06
1,2,3,6,7,8-HxCDD	288	0.000288	2.9E-04	0.1	29	2.9E-05
1,2,3,7,8,9-HxCDD	50.6	0.0000506	5.1E-05	0.1	5.1	5.1E-06
1,2,3,4,6,7,8-HpCDD	3,470	0.00347	3.5E-03	0.01	35	3.5E-05
OCDD	14,100	0.0141	1.4E-02	0.0003	4.2	4.2E-06
2,3,7,8-TCDF	19.1	0.0000191	1.9E-05	0.1	1.91	1.9E-06
1,2,3,7,8-PeCDF	9.79	0.00000979	9.8E-06	0.03	0.29	2.9E-07
2,3,4,7,8-PeCDF	11.4	0.0000114	1.1E-05	0.3	3.4	3.4E-06
1,2,3,4,7,8-HxCDF	48.8	0.0000488	4.9E-05	0.1	4.9	4.9E-06
1,2,3,6,7,8-HxCDF	46.9	0.0000469	4.7E-05	0.1	4.7	4.7E-06
2,3,4,6,7,8-HxCDF	32.1	0.0000321	3.2E-05	0.1	3.2	3.2E-06
1,2,3,7,8,9-HxCDF	1.75	0.00000175	1.8E-06	0.1	0.2	1.8E-07
1,2,3,4,6,7,8-HpCDF	1020	0.00102	1.0E-03	0.01	10.2	1.0E-05
1,2,3,4,7,8,9-HpCDF	33.7	0.0000337	3.4E-05	0.01	0.34	3.4E-07
OCDF	676	0.000676	6.8E-04	0.0003	0.203	2.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					115	1.2E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					115	1.2E-04
2,3,7,8-TCDD TEQ (without non-detects)					115	1.2E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-17
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-25-3COMP (0-1), November 2014						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	5.04	0.00000504	5.0E-06	1	5.04	5.0E-06
1,2,3,7,8-PeCDD	39.4	0.0000394	3.9E-05	1	39.4	3.9E-05
1,2,3,4,7,8-HxCDD	63.5	0.0000635	6.4E-05	0.1	6.35	6.4E-06
1,2,3,6,7,8-HxCDD	1,260	0.00126	1.3E-03	0.1	126	1.3E-04
1,2,3,7,8,9-HxCDD	189	0.000189	1.9E-04	0.1	18.9	1.9E-05
1,2,3,4,6,7,8-HpCDD	12,200	0.0122	1.2E-02	0.01	122	1.2E-04
OCDD	39,500	0.0395	4.0E-02	0.0003	11.9	1.2E-05
2,3,7,8-TCDF	76.7	0.0000767	7.7E-05	0.1	7.67	7.7E-06
1,2,3,7,8-PeCDF	45	0.000045	4.5E-05	0.03	1.35	1.4E-06
2,3,4,7,8-PeCDF	52	0.000052	5.2E-05	0.3	15.6	1.6E-05
1,2,3,4,7,8-HxCDF	267	0.000267	2.7E-04	0.1	26.7	2.7E-05
1,2,3,6,7,8-HxCDF	173	0.000173	1.7E-04	0.1	17.3	1.7E-05
2,3,4,6,7,8-HxCDF	166	0.000166	1.7E-04	0.1	16.6	1.7E-05
1,2,3,7,8,9-HxCDF	8.15	0.00000815	8.2E-06	0.1	0.82	8.2E-07
1,2,3,4,6,7,8-HpCDF	6,560	0.00656	6.6E-03	0.01	65.6	6.6E-05
1,2,3,4,7,8,9-HpCDF	198	0.000198	2.0E-04	0.01	1.98	2.0E-06
OCDF	4,790	0.00479	4.8E-03	0.0003	1.437	1.4E-06
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					485	4.8E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					485	4.8E-04
2,3,7,8-TCDD TEQ (without non-detects)					485	4.8E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-18
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-25-4COMP (0-1), November 2014						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.27	0.00000127	1.3E-06	1	1.27	1.3E-06
1,2,3,7,8-PeCDD	9.51	0.00000951	9.5E-06	1	9.51	9.5E-06
1,2,3,4,7,8-HxCDD	17	0.000017	1.7E-05	0.1	1.70	1.7E-06
1,2,3,6,7,8-HxCDD	254	0.000254	2.5E-04	0.1	25.4	2.5E-05
1,2,3,7,8,9-HxCDD	53.9	0.0000539	5.4E-05	0.1	5.39	5.4E-06
1,2,3,4,6,7,8-HpCDD	2,610	0.00261	2.6E-03	0.01	26.1	2.6E-05
OCDD	13,000	0.013	1.3E-02	0.0003	3.90	3.9E-06
2,3,7,8-TCDF	15.8	0.0000158	1.6E-05	0.1	1.58	1.6E-06
1,2,3,7,8-PeCDF	7.76	0.00000776	7.8E-06	0.03	0.233	2.3E-07
2,3,4,7,8-PeCDF	8.7	0.0000087	8.7E-06	0.3	2.61	2.6E-06
1,2,3,4,7,8-HxCDF	39	0.000039	3.9E-05	0.1	3.90	3.9E-06
1,2,3,6,7,8-HxCDF	35.7	0.0000357	3.6E-05	0.1	3.57	3.6E-06
2,3,4,6,7,8-HxCDF	26.6	0.0000266	2.7E-05	0.1	2.66	2.7E-06
1,2,3,7,8,9-HxCDF	1.5	0.0000015	1.5E-06	0.1	0.15	1.5E-07
1,2,3,4,6,7,8-HpCDF	805	0.000805	8.1E-04	0.01	8.05	8.1E-06
1,2,3,4,7,8,9-HpCDF	27.1	0.0000271	2.7E-05	0.01	0.271	2.7E-07
OCDF	658	0.000658	6.6E-04	0.0003	0.197	2.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					96	9.6E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					96	9.6E-05
2,3,7,8-TCDD TEQ (without non-detects)					96	9.6E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-19
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-200ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.446	0.000000446	4.5E-07	1	0.45	4.5E-07
1,2,3,7,8-PeCDD	2.49	0.00000249	2.5E-06	1	2.5	2.5E-06
1,2,3,4,7,8-HxCDD	4.06	0.00000406	4.1E-06	0.1	0.41	4.1E-07
1,2,3,6,7,8-HxCDD	154	0.000154	1.5E-04	0.1	15.4	1.5E-05
1,2,3,7,8,9-HxCDD	16.4	0.0000164	1.6E-05	0.1	1.64	1.6E-06
1,2,3,4,6,7,8-HpCDD	1,400	0.0014	1.4E-03	0.01	14.0	1.4E-05
OCDD	7,720	0.00772	7.7E-03	0.0003	2.32	2.3E-06
2,3,7,8-TCDF	8.53	0.00000853	8.5E-06	0.1	0.85	8.5E-07
1,2,3,7,8-PeCDF	4.29	0.00000429	4.3E-06	0.03	0.129	1.3E-07
2,3,4,7,8-PeCDF	5.04	0.00000504	5.0E-06	0.3	1.5	1.5E-06
1,2,3,4,7,8-HxCDF	22.7	0.0000227	2.3E-05	0.1	2.27	2.3E-06
1,2,3,6,7,8-HxCDF	17.3	0.0000173	1.7E-05	0.1	1.73	1.7E-06
2,3,4,6,7,8-HxCDF	13.3	0.0000133	1.3E-05	0.1	1.3	1.3E-06
1,2,3,7,8,9-HxCDF	0.865	0.000000865	8.7E-07	0.1	0.09	8.7E-08
1,2,3,4,6,7,8-HpCDF	367	0.000367	3.7E-04	0.01	3.7	3.7E-06
1,2,3,4,7,8,9-HpCDF	12.6	0.0000126	1.3E-05	0.01	0.126	1.3E-07
OCDF	347	0.000347	3.5E-04	0.0003	0.104	1.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					49	4.9E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					49	4.9E-05
2,3,7,8-TCDD TEQ (without non-detects)					49	4.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-20
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-200AC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.127	0.000000127	1.3E-07	1	0.13	1.3E-07
1,2,3,7,8-PeCDD	0.4	0.0000004	4.0E-07	1	0.4	4.0E-07
1,2,3,4,7,8-HxCDD	0.685	0.000000685	6.9E-07	0.1	0.07	6.9E-08
1,2,3,6,7,8-HxCDD	15.7	0.0000157	1.6E-05	0.1	2	1.6E-06
1,2,3,7,8,9-HxCDD	2.12	0.00000212	2.1E-06	0.1	0.2	2.1E-07
1,2,3,4,6,7,8-HpCDD	132	0.000132	1.3E-04	0.01	1	1.3E-06
OCDD	717	0.000717	7.2E-04	0.0003	0.2	2.2E-07
2,3,7,8-TCDF	0.905	0.000000905	9.1E-07	0.1	0.09	9.1E-08
1,2,3,7,8-PeCDF	0.463	0.000000463	4.6E-07	0.03	0.01	1.4E-08
2,3,4,7,8-PeCDF	0.495	0.000000495	5.0E-07	0.3	0.1	1.5E-07
1,2,3,4,7,8-HxCDF	1.73	0.00000173	1.7E-06	0.1	0.2	1.7E-07
1,2,3,6,7,8-HxCDF	1.67	0.00000167	1.7E-06	0.1	0.2	1.7E-07
2,3,4,6,7,8-HxCDF	1.6	0.0000016	1.6E-06	0.1	0.2	1.6E-07
1,2,3,7,8,9-HxCDF	0.161 U	0.000000161	1.6E-07 U	0.1	0.02 U	1.6E-08 U
1,2,3,4,6,7,8-HpCDF	68.4	0.0000684	6.8E-05	0.01	0.7	6.8E-07
1,2,3,4,7,8,9-HpCDF	2.08	0.00000208	2.1E-06	0.01	0.02	2.1E-08
OCDF	67.7	0.0000677	6.8E-05	0.0003	0.020	2.0E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					5.4	5.4E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					5.4	5.4E-06
2,3,7,8-TCDD TEQ (without non-detects)					5.4	5.4E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-21
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-201ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.97	0.00000197	2.0E-06	1	1.97	2.0E-06
1,2,3,7,8-PeCDD	18.7	0.0000187	1.9E-05	1	18.7	1.9E-05
1,2,3,4,7,8-HxCDD	40.6	0.0000406	4.1E-05	0.1	4.1	4.1E-06
1,2,3,6,7,8-HxCDD	833	0.000833	8.3E-04	0.1	83	8.3E-05
1,2,3,7,8,9-HxCDD	104	0.000104	1.0E-04	0.1	10.4	1.0E-05
1,2,3,4,6,7,8-HpCDD	7,340	0.00734	7.3E-03	0.01	73	7.3E-05
OCDD	47,900	0.0479	4.8E-02	0.0003	14.4	1.4E-05
2,3,7,8-TCDF	38	0.000038	3.8E-05	0.1	3.80	3.8E-06
1,2,3,7,8-PeCDF	25.7	0.0000257	2.6E-05	0.03	0.77	7.7E-07
2,3,4,7,8-PeCDF	29.2	0.0000292	2.9E-05	0.3	8.8	8.8E-06
1,2,3,4,7,8-HxCDF	106	0.000106	1.1E-04	0.1	10.6	1.1E-05
1,2,3,6,7,8-HxCDF	85.6	0.0000856	8.6E-05	0.1	8.6	8.6E-06
2,3,4,6,7,8-HxCDF	83.8	0.0000838	8.4E-05	0.1	8.4	8.4E-06
1,2,3,7,8,9-HxCDF	4.01	0.00000401	4.0E-06	0.1	0.4	4.0E-07
1,2,3,4,6,7,8-HpCDF	1,720	0.00172	1.7E-03	0.01	17.2	1.7E-05
1,2,3,4,7,8,9-HpCDF	53.4	0.0000534	5.3E-05	0.01	0.53	5.3E-07
OCDF	1,350	0.00135	1.4E-03	0.0003	0.405	4.1E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					266	2.7E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					266	2.7E-04
2,3,7,8-TCDD TEQ (without non-detects)					266	2.7E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-22
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-201ABC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	2.11	0.00000211	2.1E-06	1	2.11	2.1E-06
1,2,3,7,8-PeCDD	3.19	0.00000319	3.2E-06	1	3.2	3.2E-06
1,2,3,4,7,8-HxCDD	5.31	0.00000531	5.3E-06	0.1	0.53	5.3E-07
1,2,3,6,7,8-HxCDD	144	0.000144	1.4E-04	0.1	14	1.4E-05
1,2,3,7,8,9-HxCDD	18.5	0.0000185	1.9E-05	0.1	1.9	1.9E-06
1,2,3,4,6,7,8-HpCDD	1,180	0.00118	1.2E-03	0.01	12	1.2E-05
OCDD	6,000	0.006	6.0E-03	0.0003	1.8	1.8E-06
2,3,7,8-TCDF	8.63	0.00000863	8.6E-06	0.1	0.86	8.6E-07
1,2,3,7,8-PeCDF	3.67	0.00000367	3.7E-06	0.03	0.11	1.1E-07
2,3,4,7,8-PeCDF	3.94	0.00000394	3.9E-06	0.3	1.2	1.2E-06
1,2,3,4,7,8-HxCDF	30.3	0.0000303	3.0E-05	0.1	3.0	3.0E-06
1,2,3,6,7,8-HxCDF	24.8	0.0000248	2.5E-05	0.1	2.5	2.5E-06
2,3,4,6,7,8-HxCDF	14.3	0.0000143	1.4E-05	0.1	1.4	1.4E-06
1,2,3,7,8,9-HxCDF	1.19	0.00000119	1.2E-06	0.1	0.12	1.2E-07
1,2,3,4,6,7,8-HpCDF	800	0.0008	8.0E-04	0.01	8.0	8.0E-06
1,2,3,4,7,8,9-HpCDF	24.7	0.0000247	2.5E-05	0.01	0.25	2.5E-07
OCDF	1,000	0.001	1.0E-03	0.0003	0.300	3.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					53	5.3E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					53	5.3E-05
2,3,7,8-TCDD TEQ (without non-detects)					53	5.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-23
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-202ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.146 U	0.000000146 U	1.5E-07 U	1	0.15 U	1.5E-07 U
1,2,3,7,8-PeCDD	2.33	0.00000233	2.3E-06	1	2.33	2.3E-06
1,2,3,4,7,8-HxCDD	3.54	0.00000354	3.5E-06	0.1	0.35	3.5E-07
1,2,3,6,7,8-HxCDD	98.9	0.0000989	9.9E-05	0.1	9.9	9.9E-06
1,2,3,7,8,9-HxCDD	12.5	0.0000125	1.3E-05	0.1	1.25	1.3E-06
1,2,3,4,6,7,8-HpCDD	713	0.000713	7.1E-04	0.01	7.1	7.1E-06
OCDD	3,610	0.00361	3.6E-03	0.0003	1.08	1.1E-06
2,3,7,8-TCDF	4.12	0.00000412	4.1E-06	0.1	0.41	4.1E-07
1,2,3,7,8-PeCDF	2.85	0.00000285	2.9E-06	0.03	0.086	8.6E-08
2,3,4,7,8-PeCDF	3.49	0.00000349	3.5E-06	0.3	1.05	1.0E-06
1,2,3,4,7,8-HxCDF	11.4	0.0000114	1.1E-05	0.1	1.14	1.1E-06
1,2,3,6,7,8-HxCDF	11.1	0.0000111	1.1E-05	0.1	1.11	1.1E-06
2,3,4,6,7,8-HxCDF	11.8	0.0000118	1.2E-05	0.1	1.18	1.2E-06
1,2,3,7,8,9-HxCDF	0.523	0.000000523	5.2E-07	0.1	0.05	5.2E-08
1,2,3,4,6,7,8-HpCDF	438	0.000438	4.4E-04	0.01	4.38	4.4E-06
1,2,3,4,7,8,9-HpCDF	12	0.000012	1.2E-05	0.01	0.120	1.2E-07
OCDF	351	0.000351	3.5E-04	0.0003	0.105	1.1E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					32	3.2E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					32	3.2E-05
2,3,7,8-TCDD TEQ (without non-detects)					32	3.2E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-24
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-203ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.741	0.000000741	7.4E-07	1	0.74	7.4E-07
1,2,3,7,8-PeCDD	7.26	0.00000726	7.3E-06	1	7.26	7.3E-06
1,2,3,4,7,8-HxCDD	14.9	0.0000149	1.5E-05	0.1	1.49	1.5E-06
1,2,3,6,7,8-HxCDD	343	0.000343	3.4E-04	0.1	34.3	3.4E-05
1,2,3,7,8,9-HxCDD	45.5	0.0000455	4.6E-05	0.1	4.55	4.6E-06
1,2,3,4,6,7,8-HpCDD	3,320	0.00332	3.3E-03	0.01	33.2	3.3E-05
OCDD	25,100	0.0251	2.5E-02	0.0003	7.53	7.5E-06
2,3,7,8-TCDF	15.5	0.0000155	1.6E-05	0.1	1.55	1.6E-06
1,2,3,7,8-PeCDF	8.87	0.00000887	8.9E-06	0.03	0.266	2.7E-07
2,3,4,7,8-PeCDF	9.7	0.0000097	9.7E-06	0.3	2.91	2.9E-06
1,2,3,4,7,8-HxCDF	48.4	0.0000484	4.8E-05	0.1	4.84	4.8E-06
1,2,3,6,7,8-HxCDF	49.5	0.0000495	5.0E-05	0.1	4.95	5.0E-06
2,3,4,6,7,8-HxCDF	33.5	0.0000335	3.4E-05	0.1	3.35	3.4E-06
1,2,3,7,8,9-HxCDF	1.48	0.00000148	1.5E-06	0.1	0.15	1.5E-07
1,2,3,4,6,7,8-HpCDF	1,190	0.00119	1.2E-03	0.01	11.90	1.2E-05
1,2,3,4,7,8,9-HpCDF	33.4	0.0000334	3.3E-05	0.01	0.334	3.3E-07
OCDF	1,310	0.00131	1.3E-03	0.0003	0.393	3.9E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					120	1.2E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					120	1.2E-04
2,3,7,8-TCDD TEQ (without non-detects)					120	1.2E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-25
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-203AC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.107 U	0.000000107 U	1.1E-07 U	1	0.11 U	1.1E-07 U
1,2,3,7,8-PeCDD	0.8	0.0000008	8.0E-07	1	0.80	8.0E-07
1,2,3,4,7,8-HxCDD	1.29	0.00000129	1.3E-06	0.1	0.13	1.3E-07
1,2,3,6,7,8-HxCDD	30.9	0.0000309	3.1E-05	0.1	3.1	3.1E-06
1,2,3,7,8,9-HxCDD	3.79	0.00000379	3.8E-06	0.1	0.38	3.8E-07
1,2,3,4,6,7,8-HpCDD	251	0.000251	2.5E-04	0.01	2.5	2.5E-06
OCDD	725	0.000725	7.3E-04	0.0003	0.22	2.2E-07
2,3,7,8-TCDF	1.38	0.00000138	1.4E-06	0.1	0.14	1.4E-07
1,2,3,7,8-PeCDF	0.805	0.000000805	8.1E-07	0.03	0.024	2.4E-08
2,3,4,7,8-PeCDF	1.04	0.00000104	1.0E-06	0.3	0.31	3.1E-07
1,2,3,4,7,8-HxCDF	4.57	0.00000457	4.6E-06	0.1	0.46	4.6E-07
1,2,3,6,7,8-HxCDF	4.44	0.00000444	4.4E-06	0.1	0.44	4.4E-07
2,3,4,6,7,8-HxCDF	4.81	0.00000481	4.8E-06	0.1	0.48	4.8E-07
1,2,3,7,8,9-HxCDF	0.244	0.000000244	2.4E-07	0.1	0.02	2.4E-08
1,2,3,4,6,7,8-HpCDF	198	0.000198	2.0E-04	0.01	1.98	2.0E-06
1,2,3,4,7,8,9-HpCDF	5.18	0.00000518	5.2E-06	0.01	0.052	5.2E-08
OCDF	180	0.00018	1.8E-04	0.0003	0.054	5.4E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					11	1.1E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					11	1.1E-05
2,3,7,8-TCDD TEQ (without non-detects)					11	1.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-26
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-204ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	2.14	0.00000214	2.1E-06	1	2.14	2.1E-06
1,2,3,7,8-PeCDD	15.3	0.0000153	1.5E-05	1	15.30	1.5E-05
1,2,3,4,7,8-HxCDD	37.3	0.0000373	3.7E-05	0.1	3.73	3.7E-06
1,2,3,6,7,8-HxCDD	706	0.000706	7.1E-04	0.1	70.6	7.1E-05
1,2,3,7,8,9-HxCDD	66.6	0.0000666	6.7E-05	0.1	6.66	6.7E-06
1,2,3,4,6,7,8-HpCDD	3,950	0.00395	4.0E-03	0.01	39.5	4.0E-05
OCDD	14,400	0.0144	1.4E-02	0.0003	4.32	4.3E-06
2,3,7,8-TCDF	22.5	0.0000225	2.3E-05	0.1	2.25	2.3E-06
1,2,3,7,8-PeCDF	14.1	0.0000141	1.4E-05	0.03	0.423	4.2E-07
2,3,4,7,8-PeCDF	12.2	0.0000122	1.2E-05	0.3	3.66	3.7E-06
1,2,3,4,7,8-HxCDF	145	0.000145	1.5E-04	0.1	14.50	1.5E-05
1,2,3,6,7,8-HxCDF	99.9 U	0.0000999 U	1.0E-04 U	0.1	9.99 U	1.0E-05 U
2,3,4,6,7,8-HxCDF	74.8	0.0000748	7.5E-05	0.1	7.48	7.5E-06
1,2,3,7,8,9-HxCDF	5.82	0.00000582	5.8E-06	0.1	0.58	5.8E-07
1,2,3,4,6,7,8-HpCDF	3,720	0.00372	3.7E-03	0.01	37.20	3.7E-05
1,2,3,4,7,8,9-HpCDF	103	0.000103	1.0E-04	0.01	1.030	1.0E-06
OCDF	2,670	0.00267	2.7E-03	0.0003	0.801	8.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					220	2.2E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					215	2.2E-04
2,3,7,8-TCDD TEQ (without non-detects)					210	2.1E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-27
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-204AC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.42	0.00000142	1.4E-06	1	1.42	1.4E-06
1,2,3,7,8-PeCDD	14.1	0.0000141	1.4E-05	1	14.10	1.4E-05
1,2,3,4,7,8-HxCDD	20.1	0.0000201	2.0E-05	0.1	2.01	2.0E-06
1,2,3,6,7,8-HxCDD	372	0.000372	3.7E-04	0.1	37.2	3.7E-05
1,2,3,7,8,9-HxCDD	69.3	0.0000693	6.9E-05	0.1	6.93	6.9E-06
1,2,3,4,6,7,8-HpCDD	253	0.000253	2.5E-04	0.01	2.5	2.5E-06
OCDD	1,630	0.00163	1.6E-03	0.0003	0.49	4.9E-07
2,3,7,8-TCDF	19.2	0.0000192	1.9E-05	0.1	1.92	1.9E-06
1,2,3,7,8-PeCDF	11.3	0.0000113	1.1E-05	0.03	0.339	3.4E-07
2,3,4,7,8-PeCDF	12.4	0.0000124	1.2E-05	0.3	3.72	3.7E-06
1,2,3,4,7,8-HxCDF	43.6	0.0000436	4.4E-05	0.1	4.36	4.4E-06
1,2,3,6,7,8-HxCDF	48.1 U	0.0000481 U	4.8E-05 U	0.1	4.81 U	4.8E-06 U
2,3,4,6,7,8-HxCDF	40.4	0.0000404	4.0E-05	0.1	4.04	4.0E-06
1,2,3,7,8,9-HxCDF	1.81	0.00000181	1.8E-06	0.1	0.18	1.8E-07
1,2,3,4,6,7,8-HpCDF	1,260	0.00126	1.3E-03	0.01	12.60	1.3E-05
1,2,3,4,7,8,9-HpCDF	42.7 U	0.0000427 U	4.3E-05 U	0.01	0.427 U	4.3E-07 U
OCDF	1,090	0.00109	1.1E-03	0.0003	0.327	3.3E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					97	9.7E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					95	9.5E-05
2,3,7,8-TCDD TEQ (without non-detects)					92	9.2E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-28
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-205ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.939	0.000000939	9.4E-07	1	0.94	9.4E-07
1,2,3,7,8-PeCDD	5.99	0.00000599	6.0E-06	1	5.99	6.0E-06
1,2,3,4,7,8-HxCDD	12.8	0.0000128	1.3E-05	0.1	1.28	1.3E-06
1,2,3,6,7,8-HxCDD	256	0.000256	2.6E-04	0.1	25.6	2.6E-05
1,2,3,7,8,9-HxCDD	41.6	0.0000416	4.2E-05	0.1	4.16	4.2E-06
1,2,3,4,6,7,8-HpCDD	1,980	0.00198	2.0E-03	0.01	19.8	2.0E-05
OCDD	11,700	0.0117	1.2E-02	0.0003	3.51	3.5E-06
2,3,7,8-TCDF	17.1	0.0000171	1.7E-05	0.1	1.71	1.7E-06
1,2,3,7,8-PeCDF	5.8	0.0000058	5.8E-06	0.03	0.174	1.7E-07
2,3,4,7,8-PeCDF	6.25	0.00000625	6.3E-06	0.3	1.88	1.9E-06
1,2,3,4,7,8-HxCDF	51.7	0.0000517	5.2E-05	0.1	5.17	5.2E-06
1,2,3,6,7,8-HxCDF	45.8 U	0.0000458 U	4.6E-05 U	0.1	4.58 U	4.6E-06 U
2,3,4,6,7,8-HxCDF	27.1	0.0000271	2.7E-05	0.1	2.71	2.7E-06
1,2,3,7,8,9-HxCDF	1.41	0.00000141	1.4E-06	0.1	0.14	1.4E-07
1,2,3,4,6,7,8-HpCDF	1,440	0.00144	1.4E-03	0.01	14.40	1.4E-05
1,2,3,4,7,8,9-HpCDF	44.7	0.0000447	4.5E-05	0.01	0.447	4.5E-07
OCDF	1,780	0.00178	1.8E-03	0.0003	0.534	5.3E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					93	9.3E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					91	9.1E-05
2,3,7,8-TCDD TEQ (without non-detects)					88	8.8E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-29
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-206ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.3	0.0000013	1.3E-06	1	1.30	1.3E-06
1,2,3,7,8-PeCDD	10.8	0.0000108	1.1E-05	1	10.80	1.1E-05
1,2,3,4,7,8-HxCDD	15.4	0.0000154	1.5E-05	0.1	1.54	1.5E-06
1,2,3,6,7,8-HxCDD	297	0.000297	3.0E-04	0.1	29.7	3.0E-05
1,2,3,7,8,9-HxCDD	54	0.000054	5.4E-05	0.1	5.40	5.4E-06
1,2,3,4,6,7,8-HpCDD	2,420	0.00242	2.4E-03	0.01	24.2	2.4E-05
OCDD	13,600	0.0136	1.4E-02	0.0003	4.08	4.1E-06
2,3,7,8-TCDF	16.4	0.0000164	1.6E-05	0.1	1.64	1.6E-06
1,2,3,7,8-PeCDF	9.21	0.00000921	9.2E-06	0.03	0.276	2.8E-07
2,3,4,7,8-PeCDF	9.97	0.00000997	1.0E-05	0.3	2.99	3.0E-06
1,2,3,4,7,8-HxCDF	34.6	0.0000346	3.5E-05	0.1	3.46	3.5E-06
1,2,3,6,7,8-HxCDF	38.7	0.0000387	3.9E-05	0.1	3.87	3.9E-06
2,3,4,6,7,8-HxCDF	34	0.000034	3.4E-05	0.1	3.40	3.4E-06
1,2,3,7,8,9-HxCDF	1.61	0.00000161	1.6E-06	0.1	0.16	1.6E-07
1,2,3,4,6,7,8-HpCDF	843	0.000843	8.4E-04	0.01	8.43	8.4E-06
1,2,3,4,7,8,9-HpCDF	29.5	0.0000295	3.0E-05	0.01	0.295	3.0E-07
OCDF	671	0.000671	6.7E-04	0.0003	0.201	2.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					102	1.0E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					102	1.0E-04
2,3,7,8-TCDD TEQ (without non-detects)					102	1.0E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-30
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-207ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.666	0.000000666	6.7E-07	1	0.67	6.7E-07
1,2,3,7,8-PeCDD	4.14	0.00000414	4.1E-06	1	4.14	4.1E-06
1,2,3,4,7,8-HxCDD	6.99	0.00000699	7.0E-06	0.1	0.70	7.0E-07
1,2,3,6,7,8-HxCDD	172	0.000172	1.7E-04	0.1	17.2	1.7E-05
1,2,3,7,8,9-HxCDD	22.5	0.0000225	2.3E-05	0.1	2.25	2.3E-06
1,2,3,4,6,7,8-HpCDD	1,230	0.00123	1.2E-03	0.01	12.3	1.2E-05
OCDD	4,390	0.00439	4.4E-03	0.0003	1.32	1.3E-06
2,3,7,8-TCDF	13.8	0.0000138	1.4E-05	0.1	1.38	1.4E-06
1,2,3,7,8-PeCDF	4.23	0.00000423	4.2E-06	0.03	0.127	1.3E-07
2,3,4,7,8-PeCDF	4.69	0.00000469	4.7E-06	0.3	1.41	1.4E-06
1,2,3,4,7,8-HxCDF	23.2	0.0000232	2.3E-05	0.1	2.32	2.3E-06
1,2,3,6,7,8-HxCDF	24.3	0.0000243	2.4E-05	0.1	2.43	2.4E-06
2,3,4,6,7,8-HxCDF	22.9	0.0000229	2.3E-05	0.1	2.29	2.3E-06
1,2,3,7,8,9-HxCDF	1.45	0.00000145	1.5E-06	0.1	0.15	1.5E-07
1,2,3,4,6,7,8-HpCDF	713	0.000713	7.1E-04	0.01	7.13	7.1E-06
1,2,3,4,7,8,9-HpCDF	27.7	0.0000277	2.8E-05	0.01	0.277	2.8E-07
OCDF	699	0.000699	7.0E-04	0.0003	0.210	2.1E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					56	5.6E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					56	5.6E-05
2,3,7,8-TCDD TEQ (without non-detects)					56	5.6E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-31
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-207ABC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	6.3	0.0000063	6.3E-06	1	6.30	6.3E-06
1,2,3,7,8-PeCDD	11.9	0.0000119	1.2E-05	1	11.90	1.2E-05
1,2,3,4,7,8-HxCDD	37	0.000037	3.7E-05	0.1	3.70	3.7E-06
1,2,3,6,7,8-HxCDD	1,160	0.00116	1.2E-03	0.1	116.0	1.2E-04
1,2,3,7,8,9-HxCDD	157	0.000157	1.6E-04	0.1	15.70	1.6E-05
1,2,3,4,6,7,8-HpCDD	10,800	0.0108	1.1E-02	0.01	108.0	1.1E-04
OCDD	23,400	0.0234	2.3E-02	0.0003	7.02	7.0E-06
2,3,7,8-TCDF	95.6	0.0000956	9.6E-05	0.1	9.56	9.6E-06
1,2,3,7,8-PeCDF	16.2	0.0000162	1.6E-05	0.03	0.486	4.9E-07
2,3,4,7,8-PeCDF	12.5	0.0000125	1.3E-05	0.3	3.75	3.8E-06
1,2,3,4,7,8-HxCDF	224	0.000224	2.2E-04	0.1	22.40	2.2E-05
1,2,3,6,7,8-HxCDF	151 U	0.000151 U	1.5E-04 U	0.1	15.10 U	1.5E-05 U
2,3,4,6,7,8-HxCDF	139	0.000139	1.4E-04	0.1	13.90	1.4E-05
1,2,3,7,8,9-HxCDF	8.96	0.00000896	9.0E-06	0.1	0.90	9.0E-07
1,2,3,4,6,7,8-HpCDF	6,220	0.00622	6.2E-03	0.01	62.20	6.2E-05
1,2,3,4,7,8,9-HpCDF	317	0.000317	3.2E-04	0.01	3.170	3.2E-06
OCDF	7,280	0.00728	7.3E-03	0.0003	2.184	2.2E-06
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					402	4.0E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					395	3.9E-04
2,3,7,8-TCDD TEQ (without non-detects)					387	3.9E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-32
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-208ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.712	0.000000712	7.1E-07	1	0.71	7.1E-07
1,2,3,7,8-PeCDD	3.63	0.00000363	3.6E-06	1	3.63	3.6E-06
1,2,3,4,7,8-HxCDD	5.34	0.00000534	5.3E-06	0.1	0.53	5.3E-07
1,2,3,6,7,8-HxCDD	122	0.000122	1.2E-04	0.1	12.2	1.2E-05
1,2,3,7,8,9-HxCDD	19.1	0.0000191	1.9E-05	0.1	1.91	1.9E-06
1,2,3,4,6,7,8-HpCDD	1,000	0.001	1.0E-03	0.01	10.0	1.0E-05
OCDD	6,350	0.00635	6.4E-03	0.0003	1.91	1.9E-06
2,3,7,8-TCDF	7.82	0.00000782	7.8E-06	0.1	0.78	7.8E-07
1,2,3,7,8-PeCDF	4.05	0.00000405	4.1E-06	0.03	0.122	1.2E-07
2,3,4,7,8-PeCDF	4.91	0.00000491	4.9E-06	0.3	1.47	1.5E-06
1,2,3,4,7,8-HxCDF	13.3	0.0000133	1.3E-05	0.1	1.33	1.3E-06
1,2,3,6,7,8-HxCDF	13.1	0.0000131	1.3E-05	0.1	1.31	1.3E-06
2,3,4,6,7,8-HxCDF	13.3	0.0000133	1.3E-05	0.1	1.33	1.3E-06
1,2,3,7,8,9-HxCDF	0.746	0.000000746	7.5E-07	0.1	0.07	7.5E-08
1,2,3,4,6,7,8-HpCDF	349	0.000349	3.5E-04	0.01	3.49	3.5E-06
1,2,3,4,7,8,9-HpCDF	11.2	0.0000112	1.1E-05	0.01	0.112	1.1E-07
OCDF	288	0.000288	2.9E-04	0.0003	0.086	8.6E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					41	4.1E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					41	4.1E-05
2,3,7,8-TCDD TEQ (without non-detects)					41	4.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-33
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-208ABC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.269	0.000000269	2.7E-07	1	0.27	2.7E-07
1,2,3,7,8-PeCDD	0.861	0.000000861	8.6E-07	1	0.86	8.6E-07
1,2,3,4,7,8-HxCDD	1.37	0.00000137	1.4E-06	0.1	0.14	1.4E-07
1,2,3,6,7,8-HxCDD	24.9	0.0000249	2.5E-05	0.1	2.5	2.5E-06
1,2,3,7,8,9-HxCDD	3.88	0.00000388	3.9E-06	0.1	0.39	3.9E-07
1,2,3,4,6,7,8-HpCDD	212	0.000212	2.1E-04	0.01	2.1	2.1E-06
OCDD	1,100	0.0011	1.1E-03	0.0003	0.33	3.3E-07
2,3,7,8-TCDF	1.25	0.00000125	1.3E-06	0.1	0.13	1.3E-07
1,2,3,7,8-PeCDF	0.72	0.00000072	7.2E-07	0.03	0.022	2.2E-08
2,3,4,7,8-PeCDF	0.829	0.000000829	8.3E-07	0.3	0.25	2.5E-07
1,2,3,4,7,8-HxCDF	3.45	0.00000345	3.5E-06	0.1	0.35	3.5E-07
1,2,3,6,7,8-HxCDF	3.82	0.00000382	3.8E-06	0.1	0.38	3.8E-07
2,3,4,6,7,8-HxCDF	3.42	0.00000342	3.4E-06	0.1	0.34	3.4E-07
1,2,3,7,8,9-HxCDF	0.474	0.000000474	4.7E-07	0.1	0.05	4.7E-08
1,2,3,4,6,7,8-HpCDF	144	0.000144	1.4E-04	0.01	1.44	1.4E-06
1,2,3,4,7,8,9-HpCDF	4.4	0.0000044	4.4E-06	0.01	0.044	4.4E-08
OCDF	127	0.000127	1.3E-04	0.0003	0.038	3.8E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					9.6	9.6E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					9.6	9.6E-06
2,3,7,8-TCDD TEQ (without non-detects)					9.6	9.6E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-34
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-209ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.47	0.00000147	1.5E-06	1	1.47	1.5E-06
1,2,3,7,8-PeCDD	16.2	0.0000162	1.6E-05	1	16.20	1.6E-05
1,2,3,4,7,8-HxCDD	23.4	0.0000234	2.3E-05	0.1	2.34	2.3E-06
1,2,3,6,7,8-HxCDD	422	0.000422	4.2E-04	0.1	42.2	4.2E-05
1,2,3,7,8,9-HxCDD	73.8	0.0000738	7.4E-05	0.1	7.38	7.4E-06
1,2,3,4,6,7,8-HpCDD	3,220	0.00322	3.2E-03	0.01	32.2	3.2E-05
OCDD	14,200	0.0142	1.4E-02	0.0003	4.26	4.3E-06
2,3,7,8-TCDF	20.8	0.0000208	2.1E-05	0.1	2.08	2.1E-06
1,2,3,7,8-PeCDF	14.2	0.0000142	1.4E-05	0.03	0.426	4.3E-07
2,3,4,7,8-PeCDF	15.4	0.0000154	1.5E-05	0.3	4.62	4.6E-06
1,2,3,4,7,8-HxCDF	56.5	0.0000565	5.7E-05	0.1	5.65	5.7E-06
1,2,3,6,7,8-HxCDF	62.5	0.0000625	6.3E-05	0.1	6.25	6.3E-06
2,3,4,6,7,8-HxCDF	55.8	0.0000558	5.6E-05	0.1	5.58	5.6E-06
1,2,3,7,8,9-HxCDF	2.28	0.00000228	2.3E-06	0.1	0.23	2.3E-07
1,2,3,4,6,7,8-HpCDF	1,920	0.00192	1.9E-03	0.01	19.20	1.9E-05
1,2,3,4,7,8,9-HpCDF	61	0.000061	6.1E-05	0.01	0.610	6.1E-07
OCDF	1,710	0.00171	1.7E-03	0.0003	0.513	5.1E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					151	1.5E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					151	1.5E-04
2,3,7,8-TCDD TEQ (without non-detects)					151	1.5E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-35
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-209AB (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.208 U	0.000000208 U	2.1E-07 U	1	0.21 U	2.1E-07 U
1,2,3,7,8-PeCDD	1.4	0.0000014	1.4E-06	1	1.40	1.4E-06
1,2,3,4,7,8-HxCDD	3.17	0.00000317	3.2E-06	0.1	0.32	3.2E-07
1,2,3,6,7,8-HxCDD	50.8	0.0000508	5.1E-05	0.1	5.1	5.1E-06
1,2,3,7,8,9-HxCDD	8.21	0.00000821	8.2E-06	0.1	0.82	8.2E-07
1,2,3,4,6,7,8-HpCDD	426	0.000426	4.3E-04	0.01	4.3	4.3E-06
OCDD	1,600	0.0016	1.6E-03	0.0003	0.48	4.8E-07
2,3,7,8-TCDF	1.22	0.00000122	1.2E-06	0.1	0.12	1.2E-07
1,2,3,7,8-PeCDF	1.36	0.00000136	1.4E-06	0.03	0.041	4.1E-08
2,3,4,7,8-PeCDF	1.27	0.00000127	1.3E-06	0.3	0.38	3.8E-07
1,2,3,4,7,8-HxCDF	12.4	0.0000124	1.2E-05	0.1	1.24	1.2E-06
1,2,3,6,7,8-HxCDF	15.3	0.0000153	1.5E-05	0.1	1.53	1.5E-06
2,3,4,6,7,8-HxCDF	10.8	0.0000108	1.1E-05	0.1	1.08	1.1E-06
1,2,3,7,8,9-HxCDF	0.693 U	0.000000693 U	6.9E-07 U	0.1	0.07 U	6.9E-08 U
1,2,3,4,6,7,8-HpCDF	744	0.000744	7.4E-04	0.01	7.44	7.4E-06
1,2,3,4,7,8,9-HpCDF	20.3	0.0000203	2.0E-05	0.01	0.203	2.0E-07
OCDF	673	0.000673	6.7E-04	0.0003	0.202	2.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					25	2.5E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					25	2.5E-05
2,3,7,8-TCDD TEQ (without non-detects)					25	2.5E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-36
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-210ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.369	0.000000369	3.7E-07	1	0.37	3.7E-07
1,2,3,7,8-PeCDD	3.81	0.00000381	3.8E-06	1	3.81	3.8E-06
1,2,3,4,7,8-HxCDD	6.08	0.00000608	6.1E-06	0.1	0.61	6.1E-07
1,2,3,6,7,8-HxCDD	114	0.000114	1.1E-04	0.1	11.4	1.1E-05
1,2,3,7,8,9-HxCDD	19.5	0.0000195	2.0E-05	0.1	1.95	2.0E-06
1,2,3,4,6,7,8-HpCDD	822	0.000822	8.2E-04	0.01	8.2	8.2E-06
OCDD	2,560	0.00256	2.6E-03	0.0003	0.77	7.7E-07
2,3,7,8-TCDF	4.33	0.00000433	4.3E-06	0.1	0.43	4.3E-07
1,2,3,7,8-PeCDF	3.25	0.00000325	3.3E-06	0.03	0.098	9.8E-08
2,3,4,7,8-PeCDF	3.77	0.00000377	3.8E-06	0.3	1.13	1.1E-06
1,2,3,4,7,8-HxCDF	21.9	0.0000219	2.2E-05	0.1	2.19	2.2E-06
1,2,3,6,7,8-HxCDF	29.7	0.0000297	3.0E-05	0.1	2.97	3.0E-06
2,3,4,6,7,8-HxCDF	21.2	0.0000212	2.1E-05	0.1	2.12	2.1E-06
1,2,3,7,8,9-HxCDF	0.748	0.000000748	7.5E-07	0.1	0.07	7.5E-08
1,2,3,4,6,7,8-HpCDF	862	0.000862	8.6E-04	0.01	8.62	8.6E-06
1,2,3,4,7,8,9-HpCDF	28.1	0.0000281	2.8E-05	0.01	0.281	2.8E-07
OCDF	740	0.00074	7.4E-04	0.0003	0.222	2.2E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					45	4.5E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					45	4.5E-05
2,3,7,8-TCDD TEQ (without non-detects)					45	4.5E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-37
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-211ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.49	0.00000149	1.5E-06	1	1.49	1.5E-06
1,2,3,7,8-PeCDD	7.56	0.00000756	7.6E-06	1	7.56	7.6E-06
1,2,3,4,7,8-HxCDD	13.8	0.0000138	1.4E-05	0.1	1.38	1.4E-06
1,2,3,6,7,8-HxCDD	298	0.000298	3.0E-04	0.1	29.8	3.0E-05
1,2,3,7,8,9-HxCDD	39.8	0.0000398	4.0E-05	0.1	3.98	4.0E-06
1,2,3,4,6,7,8-HpCDD	2,390	0.00239	2.4E-03	0.01	23.9	2.4E-05
OCDD	11,900	0.0119	1.2E-02	0.0003	3.57	3.6E-06
2,3,7,8-TCDF	10.9	0.0000109	1.1E-05	0.1	1.09	1.1E-06
1,2,3,7,8-PeCDF	8.78	0.00000878	8.8E-06	0.03	0.263	2.6E-07
2,3,4,7,8-PeCDF	9.07	0.00000907	9.1E-06	0.3	2.72	2.7E-06
1,2,3,4,7,8-HxCDF	44.2	0.0000442	4.4E-05	0.1	4.42	4.4E-06
1,2,3,6,7,8-HxCDF	40.7	0.0000407	4.1E-05	0.1	4.07	4.1E-06
2,3,4,6,7,8-HxCDF	36.4	0.0000364	3.6E-05	0.1	3.64	3.6E-06
1,2,3,7,8,9-HxCDF	2.52	0.00000252	2.5E-06	0.1	0.25	2.5E-07
1,2,3,4,6,7,8-HpCDF	1,620	0.00162	1.6E-03	0.01	16.20	1.6E-05
1,2,3,4,7,8,9-HpCDF	47.4	0.0000474	4.7E-05	0.01	0.474	4.7E-07
OCDF	1,350	0.00135	1.4E-03	0.0003	0.405	4.1E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					105	1.1E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					105	1.1E-04
2,3,7,8-TCDD TEQ (without non-detects)					105	1.1E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-38
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-211ABC (0-1) COMP Duplicate (SED-250), October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.43	0.00000143	1.4E-06	1	1.43	1.4E-06
1,2,3,7,8-PeCDD	7.81	0.00000781	7.8E-06	1	7.81	7.8E-06
1,2,3,4,7,8-HxCDD	13.9	0.0000139	1.4E-05	0.1	1.39	1.4E-06
1,2,3,6,7,8-HxCDD	274	0.000274	2.7E-04	0.1	27.4	2.7E-05
1,2,3,7,8,9-HxCDD	37.8	0.0000378	3.8E-05	0.1	3.78	3.8E-06
1,2,3,4,6,7,8-HpCDD	2,170	0.00217	2.2E-03	0.01	21.7	2.2E-05
OCDD	11,600	0.0116	1.2E-02	0.0003	3.48	3.5E-06
2,3,7,8-TCDF	11.4	0.0000114	1.1E-05	0.1	1.14	1.1E-06
1,2,3,7,8-PeCDF	8.68	0.00000868	8.7E-06	0.03	0.260	2.6E-07
2,3,4,7,8-PeCDF	8.58	0.00000858	8.6E-06	0.3	2.57	2.6E-06
1,2,3,4,7,8-HxCDF	43.3	0.0000433	4.3E-05	0.1	4.33	4.3E-06
1,2,3,6,7,8-HxCDF	48.4	0.0000484	4.8E-05	0.1	4.84	4.8E-06
2,3,4,6,7,8-HxCDF	38.2	0.0000382	3.8E-05	0.1	3.82	3.8E-06
1,2,3,7,8,9-HxCDF	2.43	0.00000243	2.4E-06	0.1	0.24	2.4E-07
1,2,3,4,6,7,8-HpCDF	1,680	0.00168	1.7E-03	0.01	16.80	1.7E-05
1,2,3,4,7,8,9-HpCDF	50.5	0.0000505	5.1E-05	0.01	0.505	5.1E-07
OCDF	1,420	0.00142	1.4E-03	0.0003	0.426	4.3E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					102	1.0E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					102	1.0E-04
2,3,7,8-TCDD TEQ (without non-detects)					102	1.0E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-39
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample SED-211ABC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.08 U	0.00000108 U	1.1E-06 U	1	1.08 U	1.1E-06 U
1,2,3,7,8-PeCDD	6.23	0.00000623	6.2E-06	1	6.23	6.2E-06
1,2,3,4,7,8-HxCDD	12.2	0.0000122	1.2E-05	0.1	1.22	1.2E-06
1,2,3,6,7,8-HxCDD	212	0.000212	2.1E-04	0.1	21.2	2.1E-05
1,2,3,7,8,9-HxCDD	33.3	0.0000333	3.3E-05	0.1	3.33	3.3E-06
1,2,3,4,6,7,8-HpCDD	1,770	0.00177	1.8E-03	0.01	17.7	1.8E-05
OCDD	8,640	0.00864	8.6E-03	0.0003	2.59	2.6E-06
2,3,7,8-TCDF	8.25	0.00000825	8.3E-06	0.1	0.83	8.3E-07
1,2,3,7,8-PeCDF	7.19	0.00000719	7.2E-06	0.03	0.216	2.2E-07
2,3,4,7,8-PeCDF	6.81	0.00000681	6.8E-06	0.3	2.04	2.0E-06
1,2,3,4,7,8-HxCDF	36.7	0.0000367	3.7E-05	0.1	3.67	3.7E-06
1,2,3,6,7,8-HxCDF	45	0.000045	4.5E-05	0.1	4.50	4.5E-06
2,3,4,6,7,8-HxCDF	33.2	0.0000332	3.3E-05	0.1	3.32	3.3E-06
1,2,3,7,8,9-HxCDF	2.01	0.00000201	2.0E-06	0.1	0.20	2.0E-07
1,2,3,4,6,7,8-HpCDF	1,460	0.00146	1.5E-03	0.01	14.60	1.5E-05
1,2,3,4,7,8,9-HpCDF	49.8	0.0000498	5.0E-05	0.01	0.498	5.0E-07
OCDF	1,340	0.00134	1.3E-03	0.0003	0.402	4.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					84	8.4E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					83	8.3E-05
2,3,7,8-TCDD TEQ (without non-detects)					83	8.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 1-40
Bear Creek Sediment Analytical Results - Total Petroleum Hydrocarbons (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Gasoline	Diesel	Oil
AB-22	-	02/02/2010	65 U	118 [a]	1,060 [a]
AB-23	-	02/02/2010	49 U	124 U	247 U
AB-24	-	02/02/2010	48 U	119 U	239 U
AB-25	-	02/02/2010	92 U	230 U	460 U
AB-26	-	02/02/2010	74 U	149 [a]	1,050 [a]
AB-27	-	02/02/2010	25 U	63 U	125 U
AB-28	-	02/02/2010	35 U	86 U	172 U

Notes:

Gasoline, Diesel and Oil Range hydrocarbon identification screen by Method NWTPH-HCID unless indicated otherwise

[a] Diesel and Oil Range Hydrocarbons by Method NWTPH-Dx

mg/Kg = Milligrams per kilogram

U = Not detected at the method reporting limit shown

Table 1-41
Bear Creek Sediment Analytical Results - Chlorophenols (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Pentachlorophenol	2-Chlorophenol	3+4-Chlorophenols	2,4-Dichlorophenol	3,4-Dichlorophenol	2,3,4,5-Tetrachlorophenol	2,3,4,6-Tetrachlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol
AB-22	-	02/02/2010	0.0907 U	0.0907 U	0.181 U	0.0907 U	0.0907 U	0.0907 U	0.0907 U	0.0907 U	0.0907 U
AB-23	-	02/02/2010	0.0746 U	0.0746 U	0.149 U	0.0746 U	0.0746 U	0.0746 U	0.0746 U	0.0746 U	0.0746 U
AB-24	-	02/02/2010	0.156 U	0.156 U	0.312 U	0.156 U	0.156 U	0.156 U	0.156 U	0.156 U	0.156 U
AB-25	-	02/02/2010	0.165 U	0.165 U	0.33 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U
AB-26	-	02/02/2010	0.265 U	0.265 U	0.529 U	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U	0.265 U
AB-27	-	02/02/2010	0.0916 U	0.0916 U	0.183 U	0.0916 U	0.0916 U	0.0916 U	0.0916 U	0.0916 U	0.0916 U
AB-28	-	02/02/2010	0.122 U	0.122 U	0.245 U	0.122 U	0.122 U	0.122 U	0.122 U	0.122 U	0.122 U
SED-COMP-1	-	04/13/2012	0.473 U	0.473 U	0.236 UX	0.473 U	0.945 UX	0.0567 UX	0.473 U	0.473 U	0.473 U
SED-COMP-2	-	04/13/2012	0.618 U	0.618 U	0.309 UX	0.618 U	0.124 UX	0.742 UX	0.618 U	0.618 U	0.618 U
SED-COMP-3	-	04/12/2012	0.306 U	0.306 U	0.153 UX	0.306 U	0.0611 UX	0.0367 UX	0.306 U	0.306 U	0.306 U
SED-COMP-99 (SED-3 Dup)	-	04/12/2012	0.317 U	0.317 U	0.158 UX	0.317 U	0.0633 UX	0.038 UX	0.317 U	0.317 U	0.317 U
SED-COMP-4	-	04/11/2012	0.270 U	0.270 U	0.135 UX	0.270 U	0.054 UX	0.0324 UX	0.270 U	0.270 U	0.270 U
SED-COMP-5	-	04/11/2012	0.292 U	0.292 U	0.146 UX	0.292 U	0.0584 UX	0.0351 UX	0.292 U	0.292 U	0.292 U
SED-COMP-6	-	04/11/2012	0.238 U	0.238 U	0.119 UX	0.238 U	0.0476 UX	0.0286 UX	0.238 U	0.238 U	0.238 U
SED-COMP-7	-	04/11/2012	0.265 U	0.265 U	0.133 UX	0.265 U	0.0531 UX	0.0318 UX	0.265 U	0.265 U	0.265 U
SED-COMP-8	-	04/12/2012	0.356 U	0.356 U	0.178 UX	0.356 U	0.0712 UX	0.0427 UX	0.356 U	0.356 U	0.356 U

Notes:
Chlorophenols by EPA Method 8270C SIM
Phenols by EPA Method 8270D was used for April 2012 sampling event (4-Chloro-3-methylphenol, 2,4-Dimethylphenol, 4,6-Dinitro-2-methylphenol, 2,4-Dinitrophenol, 2-Methylphenol, 3+4-Methylphenol, 2-Nitrophenol, 4-Nitrophenol, Phenol and 2,3,5,6-Tetrachlorophenol were not detected by the laboratory).

mg/Kg = Milligrams per kilogram
- = Not available
U = Not detected at the method reporting limit shown
J = (Laboratory Qualifier) Estimated concentration. Reported result is below the reporting limit, but above the Method Detection Limit (MDL).
UX = (PNG Qualifier) Estimated values, results should be used for screening purposes only. See corresponding laboratory report and data validation report for further information.

Table 1-42
Bear Creek Sediment Analytical Results - Metals (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
AB-22	-	02/02/2010	4.21 U	8.43 U	-	4.21 U	4.21 U	33.8	46.5	12.7	0.337 U	22.6	8.43 U	4.21 U	4.21 U	272
AB-23	-	02/02/2010	2.88 U	5.75 U	-	2.88 U	2.88 U	57.5	40.9	10.7	0.230 U	27.6	5.75 U	2.88 U	2.88 U	159
AB-24	-	02/02/2010	3.21 U	6.43 U	-	3.21 U	3.21 U	44.9	42.5	15.9	0.643	25.5	6.43 U	3.21 U	3.21 U	288
AB-25	-	02/02/2010	5.09 U	10.2 U	-	5.09 U	5.09 U	45.2	55.3	23.8	0.407 U	30.8	10.2 U	5.09 U	5.09 U	329
AB-26	-	02/02/2010	4.31 U	8.61 U	-	4.31 U	4.31 U	48.4	65.9	31.5	0.431	35.9	8.61 U	4.31 U	4.31 U	443
AB-27	-	02/02/2010	1.36 U	5.64	-	1.36 U	1.36 U	44.4	33.7	14.0	0.109	24.3	2.73 U	1.36 U	1.36 U	105
AB-28	-	02/02/2010	2.28 U	10.7	-	2.28 U	2.28 U	45.3	45.5	110	0.183 U	23.0	4.57 U	2.28 U	2.28 U	122
SED-COMP-1	-	04/13/2012	1.26 U	4.75	105 J[1]	1.26 U	1.26 U	28.3	21	9.45	0.121	7.25	2.51 U	1.26 U	1.26 U	114 J[1]
SED-COMP-2	-	04/13/2012	1.55 U	3.11 U	78.9 J[1]	1.55 U	1.55 U	11.6	38.4	5.6	0.124 U	11.6	3.11 U	1.55 U	1.55 U	169 J[1]
SED-COMP-3	-	04/12/2012	1.43 UJ[1]	3.54	306 J[1]	1.43 U	1.43 U	28.3 J[1]	40.5	7.75	0.115 U	18.8	2.87 U	1.43 U	1.43 U	72.7 J[1]
SED-COMP-99 (SED-3 Dup)	-	04/12/2012	1.73 UJ[1]	3.46 U	259 J[1]	1.73 U	1.73 U	30.3 J[1]	26.7	6.95	1.30	15.5	3.46 U	1.73 U	1.73 U	97 J[1]
SED-COMP-4	-	04/11/2012	1.35 UJ[1]	2.69 U	218 J[1]	1.35 U	1.35 U	35.3 J[1]	17.8	6.69	0.108 U	14.6	2.69 U	1.35 U	1.35 U	25.3 J[1]
SED-COMP-5	-	04/11/2012	1.26 UJ[1]	6.07	126 J[1]	1.91	1.26 U	98.8 J[1]	26.3	20.6	0.101 U	15	2.53 U	1.26 U	1.26 U	92.2 J[1]
SED-COMP-6	-	04/11/2012	1.12 UJ[1]	3.42	113 J[1]	1.49	1.12 U	70.6 J[1]	23.5	10.6	0.089 U	13.9	2.23 U	1.12 U	1.12 U	75.5 J[1]
SED-COMP-7	-	04/11/2012	1.46 UJ[1]	6.84	121 J[1]	1.83	1.46 U	83.5 J[1]	24.4	10.6	0.117 U	12.2	2.93 U	1.46 U	1.46 U	80.4 J[1]
SED-COMP-8	-	04/12/2012	1.64 U	6.02	159 J[1]	1.64 U	1.64 U	37.2 J[1]	26.1	10.5	0.131 U	14.2	3.27 U	1.64 U	1.64 U	110 J[1]
SED-200ABC(0-1) COMP	0-1	10/15/2015	-	1.3 U	208	-	1.3 U	25	-	3.7	0.053 U	-	2.6 U	0.66 U	-	-
SED-201ABC(0-1) COMP	0-1	10/15/2015	-	1.8	122	-	1.7 U	23	-	7.9	0.071	-	3.4 U	0.85 U	-	-
SED-203ABC(0-1) COMP	0-1	10/16/2015	-	1.6 U	150	-	1.6 U	21	-	6.0	0.10	-	3.3 U	0.81 U	-	-
SED-205ABC(0-1) COMP	0-1	10/16/2015	-	2.2	187	-	1.6 U	31	-	8.3	0.097	-	3.3 U	0.81 U	-	-
SED-211ABC(0-1) COMP	0-1	10/19/2015	-	3.9	129	-	1.4 U	40	-	10	0.26	-	2.8 U	0.71 U	-	-
Default Background Concentrations																
Freshwater (sediment)[h]			1	7.9	NA	NA	<0.5	30	12	2	0.2	20	0.4	0.4	NA	53

Notes:
Metals analyzed by EPA Method 6020
[h] DEQ Human Health Risk Assessment Guidance, Table 1 - Oregon Default Background Concentrations for Inorganic Chemicals. (DEQ, October 2010)
mg/Kg = Milligrams per kilogram
NA = Not applicable (no screening levels published for these chemicals)
U = Not detected at the method reporting limit shown
- = Not analyzed for this parameter
J = (Laboratory Qualifier) Estimated value. The analyte was detected above the method detection limit, but below the method reporting limit.
J[1] = (PNG Qualifier) The analyte was not detected, but the reported quantitation limit should be considered an estimate. See corresponding data validation report for further information.

Table 1-43
Bear Creek Sediment Analytical Results - TCLP Metals (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
SED-200ABC(0-1) COMP	0-1	10/15/2015	0.10 U	1.7	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
SED-201ABC(0-1) COMP	0-1	10/15/2015	0.10 U	1.0	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
SED-203ABC(0-1) COMP	0-1	10/16/2015	0.10 U	1.5	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
SED-205ABC(0-1) COMP	0-1	10/16/2015	0.10 U	1.7	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
SED-211ABC(0-1) COMP	0-1	10/19/2015	0.10 U	1.1	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U

Notes:
TCLP Metals analyzed by EPA Method 1311/6020
TCLP = Toxicity Characteristic Leaching Procedure
mg/Kg = Milligrams per kilogram
U = Not detected at the method reporting limit shown

Table 1-44
Bear Creek Sediment Analytical Results - Semivolatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Date Sampled	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene
AB-22	02/02/2010	0.0302 U	0.0302 U	0.0302 U	0.0302 U	0.0302 U	0.0302 U	0.0302 U	0.0302 U	0.0302 U	0.0302 U	0.0302 U	0.0302 U	0.0302 U
AB-23	02/02/2010	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U
AB-24	02/02/2010	0.0521 U	0.0521 U	0.0521 U	0.0521 U	0.0521 U	0.0521 U	0.0521 U	0.0521 U	0.0521 U	0.0521 U	0.0521 U	0.0521 U	0.0521 U
AB-25	02/02/2010	0.0551 U	0.0551 U	0.0551 U	0.0551 U	0.0551 U	0.0551 U	0.0551 U	0.0551 U	0.0551 U	0.0551 U	0.0551 U	0.0551 U	0.0551 U
AB-26	02/02/2010	0.0883 U	0.0883 U	0.0883 U	0.0883 U	0.0883 U	0.0883 U	0.0883 U	0.0883 U	0.0883 U	0.0883 U	0.0883 U	0.0883 U	0.0883 U
AB-27	02/02/2010	0.0305 U	0.0305 U	0.0305 U	0.0305 U	0.0305 U	0.0305 U	0.0305 U	0.0305 U	0.0305 U	0.0305 U	0.0305 U	0.0305 U	0.0305 U
AB-28	02/02/2010	0.0408 U	0.0449	0.0527	0.287	0.354	- [a]	0.327	- [a]	0.356	0.043	0.681	0.0408 U	0.321 U
SED-COMP-1	04/13/2012	0.0189 U	0.0189 U	0.0189 U	0.0189 U	0.0284 U	0.0284 U	0.0945 U	0.0284 U	0.0189 U	0.0945 U	0.0189 U	0.0189 U	0.0945 U
SED-COMP-2	04/13/2012	0.0247 U	0.0247 U	0.0247 U	0.0247 U	0.0371 U	0.0371 U	0.0495 U	0.0371 U	0.0247 U	0.0247 U	0.0247 U	0.0247 U	0.0495 U
SED-COMP-3	04/12/2012	0.0122 U	0.0122 U	0.0122 U	0.0122 U	0.0183 U	0.0183 U	0.0122 U	0.0183 U	0.0122 U	0.0122 U	0.0122 U	0.0122 U	0.0122 U
SED-COMP-99 (SED-3 Dup)	04/12/2012	0.0127 U	0.0127 U	0.0127 U	0.0127 U	0.0190 U	0.0190 U	0.0127 U	0.0190 U	0.0127 U	0.0127 U	0.0127 U	0.0127 U	0.0127 U
SED-COMP-4	04/11/2012	0.0108 U	0.0108 U	0.0108 U	0.0108 U	0.0162 U	0.0162 U	0.0108 U	0.0162 U	0.0108 U	0.0108 U	0.0108 U	0.0108 U	0.0108 U
SED-COMP-5	04/11/2012	0.0117 U	0.0117 U	0.0117 U	0.0117 U	0.0175 U	0.0175 U	0.0117 U	0.0175 U	0.0117 U	0.0117 U	0.0117 U	0.0117 U	0.0117 U
SED-COMP-6	04/11/2012	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0143 U	0.0143 U	0.0095 U	0.0143 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U
SED-COMP-7	04/11/2012	0.0106 U	0.0106 U	0.0106 U	0.0106 U	0.0159 U	0.0159 U	0.0106 U	0.0159 U	0.0106 U	0.0106 U	0.0106 U	0.0106 U	0.0106 U
SED-COMP-8	04/12/2012	0.0142 U	0.0142 U	0.0142 U	0.0142 U	0.0213 U	0.0213 U	0.0142 U	0.0213 U	0.0142 U	0.0142 U	0.0142 U	0.0142 U	0.0142 U

Table 1-44
Bear Creek Sediment Analytical Results - Semivolatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Date Sampled	Naphthalene	Phenanthrene	Pyrene	Benzo(b+k) fluoranthene(s)	Bis (2-ethylhexyl) phthalate	Carbazole
AB-22	02/02/2010	0.0603 U	0.0302 U	0.0302 U	-	-	-
AB-23	02/02/2010	0.0496 U	0.0249 U	0.0249 U	-	-	-
AB-24	02/02/2010	0.104 U	0.0521 U	0.0521 U	-	-	-
AB-25	02/02/2010	0.110 U	0.0551 U	0.0551 U	-	-	-
AB-26	02/02/2010	0.176 U	0.0883 U	0.0883 U	-	-	-
AB-27	02/02/2010	0.0609 U	0.0305 U	0.0305 U	-	-	-
AB-28	02/02/2010	0.0814 U	0.303	0.780	0.517 [f]	-	-
SED-COMP-1	04/13/2012	0.0189 U	0.0189 U	0.0189 U	-	-	0.0284 U
SED-COMP-2	04/13/2012	0.0247 U	0.0247 U	0.0247 U	-	-	0.0371 U
SED-COMP-3	04/12/2012	0.0122 U	0.0122 U	0.0122 U	-	-	0.0183 U
SED-COMP-99 (SED-3 Dup)	04/12/2012	0.0127 U	0.0127 U	0.0127 U	-	-	0.0190 U
SED-COMP-4	04/11/2012	0.0108 U	0.0108 U	0.0108 U	-	-	0.0162 U
SED-COMP-5	04/11/2012	0.0117 U	0.0117 U	0.0117 U	-	-	0.0175 U
SED-COMP-6	04/11/2012	0.0095 U	0.0095 U	0.0095 U	-	-	0.0143 U
SED-COMP-7	04/11/2012	0.0106 U	0.0106 U	0.0106 U	-	-	0.0159 U
SED-COMP-8	04/12/2012	0.0142 U	0.0142 U	0.0142 U	-	-	0.0213 U

Table 1-44
Bear Creek Sediment Analytical Results - Semivolatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Notes:
Semivolatile Organic Compounds EPA Method 8270/8270 SIM
[a] Peak separation for Benzo(b) and Benzo(k)fluoranthenes does not meet method specified criteria.
mg/Kg = Milligrams per kilogram
- = Not analyzed for this parameter
U = Not detected at the method reporting limit shown

Table 1-45
Bear Creek Sediment Analytical Results - Conventional Parameters
Floragon Property
Molalla, Oregon

Sample ID	Date	TOC (mg/kg)	Wet Density (lbs/ft^3)	Dry Density (lbs/ft^3)	% Solids	%Gravel	% Sand	%Silt	%Clay	USCS
SED - 1B / SED-COMP-1	04/13/2012	47,000	122.4	92.1	69.2	31.9	60.4	5.0	2.8	SW/SP
SED - 2B / SED-COMP-2	04/13/2012	37,000	123.5	94.8	68.2	50.9	44.2	3.1	1.8	GW/GP
SED - 3B / SED-COMP-3	04/12/2012	28,000	116.7	84.3	63.6	33.1	46.4	11.1	9.3	SW/SP
SED - 3B Dup (SED-COMP-99)	04/12/2012	27,000	124.1	99.3	58.9	44.7	38.9	9.8	6.8	GW/GP
SED - 4B / SED-COMP-4	04/11/2012	9,700	110.0	74.6	70.8	27.9	28.9	13.6	29.7	SW/SP
SED - 5B / SED-COMP-5	04/11/2012	28,000	127.6	100.6	69.6	36.9	53.0	4.5	5.7	SW/SP
SED - 6B / SED-COMP-6	04/11/2012	6,500	135.7	109.4	83.9	31.9	59.2	3.3	5.6	SW/SP
SED - 7B / SED-COMP-7	04/11/2012	12,000	130.4	104.1	77.4	29.8	58.8	5.1	6.4	SW/SP
SED - 8B / SED-COMP-8	04/12/2012	36,000	125.5	100.3	51.5	52.0	35.3	6.7	6.1	GW/GP
SED-200 (0-1)	10/15/2015	-	112.4	93.0	-	86.9	7.33	5.4	0.40	GP/GM
SED-200ABC (0-1) COMP	10/15/2015	2,600	-	-	74.0	-	-	-	-	-
SED-200AC (1-2) COMP	10/15/2015	2,100	-	-	71.0	-	-	-	-	-
SED-201 (0-1)	10/15/2015	-	92.1	61.3	-	65.6	20.7	11.0	2.8	GW/GM
SED-201ABC (0-1) COMP	10/15/2015	15,000	-	-	57.3	-	-	-	-	-
SED-201 (1-2)	10/15/2015	-	97.3	70.7	-	44.8	30.4	18.5	6.4	GM
SED-201ABC (1-2) COMP	10/15/2015	5,400	-	-	67.1	-	-	-	-	-
SED-202 (0-1)	10/15/2015	-	100.1	73.3	-	24.2	24.1	28.9	22.8	ML/CL
SED-202ABC (0-1) COMP	10/15/2015	6,000	-	-	67.6	-	-	-	-	-
SED-203 (0-1)	10/16/2015	-	98.9	70.1	-	63.0	18.4	14.3	4.3	GM
SED-203ABC (0-1) COMP	10/16/2015	6,500	-	-	60.9	-	-	-	-	-
SED-203 (1-2)	10/16/2015	-	99.2	70.7	-	46.7	20.7	22.4	10.2	GM/GC
SED-203AC (1-2) COMP	10/16/2015	2,000	-	-	66.6	-	-	-	-	-
SED-204 (0-1)	10/16/2015	-	94.2	64.2	-	63.8	11.3	19.7	5.2	GM
SED-204ABC (0-1) COMP	10/16/2015	8,800	-	-	58.5	-	-	-	-	-
SED-204 (1-2)	10/16/2015	-	100.1	73.5	-	64.6	15.7	15.7	4.0	GM
SED-204AC (1-2) COMP	10/16/2015	9,400	-	-	65.8	-	-	-	-	-
SED-205 (0-1)	10/16/2015	-	101.5	76.1	-	62.2	15.1	17.8	5.0	GM
SED-205ABC (0-1) COMP	10/16/2015	7,600	-	-	59.4	-	-	-	-	-
SED-206 (0-1)	10/16/2015	-	100.2	76.2	-	88.3	8.48	3.1	0.20	GP
SED-206ABC (0-1) COMP	10/16/2015	19,000	-	-	59.8	-	-	-	-	-
SED-207 (0-1)	10/16/2015	-	110.1	91.4	-	28.0	22.6	30.1	19.3	ML
SED-207ABC (0-1) COMP	10/16/2015	8,200	-	-	59.7	-	-	-	-	-
SED-207 (1-2)	10/16/2015	-	92.7	63.3	-	64.5	11.6	18.0	5.9	GM
SED-207AC (1-2) COMP	10/16/2015	7,500	-	-	60.5	-	-	-	-	-
SED-208 (0-1)	10/19/2015	-	90.3	63.5	-	41.6	29.2	21.2	8.1	GM
SED-208ABC (0-1) COMP	10/19/2015	16,000	-	-	62.7	-	-	-	-	-
SED-208 (1-2)	10/19/2015	-	101.3	75.1	-	43.3	27.8	20.3	8.6	GM
SED-208ABC (1-2) COMP	10/19/2015	7,400	-	-	71.3	-	-	-	-	-
SED-209 (0-1)	10/19/2015	-	87.2	64.5	-	48.4	28.5	18.3	4.8	GM
SED-209ABC (0-1) COMP	10/19/2015	21,000	-	-	28.6	-	-	-	-	-
SED-209 (1-2)	10/19/2015	-	99.1	73.1	-	61.6	20.1	14.3	4.0	GM
SED-209AB (1-2) COMP	10/19/2015	7,100	-	-	73.2	-	-	-	-	-
SED-210 (0-1)	10/19/2015	-	91.0	61.9	-	38.6	26.1	24.0	11.4	GM
SED-210ABC (0-1) COMP	10/19/2015	5,200	-	-	64.9	-	-	-	-	-
SED-210 (1-2)	10/19/2015	-	97.4	72.1	-	-	-	-	-	-
SED-210ABC (1-2) COMP	10/19/2015	-	-	-	-	-	-	-	-	-

Table 1-45
Bear Creek Sediment Analytical Results - Conventional Parameters
Floragon Property
Molalla, Oregon

Sample ID	Date	TOC (mg/kg)	Wet Density (lbs/ft^3)	Dry Density (lbs/ft^3)	% Solids	%Gravel	% Sand	%Silt	%Clay	USCS
SED-211 (0-1)	10/19/2015	-	98.4	72.5	-	59.8	21.5	14.6	4.1	GM
SED-211ABC (0-1) COMP	10/19/2015	9,200	-	-	70.2	-	-	-	-	-
SED-211ABC (0-1) COMP Dup (SED-250	10/19/2015	16,000	-	-	63.2	-	-	-	-	-
SED-211 (1-2)	10/19/2015	-	100.0	75.5	-	60.1	24.3	12.9	2.6	GM
SED-211ABC (1-2) COMP	10/19/2015	2,800	-	-	71.8	-	-	-	-	-

Notes:
mg/kg = milligrams per kilogram
lbs/ft^3 = pounds per cubic foot
USCS = Unified Soil Classification System
TOC = Total organic carbon analyzed by EPA Method SM 5310B MOD
Percent Soilids measured by EPA Method 8000C
Grain size measured by Method ASTM D 422m
CL = Inorganic clay
GC = Clayey gravel
GM = Silty gravel
GP = Poorly graded gravel
GW = Well graded gravel
ML = Inorganic silt
SP = Poorly graded sands
SW = Well graded sands
- = not analyzed / not available

Table 2-1

Dip Tank Area Soil Analytical Results Summary - Dioxin Equivalent Concentrations - Mammalian TEQ (pg/g)

Floragon Property

Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	2,3,7,8-TCDD TEQ with EDLs	2,3,7,8-TCDD TEQ with 1/2 EDLs	2,3,7,8-TCDD TEQ without non-detects
AB-03/1	1	02/02/2010	152	152	152
AB-05/0-6	0.5	02/03/2010	328	328	328
AB-06/0-6	0.5	02/03/2010	2,221	2,221	2,221
AB-08/0-6	0.5	02/03/2010	43	43	43
B1-4 (0.5) COMP	0.5	10/14/2015	41	41	41
B1-4 (1.5) COMP	1.5	10/14/2015	14	14	14
B5-8 (0.5) COMP	0.5	10/14/2015	19	19	19
B5-8 (1.5) COMP	1.5	10/14/2015	6.0	6.0	6.0
B9-12 (0.5) COMP	0.5	10/13/2015	19	19	19
B9-12 (1.5) COMP	1.5	10/13/2015	20	19	19
B13-16 (0.5) COMP	0.5	10/13/2015	489	489	489
B13-16 (1.5) COMP	1.5	10/13/2015	172	171	171
B17-20 (0.5) COMP	0.5	10/14/2015	51	51	51
B17-20 (1.5) COMP	1.5	10/14/2015	63	63	63
B21-24 (0.5) COMP	0.5	10/14/2015	29	29	29
B21-24 (1.5) COMP	1.5	10/14/2015	3.6	3.5	3.5
B25-28 (0.5) COMP	0.5	10/14/2015	5.6	5.5	5.5
B25-28 (1.5) COMP	1.5	10/14/2015	0.58	0.44	0.29
B29-32 (0.5) COMP	0.5	10/14/2015	44	44	44
B29-32 (1.5) COMP	1.5	10/14/2015	4.7	4.6	4.5
Catch Basin Samples					
AB-19A**	-	02/02/2010	109	109	109
AB-19B**	-	02/02/2010	1,115	1,115	1,115

Notes:

** Catch Basin Sample

pg/g = picograms per gram

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TCDD = Tetrachlorinated Dibenzo-p-Dioxin(s)

EDL = Estimated Detection Limit

Table 2-2
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-03/1', February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.65 J	0.00000165 J	1.7E-06 J	1	1.65 J	1.7E-06 J
1,2,3,7,8-PeCDD	6.37 J	0.00000637 J	6.4E-06 J	1	6.4 J	6.4E-06 J
1,2,3,4,7,8-HxCDD	13.2	0.0000132	1.3E-05	0.1	1.32	1.3E-06
1,2,3,6,7,8-HxCDD	264	0.000264	2.6E-04	0.1	26.4	2.6E-05
1,2,3,7,8,9-HxCDD	67.9	0.0000679	6.8E-05	0.1	6.79	6.8E-06
1,2,3,4,6,7,8-HpCDD	7,980	0.00798	8.0E-03	0.01	79.8	8.0E-05
OCDD	46,800	0.0468	4.7E-02	0.0003	14.04	1.4E-05
2,3,7,8-TCDF	7.76	0.00000776	7.8E-06	0.1	0.78	7.8E-07
1,2,3,7,8-PeCDF	6.44 J	0.00000644 J	6.4E-06 J	0.03	0.193 J	1.9E-07 J
2,3,4,7,8-PeCDF	8.36 J	0.00000836 J	8.4E-06 J	0.3	2.5 J	2.5E-06 J
1,2,3,4,7,8-HxCDF	18.3	0.0000183	1.8E-05	0.1	1.83	1.8E-06
1,2,3,6,7,8-HxCDF	20.3	0.0000203	2.0E-05	0.1	2.03	2.0E-06
2,3,4,6,7,8-HxCDF	21.8	0.0000218	2.2E-05	0.1	2.2	2.2E-06
1,2,3,7,8,9-HxCDF	1.24 J	0.00000124 J	1.2E-06 J	0.1	0.12 J	1.2E-07 J
1,2,3,4,6,7,8-HpCDF	565	0.000565	5.7E-04	0.01	5.7	5.7E-06
1,2,3,4,7,8,9-HpCDF	17.3	0.0000173	1.7E-05	0.01	0.173	1.7E-07
OCDF	320	0.00032	3.2E-04	0.0003	0.096	9.6E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					152	1.5E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					152	1.5E-04
2,3,7,8-TCDD TEQ (without non-detects)					152	1.5E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-3
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-05/0-6", February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.52 J	0.00000152 J	1.5E-06 J	1	1.52 J	1.5E-06 J
1,2,3,7,8-PeCDD	33.6	0.0000336	3.4E-05	1	33.60	3.4E-05
1,2,3,4,7,8-HxCDD	33.8	0.0000338	3.4E-05	0.1	3.380	3.4E-06
1,2,3,6,7,8-HxCDD	991	0.000991	9.9E-04	0.1	99.10	9.9E-05
1,2,3,7,8,9-HxCDD	241	0.000241	2.4E-04	0.1	24.10	2.4E-05
1,2,3,4,6,7,8-HpCDD	7,470	0.00747	7.5E-03	0.01	74.70	7.5E-05
OCDD	8,720	0.00872	8.7E-03	0.0003	2.616	2.6E-06
2,3,7,8-TCDF	20.2	0.0000202	2.0E-05	0.1	2.020	2.0E-06
1,2,3,7,8-PeCDF	18.3	0.0000183	1.8E-05	0.03	0.549	5.5E-07
2,3,4,7,8-PeCDF	17.1	0.0000171	1.7E-05	0.3	5.130	5.1E-06
1,2,3,4,7,8-HxCDF	103	0.000103	1.0E-04	0.1	10.300	1.0E-05
1,2,3,6,7,8-HxCDF	161	0.000161	1.6E-04	0.1	16.100	1.6E-05
2,3,4,6,7,8-HxCDF	122	0.000122	1.2E-04	0.1	12.200	1.2E-05
1,2,3,7,8,9-HxCDF	7.29 J	0.00000729 J	7.3E-06 J	0.1	0.729 J	7.3E-07 J
1,2,3,4,6,7,8-HpCDF	3,960	0.00396	4.0E-03	0.01	39.60	4.0E-05
1,2,3,4,7,8,9-HpCDF	133	0.000133	1.3E-04	0.01	1.3300	1.3E-06
OCDF	1,870	0.00187	1.9E-03	0.0003	0.5610	5.6E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					328	3.3E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					328	3.3E-04
2,3,7,8-TCDD TEQ (without non-detects)					328	3.3E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-4
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-06/0-6", February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	24.3 J	0.0000243 J	2.4E-05 J	1	24.30 J	2.4E-05 J
1,2,3,7,8-PeCDD	294	0.000294	2.9E-04	1	294.0	2.9E-04
1,2,3,4,7,8-HxCDD	157 J	0.000157 J	1.6E-04 J	0.1	15.70 J	1.6E-05 J
1,2,3,6,7,8-HxCDD	5,000	0.005	5.0E-03	0.1	500.0	5.0E-04
1,2,3,7,8,9-HxCDD	680	0.00068	6.8E-04	0.1	68.00	6.8E-05
1,2,3,4,6,7,8-HpCDD	85,000	0.085	8.5E-02	0.01	850.0	8.5E-04
OCDD	162,000	0.162	1.6E-01	0.0003	48.60	4.9E-05
2,3,7,8-TCDF	346	0.000346	3.5E-04	0.1	34.60	3.5E-05
1,2,3,7,8-PeCDF	106 J	0.000106 J	1.1E-04 J	0.03	3.180 J	3.2E-06 J
2,3,4,7,8-PeCDF	188 J	0.000188 J	1.9E-04 J	0.3	56.4 J	5.6E-05 J
1,2,3,4,7,8-HxCDF	640	0.00064	6.4E-04	0.1	64.00	6.4E-05
1,2,3,6,7,8-HxCDF	333	0.000333	3.3E-04	0.1	33.30	3.3E-05
2,3,4,6,7,8-HxCDF	274	0.000274	2.7E-04	0.1	27.4	2.7E-05
1,2,3,7,8,9-HxCDF	13.6 J	0.0000136 J	1.4E-05 J	0.1	1.36 J	1.4E-06 J
1,2,3,4,6,7,8-HpCDF	14,900	0.0149	1.5E-02	0.01	149.0	1.5E-04
1,2,3,4,7,8,9-HpCDF	2,640	0.00264	2.6E-03	0.01	26.400	2.6E-05
OCDF	82,000	0.082	8.2E-02	0.0003	24.600	2.5E-05
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					2,221	2.2E-03
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					2,221	2.2E-03
2,3,7,8-TCDD TEQ (without non-detects)					2,221	2.2E-03

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-5
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-08/0-6", February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.88 J	0.00000188 J	1.9E-06 J	1	1.88 J	1.9E-06 J
1,2,3,7,8-PeCDD	13.3	0.0000133	1.3E-05	1	13.3	1.3E-05
1,2,3,4,7,8-HxCDD	6.85 J	0.00000685 J	6.9E-06 J	0.1	0.69 J	6.9E-07 J
1,2,3,6,7,8-HxCDD	79.7	0.0000797	8.0E-05	0.1	8.0	8.0E-06
1,2,3,7,8,9-HxCDD	22.3	0.0000223	2.2E-05	0.1	2.23	2.2E-06
1,2,3,4,6,7,8-HpCDD	368	0.000368	3.7E-04	0.01	3.7	3.7E-06
OCDD	988	0.000988	9.9E-04	0.0003	0.30	3.0E-07
2,3,7,8-TCDF	22.6	0.0000226	2.3E-05	0.1	2.26	2.3E-06
1,2,3,7,8-PeCDF	12.2	0.0000122	1.2E-05	0.03	0.366	3.7E-07
2,3,4,7,8-PeCDF	9.65 J	0.00000965 J	9.7E-06 J	0.3	2.9 J	2.9E-06 J
1,2,3,4,7,8-HxCDF	11.9	0.0000119	1.2E-05	0.1	1.19	1.2E-06
1,2,3,6,7,8-HxCDF	20.5	0.0000205	2.1E-05	0.1	2.05	2.1E-06
2,3,4,6,7,8-HxCDF	11.2	0.0000112	1.1E-05	0.1	1.1	1.1E-06
1,2,3,7,8,9-HxCDF	1.52 J	0.00000152 J	1.5E-06 J	0.1	0.15 J	1.5E-07 J
1,2,3,4,6,7,8-HpCDF	309	0.000309	3.1E-04	0.01	3.1	3.1E-06
1,2,3,4,7,8,9-HpCDF	13.4	0.0000134	1.3E-05	0.01	0.134	1.3E-07
OCDF	181	0.000181	1.8E-04	0.0003	0.054	5.4E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					43	4.3E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					43	4.3E-05
2,3,7,8-TCDD TEQ (without non-detects)					43	4.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-6
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B1-4 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.186	0.000000186	1.9E-07	1	0.19	1.9E-07
1,2,3,7,8-PeCDD	1.54	0.00000154	1.5E-06	1	1.5	1.5E-06
1,2,3,4,7,8-HxCDD	90.9	0.0000909	9.1E-05	0.1	9.09	9.1E-06
1,2,3,6,7,8-HxCDD	87.6	0.0000876	8.8E-05	0.1	8.8	8.8E-06
1,2,3,7,8,9-HxCDD	10.1	0.0000101	1.0E-05	0.1	1.01	1.0E-06
1,2,3,4,6,7,8-HpCDD	791	0.000791	7.9E-04	0.01	7.9	7.9E-06
OCDD	3,120	0.00312	3.1E-03	0.0003	0.94	9.4E-07
2,3,7,8-TCDF	0.972	0.000000972	9.7E-07	0.1	0.10	9.7E-08
1,2,3,7,8-PeCDF	1.11	0.00000111	1.1E-06	0.03	0.033	3.3E-08
2,3,4,7,8-PeCDF	1.01	0.00000101	1.0E-06	0.3	0.3	3.0E-07
1,2,3,4,7,8-HxCDF	18.5	0.0000185	1.9E-05	0.1	1.85	1.9E-06
1,2,3,6,7,8-HxCDF	12.4	0.0000124	1.2E-05	0.1	1.24	1.2E-06
2,3,4,6,7,8-HxCDF	7.68	0.00000768	7.7E-06	0.1	0.8	7.7E-07
1,2,3,7,8,9-HxCDF	0.672	0.000000672	6.7E-07	0.1	0.07	6.7E-08
1,2,3,4,6,7,8-HpCDF	673	0.000673	6.7E-04	0.01	6.7	6.7E-06
1,2,3,4,7,8,9-HpCDF	22.1	0.0000221	2.2E-05	0.01	0.221	2.2E-07
OCDF	882	0.000882	8.8E-04	0.0003	0.265	2.6E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					41	4.1E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					41	4.1E-05
2,3,7,8-TCDD TEQ (without non-detects)					41	4.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-7
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B1-4 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.28	0.00000028	2.8E-07	1	0.28	2.8E-07
1,2,3,7,8-PeCDD	1.46	0.00000146	1.5E-06	1	1.5	1.5E-06
1,2,3,4,7,8-HxCDD	1.78	0.00000178	1.8E-06	0.1	0.18	1.8E-07
1,2,3,6,7,8-HxCDD	47.7	0.0000477	4.8E-05	0.1	5	4.8E-06
1,2,3,7,8,9-HxCDD	5.71	0.00000571	5.7E-06	0.1	0.6	5.7E-07
1,2,3,4,6,7,8-HpCDD	259	0.000259	2.6E-04	0.01	3	2.6E-06
OCDD	1,060	0.00106	1.1E-03	0.0003	0.3	3.2E-07
2,3,7,8-TCDF	2.75	0.00000275	2.8E-06	0.1	0.28	2.8E-07
1,2,3,7,8-PeCDF	0.895	0.000000895	9.0E-07	0.03	0.03	2.7E-08
2,3,4,7,8-PeCDF	1.14	0.00000114	1.1E-06	0.3	0.3	3.4E-07
1,2,3,4,7,8-HxCDF	3.96	0.00000396	4.0E-06	0.1	0.4	4.0E-07
1,2,3,6,7,8-HxCDF	4.64	0.00000464	4.6E-06	0.1	0.5	4.6E-07
2,3,4,6,7,8-HxCDF	3.29	0.00000329	3.3E-06	0.1	0.3	3.3E-07
1,2,3,7,8,9-HxCDF	0.099 U	0.000000099 U	9.9E-08 U	0.1	0.01 U	9.9E-09 U
1,2,3,4,6,7,8-HpCDF	222	0.000222	2.2E-04	0.01	2.2	2.2E-06
1,2,3,4,7,8,9-HpCDF	7.14	0.00000714	7.1E-06	0.01	0.07	7.1E-08
OCDF	335	0.000335	3.4E-04	0.0003	0.101	1.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					14	1.4E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					14	1.4E-05
2,3,7,8-TCDD TEQ (without non-detects)					14	1.4E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-8
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B5-8 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.187 U	0.000000187 U	1.9E-07 U	1	0.19 U	1.9E-07 U
1,2,3,7,8-PeCDD	0.943	0.000000943	9.4E-07	1	0.9	9.4E-07
1,2,3,4,7,8-HxCDD	1.7	0.0000017	1.7E-06	0.1	0.2	1.7E-07
1,2,3,6,7,8-HxCDD	46.9	0.0000469	4.7E-05	0.1	5	4.7E-06
1,2,3,7,8,9-HxCDD	7.82	0.00000782	7.8E-06	0.1	0.8	7.8E-07
1,2,3,4,6,7,8-HpCDD	445	0.000445	4.5E-04	0.01	4	4.5E-06
OCDD	3,630	0.00363	3.6E-03	0.0003	1.1	1.1E-06
2,3,7,8-TCDF	0.755	0.000000755	7.6E-07	0.1	0.08	7.6E-08
1,2,3,7,8-PeCDF	0.782	0.000000782	7.8E-07	0.03	0.02	2.3E-08
2,3,4,7,8-PeCDF	0.939	0.000000939	9.4E-07	0.3	0.3	2.8E-07
1,2,3,4,7,8-HxCDF	6.58	0.00000658	6.6E-06	0.1	0.7	6.6E-07
1,2,3,6,7,8-HxCDF	5.16	0.00000516	5.2E-06	0.1	0.5	5.2E-07
2,3,4,6,7,8-HxCDF	4.43	0.00000443	4.4E-06	0.1	0.4	4.4E-07
1,2,3,7,8,9-HxCDF	0.296	0.000000296	3.0E-07	0.1	0.0	3.0E-08
1,2,3,4,6,7,8-HpCDF	418	0.000418	4.2E-04	0.01	4.2	4.2E-06
1,2,3,4,7,8,9-HpCDF	7.3	0.0000073	7.3E-06	0.01	0.07	7.3E-08
OCDF	328	0.000328	3.3E-04	0.0003	0.098	9.8E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					19	1.9E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					19	1.9E-05
2,3,7,8-TCDD TEQ (without non-detects)					19	1.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-9
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B5-8 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.426	0.000000426	4.3E-07	1	0.43	4.3E-07
1,2,3,7,8-PeCDD	0.984	0.000000984	9.8E-07	1	1.0	9.8E-07
1,2,3,4,7,8-HxCDD	1.37	0.00000137	1.4E-06	0.1	0.14	1.4E-07
1,2,3,6,7,8-HxCDD	12.4	0.0000124	1.2E-05	0.1	1	1.2E-06
1,2,3,7,8,9-HxCDD	2.61	0.00000261	2.6E-06	0.1	0.3	2.6E-07
1,2,3,4,6,7,8-HpCDD	108	0.000108	1.1E-04	0.01	1	1.1E-06
OCDD	971	0.000971	9.7E-04	0.0003	0.3	2.9E-07
2,3,7,8-TCDF	0.454	0.000000454	4.5E-07	0.1	0.05	4.5E-08
1,2,3,7,8-PeCDF	0.248	0.000000248	2.5E-07	0.03	0.01	7.4E-09
2,3,4,7,8-PeCDF	0.268	0.000000268	2.7E-07	0.3	0.1	8.0E-08
1,2,3,4,7,8-HxCDF	2.45	0.00000245	2.5E-06	0.1	0.2	2.5E-07
1,2,3,6,7,8-HxCDF	1.69	0.00000169	1.7E-06	0.1	0.2	1.7E-07
2,3,4,6,7,8-HxCDF	1.07	0.00000107	1.1E-06	0.1	0.1	1.1E-07
1,2,3,7,8,9-HxCDF	0.117 U	0.000000117 U	1.2E-07 U	0.1	0.01 U	1.2E-08 U
1,2,3,4,6,7,8-HpCDF	83.3	0.0000833	8.3E-05	0.01	0.8	8.3E-07
1,2,3,4,7,8,9-HpCDF	2.94	0.00000294	2.9E-06	0.01	0.03	2.9E-08
OCDF	133	0.000133	1.3E-04	0.0003	0.040	4.0E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					6.0	6.0E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					6.0	6.0E-06
2,3,7,8-TCDD TEQ (without non-detects)					6.0	6.0E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-10
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B9-12 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.101 U	0.000000101 U	1.0E-07 U	1	0.10 U	1.0E-07 U
1,2,3,7,8-PeCDD	0.925	0.000000925	9.3E-07	1	0.93	9.3E-07
1,2,3,4,7,8-HxCDD	1.12	0.00000112	1.1E-06	0.1	0.11	1.1E-07
1,2,3,6,7,8-HxCDD	77.1	0.0000771	7.7E-05	0.1	7.7	7.7E-06
1,2,3,7,8,9-HxCDD	24.5	0.0000245	2.5E-05	0.1	2.45	2.5E-06
1,2,3,4,6,7,8-HpCDD	475	0.000475	4.8E-04	0.01	4.8	4.8E-06
OCDD	2,170	0.00217	2.2E-03	0.0003	0.65	6.5E-07
2,3,7,8-TCDF	0.354	0.000000354	3.5E-07	0.1	0.04	3.5E-08
1,2,3,7,8-PeCDF	0.449	0.000000449	4.5E-07	0.03	0.013	1.3E-08
2,3,4,7,8-PeCDF	0.445	0.000000445	4.5E-07	0.3	0.13	1.3E-07
1,2,3,4,7,8-HxCDF	2.64	0.00000264	2.6E-06	0.1	0.26	2.6E-07
1,2,3,6,7,8-HxCDF	2.85	0.00000285	2.9E-06	0.1	0.29	2.9E-07
2,3,4,6,7,8-HxCDF	2.41	0.00000241	2.4E-06	0.1	0.24	2.4E-07
1,2,3,7,8,9-HxCDF	0.189	0.000000189	1.9E-07	0.1	0.02	1.9E-08
1,2,3,4,6,7,8-HpCDF	157	0.000157	1.6E-04	0.01	1.57	1.6E-06
1,2,3,4,7,8,9-HpCDF	4	0.000004	4.0E-06	0.01	0.040	4.0E-08
OCDF	135	0.000135	1.4E-04	0.0003	0.041	4.1E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					19	1.9E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					19	1.9E-05
2,3,7,8-TCDD TEQ (without non-detects)					19	1.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-11
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B9-12 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.0834 U	8.34E-08 U	8.3E-08 U	1	0.08 U	8.3E-08 U
1,2,3,7,8-PeCDD	0.602	0.000000602	6.0E-07	1	0.60	6.0E-07
1,2,3,4,7,8-HxCDD	1.8	0.0000018	1.8E-06	0.1	0.18	1.8E-07
1,2,3,6,7,8-HxCDD	85.5	0.0000855	8.6E-05	0.1	8.6	8.6E-06
1,2,3,7,8,9-HxCDD	34.5	0.0000345	3.5E-05	0.1	3.45	3.5E-06
1,2,3,4,6,7,8-HpCDD	476	0.000476	4.8E-04	0.01	4.8	4.8E-06
OCDD	2,640	0.00264	2.6E-03	0.0003	0.79	7.9E-07
2,3,7,8-TCDF	0.182	0.000000182	1.8E-07	0.1	0.02	1.8E-08
1,2,3,7,8-PeCDF	0.227	0.000000227	2.3E-07	0.03	0.007	6.8E-09
2,3,4,7,8-PeCDF	0.182 U	0.000000182 U	1.8E-07 U	0.3	0.05 U	5.5E-08 U
1,2,3,4,7,8-HxCDF	1.16	0.00000116	1.2E-06	0.1	0.12	1.2E-07
1,2,3,6,7,8-HxCDF	1.35	0.00000135	1.4E-06	0.1	0.14	1.4E-07
2,3,4,6,7,8-HxCDF	1.16	0.00000116	1.2E-06	0.1	0.12	1.2E-07
1,2,3,7,8,9-HxCDF	0.116	0.000000116	1.2E-07	0.1	0.01	1.2E-08
1,2,3,4,6,7,8-HpCDF	59.3	0.0000593	5.9E-05	0.01	0.59	5.9E-07
1,2,3,4,7,8,9-HpCDF	1.78	0.00000178	1.8E-06	0.01	0.018	1.8E-08
OCDF	69.5	0.0000695	7.0E-05	0.0003	0.021	2.1E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					20	2.0E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					19	4.2E-02
2,3,7,8-TCDD TEQ (without non-detects)					19	1.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-12
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B13-16 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	2.36	0.00000236	2.4E-06	1	2.36	2.4E-06
1,2,3,7,8-PeCDD	58.3	0.0000583	5.8E-05	1	58.30	5.8E-05
1,2,3,4,7,8-HxCDD	84.7	0.0000847	8.5E-05	0.1	8.47	8.5E-06
1,2,3,6,7,8-HxCDD	1,530	0.00153	1.5E-03	0.1	153.0	1.5E-04
1,2,3,7,8,9-HxCDD	307	0.000307	3.1E-04	0.1	30.70	3.1E-05
1,2,3,4,6,7,8-HpCDD	10,400	0.0104	1.0E-02	0.01	104.0	1.0E-04
OCDD	64,100	0.0641	6.4E-02	0.0003	19.23	1.9E-05
2,3,7,8-TCDF	64.7	0.0000647	6.5E-05	0.1	6.47	6.5E-06
1,2,3,7,8-PeCDF	58.8	0.0000588	5.9E-05	0.03	1.764	1.8E-06
2,3,4,7,8-PeCDF	60.1	0.0000601	6.0E-05	0.3	18.03	1.8E-05
1,2,3,4,7,8-HxCDF	188	0.000188	1.9E-04	0.1	18.80	1.9E-05
1,2,3,6,7,8-HxCDF	201	0.000201	2.0E-04	0.1	20.10	2.0E-05
2,3,4,6,7,8-HxCDF	135	0.000135	1.4E-04	0.1	13.50	1.4E-05
1,2,3,7,8,9-HxCDF	14.9	0.0000149	1.5E-05	0.1	1.49	1.5E-06
1,2,3,4,6,7,8-HpCDF	3,030	0.00303	3.0E-03	0.01	30.30	3.0E-05
1,2,3,4,7,8,9-HpCDF	143	0.000143	1.4E-04	0.01	1.430	1.4E-06
OCDF	2,340	0.00234	2.3E-03	0.0003	0.702	7.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					489	4.9E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					489	4.9E-04
2,3,7,8-TCDD TEQ (without non-detects)					489	4.9E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-13
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B13-16 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.834	0.000000834	8.3E-07	1	0.83	8.3E-07
1,2,3,7,8-PeCDD	11.7	0.0000117	1.2E-05	1	11.70	1.2E-05
1,2,3,4,7,8-HxCDD	22.1	0.0000221	2.2E-05	0.1	2.21	2.2E-06
1,2,3,6,7,8-HxCDD	542	0.000542	5.4E-04	0.1	54.2	5.4E-05
1,2,3,7,8,9-HxCDD	72.3	0.0000723	7.2E-05	0.1	7.23	7.2E-06
1,2,3,4,6,7,8-HpCDD	4,060	0.00406	4.1E-03	0.01	40.6	4.1E-05
OCDD	23,300	0.0233	2.3E-02	0.0003	6.99	7.0E-06
2,3,7,8-TCDF	43.2	0.0000432	4.3E-05	0.1	4.32	4.3E-06
1,2,3,7,8-PeCDF	26.2	0.0000262	2.6E-05	0.03	0.786	7.9E-07
2,3,4,7,8-PeCDF	30.6	0.0000306	3.1E-05	0.3	9.18	9.2E-06
1,2,3,4,7,8-HxCDF	65.5	0.0000655	6.6E-05	0.1	6.55	6.6E-06
1,2,3,6,7,8-HxCDF	44.4	0.0000444	4.4E-05	0.1	4.44	4.4E-06
2,3,4,6,7,8-HxCDF	56.7	0.0000567	5.7E-05	0.1	5.67	5.7E-06
1,2,3,7,8,9-HxCDF	2.4	0.0000024	2.4E-06	0.1	0.24	2.4E-07
1,2,3,4,6,7,8-HpCDF	1,540	0.00154	1.5E-03	0.01	15.40	1.5E-05
1,2,3,4,7,8,9-HpCDF	67.9	0.0000679	6.8E-05	0.01	0.679	6.8E-07
OCDF	2,390 U	0.00239 U	2.4E-03 U	0.0003	0.717 U	7.2E-07 U
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					172	1.7E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					171	1.7E-04
2,3,7,8-TCDD TEQ (without non-detects)					171	1.7E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-14
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B17-20 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.317	0.000000317	3.2E-07	1	0.32	3.2E-07
1,2,3,7,8-PeCDD	3.81	0.00000381	3.8E-06	1	3.81	3.8E-06
1,2,3,4,7,8-HxCDD	5.51	0.00000551	5.5E-06	0.1	0.55	5.5E-07
1,2,3,6,7,8-HxCDD	161	0.000161	1.6E-04	0.1	16.1	1.6E-05
1,2,3,7,8,9-HxCDD	22.8	0.0000228	2.3E-05	0.1	2.28	2.3E-06
1,2,3,4,6,7,8-HpCDD	1,250	0.00125	1.3E-03	0.01	12.5	1.3E-05
OCDD	10,200	0.0102	1.0E-02	0.0003	3.06	3.1E-06
2,3,7,8-TCDF	3.6	0.0000036	3.6E-06	0.1	0.36	3.6E-07
1,2,3,7,8-PeCDF	4.54	0.00000454	4.5E-06	0.03	0.136	1.4E-07
2,3,4,7,8-PeCDF	5.36	0.00000536	5.4E-06	0.3	1.61	1.6E-06
1,2,3,4,7,8-HxCDF	19.6	0.0000196	2.0E-05	0.1	1.96	2.0E-06
1,2,3,6,7,8-HxCDF	17.1	0.0000171	1.7E-05	0.1	1.71	1.7E-06
2,3,4,6,7,8-HxCDF	14.3	0.0000143	1.4E-05	0.1	1.43	1.4E-06
1,2,3,7,8,9-HxCDF	0.982	0.000000982	9.8E-07	0.1	0.10	9.8E-08
1,2,3,4,6,7,8-HpCDF	486	0.000486	4.9E-04	0.01	4.86	4.9E-06
1,2,3,4,7,8,9-HpCDF	9.81	0.00000981	9.8E-06	0.01	0.098	9.8E-08
OCDF	339	0.000339	3.4E-04	0.0003	0.102	1.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					51	5.1E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					51	5.1E-05
2,3,7,8-TCDD TEQ (without non-detects)					51	5.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-15
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B17-20 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.275	0.000000275	2.8E-07	1	0.28	2.8E-07
1,2,3,7,8-PeCDD	5.13	0.00000513	5.1E-06	1	5.13	5.1E-06
1,2,3,4,7,8-HxCDD	7.65	0.00000765	7.7E-06	0.1	0.77	7.7E-07
1,2,3,6,7,8-HxCDD	218	0.000218	2.2E-04	0.1	21.8	2.2E-05
1,2,3,7,8,9-HxCDD	28.4	0.0000284	2.8E-05	0.1	2.84	2.8E-06
1,2,3,4,6,7,8-HpCDD	1,530	0.00153	1.5E-03	0.01	15.3	1.5E-05
OCDD	11,800	0.0118	1.2E-02	0.0003	3.54	3.5E-06
2,3,7,8-TCDF	6.92	0.00000692	6.9E-06	0.1	0.69	6.9E-07
1,2,3,7,8-PeCDF	7.22	0.00000722	7.2E-06	0.03	0.217	2.2E-07
2,3,4,7,8-PeCDF	8.74	0.00000874	8.7E-06	0.3	2.62	2.6E-06
1,2,3,4,7,8-HxCDF	22.5	0.0000225	2.3E-05	0.1	2.25	2.3E-06
1,2,3,6,7,8-HxCDF	20	0.00002	2.0E-05	0.1	2.00	2.0E-06
2,3,4,6,7,8-HxCDF	18.5	0.0000185	1.9E-05	0.1	1.85	1.9E-06
1,2,3,7,8,9-HxCDF	0.823	0.000000823	8.2E-07	0.1	0.08	8.2E-08
1,2,3,4,6,7,8-HpCDF	352	0.000352	3.5E-04	0.01	3.52	3.5E-06
1,2,3,4,7,8,9-HpCDF	10.1	0.0000101	1.0E-05	0.01	0.101	1.0E-07
OCDF	255	0.000255	2.6E-04	0.0003	0.077	7.7E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					63	6.3E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					63	6.3E-05
2,3,7,8-TCDD TEQ (without non-detects)					63	6.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-16
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B21-24 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.162 U	0.000000162 U	1.6E-07 U	1	0.16 U	1.6E-07 U
1,2,3,7,8-PeCDD	2.64	0.00000264	2.6E-06	1	2.64	2.6E-06
1,2,3,4,7,8-HxCDD	4.47	0.00000447	4.5E-06	0.1	0.45	4.5E-07
1,2,3,6,7,8-HxCDD	79.6	0.0000796	8.0E-05	0.1	8.0	8.0E-06
1,2,3,7,8,9-HxCDD	18.9	0.0000189	1.9E-05	0.1	1.89	1.9E-06
1,2,3,4,6,7,8-HpCDD	595	0.000595	6.0E-04	0.01	6.0	6.0E-06
OCDD	3,840	0.00384	3.8E-03	0.0003	1.15	1.2E-06
2,3,7,8-TCDF	1.33	0.00000133	1.3E-06	0.1	0.13	1.3E-07
1,2,3,7,8-PeCDF	1.64	0.00000164	1.6E-06	0.03	0.049	4.9E-08
2,3,4,7,8-PeCDF	1.85	0.00000185	1.9E-06	0.3	0.56	5.6E-07
1,2,3,4,7,8-HxCDF	9.73	0.00000973	9.7E-06	0.1	0.97	9.7E-07
1,2,3,6,7,8-HxCDF	10.4	0.0000104	1.0E-05	0.1	1.04	1.0E-06
2,3,4,6,7,8-HxCDF	7.99	0.00000799	8.0E-06	0.1	0.80	8.0E-07
1,2,3,7,8,9-HxCDF	0.313	0.000000313	3.1E-07	0.1	0.03	3.1E-08
1,2,3,4,6,7,8-HpCDF	470	0.00047	4.7E-04	0.01	4.70	4.7E-06
1,2,3,4,7,8,9-HpCDF	12	0.000012	1.2E-05	0.01	0.120	1.2E-07
OCDF	469	0.000469	4.7E-04	0.0003	0.141	1.4E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					29	2.9E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					29	2.9E-05
2,3,7,8-TCDD TEQ (without non-detects)					29	2.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-17
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B21-24 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.0725 U	7.25E-08 U	7.3E-08 U	1	0.07 U	7.3E-08 U
1,2,3,7,8-PeCDD	0.479	0.000000479	4.8E-07	1	0.48	4.8E-07
1,2,3,4,7,8-HxCDD	0.873	0.000000873	8.7E-07	0.1	0.09	8.7E-08
1,2,3,6,7,8-HxCDD	7.85	0.00000785	7.9E-06	0.1	0.8	7.9E-07
1,2,3,7,8,9-HxCDD	2.27	0.00000227	2.3E-06	0.1	0.23	2.3E-07
1,2,3,4,6,7,8-HpCDD	81.5	0.0000815	8.2E-05	0.01	0.8	8.2E-07
OCDD	889	0.000889	8.9E-04	0.0003	0.27	2.7E-07
2,3,7,8-TCDF	0.306	0.000000306	3.1E-07	0.1	0.03	3.1E-08
1,2,3,7,8-PeCDF	0.305	0.000000305	3.1E-07	0.03	0.009	9.2E-09
2,3,4,7,8-PeCDF	0.319	0.000000319	3.2E-07	0.3	0.10	9.6E-08
1,2,3,4,7,8-HxCDF	1.06	0.00000106	1.1E-06	0.1	0.11	1.1E-07
1,2,3,6,7,8-HxCDF	1.27	0.00000127	1.3E-06	0.1	0.13	1.3E-07
2,3,4,6,7,8-HxCDF	0.886	0.000000886	8.9E-07	0.1	0.09	8.9E-08
1,2,3,7,8,9-HxCDF	0.0827 U	8.27E-08 U	8.3E-08 U	0.1	0.01 U	8.3E-09 U
1,2,3,4,6,7,8-HpCDF	36.1	0.0000361	3.6E-05	0.01	0.36	3.6E-07
1,2,3,4,7,8,9-HpCDF	1.42	0.00000142	1.4E-06	0.01	0.014	1.4E-08
OCDF	48.7	0.0000487	4.9E-05	0.0003	0.015	1.5E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					3.6	3.6E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					3.5	3.5E-06
2,3,7,8-TCDD TEQ (without non-detects)					3.5	3.5E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-18
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B25-28 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.0945 U	9.45E-08 U	9.5E-08 U	1	0.09 U	9.5E-08 U
1,2,3,7,8-PeCDD	0.822	0.000000822	8.2E-07	1	0.82	8.2E-07
1,2,3,4,7,8-HxCDD	0.936	0.000000936	9.4E-07	0.1	0.09	9.4E-08
1,2,3,6,7,8-HxCDD	16.5	0.0000165	1.7E-05	0.1	1.7	1.7E-06
1,2,3,7,8,9-HxCDD	4.13	0.00000413	4.1E-06	0.1	0.41	4.1E-07
1,2,3,4,6,7,8-HpCDD	110	0.00011	1.1E-04	0.01	1.1	1.1E-06
OCDD	642	0.000642	6.4E-04	0.0003	0.19	1.9E-07
2,3,7,8-TCDF	0.692	0.000000692	6.9E-07	0.1	0.07	6.9E-08
1,2,3,7,8-PeCDF	0.537	0.000000537	5.4E-07	0.03	0.016	1.6E-08
2,3,4,7,8-PeCDF	0.511	0.000000511	5.1E-07	0.3	0.15	1.5E-07
1,2,3,4,7,8-HxCDF	1.43	0.00000143	1.4E-06	0.1	0.14	1.4E-07
1,2,3,6,7,8-HxCDF	2.76	0.00000276	2.8E-06	0.1	0.28	2.8E-07
2,3,4,6,7,8-HxCDF	1.24	0.00000124	1.2E-06	0.1	0.12	1.2E-07
1,2,3,7,8,9-HxCDF	0.0953 U	9.53E-08 U	9.5E-08 U	0.1	0.01 U	9.5E-09 U
1,2,3,4,6,7,8-HpCDF	38.9	0.0000389	3.9E-05	0.01	0.39	3.9E-07
1,2,3,4,7,8,9-HpCDF	1.31	0.00000131	1.3E-06	0.01	0.013	1.3E-08
OCDF	29.8	0.0000298	3.0E-05	0.0003	0.009	8.9E-09
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					5.6	5.6E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					5.5	5.5E-06
2,3,7,8-TCDD TEQ (without non-detects)					5.5	5.5E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-19
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B25-28 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.109 U	0.000000109 U	1.1E-07 U	1	0.11 U	1.1E-07 U
1,2,3,7,8-PeCDD	0.11 U	0.00000011 U	1.1E-07 U	1	0.11 U	1.1E-07 U
1,2,3,4,7,8-HxCDD	0.119 U	0.000000119 U	1.2E-07 U	0.1	0.01 U	1.2E-08 U
1,2,3,6,7,8-HxCDD	0.692	0.000000692	6.9E-07	0.1	0.1	6.9E-08
1,2,3,7,8,9-HxCDD	0.406	0.000000406	4.1E-07	0.1	0.04	4.1E-08
1,2,3,4,6,7,8-HpCDD	9.67	0.00000967	9.7E-06	0.01	0.1	9.7E-08
OCDD	98.5	0.0000985	9.9E-05	0.0003	0.03	3.0E-08
2,3,7,8-TCDF	0.105 U	0.000000105 U	1.1E-07 U	0.1	0.01 U	1.1E-08 U
1,2,3,7,8-PeCDF	0.116 U	0.000000116 U	1.2E-07 U	0.03	0.003 U	3.5E-09 U
2,3,4,7,8-PeCDF	0.113 U	0.000000113 U	1.1E-07 U	0.3	0.03 U	3.4E-08 U
1,2,3,4,7,8-HxCDF	0.113	0.000000113	1.1E-07	0.1	0.01	1.1E-08
1,2,3,6,7,8-HxCDF	0.151	0.000000151	1.5E-07	0.1	0.02	1.5E-08
2,3,4,6,7,8-HxCDF	0.095	0.000000095	9.5E-08	0.1	0.01	9.5E-09
1,2,3,7,8,9-HxCDF	0.0852 U	8.52E-08 U	8.5E-08 U	0.1	0.01 U	8.5E-09 U
1,2,3,4,6,7,8-HpCDF	1.87	0.00000187	1.9E-06	0.01	0.02	1.9E-08
1,2,3,4,7,8,9-HpCDF	0.137	0.000000137	1.4E-07	0.01	0.001	1.4E-09
OCDF	2.05	0.00000205	2.1E-06	0.0003	0.001	6.2E-10
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					0.58	5.8E-07
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					0.44	4.4E-07
2,3,7,8-TCDD TEQ (without non-detects)					0.29	2.9E-07

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-20
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B29-32 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.144 U	0.000000144 U	1.4E-07 U	1	0.14 U	1.4E-07 U
1,2,3,7,8-PeCDD	1.72	0.00000172	1.7E-06	1	1.72	1.7E-06
1,2,3,4,7,8-HxCDD	8.66	0.00000866	8.7E-06	0.1	0.87	8.7E-07
1,2,3,6,7,8-HxCDD	165	0.000165	1.7E-04	0.1	16.5	1.7E-05
1,2,3,7,8,9-HxCDD	38.1	0.0000381	3.8E-05	0.1	3.81	3.8E-06
1,2,3,4,6,7,8-HpCDD	1,220	0.00122	1.2E-03	0.01	12.2	1.2E-05
OCDD	12,400	0.0124	1.2E-02	0.0003	3.72	3.7E-06
2,3,7,8-TCDF	4.39	0.00000439	4.4E-06	0.1	0.44	4.4E-07
1,2,3,7,8-PeCDF	2.15	0.00000215	2.2E-06	0.03	0.065	6.5E-08
2,3,4,7,8-PeCDF	2.58	0.00000258	2.6E-06	0.3	0.77	7.7E-07
1,2,3,4,7,8-HxCDF	5.78	0.00000578	5.8E-06	0.1	0.58	5.8E-07
1,2,3,6,7,8-HxCDF	7.07	0.00000707	7.1E-06	0.1	0.71	7.1E-07
2,3,4,6,7,8-HxCDF	7.2	0.0000072	7.2E-06	0.1	0.72	7.2E-07
1,2,3,7,8,9-HxCDF	0.447	0.000000447	4.5E-07	0.1	0.04	4.5E-08
1,2,3,4,6,7,8-HpCDF	112	0.000112	1.1E-04	0.01	1.12	1.1E-06
1,2,3,4,7,8,9-HpCDF	12.4	0.0000124	1.2E-05	0.01	0.124	1.2E-07
OCDF	434	0.000434	4.3E-04	0.0003	0.130	1.3E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					44	4.4E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					44	4.4E-05
2,3,7,8-TCDD TEQ (without non-detects)					44	4.4E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-21
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B29-32 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.185 U	0.000000185 U	1.9E-07 U	1	0.19 U	1.9E-07 U
1,2,3,7,8-PeCDD	0.384	0.000000384	3.8E-07	1	0.38	3.8E-07
1,2,3,4,7,8-HxCDD	0.604	0.000000604	6.0E-07	0.1	0.06	6.0E-08
1,2,3,6,7,8-HxCDD	13.6	0.0000136	1.4E-05	0.1	1.4	1.4E-06
1,2,3,7,8,9-HxCDD	3.32	0.00000332	3.3E-06	0.1	0.33	3.3E-07
1,2,3,4,6,7,8-HpCDD	140	0.00014	1.4E-04	0.01	1.4	1.4E-06
OCDD	1,530	0.00153	1.5E-03	0.0003	0.46	4.6E-07
2,3,7,8-TCDF	0.45	0.00000045	4.5E-07	0.1	0.05	4.5E-08
1,2,3,7,8-PeCDF	0.308	0.000000308	3.1E-07	0.03	0.009	9.2E-09
2,3,4,7,8-PeCDF	0.319	0.000000319	3.2E-07	0.3	0.10	9.6E-08
1,2,3,4,7,8-HxCDF	0.726	0.000000726	7.3E-07	0.1	0.07	7.3E-08
1,2,3,6,7,8-HxCDF	0.755	0.000000755	7.6E-07	0.1	0.08	7.6E-08
2,3,4,6,7,8-HxCDF	0.740	0.00000074	7.4E-07	0.1	0.07	7.4E-08
1,2,3,7,8,9-HxCDF	0.121	0.000000121	1.2E-07	0.1	0.01	1.2E-08
1,2,3,4,6,7,8-HpCDF	14.9	0.0000149	1.5E-05	0.01	0.15	1.5E-07
1,2,3,4,7,8,9-HpCDF	0.879 U	0.000000879 U	8.8E-07 U	0.01	0.009 U	8.8E-09 U
OCDF	29.2	0.0000292	2.9E-05	0.0003	0.009	8.8E-09
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					4.7	4.7E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					4.6	4.6E-06
2,3,7,8-TCDD TEQ (without non-detects)					4.5	4.5E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-22
Dip Tank Area Catch Basin Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-19A**, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	3.17	0.00000317	3.2E-06	1	3.17	3.2E-06
1,2,3,7,8-PeCDD	29.3	0.0000293	2.9E-05	1	29.3	2.9E-05
1,2,3,4,7,8-HxCDD	29.4	0.0000294	2.9E-05	0.1	2.94	2.9E-06
1,2,3,6,7,8-HxCDD	200	0.0002	2.0E-04	0.1	20.0	2.0E-05
1,2,3,7,8,9-HxCDD	112	0.000112	1.1E-04	0.1	11.20	1.1E-05
1,2,3,4,6,7,8-HpCDD	1,980	0.00198	2.0E-03	0.01	19.8	2.0E-05
OCDD	11,300	0.0113	1.1E-02	0.0003	3.39	3.4E-06
2,3,7,8-TCDF	16.9	0.0000169	1.7E-05	0.1	1.69	1.7E-06
1,2,3,7,8-PeCDF	10.5	0.0000105	1.1E-05	0.03	0.315	3.2E-07
2,3,4,7,8-PeCDF	13.1	0.0000131	1.3E-05	0.3	3.9	3.9E-06
1,2,3,4,7,8-HxCDF	22.2	0.0000222	2.2E-05	0.1	2.22	2.2E-06
1,2,3,6,7,8-HxCDF	38.9	0.0000389	3.9E-05	0.1	3.89	3.9E-06
2,3,4,6,7,8-HxCDF	26.2	0.0000262	2.6E-05	0.1	2.6	2.6E-06
1,2,3,7,8,9-HxCDF	0.889 J	0.000000889 J	8.9E-07 J	0.1	0.09 J	8.9E-08 J
1,2,3,4,6,7,8-HpCDF	424	0.000424	4.2E-04	0.01	4.2	4.2E-06
1,2,3,4,7,8,9-HpCDF	24.1	0.0000241	2.4E-05	0.01	0.241	2.4E-07
OCDF	553	0.000553	5.5E-04	0.0003	0.166	1.7E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					109	1.1E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					109	1.1E-04
2,3,7,8-TCDD TEQ (without non-detects)					109	1.1E-04

Notes:

** Catch Basin Sample

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 2-23
Dip Tank Area Catch Basin Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-19B**, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	27.2	0.0000272	2.7E-05	1	27.20	2.7E-05
1,2,3,7,8-PeCDD	297	0.000297	3.0E-04	1	297.0	3.0E-04
1,2,3,4,7,8-HxCDD	269	0.000269	2.7E-04	0.1	26.90	2.7E-05
1,2,3,6,7,8-HxCDD	2,370	0.00237	2.4E-03	0.1	237.0	2.4E-04
1,2,3,7,8,9-HxCDD	899	0.000899	9.0E-04	0.1	89.90	9.0E-05
1,2,3,4,6,7,8-HpCDD	21,500	0.0215	2.2E-02	0.01	215.0	2.2E-04
OCDD	98,300	0.0983	9.8E-02	0.0003	29.49	2.9E-05
2,3,7,8-TCDF	152	0.000152	1.5E-04	0.1	15.20	1.5E-05
1,2,3,7,8-PeCDF	116	0.000116	1.2E-04	0.03	3.480	3.5E-06
2,3,4,7,8-PeCDF	136	0.000136	1.4E-04	0.3	40.8	4.1E-05
1,2,3,4,7,8-HxCDF	215	0.000215	2.2E-04	0.1	21.50	2.2E-05
1,2,3,6,7,8-HxCDF	419	0.000419	4.2E-04	0.1	41.90	4.2E-05
2,3,4,6,7,8-HxCDF	270	0.00027	2.7E-04	0.1	27.0	2.7E-05
1,2,3,7,8,9-HxCDF	9.63 J	0.00000963 J	9.6E-06 J	0.1	0.96 J	9.6E-07 J
1,2,3,4,6,7,8-HpCDF	3,880	0.00388	3.9E-03	0.01	38.8	3.9E-05
1,2,3,4,7,8,9-HpCDF	196	0.000196	2.0E-04	0.01	1.960	2.0E-06
OCDF	1,920	0.00192	1.9E-03	0.0003	0.576	5.8E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					1,115	1.1E-03
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					1,115	1.1E-03
2,3,7,8-TCDD TEQ (without non-detects)					1,115	1.1E-03

Notes:

** Catch Basin Sample

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Table 3-1
Dip Tank Area Soil Analytical Results - Total Petroleum Hydrocarbons (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Gasoline	Diesel	Oil
GP5-8*	8	10/05/2005	3.4 U	20 U	68 U
GP6-8*	8	10/05/2005	3.6 U	21 U	71 U
GP7-7*	7	10/05/2005	3.3 U	20 U	65 U
GP8-8*	8	10/05/2005	3.2 U	19 U	65 U
AB-02/MW-02	1	02/02/2010	18 U	25 U[a]	51 U[a]
AB-03/MW-03	1	02/02/2010	18 U	221 [a]	1,030 [a]
IMW-1-1	1	03/04/2013	-	8.6 U[a]	29 [a],X
IMW-2-1	1	03/05/2013	-	11 U[a]	21 U[a]
IMW-2-6	6	03/05/2013	-	9.7 U[a]	20 U[a]
MW-7-1	1	03/07/2013	-	19 U[a]	486 [a],J
MW-7-3	3	03/07/2013	-	8.4 U[a]	17 U[a],UJ
B1-4(0.5) COMP	0.5	10/13/2015	-	25 U	98
B1-4(1.5) COMP	1.5	10/13/2015	-	25 U	50 U
B5-8(0.5) COMP	0.5	10/13/2015	-	104 U	817
B5-8(1.5) COMP	1.5	10/13/2015	-	25 U	153
B9-12(0.5 COMP	0.5	10/13/2015	-	96 U	1,040
B9-12(1.5) COMP	1.5	10/13/2015	-	25 U	231
B13-16(0.5) COMP	0.5	10/13/2015	-	191 U	3,860
B13-16(1.5) COMP	1.5	10/13/2015	-	182 U	3,550
B17-20(0.5) COMP	0.5	10/14/2015	-	25 U	210
B17-20(1.5) COMP	1.5	10/14/2015	-	25 U	81
B21-24(0.5) COMP	0.5	10/14/2015	-	92 U	1,320
B21-24(1.5) COMP	1.5	10/14/2015	-	25 U	52
B25-28(0.5) COMP	0.5	10/14/2015	-	202 U	2,540
B25-28(1.5) COMP	1.5	10/14/2015	-	25 U	50 U
B29-32(0.5) COMP	0.5	10/14/2015	-	204 U	2,210
B29-32(1.5) COMP	1.5	10/14/2015	-	25 U	110
Catch Basin Samples					
AB-19A**	-	02/02/2010	156 U	390 U	4,190 [a1]
AB-19B**	-	02/02/2010	30 U	701 [a]	4,260 [a]
RBC Screening Level Criteria for Soil					
Ingestion, Dermal Contact, & Inhalation:					
Occupational[b]			20,000	14,000	14,000
Construction Worker[c]			9,700	4,600	4,600
Excavation Worker[d]			>Max	>Max	>Max
Volatilization to Outdoor Air:					
Occupational[e]			69,000	>Max	>Max
Vapor Intrusion into Buildings:			.		
Occupational[f]			>Max	>Max	>Max

Table 3-1
Dip Tank Area Soil Analytical Results - Total Petroleum Hydrocarbons (mg/Kg)
Floragon Property
Molalla, Oregon

Notes:

* Data from NWES Assessment (2005)

** Catch Basin Sediment

Gasoline, Diesel and Oil Range hydrocarbon identification screen by Method NWTPH-HCID unless indicated otherwise

[a] Diesel and Oil Range Hydrocarbons by Method NWTPH-Dx (with silica-gel cleanup[a1])

[b] Oregon Department of Environmental Quality (DEQ), Generic Risk Based Concentration (RBC) for ingestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)

[c] DEQ, RBC for ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)

[d] DEQ, RBC for ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)

[e] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)

[f] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

mg/Kg = Milligrams per kilogram

>Max = The constituent RBC for this pathway is greater than 100,000 mg/kg or 100,000 mg/L and is considered unlikely to be encountered.

- = Not analyzed for this parameter

X = (Laboratory Qualifier) No fuel pattern detected.

J = (PNG Qualifier) Result is estimated. See corresponding data validation report for further explanation.

UJ = (PNG Qualifier) Analyte was not detected, but should be considered estimated. See corresponding data validation report for further explanation.

U = Undetected at the method reporting limit shown

Table 3-2
Dip Tank Area Groundwater Analytical Results - Total Petroleum Hydrocarbons (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	Gasoline	Diesel	Oil
GP5-W*	10/05/2005	100 U	470	1,300
GP6-W*	10/05/2005	100 U	510	1,260
GP8-W*	10/05/2005	100 U	880	1,740
AB-06/GW	02/02/2010	94 U	1,110 [b]	12,500 [b]
AB-77	04/14/2010	94 U	485 [a]	1,120 [a]
AB-78	04/14/2010	100 U	250 U	500 U
MW-1	02/04/2010	94 U	236 U	472 U
	03/25/2013	-	77 U[b]	295 [b]
	06/24/2013	-	77 U[b]	142 [b]
IMW-1	03/25/2013	-	239 [b,g]	164 [b]
	06/24/2013	-	76 U[b]	151 U[b]
MW-2	02/04/2010	94 U	236 U	472 U
MW-99 (MW-2 duplicate)	02/04/2010	94 U	236 U	472 U
	03/25/2013	-	104 [b,h]	126 J[b]
	06/24/2013	-	76 J[1,b]	152 UJ[1,b]
MW-99 (MW-2 duplicate)	06/24/2013	-	76 U[b]	152 U[b]
IMW-2	03/25/2013	-	41 J[b]	85 J[b]
	06/24/2013	-	52 [b]	82 [b]
IMW-99 (IMW-2 duplicate)	03/25/2013	-	75 U[b]	150 U[b]
MW-3	02/04/2010	94 U	236 U	472 U
	03/25/2013	-	245 [b,h]	337 [b]
	06/24/2013	-	183 J[1,b]	149 J[1,b]
MW-7	03/25/2013	-	84 [b,h]	106 J[b]
	06/24/2013	-	78 U[b]	131 [b]
RBC Screening Level Criteria for Groundwater				
Groundwater Volitilization to Outdoor Air Occupational[d]		>S	>S	>S
Groundwater Vapor Intrusion into Buildings Occupational[e]		>S	>S	>S
Groundwater in Excavation Construction/Excavation Worker[f]		14,000	>S	>S

Table 3-2
Dip Tank Area Groundwater Analytical Results - Total Petroleum Hydrocarbons (ug/L)
Floragon Property
Molalla, Oregon

Notes:

* Data from NWES Assessment (2005)

Gasoline, Diesel and Oil Range hydrocarbon identification screen by Method NWTPH-HCID unless indicated otherwise

[a] Gasoline detected but flagged by laboratory (F-09) as overlap from a heavier fuel hydrocarbon product. Gasoline range hydrocarbons were not quantified.

[b] Diesel and Oil Range Hydrocarbons by Method NWTPH-Dx

[c] Reference removed

[d] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for groundwater volitilization to outdoor air in an occupational setting (revised November 1, 2015)

[e] DEQ Generic RBC for groundwater vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

[f] DEQ Generic RBC for groundwater in excavation for a construction/excavation worker (revised November 1, 2015)

[g] The sample chromatographic pattern does not resemble the fuel standard used for quanitation

[h] The hydrocarbon pattern indicates possible weathered diesel, or contribution from a related component.

ug/L = Micrograms per liter

>S = This groundwater RBC exceeds the solubility limit. Groundwater in excess of S indicates that free product may be present.

J = (Laboratory Qualifier) Estimated value. Detection was below the reporting limit, but above the method detection limit.

J^1 = (PNG Qualifier) Result is estimated. See corresponding data validation report for further explanation.

- = not analyzed for this parameter

U = Not detected at the method reporting limit shown

NA = Not applicable (no screening levels published for these chemicals)

Table 4-1
Dip Tank Area Soil Analytical Results - Chlorophenols (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Pentachlorophenol	2-Chlorophenol	3+4-Chlorophenols	2,4-Dichlorophenol	3,4-Dichlorophenol	2,3,4,5-Tetrachlorophenol	2,3,4,6-Tetrachlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol
GP5-8*	8	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
GP6-8*	8	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
GP7-7*	7	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
GP8-8*	8	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
AB-02/MW-02	1	02/02/2010	0.0506 U	0.0506 U	0.101 U	0.0506 U	0.0506 U	0.0506 U	0.0506 U	0.0506 U	0.0506 U
AB-03/MW-02	1	02/02/2010	3.63	0.0506 U	0.127 U	0.0506 U	0.466	0.0651	0.637	0.0896	0.0506 U
AB-05	0-0.5	02/03/2010	2.57	0.460 U	0.921 U	0.460 U	0.460 U	0.460 U	6.96	0.460 U	0.460 U
AB-05	1-2	02/03/2010	0.0903 U	0.0903 U	0.181 U	0.0903 U	0.0903 U	0.0903 U	0.0903 U	0.0903 U	0.0903 U
AB-05	2-3	02/03/2010	0.0236 U	0.0236 U	0.0473 U	0.0236 U	0.0236 U	0.0236 U	0.0236 U	0.0236 U	0.0236 U
AB-05	3-5	02/03/2010	0.105	0.0725 U	0.145 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U
AB-06	0-0.5	02/03/2010	5.10	0.259 U	0.518 U	0.259 U	0.259 U	0.259 U	0.259 U	0.259 U	0.259 U
AB-06	1-2	02/03/2010	3.28	0.105 U	0.210 U	0.105 U	0.105 U	0.105 U	0.240	0.105 U	0.105 U
AB-06	2-3	02/03/2010	0.914	0.120 U	0.240 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U
AB-06	3-5	02/03/2010	0.143	0.0639 U	0.128 U	0.0639 U	0.0639 U	0.0639 U	0.0639 U	0.0639 U	0.0639 U
AB-07	0-0.5	02/03/2010	0.436 U	0.436 U	0.873 U	0.436 U	0.436 U	0.436 U	0.436 U	0.436 U	0.436 U
AB-08	0-0.5	02/03/2010	0.471 U	0.471 U	0.943 U	0.471 U	0.471 U	0.471 U	0.471 U	0.471 U	0.471 U
AB-09	0-0.5	02/03/2010	0.0235 U	0.0235 U	0.047 U	0.0235 U	0.0235 U	0.0235 U	0.0235 U	0.0235 U	0.0235 U
AB-09 (DUP)	0-0.5	02/03/2010	0.0231 U	0.0231 U	0.0461 U	0.0231 U	0.0231 U	0.0231 U	0.0231 U	0.0231 U	0.0231 U
IMW-1-1	1	03/04/2013	0.106 U	0.0317 U	0.106 U	0.0317 U	0.0200 J	0.0317 U	0.0317 U	0.0317 U	0.0317 U
IMW-2-1	1	03/05/2013	0.100 U	0.0301 U	0.100 U	0.0301 U	0.0301 U	0.0301 U	0.0301 U	0.0301 U	0.0301 U
IMW-2-6	6	03/05/2013	0.102 U	0.0306 U	0.102 U	0.0306 U	0.0306 U	0.0306 U	0.0306 U	0.0306 U	0.0306 U
MW-7-1	1	03/07/2013	0.209 U	0.0626 U	0.209 U	0.0626 U	0.0626 U	0.0626 U	0.0626 U	0.0626 U	0.0626 U
MW-7-3	3	03/07/2013	0.094 U	0.0282 U	0.094 U	0.0282 U	0.0282 U	0.0282 U	0.0282 U	0.0282 U	0.0282 U
B1-4(0.5) COMP	0.5	10/13/2015	0.193 J	-	-	-	-	-	-	-	-
B1-4(1.5) COMP	1.5	10/13/2015	0.021 J	0.0074 U	0.0037 U	0.00735 U	-	-	0.0287	0.0112 J	0.00735 U
B1-4(3) COMP	3	10/13/2015	0.017 J	-	-	-	-	-	-	-	-
B5-8(1.5) COMP	1.5	10/13/2015	0.057 U	0.0284 U	0.014 U	0.0284 U	-	-	0.0284 U	0.0284 U	0.0284 U
B9-12(1.5) COMP	1.5	10/13/2015	0.139 U	0.0697 U	0.035 U	0.0697 U	-	-	0.0697 U	0.0697 U	0.0697 U
B13-16(1.5) COMP	1.5	10/13/2015	0.560 U	0.281 U	0.140 U	0.281 U	-	-	0.281 U	0.281 U	0.281 U
B17-20(1.5) COMP	1.5	10/14/2015	0.090 J	-	-	-	-	-	-	-	-
B21-24(1.5) COMP	1.5	10/14/2015	0.059 U	-	-	-	-	-	-	-	-
B25-28(1.5) COMP	1.5	10/14/2015	0.014 U	-	-	-	-	-	-	-	-
B29-32(1.5) COMP	1.5	10/14/2015	0.142 U	-	-	-	-	-	-	-	-
Catch Basin Samples											
AB-19A**	-	02/02/2010	0.585 U	0.585 U	1.17 U	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U
AB-19B**	-	02/02/2010	0.598 U	0.598 U	1.2 U	0.598 U	0.598 U	0.598 U	0.598 U	0.598 U	0.598 U
RBC Screening Level Criteria for Soil											
Ingestion, Dermal Contact, and Inhalation:											
Occupational[a]			4	NA	NA	NA	NA	NA	NA	NA	210
Construction Worker[b]			34	NA	NA	NA	NA	NA	NA	NA	270
Excavation Worker[c]			960	NA	NA	NA	NA	NA	NA	NA	7,400
Volatilization to Outdoor Air											
Occupational[d]			NV	NA	NA	NA	NA	NA	NA	NA	NV
Vapor Intrustion into Buildings											
Occupational[e]			NV	NA	NA	NA	NA	NA	NA	NA	NV

Table 4-1
Dip Tank Area Soil Analytical Results - Chlorophenols (mg/Kg)
Floragon Property
Molalla, Oregon

Notes:
* Data from NWES Assessment (2005)
** Catch Basin Sample
Chlorophenols by EPA Method 8270C SIM
[a]Oregon Department of Environmental Quality (DEQ), Generic Risk Based Concentration (RBC) for soil injestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)
[b] DEQ, RBC for soil ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)
[c] DEQ, RBC for soil ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)
[d] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)
[e] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)
Phenols by EPA Method 8270D was used for April 2012 sampling event (4-Chloro-3-methylphenol, 2,4-Dimethylphenol, 4,6-Dinitro-2-methylphenol, 2,4-Dinitrophenol, 2-Methylphenol, 3+4-Methylphenol, 2-Nitrophenol, 4-Nitrophenol, Phenol and 2,3,5,6-Tetrachlorophenol were not detected by the laboratory).
mg/Kg = Milligrams per kilogram
NA = Not applicable (no screening levels published for these chemicals)
NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations
- = Undetected at method reporting limit shown
U = Not detected at the method reporting limit shown
J = (Laboratory Qualifier) Estimated concentration. Reported result is below the reporting limit, but above the Method Detection Limit (MDL).
UJ = (PNG Qualifier) Analyte was not detected, but should be considered estimated. See corresponding data validation report for further explanation.
UX = (PNG Qualifier) Estimated values, results should be used for screening purposes only. See corresponding laboratory report and data validation report for further information.

Table 4-2
Dip Tank Area Groundwater Analytical Results - Chlorophenols (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	Pentachlorophenol	2-Chlorophenol	3,4-Chlorophenols	2,4-Dichlorophenol	2,6-Dichlorophenol	3,4-Dichlorophenol	2,3,4,5-Tetrachlorophenol	2,3,4,6-Tetrachlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	3&4-Methylphenol	IPBC
GP5-W*	10/05/2005	12	-	-	-	-	-	-	16	-	-	14 U	-
GP6-W*	10/05/2005	9.6 U	-	-	-	-	-	-	-	-	-	19 U	-
GP8-W*	10/05/2005	21 U	-	-	-	-	-	-	-	-	-	42 U	-
AB-06/GW	02/03/2010	1.97	1.41 U	2.82 U	1.41 U	-	1.41 U	1.41 U	1.41 U	1.41 U	1.41 U	-	1.41 U
AB-77/GW	04/14/2010	0.708 U	0.283 U	0.943 U	0.283 U	-	0.283 U	0.283 U	0.283 U	0.283 U	0.283 U	-	-
AB-78/GW	04/14/2010	0.708 U	0.283 U	0.943 U	0.283 U	-	0.283 U	0.283 U	0.283 U	0.283 U	0.283 U	-	-
MW-1	02/04/2010	0.282 U	0.282 U	0.563 U	0.282 U	-	0.282 U	0.282 U	0.282 U	0.282 U	0.282 U	-	0.282 U
	03/25/2013	0.113 J	0.057 U	0.189 U	0.057 U	0.056 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	-	-
	06/24/2013	0.192 U	0.058 U	0.192 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	-	-
IMW-1	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.075 U	0.056 U	0.056 U	-	-
	06/24/2013	0.200 U	0.060 U	0.200 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	-	-
MW-2	02/04/2010	0.284 U	0.284 U	0.569 U	0.284 U	-	0.284 U	0.284 U	0.284 U	0.284 U	0.284 U	-	0.284 U
MW-99 (MW-2 duplicate)	02/04/2010	0.282 U	0.282 U	0.563 U	0.282 U	-	0.282 U	0.282 U	0.282 U	0.282 U	0.282 U	-	0.282 U
	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.056 U	0.056 U	0.056 U	-	-
	06/24/2013	0.190 U	0.057 U	0.190 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	-	-
MW-99 (MW-2 duplicate)	06/24/2013	0.190 U	0.057 U	0.190 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	-	-
IMW-2	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.056 U	0.056 U	0.056 U	-	-
	06/24/2013	0.190 U	0.057 U	0.190 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	-	-
IMW-99 (IMW-2 duplicate)	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.056 U	0.056 U	0.056 U	-	-
MW-3	02/04/2010	256	1.61 U	3.23 U	1.61 U	-	2.74	6.38	87.7	9.38	1.61 U	-	1.61 U
	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.056 U	0.056 U	0.056 U	-	-
	06/24/2013	0.190 U	0.057 U	0.190 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	-	-
MW-7	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.056 U	0.056 U	0.056 U	-	-
	06/24/2013	0.194 U	0.058 U	0.194 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	-	-
RBC Screening Level Criteria for Groundwater													
Groundwater Volitilization to Outdoor Air Occupational[b]		NV	NA	NA	NA	NA	NA	NA	NA	NA	NV	NA	NA
Groundwater Vapor Intrusion into Buildings Occupational[c]		NV	NA	NA	NA	NA	NA	NA	NA	NA	NV	NA	NA
Groundwater in Excavation Construction/Excavation Worker[d]		53	NA	NA	NA	NA	NA	NA	NA	NA	1,700	NA	NA

Notes:
* Data from NWES Assessment (2005)
Chlorophenols by EPA Method 8270C SIM
[a] Reference removed
[b] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for groundwater volitilization to outdoor air in an occupational setting (revised November 1, 2015)
[c] DEQ Generic RBC for groundwater vapor intrusion into buildings in an occupational setting (revised November 1, 2015)
[d] DEQ Generic RBC for groundwater in excavation for a construction/excavation worker (revised November 1, 2015)
ug/L = Micrograms per liter
- = Undetected at method reporting limit shown
IPBC = 3-Iodo-2-propynyl N-butylcarbamate
NA = Not applicable (no screening levels published for these chemicals)
NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations
J^1 = (PNG Qualifier) Result is estimated. See corresponding data validation report for further explanation.
J = (Laboratory Qualifier) Estimated value. Detection was below the reporting limit, but above the method detection limit.
U = Not detected at the method reporting limit shown

Table 5-1
Dip Tank Area Soil Analytical Results - Metals (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium[a1]	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
AB-02/MW-02	1	02/02/2010	1.13 U	2.26 U	-	1.13 U	1.13 U	28.2	65.2	4.62	0.090 U	23.5	2.26 U	1.13 U	1.13 U	42.4
AB-03/MW-03	1	02/02/2010	1.35	2.45 U	-	1.23 U	1.23 U	37.8	53.2	69.4	0.098 U	17.5	2.45 U	1.23 U	1.23 U	127
IMW-1-1	1	03/04/2013	0.174 J	4.13	-	1.23 J	0.362	52.7	34.2	12.2	0.061 J	22.8	0.724 J	1.34 U	0.161 J	45.3
IMW-2-1	1	03/05/2013	1.42 U	2.79 J	-	1.08 J	0.385	44.2	31.0	7.28	0.057 U	22.4	2.85 U	1.42 U	1.42 U	39.3
IMW-2-6	6	03/05/2013	1.46 U	4.80	-	1.36 J	0.423	56.4	23.3	10.9	0.117 U	10.4	1.18 J	1.46 U	1.46 U	31.7
MW-7-1	1	03/07/2013	0.268 U	1.92 J	-	0.752 J	0.403 J[1]	25.7	22.8	8.39	0.107 U	14.8	1.34 U	0.268 U	0.268 U	83.2
MW-7-3	3	03/07/2013	0.246 U	1.32 J	-	0.725 J	0.211 J	19.9	13.8	5.68	0.098 U	10.6	1.23 U	0.246 U	0.246 U	19.0
B1-4(1.5) COMP	1.5	10/13/2015	-	1.2 U	52	-	0.23 U	18	-	3.4	0.092 U	-	2.3 U	0.23 U	-	-
B5-8(1.5) COMP	1.5	10/13/2015	-	1.1	67	-	0.22 U	18	-	5.8	0.088 U	-	2.2 U	0.22 U	-	-
B9-12(1.5) COMP	1.5	10/13/2015	-	9.4	67	-	0.22 U	24	-	11	0.087 U	-	2.2 U	0.22 U	-	-
B13-16(1.5) COMP	1.5	10/13/2015	-	1.2 U	36	-	0.23 U	19	-	2.8	0.092 U	-	2.3 U	0.23 U	-	-
Catch Basin Samples																
AB-19A**	-	02/02/2010	10.8 U	21.6 U	-	10.8 U	10.8 U	68.5	263	25.0	0.973	32.8	21.6 U	10.8 U	10.8 U	3,680
AB-19B**	-	02/02/2010	2.29	3.73	-	1.85 U	3.84	39.7	109	100	0.203	29.7	3.69 U	1.85 U	1.85 U	707
RBC Screening Level Criteria for Soil																
Ingestion, Dermal Contact, and Inhalation:																
Occupational[b]			NA	1.9	220,000	2,300	1,100	6.3[a2]/>Max[a3]	47,000	800 L	350	22,000	NA	5,800	NA	NA
Construction Worker[c]			NA	15	69,000	700	350	49[a2]/530,000[a3]	14,000	800 L	110	7,000	NA	1,800	NA	NA
Excavation Worker[d]			NA	420	>Max	19,000	9,700	1,400[a2]/>Max[a3]	390,000	800 L	2,900	190,000	NA	49,000	NA	NA
Volatilization to Outdoor Air																
Occupational[e]			NA	NV	NV	NV	NV	NV[a2]/NV[a3]	NV	NV	NV	NV	NA	NV	NA	NA
Vapor Intrusion into Buildings																
Occupational[f]			NA	NV	NV	NV	NV	NV[a2]/NV[a3]	NV	NV	NV	NV	NA	NV	NA	NA
Default Background Concentrations																
Oregon (soil)[g]			0.56	8.8	790	2	0.63	76[a3]	34	79	0.23	47	0.71	0.82	5.2	180
Freshwater (sediment)[h]			1	7.9	-[1]	NA	<0.5	30	12	2	0.2	20	0.4	0.4	NA	53

Notes:
Metals analyzed by EPA Method 6020
[a1] Total Chromium (III + VI)
[a2] Chromium (VI)
[a3] Chromium (III)
[b] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for soil ingestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)
[c] DEQ, RBC for soil ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)
[d] DEQ, RBC for soil ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)
[d] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)
[d] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)
[g] DEQ Default Background Concentrations for Metals Fact Sheet (March 20, 2013)
[h] DEQ Human Health Risk Assessment Guidance, Table 1 - Oregon Default Background Concentrations for Inorganic Chemicals. (DEQ, October 2010)
mg/Kg = Milligrams per kilogram
NA = Not applicable (no screening levels published for these chemicals)
- = Leaching to groundwater RBCs not provided for inorganic chemicals
L = Values for lead reported as milligrams per liter rather than mg/Kg since they are the results of leaching tests, not soil measurements
U = Not detected at the method reporting limit shown
J = (Laboratory Qualifier) Estimated value. The analyte was detected above the method detection limit, but below the method reporting limit.
J[1] = (PNG Qualifier) The analyte was not detected, but the reported quantitation limit should be considered an estimate. See corresponding data validation report for further information.
>Max = The constituent RBC for this pathway is greater than 100,000 mg/kg or 100,000 mg/L and is considered unlikely to be encountered.

Table 5-1a
Dip Tank Area Soil Analytical Results - TCLP Metals (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
B1-4(1.5) COMP	1.5	10/13/2015	0.10 U	0.60	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
B5-8(1.5) COMP	1.5	10/13/2015	0.10 U	0.50	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
B9-12(1.5) COMP	1.5	10/13/2015	0.10 U	0.69	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
B13-16(1.5) COMP	1.5	10/13/2015	0.10 U	0.50 U	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U

Notes:
TCLP Metals analyzed by EPA Method 1311/6020
TCLP = Toxicity Characteristic Leaching Procedure
mg/Kg = Milligrams per kilogram
U = Not detected at the method reporting limit shown

Table 5-2
Dip Tank Area Groundwater Analytical Results - Metals (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	Antimony	Arsenic	Beryllium	Cadmium	Chromium[a1]	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
AB-06/GW (total)	02/03/2010	1 U	2.3	1 U	1 U	21	45	6.5	0.08 U	20	2 U	1 U	1 U	150
AB-06/GW (dissolved)	02/03/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2.5	2 U	1 U	1 U	4 U
MW-1 (total)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
	06/24/2013	1 U	2 U	1 U	1 U	2 U	3.8	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
MW-1 (dissolved)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
IMW-1 (total)	06/24/2013	1 U	2 U	1 U	1 U	2 U	2 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
MW-2 (total)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
MW-99 (MW-2 duplicate) (total)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2 U	2 U	1 U	1 U	9.9
MW-2 (dissolved)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
MW-2 (total)	06/24/2013	1 U	2.6	1 U	1 U	2 U	1.3 J	1 U	0.08 U	2.0	2 U	1 U	1 U	3.5 J
MW-99 (MW-2 duplicate) (total)	06/24/2013	1 U	2 U	1 U	1 U	2 U	2 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
IMW-2 (total)	06/24/2013	1 U	2 U	1 U	1 U	2 U	2 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
MW-3 (total)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	4.0	2 U	1 U	1 U	55
	06/24/2013	1 U	5.7	1 U	1 U	1.7 J	2.0	0.78 J	0.08 U	8.5	1.2 J	1 U	1 U	33
MW-3 (dissolved)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	3.2	2 U	1 U	1 U	23
MW-7 (total)	06/24/2013	1 U	0.89 J	1 U	1 U	2 U	2 U	1 U	0.08 U	5.0	2 U	1 U	1 U	2.1 J
RBC Screening Level Criteria for Groundwater														
Volatilization to Outdoor Air Occupational[c]		NA	NV	NV	NV	NV[a2]/NV[a3]	NV	NV	NV	NV	NA	NV	NA	NA
Vapor Intrusion into Buildings Occupational[d]		NA	NV	NV	NV	NV[a2]/NV[a3]	NV	NV	NV	NV	NA	NV	NA	NA
Groundwater in Excavation Construction/Excavation Worker[e]		NA	6,300	270,000	130,000	9,400[a2]/>S[a3]	5,400,000	>S	>S	13,446,802	NA	1,100,000	NA	NA

Notes:
Total Metals analyzed by EPA 6020
[a1] Total Chromium (III + VI)
[a2] Chromium (VI)
[a3] Chromium (III)
[b] Reference removed
[c] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for groundwater volatilization to outdoor air in an occupational setting (revised November 1, 2015)
[d] DEQ, RBC for groundwater vapor intrusion into buildings in an occupational setting (revised November 1, 2015)
[e] DEQ, RBC for groundwater in excavation for a construction/excavation worker (revised November 1, 2015)
ug/L = Micrograms per liter
U = Not detected at the reporting limit shown
J = (Laboratory Qualifier) Estimated value. Detection was below the reporting limit, but above the method detection limit.
NA = Not applicable (no screening levels published for these chemicals)
NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations
>S = This groundwater RBC exceeds the solubility limit. Groundwater in excess of S indicates that free product may be present.

Table 6-1
Dip Tank Area Soil Analytical Results - Semivolatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Date Sampled	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene
GP5-8*	8	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
GP6-8*	8	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
GP7-7*	7	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
GP8-8*	8	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
AB-02/MW-02	1	02/02/2010	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U
AB-03/MW-03	1	02/02/2010	0.0169 U	0.0169 U	0.0169 U	0.0236	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0241	0.0169 U	0.0169 U	0.0169 U	0.0169 U
IMW-1-1	1	03/04/2013	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0031 J[1]	0.0052 U	0.0052 U
MW-7-1	1	03/07/2013	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0638 U,X,UJ	0.0638 U,X,UJ	0.0425 U,X,UJ	0.0638 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ
B1-4(1.5) COMP	1.5	10/13/2015	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0022 U	0.0022 U	0.0015 U	0.0022 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
B5-8(1.5) COMP	1.5	10/13/2015	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0085 U	0.0085 U	0.0057 U	0.0085 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U
B9-12(1.5) COMP	1.5	10/13/2015	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0209 U	0.0209 U	0.0139 U	0.0209 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U
B13-16(1.5) COMP	1.5	10/13/2015	0.0560 U	0.0560 U	0.0560 U	0.0560 U	0.0842 U	0.0842 U	0.0560 U	0.0842 U	0.1730 U	0.0560 U	0.0560 U	0.0560 U	0.0560 U
Catch Basin Samples															
AB-19A**	-	02/02/2010	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U
AB-19B**	-	02/02/2010	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
RBC Screening Level Criteria for Soil															
Ingestion, Dermal Contact, and Inhalation:															
Occupational[a]			70,000	NA	350,000	2.9	0.29	2.9	NA	29	290	0.29	30,000	47,000	2.9
Construction Worker[b]			21,000	NA	110,000	24	2.4	24	NA	240	2,400	2.4	10,000	14,000	24
Excavation Worker[c]			590,000	NA	>Max	660	67	670	NA	6,700	67,000	67	280,000	390,000	670
Volatilization to Outdoor Air															
Occupational[d]			>Max	NA	>Max	>Csat	NV	>Csat	NA	NV	NV	NV	NV	>Max	NV
Vapor Intrusion in to Buildings															
Occupational[e]			>Max	NA	>Max	>Csat	NV	>Csat	NA	NV	NV	NV	NV	>Max	NV

Table 6-1
Dip Tank Area Soil Analytical Results - Semivolatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Date Sampled	Naphthalene	Phenanthrene	Pyrene	Benzo(b+k) fluoranthene(s)	Bis (2-ethylhexyl) phthalate	Carbazole
GP5-8*	8	10/05/2005	-	0.067 U	-	-	-	-
GP6-8*	8	10/05/2005	-	0.067 U	-	-	-	-
GP7-7*	7	10/05/2005	-	0.067 U	-	-	-	-
GP8-8*	8	10/05/2005	-	0.067 U	-	-	0.131	-
AB-02/MW-02	1	02/02/2010	0.0337 U	0.0169 U	0.0169 U	-	-	-
AB-03/MW-03	1	02/02/2010	0.0483	0.0169 U	0.0169 U	-	-	-
IMW-1-1	1	03/04/2013	0.0058 J[1]	0.0031 J[1]	0.0031 J[1]	-	-	-
MW-7-1	1	03/07/2013	0.0850 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	-	-	-
B1-4(1.5) COMP	1.5	10/13/2015	0.0068	0.0019 J[1]	0.0015 U	-	-	-
B5-8(1.5) COMP	1.5	10/13/2015	0.0114 U	0.0057 U	0.0057 U	-	-	-
B9-12(1.5) COMP	1.5	10/13/2015	0.0279 U	0.0139 U	0.0139 U	-	-	-
B13-16(1.5) COMP	1.5	10/13/2015	0.1120 U	0.0560 U	0.0560 U	-	-	-
Catch Basin Samples								
AB-19A**	-	02/02/2010	0.389 U	0.195 U	0.195 U	-	-	-
AB-19B**	-	02/02/2010	0.398 U	0.200 U	0.200 U	-	-	-
RBC Screening Level Criteria for Soil								
Ingestion, Dermal Contact, and Inhalation:								
Occupational[a]			23	NA	23,000	NA	NA	NA
Construction Worker[b]			580	NA	7,500	NA	NA	NA
Excavation Worker[c]			16,000	NA	210,000	NA	NA	NA
Volatilization to Outdoor Air								
Occupational[d]			83	NA	>Csat	NA	NA	NA
Vapor Intrusion in to Buildings								
Occupational[e]			83	NA	>Csat	NA	NA	NA

Table 6-1
Dip Tank Area Soil Analytical Results - Semivolatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Notes:

* Data from NWES Assessment (2005)

** Catch Basin Sample

Polynuclear aromatic hydrocarbons (PAHs) analyzed by EPA Method 8270C SIM

[a] Oregon Department of Environmental Quality (DEQ), Generic Risk Based Concentration (RBC) for soil ingestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)

[b] DEQ, RBC for soil ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)

[c] DEQ, RBC for soil ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)

[d] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)

[e] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

[f] Peak separation for Benzo(b) and Benzo(k)fluoranthenes does not meet method specified criteria.
Reported laboratory result includes the combined area of the two isomers and should be considered the total of Benzo(b+k)fluoranthenes.

mg/Kg = Milligrams per kilogram

- = Not analyzed for this parameter

NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations

NA = Not applicable (no screening levels published for these chemicals)

>Max = The constituent RBC for this pathway is greater than 100,000 mg/kg or 100,000 mg/L and is considered unlikely to be encountered.

>Csat = This soil RBC exceeds the limit of three-phase equilibrium partitioning. Soil concentrations in excess of Csat indicate that free product might be present. See Section B.2.1.4 for additional information.

UJ = (PNG Qualifier) Analyte was not detected, but should be considered estimated. See corresponding data validation report for further explanation.

J = (PNG Qualifier) Result is estimated. See corresponding data validation report for further explanation.

J^1 = (Laboratory Qualifier) Result is estimated. Reported detection is below the reporting limit, but above the Method Detection Limit (MDL).

U = Not detected at the method reporting limit shown

X = (Laboratory Qualifier) Sample was extracted past the recommended holding time.

Table 6-2
Dip Tank Area Groundwater Analytical Results - Semivolatile Organic Compounds (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Benzo(g,h,i) perylene	Chrysene	Dibenz(a,h) anthracene	Dibenzofuran	Fluoranthene	Fluorene
GP5-W*	10/05/2005	-	-	-	-	-	-	-	-	-	-	-	-	-
GP6-W*	10/05/2005	-	-	-	-	-	-	-	-	-	-	-	-	-
GP8-W*	10/05/2005	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-77/GW	04/14/2010	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	-	0.0187 U	0.0187 U
MW-1	03/25/2013	0.0189 U	0.0189 U	0.0189 U	0.0189 U	0.0283 U	0.0283 U	0.0283 U	0.0189 U	0.0189 U	0.0189 U	0.0189 U	0.0189 U	0.0189 U
	06/24/2013	0.0192 U	0.0192 U	0.0192 U	0.0192 U	0.0288 U	0.0288 U	0.0288 U	0.0192 U	0.0192 U	0.0192 U	-	0.0192 U	0.0192 U
IMW-1	03/25/2013	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.112 U	0.112 U	0.112 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U
MW-2	03/25/2013	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.028 U	0.028 U	0.028 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U
	06/24/2013	0.0190 U	0.0190 U	0.0190 U	0.0190 U	0.0286 U	0.0286 U	0.0286 U	0.0190 U	0.0190 U	0.0190 U	-	0.0190 U	0.0190 U
IMW-2	03/25/2013	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.028 U	0.028 U	0.028 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U
	06/24/2013	0.0190 U	0.0190 U	0.0190 U	0.0190 U	0.0286 U	0.0286 U	0.0286 U	0.0190 U	0.0190 U	0.0190 U	-	0.0102	0.0190 U
MW-3	03/25/2013	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.112 U	0.112 U	0.112 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U
	06/24/2013	0.0190 U	0.0190 U	0.0190 U	0.0190 U	0.0286 U	0.0286 U	0.0286 U	0.0190 U	0.0190 U	0.0190 U	-	0.0119	0.0190 U
MW-7	03/25/2013	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.028 U	0.028 U	0.028 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0101 J	0.0187 U
	06/24/2013	0.0194 U	0.0194 U	0.0194 U	0.0194 U	0.0291 U	0.0291 U	0.0291 U	0.0194 U	0.0194 U	0.0194 U	-	0.0194 U	0.0194 U
RBC Screening Level Criteria for Groundwater														
Groundwater Volitilization to Outdoor Air Occupational[b]		>S	NA	>S	>S	NV	NV	NV	NA	NV	NV	NA	NV	>S
Groundwater Vapor Intrusion into Buildings Occupational[c]		>S	NA	>S	>S	NV	NV	NV	NA	NV	NV	NA	NV	>S
Groundwater in Excavation Construction/Excavation Worker[d]		>S	NA	>S	>S	>S	>S	>S	NA	>S	>S	NA	>S	>S

Table 6-2
Dip Tank Area Groundwater Analytical Results - Semivolatile Organic Compounds (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Butyl benzyl Phthalate	Bis (2-ethylhexyl) phthalate	Di-n-butyl phthalate	Diethyl phthalate	Dimethyl phthalate	1,4-Dichlorobenzene	2-Methyl naphthalene	Benzoic Acid	Phenol
GP5-W*	10/05/2005	-	1.4 U	-	-	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	27 U	2.7 U
GP6-W*	10/05/2005	-	1.9 U	-	-	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	39 U	3.9 U
GP8-W*	10/05/2005	-	4.2 U	-	-	-	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	83 U	8.3 U
AB-77/GW	04/14/2010	0.0187 U	0.0374 U	0.0374 U	0.0187 U	-	-	-	-	-	-	-	-	-
MW-1	03/25/2013	0.0189 U	0.0262 J	0.00999 J	0.0189 U	-	-	-	-	-	-	-	-	-
	06/24/2013	0.0192 U	0.0449	0.0192 U	0.0192 U	-	-	-	-	-	-	-	-	-
IMW-1	03/25/2013	0.0748 U	0.150 U	0.0748 U	0.0748 U	-	-	-	-	-	-	-	-	-
MW-2	03/25/2013	0.0187 U	0.0269 J	0.0187 U	0.0187 U	-	-	-	-	-	-	-	-	-
	06/24/2013	0.0190 U	0.0367	0.0190 U	0.0190 U	-	-	-	-	-	-	-	-	-
IMW-2	03/25/2013	0.0187 U	0.0346 J	0.0187 U	0.0187 U	-	-	-	-	-	-	-	-	-
	06/24/2013	0.0190 U	0.0381 U	0.0190 U	0.0190 U	-	-	-	-	-	-	-	-	-
MW-3	03/25/2013	0.0748 U	0.150 U	0.0748 U	0.0748 U	-	-	-	-	-	-	-	-	-
	06/24/2013	0.0190 U	0.0258	0.0122	0.0190 U	-	-	-	-	-	-	-	-	-
MW-7	03/25/2013	0.0187 U	0.0192 J	0.0125 J	0.0187 U	-	-	-	-	-	-	-	-	-
	06/24/2013	0.0194 U	0.0196	0.0194 U	0.0194 U	-	-	-	-	-	-	-	-	-
RBC Screening Level Criteria for Groundwater														
Groundwater Volitilization to Outdoor Air Occupational[b]		NV	16,000	NA	>S	NA	NV	NA	NA	NA	21,000	NA	NA	NA
Groundwater Vapor Intrusion into Buildings Occupational[c]		NV	11,000	NA	>S	NA	NV	NA	NA	NA	7,100	NA	NA	NA
Groundwater in Excavation Construction/Excavation Worker[d]		>S	500	NA	>S	NA	>S	NA	NA	NA	1,500	NA	NA	NA

Table 6-2
Dip Tank Area Groundwater Analytical Results - Semivolatile Organic Compounds (ug/L)
Floragon Property
Molalla, Oregon

Notes:
Polynuclear Aromatic Hydrocarbons (PAHs) analyzed by EPA Method 8270
[a] Reference removed
[b] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for groundwater volatilization to outdoor air in an occupational setting (revised November 1, 2015)
[c] DEQ, RBC for groundwater vapor intrusion into buildings in an occupation setting (revised November 1, 2015)
[d] DEQ, RBC for groundwater in excavation for a construction/excavation worker (revised November 1, 2015)
ug/L = Micrograms per liter
NA = Not applicable (no screening levels published for these chemicals)
NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations
>S = This groundwater RBC exceeds the solubility limit. Groundwater in excess of S indicates that free product may be present
J = (Laboratory Qualifier) Estimated value. Detection was below the reporting limit, but above the method detection limit.
U = Not detected at the method reporting limit shown

Table 7-1
Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	Acetone	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	2-Butanone	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane
IMW-1-1	1	03/04/2013	1.64 U	0.02 U	0.04 U	0.08 U	0.08 U	0.08 U	0.82 U	0.82 U	0.08 U	0.08 U	0.08 U	0.04 U	0.04 U	0.82 U
MW-7-1	1	03/07/2013	1.45 UJ	0.02 U	0.04 U	0.07 U	0.07 U	0.07 U	0.72 U	0.72 U	0.07 U	0.07 U	0.07 U	0.07 U	0.04 U	0.72 U
MW-7-3	3	03/07/2013	1.27 UJ	0.02 U	0.03 U	0.06 U	0.06 U	0.06 U	0.63 U	0.63 U	0.06 U	0.06 U	0.06 U	0.06 U	0.03 U	0.63 U
RBC Screening Level Criteria for Soil																
Ingestion, Dermal Contact, and Inhalation:																
Occupational[a]			NA	37	NA	NA	15	260	750	NA	NA	NA	NA	34	8,700	>Max
Construction Worker[b]			NA	380	NA	NA	230	2,700	370	NA	NA	NA	NA	230	4,700	>Max
Excavation Worker[c]			NA	11,000	NA	NA	6,300	74,000	10,000	NA	NA	NA	NA	8,900	130,000	>Max
Volatilization to Outdoor Air																
Occupational[d]			NA	50	NA	NA	11	360	700	NA	NA	NA	NA	65	>Csat	>Csat
Vapor Intrusion into Buildings:																
Occupational[e]			NA	2.1	NA	NA	0.53	110	17	NA	NA	NA	NA	1.6	>Max	>Csat

Table 7-1
Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	1,2-Dibromo-3-chloropropane	Dibromochloromethane	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenezene	Dichlorodifluoromethane	1,1-Dichloroethane
IMW-1-1	1	03/04/2013	0.08 U	0.41 U	0.08 U	0.08 U	0.41 U	0.16 U	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.16 U	0.04 U
MW-7-1	1	03/07/2013	0.07 U	0.36 U	0.07 U	0.07 U	0.36 U	0.15 U	0.04 U	0.07 U	0.04 U	0.04 U	0.04 U	0.15 U	0.04 U
MW-7-3	3	03/07/2013	0.06 U	0.32 U	0.06 U	0.06 U	0.32 U	0.13 U	0.03 U	0.06 U	0.03 U	0.03 U	0.03 U	0.13 U	0.03 U
RBC Screening Level Criteria for Soil															
Ingestion, Dermal Contact, and Inhalation:															
Occupational[a]			26	25,000	NA	NA	NA	17	0.73	NA	36,000	NA	64	NA	260
Construction Worker[b]			410	25,000	NA	NA	NA	210	9	NA	20,000	NA	1,300	NA	3,200
Excavation Worker[c]			11,000	700,000	NA	NA	NA	2,800	250	NA	560,000	NA	36,000	NA	89,000
Volatilization to Outdoor Air															
Occupational[d]			17	>Csat	NA	NA	NA	14	0.65	NA	>Csat	NA	36	NA	240
Vapor Intrusion into Buildings:															
Occupational[e]			0.41	300	NA	NA	NA	2.9	0.16	NA	>Csat	NA	13	NA	5.9

Table 7-1
Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	Ethylbenzene	Hexachlorobutadiene	2-Hexanone	Isopropylbenzene
IMW-1-1	1	03/04/2013	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.08 U	0.08 U	0.08 U	0.08 U	0.04 U	0.16 U	0.82 U	0.08 U
MW-7-1	1	03/07/2013	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.07 U	0.07 U	0.07 U	0.07 U	0.04 U	0.15 U	0.72 U	0.07 U
MW-7-3	3	03/07/2013	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.06 U	0.06 U	0.06 U	0.06 U	0.03 U	0.13 U	0.63 U	0.06 U
RBC Screening Level Criteria for Soil																
Ingestion, Dermal Contact, and Inhalation:																
Occupational[a]			16	29,000	2,300	23,000	NA	NA	NA	NA	NA	NA	150	NA	NA	57,000
Construction Worker[b]			200	13,000	710	7,100	NA	NA	NA	NA	NA	NA	1,700	NA	NA	27,000
Excavation Worker[c]			5,600	370,000	20,000	200,000	NA	NA	NA	NA	NA	NA	49,000	NA	NA	750,000
Volatilization to Outdoor Air																
Occupational[d]			15	>Csat	>Max	>Max	NA	NA	NA	NA	NA	NA	160	NA	NA	>Csat
Vapor Intrusion into Buildings:																
Occupational[e]			1.0	680	>Max	>Max	NA	NA	NA	NA	NA	NA	17	NA	NA	>Csat

Table 7-1
Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	4-Isopropyltoluene	4-Methyl-2-pentanone	Methyl tert-butyl ether	Methylene Chloride	Naphthalene	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Toluene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene
IMW-1-1	1	03/04/2013	0.08 U	0.82 U	0.08 U	0.41 U	0.16 U	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.08 U	0.41 U	0.41 U
MW-7-1	1	03/07/2013	0.07 U	0.72 U	0.07 U	0.36 U	0.15 U	0.04 U	0.07 U	0.04 U	0.04 U	0.04 U	0.07 U	0.36 U	0.36 U
MW-7-3	3	03/07/2013	0.06 U	0.63 U	0.06 U	0.32 U	0.13 U	0.03 U	0.06 U	0.03 U	0.03 U	0.03 U	0.06 U	0.32 U	0.32 U
RBC Screening Level Criteria for Soil															
Ingestion, Dermal Contact, and Inhalation:															
Occupational[a]			NA	NA	1,100	NA	23	NA	130,000	NA	NA	1,000	88,000	NA	NA
Construction Worker[b]			NA	NA	12,000	NA	580	NA	56,000	NA	NA	1,800	28,000	NA	NA
Excavation Worker[c]			NA	NA	320,000	NA	16,000	NA	>Max	NA	NA	50,000	770,000	NA	NA
Volatilization to Outdoor Air															
Occupational[d]			NA	NA	1,500	NA	83	NA	>Csat	NA	NA	>Csat	>Csat	NA	NA
Vapor Intrusion into Buildings:															
Occupational[e]			NA	NA	110	NA	83	NA	>Csat	NA	NA	36	>Csat	NA	NA

Table 7-1
Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride	m,p-Xylene	o-Xylene
IMW-1-1	1	03/04/2013	0.04 U	0.04 U	0.04 U	0.16 U	0.08 U	0.08 U	0.08 U	0.04 U	0.08 U	0.04 U
MW-7-1	1	03/07/2013	0.04 U	0.04 U	0.04 U	0.15 U	0.07 U	0.07 U	0.07 U	0.04 U	0.07 U	0.04 U
MW-7-3	3	03/07/2013	0.03 U	0.03 U	0.03 U	0.13 U	0.06 U	0.06 U	0.06 U	0.03 U	0.06 U	0.03 U
RBC Screening Level Criteria for Soil												
Ingestion, Dermal Contact, and Inhalation:												
Occupational[a]			870,000	26	51	130,000	NA	2,000	12,000	4.4	25,000 [f]	25,000 [f]
Construction Worker[b]			470,000	54	470	69,000	NA	2,000	3,500	34	20,000 [f]	20,000 [f]
Excavation Worker[c]			>Max	1,500	13,000	>Max	NA	54,000	98,000	950	560,000 [f]	560,000 [f]
Volatilization to Outdoor Air												
Occupational[d]			>Csat	24	96	>Csat	NA	980	>Max	89	>Csat [f]	>Csat [f]
Vapor Intrusion into Buildings:												
Occupational[e]			>Csat	4.2	2.3	>Csat	NA	210	>Max	2.2	>Csat [f]	>Csat [f]

Table 7-1
Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Notes:
Volatile organic compounds (VOCs) analyzed by EPA Method 8260B
[a] Department of Environmental Quality (DEQ), Generic Risk Based Concentration (RBC) for ingestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)
[b] DEQ Generic RBC for ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)
[c] DEQ Generic RBC for ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)
[d] DEQ Generic RBC for volatilization to outdoor air by in an occupational setting (revised November 1, 2015)
[e] DEQ Generic RBC for for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)
[f] DEQ RBC screening level value for Total Xylenes
mg/Kg = Milligrams per kilogram
NA = Not applicable (no screening levels published for these chemicals)
UJ = (PNG Qualifier) Analyte was not detected, but should be considered estimated. See corresponding data validation report for further explanation.
U = Not detected at the method reporting limit shown
>Max = The constituent RBC for this pathway is greater than 100,000 mg/kg or 100,000 mg/L and is considered unlikely to be encountered.
>Csat = This soil RBC exceeds the limit of three-phase equilibrium partioning, soil concentrations in excess of Csat indicate that free product might be present

Table 7-2
Dip Tank Area Groundwater Analytical Results - Volatile Organic Compounds (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	Acetone	Benzene	Bromobenzene	Bromochloromethane	Bromoform	Bromomethane	2-Butanone	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform
AB-06/GW	02/03/2010	20 U	0.25 U	0.5 U	0.5 U	1 U	5 U	10 U	1 U	1 U	0.5 U	0.5 U	0.5 U	2 U	1 U
MW-1	02/04/2010	20 U	0.25 U	0.5 U	0.5 U	1 U	5 U	10 U	1 U	1 U	0.5 U	0.5 U	0.5 U	2 U	1 U
MW-2	02/04/2010	20 U	0.25 U	0.5 U	0.5 U	1 U	5 U	10 U	1 U	1 U	0.5 U	0.5 U	0.5 U	2 U	1 U
MW-2 DUP (MW-AB 99)	02/04/2010	20 U	0.25 U	0.5 U	0.5 U	1 U	5 U	10 U	1 U	1 U	0.5 U	0.5 U	0.5 U	2 U	1 U
MW-3	02/04/2010	303	0.25 U	0.5 U	0.5 U	1 U	5 U	250	1 U	1 U	0.5 U	0.5 U	0.5 U	2 U	1 U
RBC Screening Level Criteria for Groundwater															
Groundwater Volitilization to Outdoor Air Occupational[b]		NA	14,000	NA	NA	550,000	130,000	NA	NA	NA	NA	7,700	>S	>S	6,300
Groundwater Vapor Intrusion into Buildings Occupational[c]		NA	2,800	NA	NA	470,000	27,000	NA	NA	NA	NA	1,200	>S	>S	1,600
Groundwater in Excavation Construction/Excavation Worker[d]		NA	1,800	NA	NA	14,000	1,200	NA	NA	NA	NA	1,800	10,000	2,400,000	720

Table 7-2
Dip Tank Area Groundwater Analytical Results - Volatile Organic Compounds (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	1,2-Dibromo-3-chloroproane	Dibromochloromethane	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Dichlorodifluoromethane	1,1-Dichloroethane	1,2-Dichloroethane
AB-06/GW	02/03/2010	5 U	1 U	0.5 U	5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U
MW-1	02/04/2010	5 U	1 U	0.5 U	5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U
MW-2	02/04/2010	5 U	1 U	0.5 U	5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U
MW-2 DUP (MW-AB 99)	02/04/2010	5 U	1 U	0.5 U	5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U
MW-3	02/04/2010	5 U	1 U	0.5 U	5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U
RBC Screening Level Criteria for Groundwater														
Groundwater Volitilization to Outdoor Air Occupational[b]		1,800,000	NA	NA	NA	17,000	790	NA	>S	NA	21,000	NA	68,000	9,000
Groundwater Vapor Intrusion into Buildings Occupational[c]		330,000	NA	NA	NA	13,000	590	NA	>S	NA	7,100	NA	14,000	3,900
Groundwater in Excavation Construction/Excavation Worker[d]		22,000	NA	NA	NA	610	27	NA	37,000	NA	1,500	NA	10,000	630

Table 7-2
Dip Tank Area Groundwater Analytical Results - Volatile Organic Compounds (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	Ethylbenzene	Hexachlorobutadiene	2-Hexanone	Isopropylbenzene
AB-06/GW	02/03/2010	0.5 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	2 U	10 U	0.5 U
MW-1	02/04/2010	0.5 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	2 U	10 U	0.5 U
MW-2	02/04/2010	0.5 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	2 U	10 U	0.5 U
MW-2 DUP (MW-AB 99)	02/04/2010	0.5 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	2 U	10 U	0.5 U
MW-3	02/04/2010	0.5 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	1 U	0.5 U	2 U	10 U	0.5 U
RBC Screening Level Criteria for Groundwater														
Groundwater Volitilization to Outdoor Air														
Occupational[b]		2,400,000	>S	>S	NA	NA	NA	NA	NA	NA	43,000	NA	NA	>S
Groundwater Vapor Intrusion into Buildings														
Occupational[c]		360,000	>S	>S	NA	NA	NA	NA	NA	NA	8,200	NA	NA	>S
Groundwater in Excavation														
Construction/Excavation Worker[d]		44,000	18,000	180,000	NA	NA	NA	NA	NA	NA	4,500	NA	NA	51,000

Table 7-2
Dip Tank Area Groundwater Analytical Results - Volatile Organic Compounds (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	4-Isopropyltoluene	4-Methyl-2-pentanone	Methyl tert-butyl ether	Methylene Chloride	Naphthalene	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Toluene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,1,1-Trichloroethane
AB-06/GW	02/03/2010	1 U	10 U	1 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	2 U	0.5 U
MW-1	02/04/2010	1 U	10 U	1 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	2 U	0.5 U
MW-2	02/04/2010	1 U	10 U	1 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	2 U	0.5 U
MW-2 DUP (MW-AB 99)	02/04/2010	1 U	10 U	1 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	2 U	0.5 U
MW-3	02/04/2010	1 U	10 U	1 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.1	2 U	2 U	0.5 U
RBC Screening Level Criteria for Groundwater															
Groundwater Volitilization to Outdoor Air Occupational[b]		NA	NA	1,500,000	NA	16,000	NA	>S	NA	NA	>S	>S	NA	NA	>S
Groundwater Vapor Intrusion into Buildings Occupational[c]		NA	NA	870,000	NA	11,000	NA	>S	NA	NA	48,000	>S	NA	NA	>S
Groundwater in Excavation Construction/Excavation Worker[d]		NA	NA	63,000	NA	500	NA	170,000	NA	NA	5,600	220,000	NA	NA	1,100,000

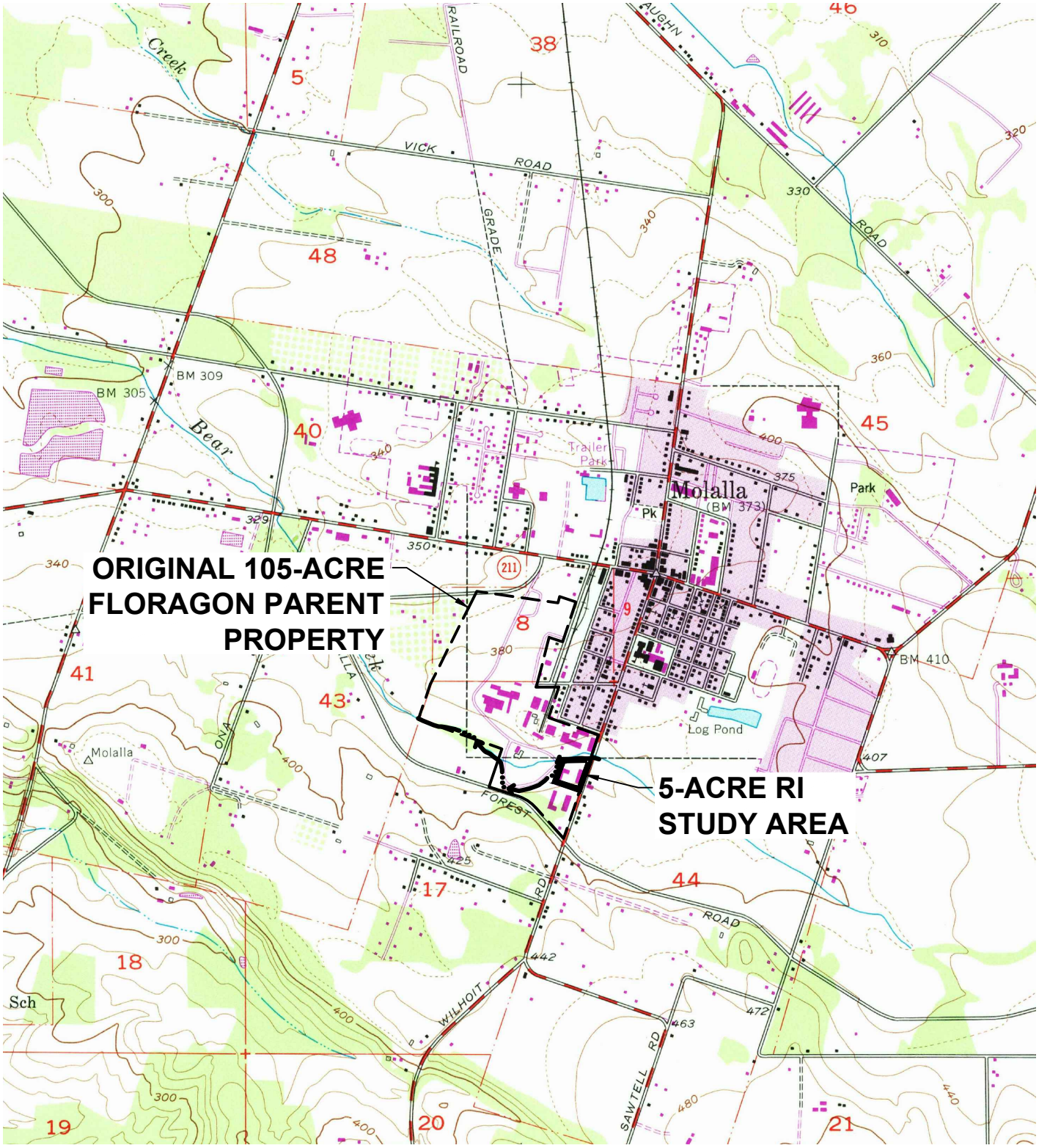
Table 7-2
Dip Tank Area Groundwater Analytical Results - Volatile Organic Compounds (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	1,1,2-Trichloroethane	Trichloroethane	Trichlorofluoromethane	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride	m,p-Xylene	o-Xylene
AB-06/GW	02/03/2010	0.5 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U
MW-1	02/04/2010	0.5 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U
MW-2	02/04/2010	0.5 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U
MW-2 DUP (MW-AB 99)	02/04/2010	0.5 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U
MW-3	02/04/2010	0.5 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	0.5 U
RBC Screening Level Criteria for Groundwater										
Groundwater Volitilization to Outdoor Air Occupational[b]		21,000	20,000	>S	NA	>S	>S	5,900	>S[e]	>S[e]
Groundwater Vapor Intrusion into Buildings Occupational[c]		11,000	3,700	460,000	NA	>S	>S	880	>S[e]	>S[e]
Groundwater in Excavation Construction/Excavation Worker[d]		49	3,000	160,000	NA	1,700	15,000	960	23,000[e]	23,000[e]

Table 7-2
Dip Tank Area Groundwater Analytical Results - Volatile Organic Compounds (ug/L)
Floragon Property
Molalla, Oregon

Notes:
Volatile organic compounds (VOCs) analyzed by EPA Method 8260B
[a] Reference removed
[b] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for groundwater volitilization to outdoor air in an occupational setting (revised November 1, 2015)
[c] DEQ RBC for groundwater vapor intrusion into buildings in an occupational setting (revised November 1, 2015)
[d] DEQ Generic RBC for groundwater in excavation for a construction/excavation worker (revised November 1, 2015)
[e] DEQ RBC screening level value is for Total Xylenes
ug/L = Micrograms per liter
NA = Not applicable (no screening levels published for these chemicals)
>S = This groundwater RBC exceeds the solubility limit. Groundwater in excess of S indicates that free product may be present
U = Not detected at the method reporting limit shown

FIGURES



APPROXIMATE SCALE IN FEET

0 1000 2000 4000

NOTE: USGS, MOLALLA QUADRANGLE
OREGON - CLACKAMAS CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

PNG ENVIRONMENTAL, INC.
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Tigard, OR 97223
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FAX (503) 620-2977

DATE:	10-27-16
FILE NAME:	1177-01
DRAWN BY:	JJT
APPROVED BY:	PE

FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

SITE VICINITY MAP

Project No. 1177-01
Figure No. 1

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APPROXIMATE SCALE IN FEET

0 250 500

N

North Drainage Ditch

84-Acre
North Parcels
Upland Area
(NFA March 2014)

HART AVENUE

7TH STREET

FORMER
HYSTER SHOP
AREA

RI Study Area

Bear Creek

Beaver Pond

Beaver Dam
#3

Beaver Dam #2

FORMER
LOG POND
AREA

Bear Creek

Beaver Dam #1

FORMER
DIP TANK
AREA

16-Acre
SE Corner Area
(NFA Pending)

S. MOLALLA FOREST ROAD

S. MOLALLA AVENUE

LEGEND

- Property Boundary
- Tax Lots
- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Beaver Pond
- RI Study Area

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FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

OVERVIEW MAP
RI STUDY AREA

Project No. 1177-01

Figure No. 2A

APPROXIMATE SCALE IN FEET

0 250 500

North Drainage Ditch

84-Acre
North Parcels
Upland Area
(NFA March 2014)

HART AVENUE

7TH STREET

RI Study Area

Bear Creek

Beaver Pond

Beaver Dam #3

Beaver Dam #2

Beaver Dam #1

Bear Creek

FORMER DIP TANK AREA

16-Acre
SE Corner Area
(NFA Pending)

S. MOLALLA FOREST ROAD

S. MOLALLA AVENUE

LEGEND

- Property Boundary
- Tax Lots
- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Beaver Pond
- RI Study Area

Note: Aerial photograph provided by Google Earth Pro™ 2012.

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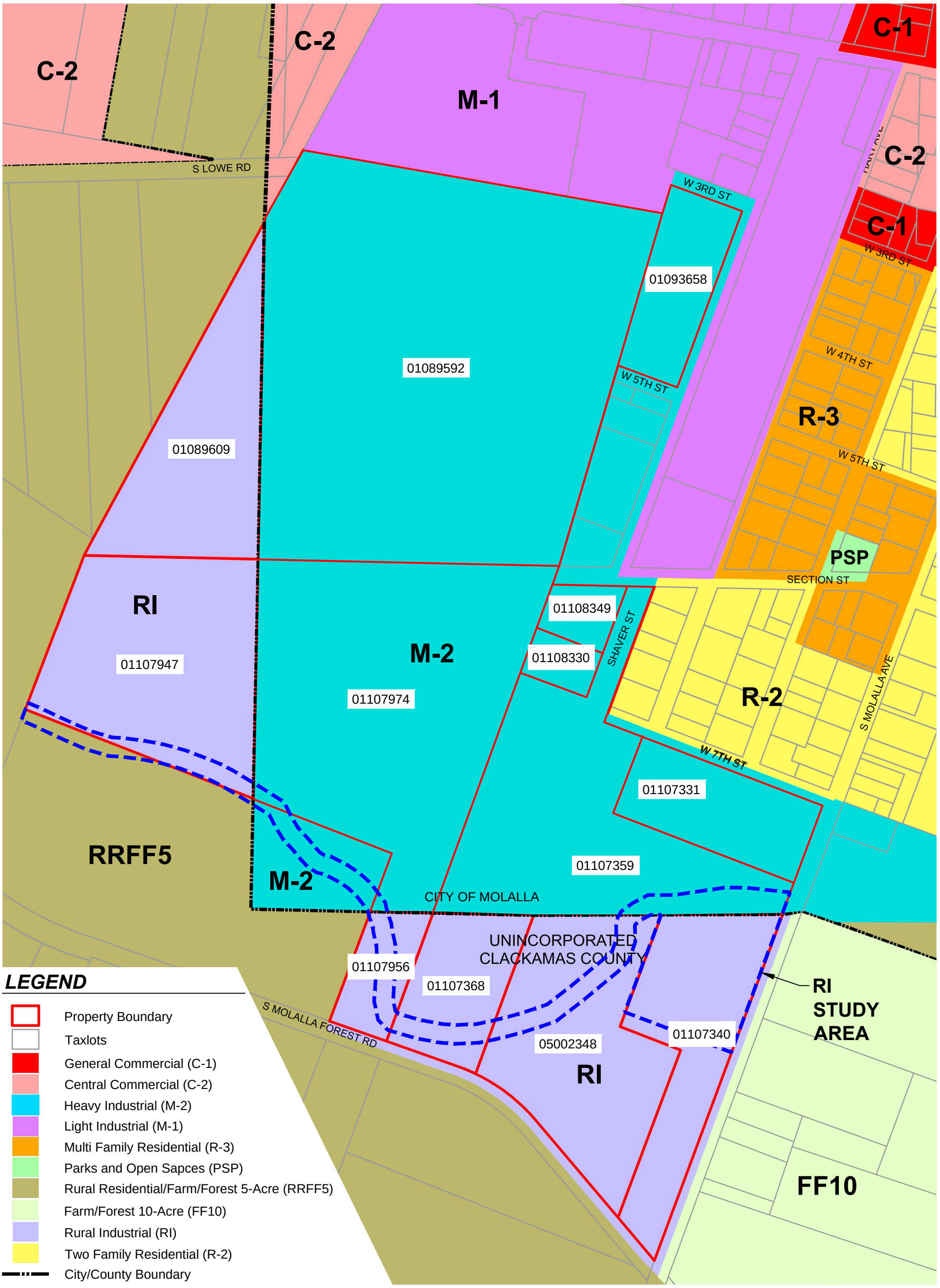
FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

OVERVIEW MAP
AERIAL 2012

Project No. 1177-01

Figure No. 2B



Source: Clackamas County Zoning Map Department of Planning (January 12, 2015) and City of Molalla Zoning Map (November 2014)

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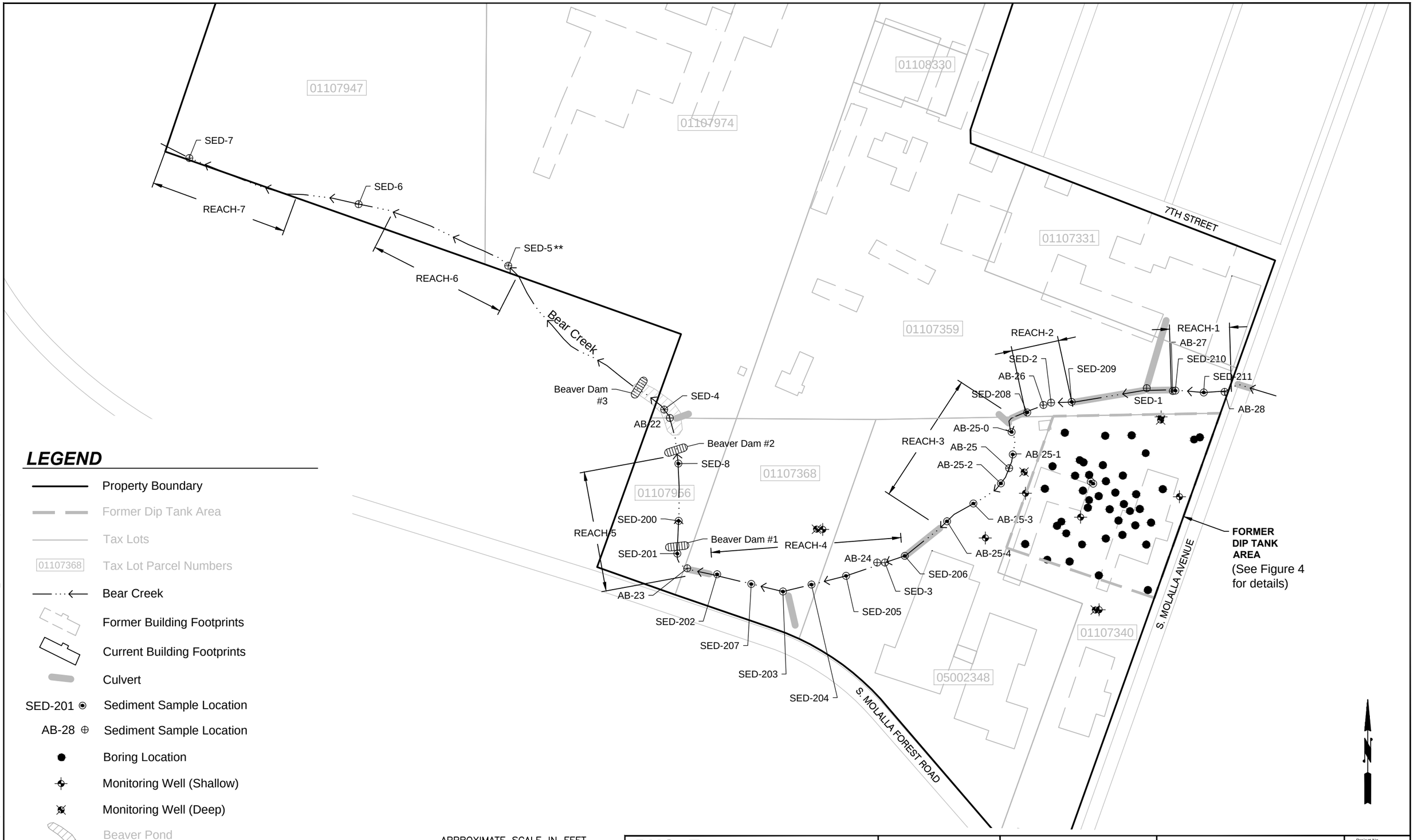
FLORAGON PROPERTY
7TH AND HART ST.
MOLOLLA, OREGON

OVERVIEW ZONING MAP

Project No. 1177-01

Figure No. 2C



LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- 01107368 Tax Lot Parcel Numbers
- Bear Creek
- Former Building Footprints
- Current Building Footprints
- Culvert
- SED-201 Sediment Sample Location
- AB-28 Sediment Sample Location
- Boring Location
- Monitoring Well (Shallow)
- Monitoring Well (Deep)
- Beaver Pond

APPROXIMATE SCALE IN FEET

0 100 200 400

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FILE NAME:	1177-01
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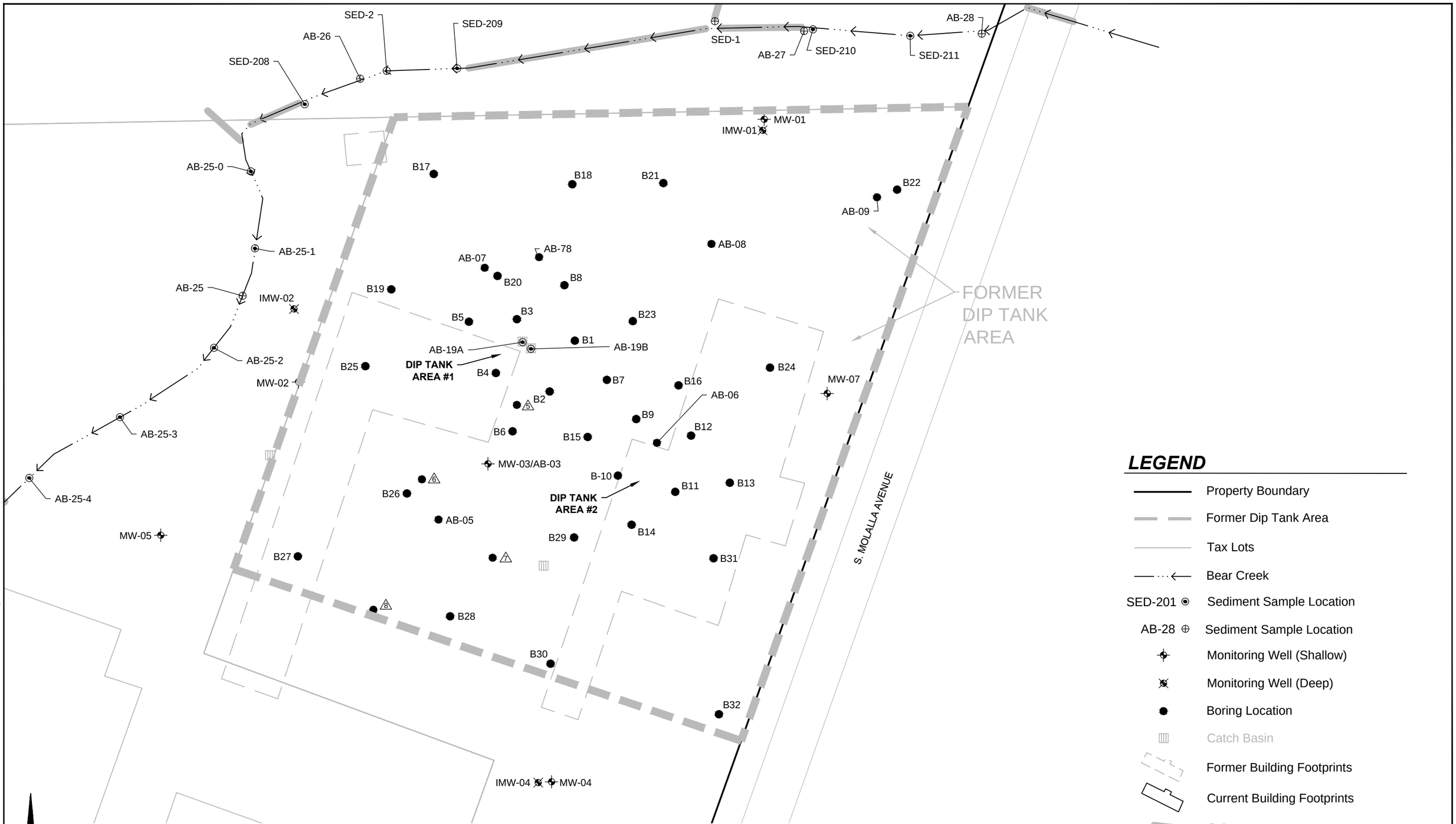
FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

BEAR CREEK SEDIMENT &
DIP TANK AREA
SAMPLE LOCATIONS

Project No. 1177-01

Figure No. 3



LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- SED-201 Sediment Sample Location
- AB-28 Sediment Sample Location
- Monitoring Well (Shallow)
- Monitoring Well (Deep)
- Boring Location
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert

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FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

SAMPLE LOCATIONS
DIP TANK AREA

Project No. 1177-01

Figure No. 4

APPROXIMATE SCALE IN FEET

0 250 500

N

North Drainage Ditch

AB-39

Surface Sediment Removal Area (See Figure 6)

84-Acre North Parcels Upland Area (NFA March 2014)

AB-71A

AB-38-5

AB-38-4

AB-38-2

AB-38-3

SECTION STREET

HART AVENUE

7TH STREET

AB-37-2

AB-37-3

Bear Creek

Beaver Pond Area

Beaver Dam #3

Beaver Dam #2

Beaver Dam #1

Former Dip Tank Area

16-Acre SE Corner Area

S. MOLALLA FOREST ROAD

S. MOLALLA AVENUE

LEGEND

- Property Boundary
- Tax Lots
- 01107368 Tax Lot Parcel Numbers
- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Catch Basin & Culvert Cleanout Locations (2013)
- Sediment Sample Locations (2010)
- 30' Bear Creek Buffer and Dip Tank Exclusion Zone

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FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

FLORAGON PROPERTY
UPLAND AREA
REMEDY (2013-2014)

Project No. 1177-01

Figure No. 5

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N

APPROXIMATE SCALE IN FEET

0 50 100 200

AB-39A

AB-39

CATCH BASIN & CULVERT CLEANOUT LOCATIONS (2013)

AB-70

STORMWATER DRAINAGE OUTFALL FROM EAST

SED-104

CATCH BASIN IN-LINE WITH DITCH FLOW

SED-103

STORMWATER DRAINAGE OUTFALL FROM EAST

SURFACE SEDIMENT REMOVAL AREA

SED-102

SEDIMENT REMOVAL (TO 12" DEPTH)

SED-101

SECTION STREET

AB-71

CATCH BASIN & CULVERT CLEANOUT LOCATIONS (2013)

AB-38-5

AB-38-1

AB-38-4

AB-38-2

AB-38-3

HART AVENUE

7TH STREET

LEGEND

- Property Boundary
- Tax Lots
- 01107368 — Tax Lot Parcel Numbers
- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- AB-70 — Sediment Sample Locations (2010)
- SED-102 — Sediment Sample Locations (2012)
- Surface Sediment Removal Area (2" to 3")
- Sediment Removal (30'Lx2'Wx1'D)

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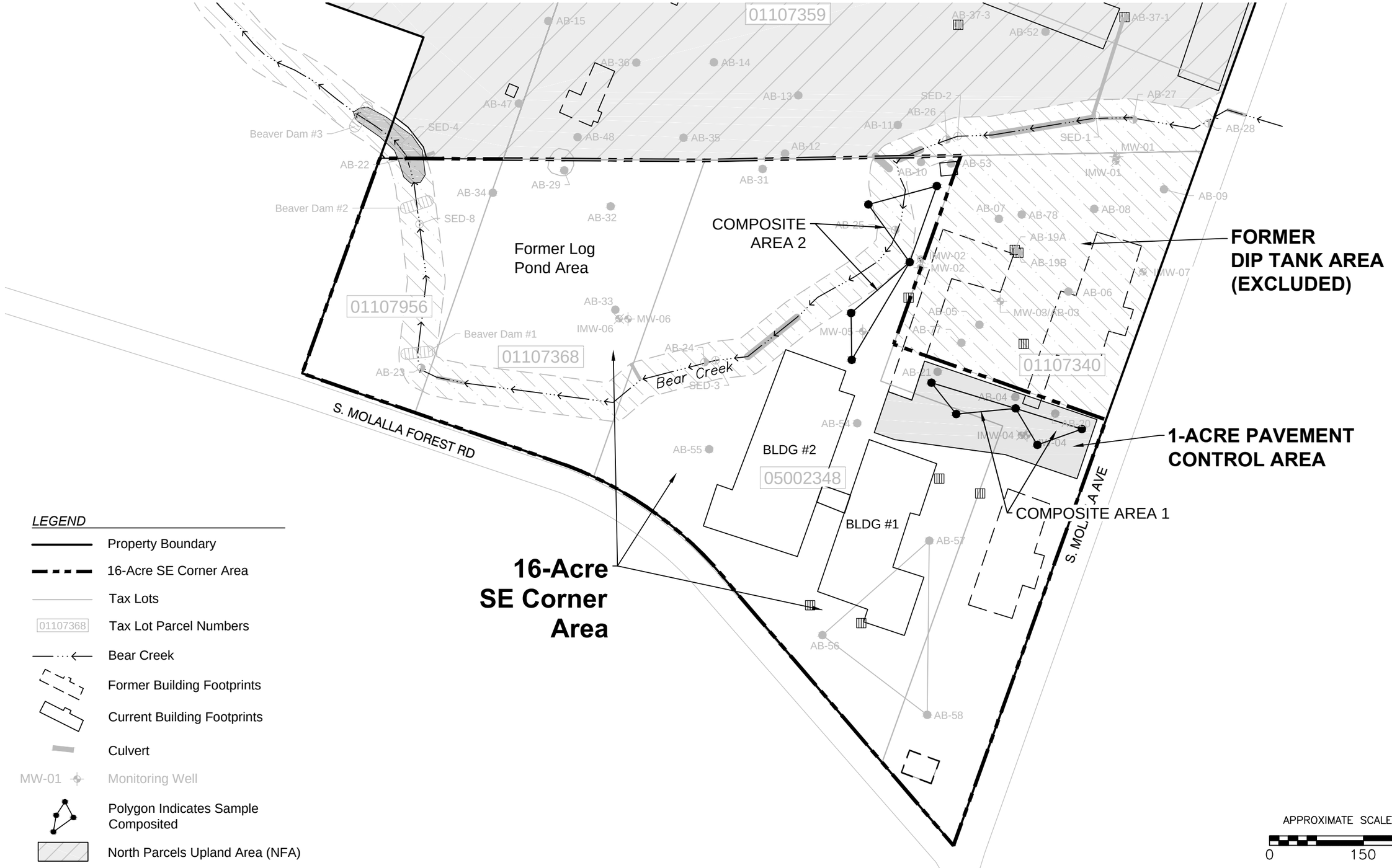
FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

FLORAGON PROPERTY
NORTH DITCH
MAINTENANCE CLEANOUT AREA

Project No. 1177-01

Figure No. 6



LEGEND

- Property Boundary
- 16-Acre SE Corner Area
- Tax Lots
- 01107368 — Tax Lot Parcel Numbers
- Bear Creek
- Former Building Footprints
- Current Building Footprints
- Culvert
- MW-01 — Monitoring Well
- Polygon Indicates Sample Composited
- North Parcels Upland Area (NFA)
- Bear Creek & Dip Tank Exclusion Zone

APPROXIMATE SCALE IN FEET

0 150 300

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APPROXIMATE SCALE IN FEET

0 250 500

N

North Drainage Ditch

01093658

01089592

01089609

01107947

01107974

01108349

01108330

01107331

01107359

01107340

01107368

01107956

05002348

HART AVENUE

7TH STREET

S. MOLALLA FOREST ROAD

S. MOLALLA AVENUE

SED-7/BCF-8
49

SED-6
4.4**
(4.2)

SED-5
122**
(119)

Bear Creek

Beaver Pond

Beaver Dam #3

SED-4
8.0

Beaver Dam #2

SED-8
43

Beaver Dam #1

AB-23
182

SED-3
71*

SED-2/BCF-2
46

SED-1
19

165
AB-28

AB-25
413

FORMER DIP TANK AREA

LEGEND

- Property Boundary
- Tax Lots
- 01107368 — Tax Lot Parcel Numbers
- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- AB-25 — Sediment Sample (2010)
- SED-1 — Sediment Sample Locations (2012)
- Beaver Pond
- **182** — Results in pg/g

* = Max value based on duplicate sampling

** = Estimated Maximum Potential Concentration is biased high due to numerous non-detect concentrations. See table 1-1.
(TEQ Concentrations using 50% laboratory detection limit shown in parentheses)

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MOLALLA, OREGON

INITIAL BEAR CREEK SEDIMENT SAMPLING LOCATIONS (2010-2012)

Project No. 1177-01

Figure No. 8

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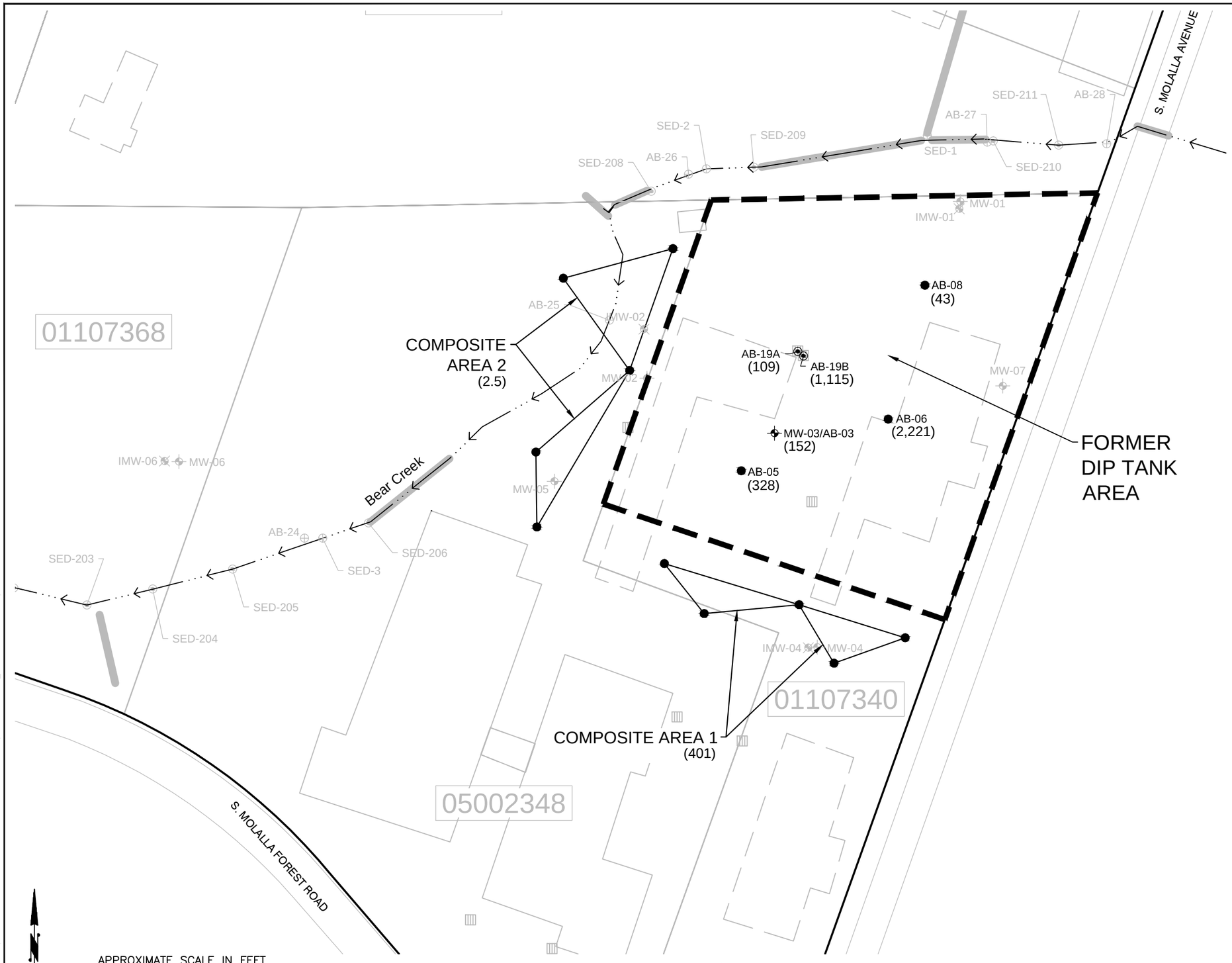

LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- 01107368 — Tax Lot Parcel Numbers
- Bear Creek
- Boring Location (2010)
- Monitoring Well (2010)
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Catch Basin Sediment Sample
- Polygon Indicates Sample Composited (2014)
- SED-1 — Sediment Sample (2010-2014)
- SED-210 — Sediment Sample Locations (2015)
- 109 — Results in pg/g

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DIOXIN CONCENTRATIONS (pg/g) IN SHALLOW DIP TANK AREA SOIL AND CATCH BASIN SEDIMENT (2010-2014)

Project No. 1177-01

Figure No. 9

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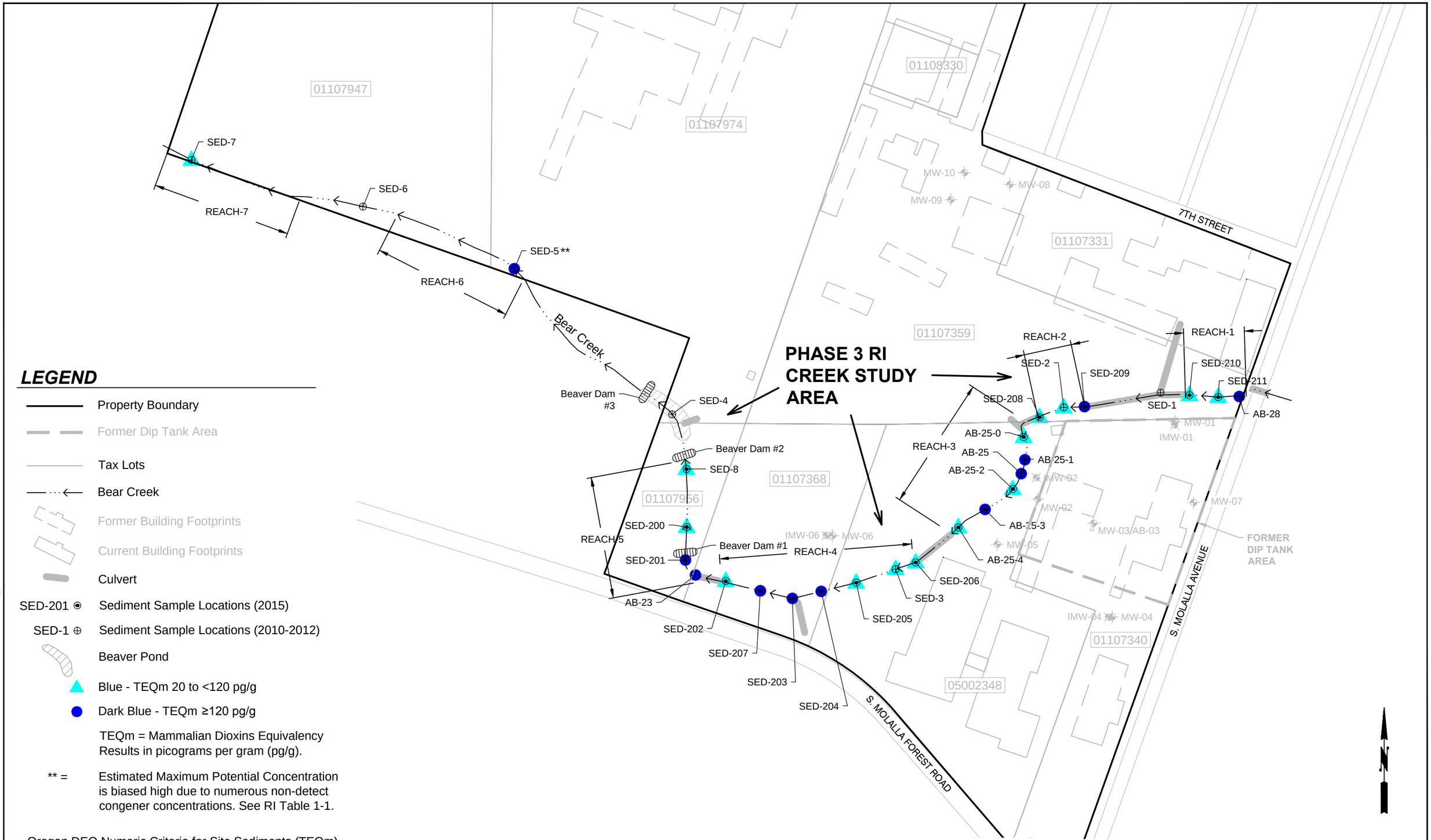

LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Former Building Footprints
- Current Building Footprints
- Culvert
- SED-201 ⊙ Sediment Sample Locations (2015)
- SED-1 ⊕ Sediment Sample Locations (2010-2012)
- Beaver Pond
- Blue - TEQm 20 to <120 pg/g
- Dark Blue - TEQm ≥120 pg/g

TEQm = Mammalian Dioxins Equivalency Results in picograms per gram (pg/g).

** = Estimated Maximum Potential Concentration is biased high due to numerous non-detect congener concentrations. See RI Table 1-1.

Oregon DEQ Numeric Criteria for Site Sediments (TEQm)
Remedial Action Goal = 20 pg/g
Remedial Action Level = 120 pg/g

APPROXIMATE SCALE IN FEET
0 100 200 400

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BEAR CREEK SEDIMENT
SAMPLING LOCATIONS
(2010-2015)

Project No. 1177-01
Figure No. 10

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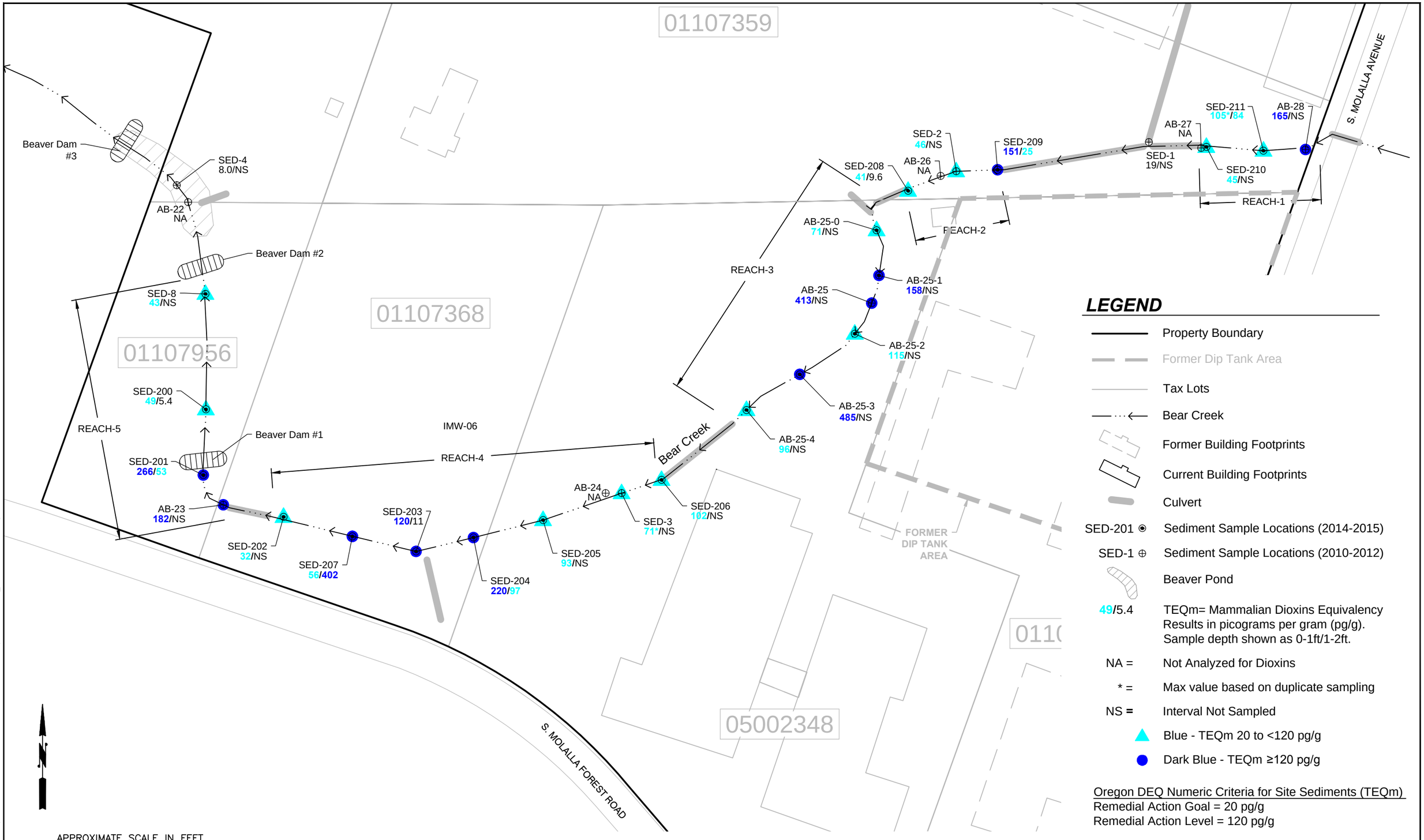

LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Former Building Footprints
- Current Building Footprints
- Culvert
- SED-201 — Sediment Sample Locations (2014-2015)
- SED-1 — Sediment Sample Locations (2010-2012)
- Beaver Pond
- 49/5.4 — TEQm= Mammalian Dioxins Equivalency Results in picograms per gram (pg/g). Sample depth shown as 0-1ft/1-2ft.
- NA = Not Analyzed for Dioxins
- * = Max value based on duplicate sampling
- NS = Interval Not Sampled
- Blue - TEQm 20 to <120 pg/g
- Dark Blue - TEQm ≥120 pg/g

Oregon DEQ Numeric Criteria for Site Sediments (TEQm)
Remedial Action Goal = 20 pg/g
Remedial Action Level = 120 pg/g

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DIOXIN TEQm
BEAR CREEK SEDIMENTS AND
PHASE 3 RI CREEK STUDY AREA

Project No. 1177-01
Figure No. 11

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Beaver Dam #3
Beaver Pond
Wetland 5-B
Beaver Dam #2
WTL-5B-DP03
WTL-5B-DP04
TL 5280
REACH-5
Beaver Dam #1
REACH-4
Breached Culvert
S. MOLALLA FOREST RD
TL 290
IMW-06
MW-06
Bear Creek
Wetland 2-A
WTL-2A-DP02
WTL-2A-DP01
REACH-3
REACH-2
REACH-1
MW-01
IMW-01
S. MOLALLA AVE
IMW-02
MW-02
IMW-07
MW-03/AB-03
MW-05
TL 101
IMW-04
MW-04
TL 102
375.00
376.00
377.00
378.00
379.00
390.00

APPROXIMATE SCALE IN FEET
0 50 100 200

LEGEND

- Property Boundary
- Tax Lots
- TL 101 — Tax Lot ID Numbers (Tax Map 5 2E 17A)
- Bear Creek Flow Direction
- Former Building Footprints
- Current Building Footprints
- Culvert
- MW-01 — Monitoring Well
- Study Area Boundary Line
- Ordinary High Water Mark (OHWM)
- Wetland Boundary
- REACH-3 concurred by DSL under WD#2015-0279
- REACH-1, -2, -4 and -5 concurred by DSL under WD#2016-0177
- WTL-2A-DP02 — Wetland Data Point

SURVEY NOTES:

THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM. THE HORIZONTAL ACCURACY FOR THE SITE IS 1 FOOT IN 50,000 FEET. THE HORIZONTAL ACCURACY AT ANY LOCATION IS ABOUT 0.10 OF ONE FOOT.

THE VERTICAL DATUM FOR THIS SURVEY IS BASED UPON OSHD BENCHMARK RAIT. THE ELEVATION IS 240.377' NGVD 29 DATUM. STUDY AREA AND DATA PLOT POINT ACCURACY IS +/- 0.5 FEET.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A LOOP FIELD TRAVERSE.

SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014, NOVEMBER 9-13 AND DECEMBER 3, 2015.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014 (REACH 3), NOVEMBER 2 AND 23, 2015 (REACH-1, -2, -4, AND -5).

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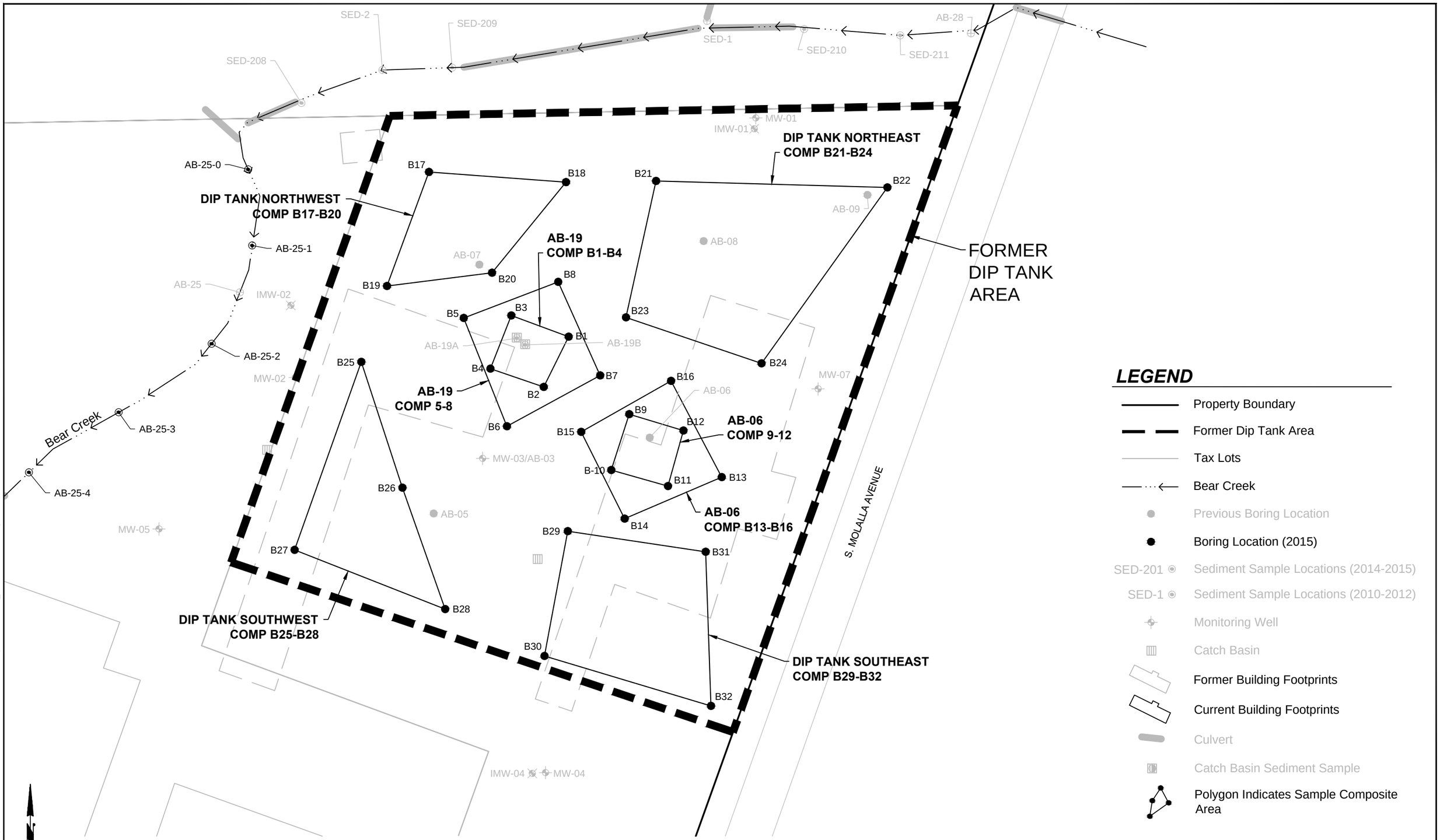
BEAR CREEK WETLAND
AND WATER SURVEY

Project No. 1177-01
Figure No. 12



LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Previous Boring Location
- Boring Location (2015)
- SED-201 Sediment Sample Locations (2014-2015)
- SED-1 Sediment Sample Locations (2010-2012)
- Monitoring Well
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Catch Basin Sediment Sample
- Polygon Indicates Sample Composite Area

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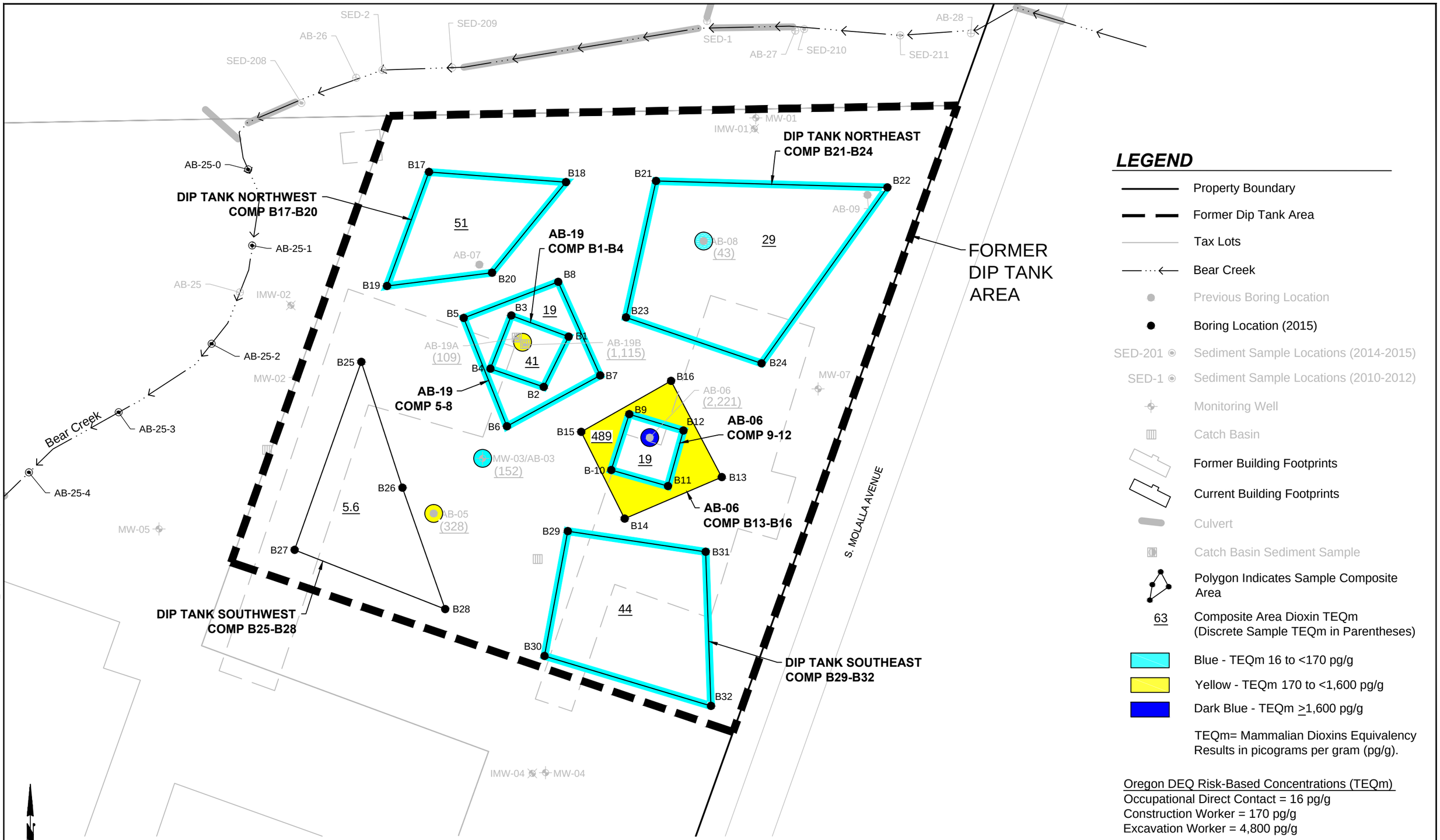
DIP TANK AREA
SOIL BORING LOCATIONS
(2015)

Project No. 1177-01

Figure No. 13



LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Previous Boring Location
- Boring Location (2015)
- SED-201 Sediment Sample Locations (2014-2015)
- SED-1 Sediment Sample Locations (2010-2012)
- Monitoring Well
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Catch Basin Sediment Sample
- Polygon Indicates Sample Composite Area
- 63 Composite Area Dioxin TEQm (Discrete Sample TEQm in Parentheses)
- Blue - TEQm 16 to <170 pg/g
- Yellow - TEQm 170 to <1,600 pg/g
- Dark Blue - TEQm ≥1,600 pg/g

TEQm= Mammalian Dioxins Equivalency Results in picograms per gram (pg/g).

Oregon DEQ Risk-Based Concentrations (TEQm)
Occupational Direct Contact = 16 pg/g
Construction Worker = 170 pg/g
Excavation Worker = 4,800 pg/g

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SOIL DIOXIN TEQm
IN DIP TANK AREA SOILS
0.5 FEET DEPTH

Project No. 1177-01
Figure No. 14

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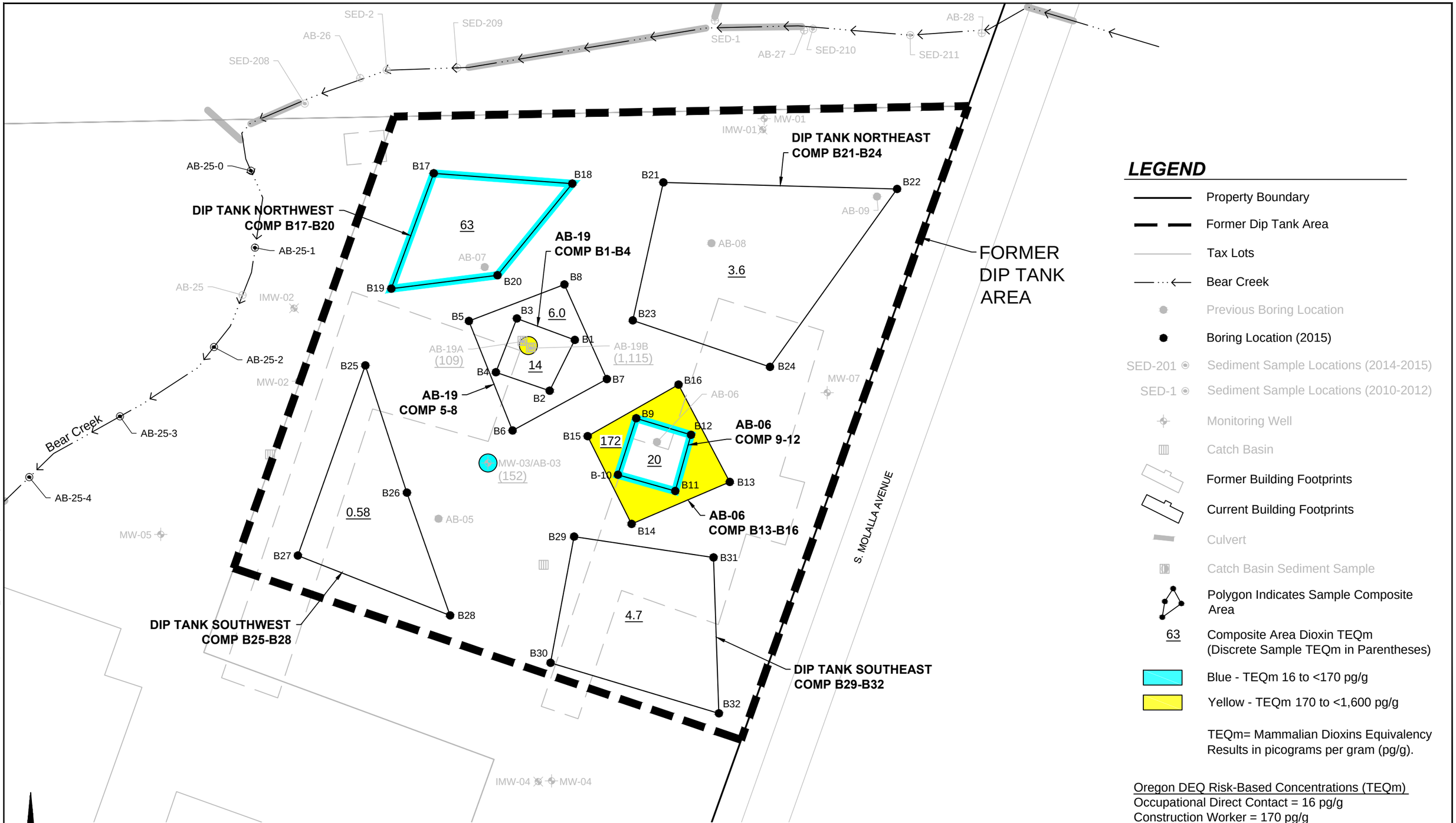

LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Previous Boring Location
- Boring Location (2015)
- SED-201 Sediment Sample Locations (2014-2015)
- SED-1 Sediment Sample Locations (2010-2012)
- Monitoring Well
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Catch Basin Sediment Sample
- Polygon Indicates Sample Composite Area
- 63 Composite Area Dioxin TEQm (Discrete Sample TEQm in Parentheses)
- Blue - TEQm 16 to <170 pg/g
- Yellow - TEQm 170 to <1,600 pg/g

TEQm= Mammalian Dioxins Equivalency Results in picograms per gram (pg/g).

Oregon DEQ Risk-Based Concentrations (TEQm)
Occupational Direct Contact = 16 pg/g
Construction Worker = 170 pg/g
Excavation Worker = 4,800 pg/g

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SOIL DIOXIN TEQm
IN DIP TANK AREA SOILS
1.5 FEET DEPTH

Project No. 1177-01
Figure No. 15

01107947
01107974
01108330
CB-03
CB-02
AB-59
01107331
CB-04
CB-05
AB-37
S. MOLALLA AVE.
01107359
Outfall
Bear Creek
S. MOLALLA FOREST RD
01107956
01107368
AB-19A
AB-19B
CB-10
Former Dip Tank Area
01107340
05002348
CB-06
CB-07
CB-09
CB-08
16-Acre SE Corner Area
N
APPROXIMATE SCALE IN FEET
0
250
500

LEGEND

- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Generalized Topographic Slope / Flow Direction
- ? = Indicates Unknown Discharge / Outfall Location
- Seasonal Standing Water
- Tax Lots
- Catch Basin
- Culvert
- RI Study Area Boundary

Source: Aerial photograph provided by Google Earth Pro ™ (2010)

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DRAINAGE FEATURES
2010 AERIAL

Project No. 1177-01
Figure No. 16

APPENDIX A
PHASE 3 RI REPORT

TECHNICAL MEMORANDUM

To: Dan Hafley, Oregon DEQ Northwest Region Office

From: Paul Ecker, R.G. and Brad Berggren, P.E., R.G.

Date: October 26, 2016

Subject: Phase 3 Remedial Investigation – Data Report
Floragon Property
Molalla, Oregon
DEQ ECSI File No. 0009

PNG Environmental, Inc. (PNG) prepared this technical memorandum on behalf of Avison Lumber Company (Avison) to document the results of Phase 3 Remedial Investigation (RI) activities for the subject property. Avison took over RI activities at the Floragon facility in early 2010 under a letter agreement required by the Oregon Department of Environmental Quality's (DEQ) Voluntary Cleanup Program (VCP). DEQ manages this project as Environmental Cleanup Site Information (ECSI) File Number 0009. The Floragon property is located in Molalla, Oregon (Figure 1).

Phase 3 RI activities were conducted in accordance with the DEQ-approved work plan (PNG 2015) at the Floragon site during 2014 and 2015. The purpose of this RI work was to delineate the magnitude and extent of contaminants in 1) Bear Creek sediments and 2) former Dip Tank Area soils at the Floragon property (Figure 2). Based on RI findings to date and recent discussions with DEQ, site contaminants of concern are limited to these specific areas, and related RI data gaps for these areas must be addressed and resolved before the Feasibility Study (FS) and final remedial action planning for this site can be completed. The findings of this Phase 3 memorandum will be incorporated into a comprehensive Remedial Investigation report for the Floragon site.

BACKGROUND

Remedial Investigation findings indicate environmental impacts are present among Bear Creek sediments and former Dip Tank Area soils at the Floragon property, with dioxin-like compounds (referred herein generally as dioxin) recognized as the primary Contaminant of Concern (COCs) (PNG 2011, 2013; EES 2014, 2015). After extensive discussions and negotiations with DEQ during 2014 and 2015, our understanding is that RI data development and risk characterization must account for certain numeric dioxin criteria established by DEQ (DEQ 2015a, 2015b). To fully address RI data needs, additional soil and sediment data were collected from the former Dip Tank Area and the Bear Creek sediments. Sampling locations and sediment and soil sample data for these two areas of concern are shown on Figures 3 through 8, and summarized in Tables 1-1 and 2-1. Other supplemental data summary tables are also attached.

PHASE 3 REMEDIAL INVESTIGATION

Phase 3 Remedial Investigation activities were conducted in November 2014 and October 2015, as described below. Work scope tasks were implemented based on discussions with DEQ in 2014-2015 and in accordance with the DEQ-approved work plan (PNG 2015).

Tasks focused on characterization of the site's two primary areas of concern, Bear Creek sediments and former Dip Tank Area soils. Principal work scope elements are summarized below.

- Updated the site-specific Health and Safety Plan.
- Conducted public and private underground utility locating and marking in an effort to avoid underground infrastructure and utilities at each planned soil sampling (drilling) location prior to initiating subsurface work.
- Collected sediment samples from Bear Creek (Reaches 1 through 5) in an effort to delineate dioxin concentrations and to characterize the physical setting of sediments in these areas.
- Collected soil samples from the former Dip Tank Area to delineate the extent of dioxin concentrations previously identified in this area of concern, particularly surrounding prior sample locations AB-19B and AB-06. Composite soil sampling rationale and locations were discussed with and approved by DEQ.
- Contracted with an experienced wetland firm to delineate the extent of wetlands and related waters (including identification of the ordinary high water mark for Bear Creek) along of the Bear Creek study area (Reaches 1,2,4, and 5).
- Contracted with a licensed land surveyor to map each sample location as well as the study area's southern and eastern property boundaries along South Molalla Forest Road and South Molalla Avenue, respectively. Creek and Dip Tank Area topography was also surveyed to an approximately 0.5-foot contour interval.
- Managed investigation-derived waste (soil and decontamination water) in labeled 55-gallon drums for temporary onsite storage, pending disposal.

Site features and sample locations are shown on Figures 4 and 6. Representative Bear Creek profiles and soil boring logs are presented in Appendices 1 and 2, respectively. Standard Operating Procedures (SOPs) which describe field soil and sediment sampling procedures are available on request.

Bear Creek Sediment Investigation

FIELD ACTIVITIES

On October 15, 16, and 19, 2015, PNG conducted sediment sampling activities at the four open, non-culverted, portions of Bear Creek (referred to as Reach-1, -2, -4, and -5). Reach-3 was evaluated in November 2014 using sampling methodology consistent with the 2015 investigation, and the results of that investigation (previously shared with DEQ) are included in this report. Within the creek, the study area extends from the eastern property margin near AB-28 downstream to the SED-8 location (Figures 2 and 4).

A total of 17 transect sample locations (SED-200 through SED-211, and AB-25-0 through AB-25-5) were established at approximately 50 to 100 foot intervals within the RI study area. Sediment sampling activities were conducted using a hand auger after multiple failed attempts using a Ponar Sampler and a drive-probe. Sediment data is limited to the top one foot of the creek bed in most areas, except where deeper sediment recovery was possible (see discussion below). Dioxin data and sediment sampling locations are illustrated on Figures 4 and 5.

PNG directed investigation activities and collected sediment samples using the following approach:

- In order to obtain representative physical and chemical data that incorporates a degree of spatial variability, three individual "A/B/C" sediment samples were collected from a transect across the creek bed at each of the 17 sampling locations (Figure 4). The transect width and separation between A/B/C sub-locations was based on observed creek conditions at the time of sampling, which was conducted during seasonal low-water conditions in October 2015. Samples were collected from near the transect edges ("A" and "C"), with the "B" sub-location collected from near the center of the creek bed. PNG collected and containerized all individual samples separately. For each A/B/C transect, the analytical laboratory split each sample such that aliquots of equal mass were mixed into a single composite sample for a given location. Remaining portions of each individual split sample were archived for potential future discrete analysis, if necessary.
- Sediment samples were collected (where possible) at depths of 0-1 and 1-2 feet below the water/sediment interface. One field duplicate sample, SED-250, was collected at the SED-211 location for data validation purposes. A total of 25 composite sediment samples were collected during the Phase 3 RI.
- Additional creek sediment thickness and distribution data were collected using a soil probe at approximately 50 foot increments within the creek basin study area. Sediment thickness was measured after sampling activities to minimize disturbance to the sampling areas. Sediment thickness was measured from the depth where the soil probe met refusal at the sediment interface with very dense underlying gravels.

CREEK CONDITIONS

Bear Creek conditions observed during RI efforts were generally consistent among sediment sampling locations and with previous sampling events. The banks of the creek were bounded with rip rap and thick vegetation to the top of bank. The Bear Creek water column was measured at approximately 1 to 3 feet deep, by 5 to 25 feet wide during the October 2015 investigation. Deeper pool areas were observed at several locations including the head of Reach 3, throughout much of Reach 4, and at the head of Reach 5. Sediment stratigraphy consists of approximately six inches to two feet of silty gravel (sediment that could be penetrated and recovered with the sampling equipment), underlain by very dense gravels. Sampling refusal occurred at the dense gravel interface. Representative transect cross sections of Reach-1 through Reach-5 are presented in Appendix 1, based on sediment and water column thickness measurements averaged among transects for each of the five Reach areas.

No obvious signs of chemical contamination such as hydrocarbon or chemical sheen, unusual discoloration, or stressed vegetation were observed at any of the sediment sampling locations.

FORMER DIP TANK SOIL INVESTIGATION

On October 13 and 14, 2015, a total of 32 soil borings were each advanced to five feet depth in the Dip Tank Area using a small, track-mounted rotosonic drill rig

operated by Cascade Drilling (Clackamas, Oregon). Soil samples were intended to provide vertical and lateral delineation of dioxin across the Dip Tank Area, particularly surrounding 2010 sample locations AB-19B (1,115 pg/g) and AB-06 (2,221 pg/g). Dioxin data and soil sampling locations are illustrated on Figures 6 through 8.

PNG directed investigation activities and collected soil samples using the following approach:

- At each drilling location, PNG retrieved, examined, and logged continuous soil cores during drilling. Soil samples were field screened for volatile organic vapors using a photo ionization detector (PID), and inspected for indications discoloration/staining, odor, and sheen.
- No obvious signs of chemical contamination or unusual fill materials were observed in any of the borings. In order to delineate previously identified shallow impacts in the Dip Tank Area, PNG collected discrete shallow soil samples from each boring at depth intervals of 0-0.5 feet, 1.5 feet, 3 feet, and 5 feet below ground surface (bgs). In areas of the site covered where foundations, footings, or other features were present, soil samples were collected immediately beneath such features and at sequential elevations intended to match other locations and depth intervals.
- PNG collected and containerized all individual samples separately. For each sampling area, the analytical laboratory split each discrete sample such that aliquots were mixed into a single composite sample for a given location and depth, as described below. Remaining portions of each individual split sample were archived for potential future discrete analysis.
  - For each depth interval, four-point composite samples were generated from (1) proximal borings B1-B4 and B9-B12 located within approximately 20 feet of AB-19B and AB-06, and (2) distal borings B5-B8 and B13-B16 located within approximately 50 feet of AB-19B and AB-06.
  - Similar to the AB-19B and AB-06 areas, four-point composite samples were generated at each depth interval from each of the four quadrants surrounding the former Dip Tank Area (borings B17-B32).
  - As discussed in the analytical results section, initial analysis was limited to the two shallowest depth intervals (0.5 and 1.5 feet) and therefore consisted of a total of sixteen such composited samples. Select deeper samples from three and five feet depth were subsequently analyzed, or archived for potential future analysis.

Wetlands and Waters Delineation

In November 2014, SWCA Environmental Consultants (Portland, Oregon) conducted a waters delineation of the Reach-3 portion of the study area (SWCA, 2015). This delineation work identified no wetlands, and the ordinary high water mark (OHWM) was mapped in Reach-3. The waters delineation report for Reach-3 of Bear Creek received concurrence from the Oregon Department of State Lands (DSL) on August 24, 2015 under WD #2015-0279.

SWCA conducted supplemental wetland and waters delineation activities in remaining sections of the Bear Creek RI study area (Reach-1, -2, -4, and -5) in November 2015. The

OHWM was mapped in the study area, and two wetlands were delineated directly abutting Bear Creek, as shown on Figure 9. The wetland and waters delineation report for Reach-1, -2, -4, and -5 of Bear Creek (SWCA 2016) received concurrence from the Oregon Department of State Lands (DSL) on June 1, 2016 under WD #2016-0177.

Copies of the 2015 and 2016 SWCA reports and DSL concurrence letter are included in Appendix 3.

Topographic Survey

On November 21, 2014, November 9-13, and December 3, 2015, Centerline Concepts (Oregon City, Oregon) surveyed each sample location as well as the study area's southern and eastern property boundaries along South Molalla Forest Road and South Molalla Avenue, respectively. Bear Creek and Dip Tank Area topography was also surveyed to an approximately 0.5-foot contour interval. Topographic survey data is shown on Figure 9.

Investigation-Derived Waste

A small volume of soil cuttings and wash water generated during Phase 3 RI field activities were placed into six 55-gallon steel drums, labeled, sealed, and staged on-site, pending disposal.

LABORATORY ANALYTICAL TESTING

PNG submitted select soil and sediment samples to Apex Laboratory (Portland, Oregon) for analytical testing in accordance with the work plan, and as supported by field observations. Dioxin analyses were subcontracted to Maxxam Analytics (Mississauga, Ontario). Bear Creek sediment and former Dip Tank Area soil analytical results were compared to the applicable screening criteria described in the background section of this report and as detailed in the RI Report (PNG 2016).

Bear Creek Sediments

A total of 25 composite sediment samples, including one duplicate sample (dioxin only), were analyzed for dioxins and furans by EPA Method 1613B, and conventional parameters including grain size distribution, bulk density, moisture content, and total organic carbon. Standard testing for total and leachable metals by EPA Method 6010 was also conducted among selected samples. Individual split samples from each discrete sampling location were archived for possible future analytical testing.

Dip Tank Soils

A total of 16 composite soil samples plus one duplicate were analyzed for dioxins and furans by EPA Method 1613B in 2015. Based on prior findings, select samples from the former Dip Tank Area were analyzed for secondary contaminants including petroleum hydrocarbons by method NWTPH-Dx, semi-volatile organic compounds (SVOCs) (including pentachlorophenol) by EPA Method 8270C, and RCRA-8 total & leachable metals by EPA Method 6020. Individual split samples from each discrete sampling location were archived for possible future analytical testing.

Chemical analytical results are summarized in the attached data tables, with laboratory reports and chain-of-custody documentation presented in Appendix 4. Sample locations with analytical results are presented on Figures 4, 5, 7, and 8.

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APPENDICIES

Appendix 1 – Bear Creek Cross Sections
Appendix 2 – Generalized Dip Tank Area Boring Logs
Appendix 3 – SWCA Wetlands and Waters Survey Reports
Appendix 4 – Laboratory Analytical Reports

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TABLES

Table 1-1
Bear Creek Sediment Analytical Results Summary - Dioxin Equivalent Concentrations - Mammalian TEQ (pg/g)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	2,3,7,8-TCDD TEQ with detection limits	2,3,7,8-TCDD TEQ with 1/2 detection limits	2,3,7,8-TCDD TEQ without non-detects
AB-23	0-1	02/02/2010	182	182	182
AB-25	0-1	02/02/2010	413	413	413
AB-28	0-1	02/02/2010	165	165	165
SED-COMP-1	0-1	04/13/2012	19	19	19
SED-COMP-2	0-1	04/13/2012	46	46	46
SED-COMP-3	0-1	04/12/2012	71	71	71
SED-COMP-3 Dup (SED-COMP-99)	0-1	04/12/2012	45	45	45
SED-COMP-4	0-1	04/11/2012	8.0	8.0	7.9
SED-COMP-5	0-1	04/11/2012	122	119	116
SED-COMP-6	0-1	04/11/2012	4.4	4.2	4.0
SED-COMP-7	0-1	04/11/2012	49	49	49
SED-COMP-8	0-1	04/12/2012	43	43	43
AB-25-0COMP (0-1)	0-1	11/20/2014	71	71	71
AB-25-1COMP (0-1)	0-1	11/19/2014	158	158	158
AB-25-2COMP (0-1)	0-1	11/19/2014	115	115	115
AB-25-3COMP (0-1)	0-1	11/19/2014	485	485	485
AB-25-4COMP (0-1)	0-1	11/19/2014	96	96	96
SED-200ABC (0-1) COMP	0-1	10/15/2015	49	49	49
SED-200AC (1-2) COMP	1-2	10/15/2015	5.4	5.4	5.4
SED-201ABC (0-1) COMP	0-1	10/15/2015	266	266	266
SED-201ABC (1-2) COMP	1-2	10/15/2015	53	53	53
SED-202ABC (0-1) COMP	0-1	10/15/2015	32	32	32
SED-203ABC (0-1) COMP	0-1	10/16/2015	120	120	120
SED-203AC (1-2) COMP	1-2	10/16/2015	11	11	11
SED-204ABC (0-1) COMP	0-1	10/16/2015	220	215	210
SED-204AC (1-2) COMP	1-2	10/16/2015	97	95	92
SED-205ABC (0-1) COMP	0-1	10/16/2015	93	91	88
SED-206ABC (0-1) COMP	0-1	10/16/2015	102	102	102
SED-207ABC (0-1) COMP	0-1	10/16/2015	56	56	56
SED-207ABC (1-2) COMP	1-2	10/16/2015	402	395	387
SED-208ABC (0-1) COMP	0-1	10/19/2015	41	41	41
SED-208ABC (1-2) COMP	1-2	10/19/2015	9.6	9.6	9.6
SED-209ABC (0-1) COMP	0-1	10/19/2015	151	151	151
SED-209AB (1-2) COMP	1-2	10/19/2015	25	25	25
SED-210ABC (0-1) COMP	0-1	10/19/2015	45	45	45
SED-211ABC (0-1) COMP	0-1	10/19/2015	105	105	105
SED-211ABC (0-1) COMP Dup (SED-250)	0-1	10/19/2015	102	102	102
SED-211ABC (1-2) COMP	1-2	10/19/2015	84	83	83

Notes:
pg/g = picograms per gram
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Ractors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)
TCDD = Tetrachlorinated Dibenzo-p-Dioxin(s)

Table 1-1a
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-23, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	2.29	0.00000229	2.3E-06	1	2.3	2.3E-06
1,2,3,7,8-PeCDD	16.9	0.0000169	1.7E-05	1	17	1.7E-05
1,2,3,4,7,8-HxCDD	21.5	0.0000215	2.2E-05	0.1	2.2	2.2E-06
1,2,3,6,7,8-HxCDD	515	0.000515	5.2E-04	0.1	52	5.2E-05
1,2,3,7,8,9-HxCDD	72.8	0.0000728	7.3E-05	0.1	7.3	7.3E-06
1,2,3,4,6,7,8-HpCDD	5,310	0.00531	5.3E-03	0.01	53	5.3E-05
OCDD	24,700	0.0247	2.5E-02	0.0003	7.4	7.4E-06
2,3,7,8-TCDF	29.9	0.0000299	3.0E-05	0.1	3.0	3.0E-06
1,2,3,7,8-PeCDF	21.0	0.000021	2.1E-05	0.03	0.63	6.3E-07
2,3,4,7,8-PeCDF	27.3	0.0000273	2.7E-05	0.3	8.2	8.2E-06
1,2,3,4,7,8-HxCDF	50.5	0.0000505	5.1E-05	0.1	5.1	5.1E-06
1,2,3,6,7,8-HxCDF	55.3	0.0000553	5.5E-05	0.1	5.5	5.5E-06
2,3,4,6,7,8-HxCDF	60.8	0.0000608	6.1E-05	0.1	6.1	6.1E-06
1,2,3,7,8,9-HxCDF	3.6 J	0.0000036 J	3.6E-06 J	0.1	0.36 J	3.6E-07 J
1,2,3,4,6,7,8-HpCDF	1,160	0.00116	1.2E-03	0.01	12	1.2E-05
1,2,3,4,7,8,9-HpCDF	40.7	0.0000407	4.1E-05	0.01	0.41	4.1E-07
OCDF	945	0.000945	9.5E-04	0.0003	0.28	2.8E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					182	1.8E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					182	1.8E-04
2,3,7,8-TCDD TEQ (without no-detects)					182	1.8E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1b
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-25, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	5.6	0.00000556	5.6E-06	1	5.6	5.6E-06
1,2,3,7,8-PeCDD	51.2	0.0000512	5.1E-05	1	51	5.1E-05
1,2,3,4,7,8-HxCDD	65.3	0.0000653	6.5E-05	0.1	6.5	6.5E-06
1,2,3,6,7,8-HxCDD	1,020	0.00102	1.0E-03	0.1	102	1.0E-04
1,2,3,7,8,9-HxCDD	179	0.000179	1.8E-04	0.1	18	1.8E-05
1,2,3,4,6,7,8-HpCDD	10,700	0.0107	1.1E-02	0.01	107	1.1E-04
OCDD	40,300	0.0403	4.0E-02	0.0003	12	1.2E-05
2,3,7,8-TCDF	51.5	0.0000515	5.2E-05	0.1	5.2	5.2E-06
1,2,3,7,8-PeCDF	44.1	0.0000441	4.4E-05	0.03	1.3	1.3E-06
2,3,4,7,8-PeCDF	55.6	0.0000556	5.6E-05	0.3	17	1.7E-05
1,2,3,4,7,8-HxCDF	139	0.000139	1.4E-04	0.1	14	1.4E-05
1,2,3,6,7,8-HxCDF	168	0.000168	1.7E-04	0.1	17	1.7E-05
2,3,4,6,7,8-HxCDF	138	0.000138	1.4E-04	0.1	14	1.4E-05
1,2,3,7,8,9-HxCDF	7.81 J	0.00000781 J	7.8E-06 J	0.1	0.78 J	7.8E-07 J
1,2,3,4,6,7,8-HpCDF	3,950	0.00395	4.0E-03	0.01	40	4.0E-05
1,2,3,4,7,8,9-HpCDF	150	0.00015	1.5E-04	0.01	1.5	1.5E-06
OCDF	3,460	0.00346	3.5E-03	0.0003	1.0	1.0E-06
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					413	4.1E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					413	4.1E-04
2,3,7,8-TCDD TEQ (without no-detects)					413	4.1E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1c
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-28, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	4.13	0.00000413	4.1E-06	1	4.1	4.1E-06
1,2,3,7,8-PeCDD	17.4	0.0000174	1.7E-05	1	17	1.7E-05
1,2,3,4,7,8-HxCDD	26.5	0.0000265	2.7E-05	0.1	2.7	2.7E-06
1,2,3,6,7,8-HxCDD	419	0.000419	4.2E-04	0.1	42	4.2E-05
1,2,3,7,8,9-HxCDD	66.4	0.0000664	6.6E-05	0.1	6.6	6.6E-06
1,2,3,4,6,7,8-HpCDD	4,150	0.00415	4.2E-03	0.01	42	4.2E-05
OCDD	16,900	0.0169	1.7E-02	0.0003	5.1	5.1E-06
2,3,7,8-TCDF	21.8	0.0000218	2.2E-05	0.1	2.2	2.2E-06
1,2,3,7,8-PeCDF	17.9	0.0000179	1.8E-05	0.03	0.54	5.4E-07
2,3,4,7,8-PeCDF	26.1	0.0000261	2.6E-05	0.3	7.8	7.8E-06
1,2,3,4,7,8-HxCDF	53.9	0.0000539	5.4E-05	0.1	5.4	5.4E-06
1,2,3,6,7,8-HxCDF	56.3	0.0000563	5.6E-05	0.1	5.6	5.6E-06
2,3,4,6,7,8-HxCDF	59.1	0.0000591	5.9E-05	0.1	5.9	5.9E-06
1,2,3,7,8,9-HxCDF	3.19 J	0.00000319 J	3.2E-06 J	0.1	0.32 J	3.2E-07 J
1,2,3,4,6,7,8-HpCDF	1,670	0.00167	1.7E-03	0.01	17	1.7E-05
1,2,3,4,7,8,9-HpCDF	56.3	0.0000563	5.6E-05	0.01	0.56	5.6E-07
OCDF	1,480	0.00148	1.5E-03	0.0003	0.44	4.4E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					165	1.6E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					165	1.6E-04
2,3,7,8-TCDD TEQ (without no-detects)					165	1.6E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1d
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-COMP-1, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.297 U	0.000000297 U	3.0E-07 U	1	0.30 U	3.0E-07 U
1,2,3,7,8-PeCDD	2.29 J	0.00000229 J	2.3E-06 J	1	2.3 J	2.3E-06 J
1,2,3,4,7,8-HxCDD	3.81 J	0.00000381 J	3.8E-06 J	0.1	0.38 J	3.8E-07 J
1,2,3,6,7,8-HxCDD	43.1	0.0000431	4.3E-05	0.1	4.3	4.3E-06
1,2,3,7,8,9-HxCDD	7.85	0.00000785	7.9E-06	0.1	0.79	7.9E-07
1,2,3,4,6,7,8-HpCDD	377	0.000377	3.8E-04	0.01	3.8	3.8E-06
OCDD	1,420	0.00142	1.4E-03	0.0003	0.43	4.3E-07
2,3,7,8-TCDF	2.06	0.00000206	2.1E-06	0.1	0.21	2.1E-07
1,2,3,7,8-PeCDF	1.94 J	0.00000194 J	1.9E-06 J	0.03	0.058 J	5.8E-08 J
2,3,4,7,8-PeCDF	6.59	0.00000659	6.6E-06	0.3	2.0	2.0E-06
1,2,3,4,7,8-HxCDF	5.74	0.00000574	5.7E-06	0.1	0.57	5.7E-07
1,2,3,6,7,8-HxCDF	6.14	0.00000614	6.1E-06	0.1	0.61	6.1E-07
2,3,4,6,7,8-HxCDF	12.8	0.0000128	1.3E-05	0.1	1.3	1.3E-06
1,2,3,7,8,9-HxCDF	2.96 J	0.00000296 J	3.0E-06 J	0.1	0.30 J	3.0E-07 J
1,2,3,4,6,7,8-HpCDF	181	0.000181	1.8E-04	0.01	1.8	1.8E-06
1,2,3,4,7,8,9-HpCDF	6.58	0.00000658	6.6E-06	0.01	0.066	6.6E-08
OCDF	139	0.000139	1.4E-04	0.0003	0.042	4.2E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					19	1.9E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					19	1.9E-05
2,3,7,8-TCDD TEQ (without no-detects)					19	1.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1e
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-COMP-2, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.352 J	0.000000352 J	3.5E-07 J	1	0.35 J	3.5E-07 J
1,2,3,7,8-PeCDD	4.14 J	0.00000414 J	4.1E-06 J	1	4.1 J	4.1E-06 J
1,2,3,4,7,8-HxCDD	7.19	0.00000719	7.2E-06	0.1	0.72	7.2E-07
1,2,3,6,7,8-HxCDD	111	0.000111	1.1E-04	0.1	11	1.1E-05
1,2,3,7,8,9-HxCDD	18.7	0.0000187	1.9E-05	0.1	1.9	1.9E-06
1,2,3,4,6,7,8-HpCDD	1,090	0.00109	1.1E-03	0.01	11	1.1E-05
OCDD	4,560 E	0.00456 E	4.6E-03 E	0.0003	1.4 E	1.4E-06 E
2,3,7,8-TCDF	5.44	0.00000544	5.4E-06	0.1	0.54	5.4E-07
1,2,3,7,8-PeCDF	4.28 J	0.00000428 J	4.3E-06 J	0.03	0.13 J	1.3E-07 J
2,3,4,7,8-PeCDF	18.8 J	0.0000188 J	1.9E-05 J	0.3	5.6 J	5.6E-06 J
1,2,3,4,7,8-HxCDF	12.2	0.0000122	1.2E-05	0.1	1.2	1.2E-06
1,2,3,6,7,8-HxCDF	14.3	0.0000143	1.4E-05	0.1	1.4	1.4E-06
2,3,4,6,7,8-HxCDF	29.2	0.0000292	2.9E-05	0.1	2.9	2.9E-06
1,2,3,7,8,9-HxCDF	6.31	0.00000631	6.3E-06	0.1	0.63	6.3E-07
1,2,3,4,6,7,8-HpCDF	291	0.000291	2.9E-04	0.01	2.9	2.9E-06
1,2,3,4,7,8,9-HpCDF	10.6	0.0000106	1.1E-05	0.01	0.11	1.1E-07
OCDF	224	0.000224	2.2E-04	0.0003	0.067	6.7E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					46	4.6E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					46	4.6E-05
2,3,7,8-TCDD TEQ (without no-detects)					46	4.6E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1f
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-COMP-3, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.517 J	0.000000517 J	5.2E-07 J	1	0.52 J	5.2E-07 J
1,2,3,7,8-PeCDD	5.8	0.0000058	5.8E-06	1	5.8	5.8E-06
1,2,3,4,7,8-HxCDD	13.1	0.0000131	1.3E-05	0.1	1.3	1.3E-06
1,2,3,6,7,8-HxCDD	178	0.000178	1.8E-04	0.1	18	1.8E-05
1,2,3,7,8,9-HxCDD	32	0.000032	3.2E-05	0.1	3.2	3.2E-06
1,2,3,4,6,7,8-HpCDD	1,720	0.00172	1.7E-03	0.01	17	1.7E-05
OCDD	7,660 E	0.00766 E	7.7E-03 E	0.0003	2.3 E	2.3E-06 E
2,3,7,8-TCDF	9.22	0.00000922	9.2E-06	0.1	0.92	9.2E-07
1,2,3,7,8-PeCDF	7.95	0.00000795	8.0E-06	0.03	0.24	2.4E-07
2,3,4,7,8-PeCDF	29.2	0.0000292	2.9E-05	0.3	8.8	8.8E-06
1,2,3,4,7,8-HxCDF	17.9	0.0000179	1.8E-05	0.1	1.8	1.8E-06
1,2,3,6,7,8-HxCDF	18.8	0.0000188	1.9E-05	0.1	1.9	1.9E-06
2,3,4,6,7,8-HxCDF	42.3	0.0000423	4.2E-05	0.1	4.2	4.2E-06
1,2,3,7,8,9-HxCDF	10.6	0.0000106	1.1E-05	0.1	1.1	1.1E-06
1,2,3,4,6,7,8-HpCDF	409	0.000409	4.1E-04	0.01	4.1	4.1E-06
1,2,3,4,7,8,9-HpCDF	15.7	0.0000157	1.6E-05	0.01	0.16	1.6E-07
OCDF	294	0.000294	2.9E-04	0.0003	0.088	8.8E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					71	7.1E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					71	7.1E-05
2,3,7,8-TCDD TEQ (without no-detects)					71	7.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1g
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-COMP-3 Duplicate (SED-COMP-99), April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.347 J	0.000000347 J	3.5E-07 J	1	0.35 J	3.5E-07 J
1,2,3,7,8-PeCDD	3.47 J	0.00000347 J	3.5E-06 J	1	3.5 J	3.5E-06 J
1,2,3,4,7,8-HxCDD	6.22	0.00000622	6.2E-06	0.1	0.62	6.2E-07
1,2,3,6,7,8-HxCDD	107	0.000107	1.1E-04	0.1	11	1.1E-05
1,2,3,7,8,9-HxCDD	16.4	0.0000164	1.6E-05	0.1	1.6	1.6E-06
1,2,3,4,6,7,8-HpCDD	1,050	0.00105	1.1E-03	0.01	11	1.1E-05
OCDD	4,690 E	0.00469 E	4.7E-03 E	0.0003	1.4 E	1.4E-06 E
2,3,7,8-TCDF	6.14	0.00000614	6.1E-06	0.1	0.61	6.1E-07
1,2,3,7,8-PeCDF	4.51 J	0.00000451 J	4.5E-06 J	0.03	0.14 J	1.4E-07 J
2,3,4,7,8-PeCDF	18.7	0.0000187	1.9E-05	0.3	5.6	5.6E-06
1,2,3,4,7,8-HxCDF	14.7	0.0000147	1.5E-05	0.1	1.5	1.5E-06
1,2,3,6,7,8-HxCDF	13.2	0.0000132	1.3E-05	0.1	1.3	1.3E-06
2,3,4,6,7,8-HxCDF	26.6	0.0000266	2.7E-05	0.1	2.7	2.7E-06
1,2,3,7,8,9-HxCDF	8.12	0.00000812	8.1E-06	0.1	0.81	8.1E-07
1,2,3,4,6,7,8-HpCDF	308	0.000308	3.1E-04	0.01	3.1	3.1E-06
1,2,3,4,7,8,9-HpCDF	12.4	0.0000124	1.2E-05	0.01	0.12	1.2E-07
OCDF	229	0.000229	2.3E-04	0.0003	0.069	6.9E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					45	4.5E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					45	4.5E-05
2,3,7,8-TCDD TEQ (without no-detects)					45	4.5E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1h
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-COMP-4, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.129 U	0.000000129 U	1.3E-07 U	1	0.13 U	1.3E-07 U
1,2,3,7,8-PeCDD	0.586 J	0.000000586 J	5.9E-07 J	1	0.59 J	5.9E-07 J
1,2,3,4,7,8-HxCDD	1.01 J	0.00000101 J	1.0E-06 J	0.1	0.10 J	1.0E-07 J
1,2,3,6,7,8-HxCDD	20.9	0.0000209	2.1E-05	0.1	2.1	2.1E-06
1,2,3,7,8,9-HxCDD	3.1 J	0.0000031 J	3.1E-06 J	0.1	0.31 J	3.1E-07 J
1,2,3,4,6,7,8-HpCDD	201	0.000201	2.0E-04	0.01	2.0	2.0E-06
OCDD	896	0.000896	9.0E-04	0.0003	0.27	2.7E-07
2,3,7,8-TCDF	1.26	0.00000126	1.3E-06	0.1	0.13	1.3E-07
1,2,3,7,8-PeCDF	0.72 J	0.00000072 J	7.2E-07 J	0.03	0.022 J	2.2E-08 J
2,3,4,7,8-PeCDF	2.96 J	0.00000296 J	3.0E-06 J	0.3	0.89 J	8.9E-07 J
1,2,3,4,7,8-HxCDF	1.89 J	0.00000189 J	1.9E-06 J	0.1	0.19 J	1.9E-07 J
1,2,3,6,7,8-HxCDF	2.23 J	0.00000223 J	2.2E-06 J	0.1	0.22 J	2.2E-07 J
2,3,4,6,7,8-HxCDF	4.49 J	0.00000449 J	4.5E-06 J	0.1	0.45 J	4.5E-07 J
1,2,3,7,8,9-HxCDF	1.24 J	0.00000124 J	1.2E-06 J	0.1	0.12 J	1.2E-07 J
1,2,3,4,6,7,8-HpCDF	49.8	0.0000498	5.0E-05	0.01	0.50	5.0E-07
1,2,3,4,7,8,9-HpCDF	1.86 J	0.00000186 J	1.9E-06 J	0.01	0.019 J	1.9E-08 J
OCDF	36.4	0.0000364	3.6E-05	0.0003	0.011	1.1E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					8.0	8.0E-06
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					8.0	8.0E-06
2,3,7,8-TCDD TEQ (without no-detects)					7.9	7.9E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1i
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-COMP-5, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.773 U	0.000000773 U	7.7E-07 U	1	0.77 U	7.7E-07 U
1,2,3,7,8-PeCDD	7.36 J	0.00000736 J	7.4E-06 J	1	7.4 J	7.4E-06 J
1,2,3,4,7,8-HxCDD	16.7 U	0.0000167 U	1.7E-05 U	0.1	1.7 U	1.7E-06 U
1,2,3,6,7,8-HxCDD	319	0.000319	3.2E-04	0.1	32	3.2E-05
1,2,3,7,8,9-HxCDD	36 U	0.000036 U	3.6E-05 U	0.1	3.6 U	3.6E-06 U
1,2,3,4,6,7,8-HpCDD	3,210	0.00321	3.2E-03	0.01	32	3.2E-05
OCDD	15,800	0.0158	1.6E-02	0.0003	4.7	4.7E-06
2,3,7,8-TCDF	13.2	0.0000132	1.3E-05	0.1	1.3	1.3E-06
1,2,3,7,8-PeCDF	12.6 J	0.0000126 J	1.3E-05 J	0.03	0.38 J	3.8E-07 J
2,3,4,7,8-PeCDF	45.3	0.0000453	4.5E-05	0.3	14	1.4E-05
1,2,3,4,7,8-HxCDF	33.5	0.0000335	3.4E-05	0.1	3.4	3.4E-06
1,2,3,6,7,8-HxCDF	31.6	0.0000316	3.2E-05	0.1	3.2	3.2E-06
2,3,4,6,7,8-HxCDF	68.5	0.0000685	6.9E-05	0.1	6.9	6.9E-06
1,2,3,7,8,9-HxCDF	19.8 J	0.0000198 J	2.0E-05 J	0.1	2.0 J	2.0E-06 J
1,2,3,4,6,7,8-HpCDF	906	0.000906	9.1E-04	0.01	9.1	9.1E-06
1,2,3,4,7,8,9-HpCDF	29.2	0.0000292	2.9E-05	0.01	0.29	2.9E-07
OCDF	615	0.000615	6.2E-04	0.0003	0.18	1.8E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					122	1.2E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					119	1.2E-04
2,3,7,8-TCDD TEQ (without no-detects)					116	1.2E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1j
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-COMP-6, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.2 U	0.0000002 U	2.0E-07 U	1	0.20 U	2.0E-07 U
1,2,3,7,8-PeCDD	0.415 J	0.000000415 J	4.2E-07 J	1	0.42 J	4.2E-07 J
1,2,3,4,7,8-HxCDD	0.698 U	0.000000698 U	7.0E-07 U	0.1	0.070 U	7.0E-08 U
1,2,3,6,7,8-HxCDD	9.89	0.00000989	9.9E-06	0.1	0.99	9.9E-07
1,2,3,7,8,9-HxCDD	1.56 J	0.00000156 J	1.6E-06 J	0.1	0.16 J	1.6E-07 J
1,2,3,4,6,7,8-HpCDD	99.3	0.0000993	9.9E-05	0.01	0.99	9.9E-07
OCDD	449	0.000449	4.5E-04	0.0003	0.13	1.3E-07
2,3,7,8-TCDF	0.719 J	0.000000719 J	7.2E-07 J	0.1	0.072 J	7.2E-08 J
1,2,3,7,8-PeCDF	0.737 J	0.000000737 J	7.4E-07 J	0.03	0.022 J	2.2E-08 J
2,3,4,7,8-PeCDF	1.47 J	0.00000147 J	1.5E-06 J	0.3	0.44 J	4.4E-07 J
1,2,3,4,7,8-HxCDF	1.25 J	0.00000125 J	1.3E-06 J	0.1	0.13 J	1.3E-07 J
1,2,3,6,7,8-HxCDF	1.1 U	0.0000011 U	1.1E-06 U	0.1	0.11 U	1.1E-07 U
2,3,4,6,7,8-HxCDF	2.48 J	0.00000248 J	2.5E-06 J	0.1	0.25 J	2.5E-07 J
1,2,3,7,8,9-HxCDF	0.731 J	0.000000731 J	7.3E-07 J	0.1	0.073 J	7.3E-08 J
1,2,3,4,6,7,8-HpCDF	33.2	0.0000332	3.3E-05	0.01	0.33	3.3E-07
1,2,3,4,7,8,9-HpCDF	1.18 J	0.00000118 J	1.2E-06 J	0.01	0.012 J	1.2E-08 J
OCDF	28.6	0.0000286	2.9E-05	0.0003	0.0086	8.6E-09
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					4.4	4.4E-06
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					4.2	4.2E-06
2,3,7,8-TCDD TEQ (without no-detects)					4.0	4.0E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1k
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-COMP-7, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.61 J	0.00000061 J	6.1E-07 J	1	0.61 J	6.1E-07 J
1,2,3,7,8-PeCDD	3.75 J	0.00000375 J	3.8E-06 J	1	3.8 J	3.8E-06 J
1,2,3,4,7,8-HxCDD	5.21 J	0.00000521 J	5.2E-06 J	0.1	0.52 J	5.2E-07 J
1,2,3,6,7,8-HxCDD	149	0.000149	1.5E-04	0.1	15	1.5E-05
1,2,3,7,8,9-HxCDD	16.5	0.0000165	1.7E-05	0.1	1.7	1.7E-06
1,2,3,4,6,7,8-HpCDD	1,010	0.00101	1.0E-03	0.01	10	1.0E-05
OCDD	4,030	0.00403	4.0E-03	0.0003	1.2	1.2E-06
2,3,7,8-TCDF	14.9	0.0000149	1.5E-05	0.1	1.5	1.5E-06
1,2,3,7,8-PeCDF	3.74 J	0.00000374 J	3.7E-06 J	0.03	0.11 J	1.1E-07 J
2,3,4,7,8-PeCDF	23.8	0.0000238	2.4E-05	0.3	7.1	7.1E-06
1,2,3,4,7,8-HxCDF	9.28	0.00000928	9.3E-06	0.1	0.93	9.3E-07
1,2,3,6,7,8-HxCDF	12.2	0.0000122	1.2E-05	0.1	1.2	1.2E-06
2,3,4,6,7,8-HxCDF	25.6	0.0000256	2.6E-05	0.1	2.6	2.6E-06
1,2,3,7,8,9-HxCDF	6.12	0.00000612	6.1E-06	0.1	0.61	6.1E-07
1,2,3,4,6,7,8-HpCDF	192	0.000192	1.9E-04	0.01	1.9	1.9E-06
1,2,3,4,7,8,9-HpCDF	6.15	0.00000615	6.2E-06	0.01	0.062	6.2E-08
OCDF	95.7	0.0000957	9.6E-05	0.0003	0.029	2.9E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					49	4.9E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					49	4.9E-05
2,3,7,8-TCDD TEQ (without no-detects)					49	4.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1l
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-COMP-8, April 2012						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.412 J	0.000000412 J	4.1E-07 J	1	0.41 J	4.1E-07 J
1,2,3,7,8-PeCDD	2.86 J	0.00000286 J	2.9E-06 J	1	2.9 J	2.9E-06 J
1,2,3,4,7,8-HxCDD	6.03	0.00000603	6.0E-06	0.1	0.60	6.0E-07
1,2,3,6,7,8-HxCDD	121	0.000121	1.2E-04	0.1	12	1.2E-05
1,2,3,7,8,9-HxCDD	16.1	0.0000161	1.6E-05	0.1	1.6	1.6E-06
1,2,3,4,6,7,8-HpCDD	1,070	0.00107	1.1E-03	0.01	11	1.1E-05
OCDD	4,810 E	0.00481 E	4.8E-03 E	0.0003	1.4 E	1.4E-06 E
2,3,7,8-TCDF	6.57	0.00000657	6.6E-06	0.1	0.66	6.6E-07
1,2,3,7,8-PeCDF	5.11	0.00000511	5.1E-06	0.03	0.15	1.5E-07
2,3,4,7,8-PeCDF	19.6	0.0000196	2.0E-05	0.3	5.9	5.9E-06
1,2,3,4,7,8-HxCDF	9.95	0.00000995	1.0E-05	0.1	1.0	1.0E-06
1,2,3,6,7,8-HxCDF	9.6	0.0000096	9.6E-06	0.1	0.96	9.6E-07
2,3,4,6,7,8-HxCDF	23.4	0.0000234	2.3E-05	0.1	2.3	2.3E-06
1,2,3,7,8,9-HxCDF	6.96	0.00000696	7.0E-06	0.1	0.70	7.0E-07
1,2,3,4,6,7,8-HpCDF	180	0.00018	1.8E-04	0.01	1.8	1.8E-06
1,2,3,4,7,8,9-HpCDF	6.37	0.00000637	6.4E-06	0.01	0.064	6.4E-08
OCDF	100	0.0001	1.0E-04	0.0003	0.030	3.0E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					43	4.3E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					43	4.3E-05
2,3,7,8-TCDD TEQ (without no-detects)					43	4.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1m
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-25-0COMP (0-1), November 2014						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.54	0.00000154	1.5E-06	1	1.54	1.5E-06
1,2,3,7,8-PeCDD	9.83	0.00000983	9.8E-06	1	9.8	9.8E-06
1,2,3,4,7,8-HxCDD	13.9	0.0000139	1.4E-05	0.1	1.39	1.4E-06
1,2,3,6,7,8-HxCDD	177	0.000177	1.8E-04	0.1	17.7	1.8E-05
1,2,3,7,8,9-HxCDD	38.7	0.0000387	3.9E-05	0.1	3.87	3.9E-06
1,2,3,4,6,7,8-HpCDD	1,640	0.00164	1.6E-03	0.01	16.4	1.6E-05
OCDD	6,750	0.00675	6.8E-03	0.0003	2.03	2.0E-06
2,3,7,8-TCDF	11.9	0.0000119	1.2E-05	0.1	1.19	1.2E-06
1,2,3,7,8-PeCDF	8.04	0.00000804	8.0E-06	0.03	0.241	2.4E-07
2,3,4,7,8-PeCDF	9.74	0.00000974	9.7E-06	0.3	2.9	2.9E-06
1,2,3,4,7,8-HxCDF	23.2	0.0000232	2.3E-05	0.1	2.32	2.3E-06
1,2,3,6,7,8-HxCDF	27	0.000027	2.7E-05	0.1	2.70	2.7E-06
2,3,4,6,7,8-HxCDF	22.6	0.0000226	2.3E-05	0.1	2.3	2.3E-06
1,2,3,7,8,9-HxCDF	1.06	0.00000106	1.1E-06	0.1	0.11	1.1E-07
1,2,3,4,6,7,8-HpCDF	616	0.000616	6.2E-04	0.01	6.2	6.2E-06
1,2,3,4,7,8,9-HpCDF	23.9	0.0000239	2.4E-05	0.01	0.239	2.4E-07
OCDF	384	0.000384	3.8E-04	0.0003	0.115	1.2E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					71	7.1E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					71	7.1E-05
2,3,7,8-TCDD TEQ (without no-detects)					71	7.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1n
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-25-1COMP (0-1), November 2014						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.45	0.00000145	1.5E-06	1	1.45	1.5E-06
1,2,3,7,8-PeCDD	14.1	0.0000141	1.4E-05	1	14.1	1.4E-05
1,2,3,4,7,8-HxCDD	25.9	0.0000259	2.6E-05	0.1	2.59	2.6E-06
1,2,3,6,7,8-HxCDD	425	0.000425	4.3E-04	0.1	43	4.3E-05
1,2,3,7,8,9-HxCDD	76.1	0.0000761	7.6E-05	0.1	7.6	7.6E-06
1,2,3,4,6,7,8-HpCDD	4,550	0.00455	4.6E-03	0.01	46	4.6E-05
OCDD	19,700	0.0197	2.0E-02	0.0003	5.9	5.9E-06
2,3,7,8-TCDF	28.4	0.0000284	2.8E-05	0.1	2.84	2.8E-06
1,2,3,7,8-PeCDF	12.9	0.0000129	1.3E-05	0.03	0.39	3.9E-07
2,3,4,7,8-PeCDF	14.4	0.0000144	1.4E-05	0.3	4.3	4.3E-06
1,2,3,4,7,8-HxCDF	62.3	0.0000623	6.2E-05	0.1	6.2	6.2E-06
1,2,3,6,7,8-HxCDF	63.8	0.0000638	6.4E-05	0.1	6.4	6.4E-06
2,3,4,6,7,8-HxCDF	46.8	0.0000468	4.7E-05	0.1	4.7	4.7E-06
1,2,3,7,8,9-HxCDF	2.2	0.0000022	2.2E-06	0.1	0.22	2.2E-07
1,2,3,4,6,7,8-HpCDF	1220	0.00122	1.2E-03	0.01	12.2	1.2E-05
1,2,3,4,7,8,9-HpCDF	44.9	0.0000449	4.5E-05	0.01	0.45	4.5E-07
OCDF	773	0.000773	7.7E-04	0.0003	0.232	2.3E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					158	1.6E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					158	1.6E-04
2,3,7,8-TCDD TEQ (without no-detects)					158	1.6E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1o
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-25-2COMP (0-1), November 2014						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.16	0.00000116	1.2E-06	1	1.16	1.2E-06
1,2,3,7,8-PeCDD	10.2	0.0000102	1.0E-05	1	10.2	1.0E-05
1,2,3,4,7,8-HxCDD	19.7	0.0000197	2.0E-05	0.1	2.0	2.0E-06
1,2,3,6,7,8-HxCDD	288	0.000288	2.9E-04	0.1	29	2.9E-05
1,2,3,7,8,9-HxCDD	50.6	0.0000506	5.1E-05	0.1	5.1	5.1E-06
1,2,3,4,6,7,8-HpCDD	3,470	0.00347	3.5E-03	0.01	35	3.5E-05
OCDD	14,100	0.0141	1.4E-02	0.0003	4.2	4.2E-06
2,3,7,8-TCDF	19.1	0.0000191	1.9E-05	0.1	1.91	1.9E-06
1,2,3,7,8-PeCDF	9.79	0.00000979	9.8E-06	0.03	0.29	2.9E-07
2,3,4,7,8-PeCDF	11.4	0.0000114	1.1E-05	0.3	3.4	3.4E-06
1,2,3,4,7,8-HxCDF	48.8	0.0000488	4.9E-05	0.1	4.9	4.9E-06
1,2,3,6,7,8-HxCDF	46.9	0.0000469	4.7E-05	0.1	4.7	4.7E-06
2,3,4,6,7,8-HxCDF	32.1	0.0000321	3.2E-05	0.1	3.2	3.2E-06
1,2,3,7,8,9-HxCDF	1.75	0.00000175	1.8E-06	0.1	0.2	1.8E-07
1,2,3,4,6,7,8-HpCDF	1020	0.00102	1.0E-03	0.01	10.2	1.0E-05
1,2,3,4,7,8,9-HpCDF	33.7	0.0000337	3.4E-05	0.01	0.34	3.4E-07
OCDF	676	0.000676	6.8E-04	0.0003	0.203	2.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					115	1.2E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					115	1.2E-04
2,3,7,8-TCDD TEQ (without no-detects)					115	1.2E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1p
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-25-3COMP (0-1), November 2014						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	5.04	0.00000504	5.0E-06	1	5.04	5.0E-06
1,2,3,7,8-PeCDD	39.4	0.0000394	3.9E-05	1	39.4	3.9E-05
1,2,3,4,7,8-HxCDD	63.5	0.0000635	6.4E-05	0.1	6.35	6.4E-06
1,2,3,6,7,8-HxCDD	1,260	0.00126	1.3E-03	0.1	126	1.3E-04
1,2,3,7,8,9-HxCDD	189	0.000189	1.9E-04	0.1	18.9	1.9E-05
1,2,3,4,6,7,8-HpCDD	12,200	0.0122	1.2E-02	0.01	122	1.2E-04
OCDD	39,500	0.0395	4.0E-02	0.0003	11.9	1.2E-05
2,3,7,8-TCDF	76.7	0.0000767	7.7E-05	0.1	7.67	7.7E-06
1,2,3,7,8-PeCDF	45	0.000045	4.5E-05	0.03	1.35	1.4E-06
2,3,4,7,8-PeCDF	52	0.000052	5.2E-05	0.3	15.6	1.6E-05
1,2,3,4,7,8-HxCDF	267	0.000267	2.7E-04	0.1	26.7	2.7E-05
1,2,3,6,7,8-HxCDF	173	0.000173	1.7E-04	0.1	17.3	1.7E-05
2,3,4,6,7,8-HxCDF	166	0.000166	1.7E-04	0.1	16.6	1.7E-05
1,2,3,7,8,9-HxCDF	8.15	0.00000815	8.2E-06	0.1	0.82	8.2E-07
1,2,3,4,6,7,8-HpCDF	6,560	0.00656	6.6E-03	0.01	65.6	6.6E-05
1,2,3,4,7,8,9-HpCDF	198	0.000198	2.0E-04	0.01	1.98	2.0E-06
OCDF	4,790	0.00479	4.8E-03	0.0003	1.437	1.4E-06
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					485	4.8E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					485	4.8E-04
2,3,7,8-TCDD TEQ (without no-detects)					485	4.8E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1q
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-25-4COMP (0-1), November 2014						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.27	0.00000127	1.3E-06	1	1.27	1.3E-06
1,2,3,7,8-PeCDD	9.51	0.00000951	9.5E-06	1	9.51	9.5E-06
1,2,3,4,7,8-HxCDD	17	0.000017	1.7E-05	0.1	1.70	1.7E-06
1,2,3,6,7,8-HxCDD	254	0.000254	2.5E-04	0.1	25.4	2.5E-05
1,2,3,7,8,9-HxCDD	53.9	0.0000539	5.4E-05	0.1	5.39	5.4E-06
1,2,3,4,6,7,8-HpCDD	2,610	0.00261	2.6E-03	0.01	26.1	2.6E-05
OCDD	13,000	0.013	1.3E-02	0.0003	3.90	3.9E-06
2,3,7,8-TCDF	15.8	0.0000158	1.6E-05	0.1	1.58	1.6E-06
1,2,3,7,8-PeCDF	7.76	0.00000776	7.8E-06	0.03	0.233	2.3E-07
2,3,4,7,8-PeCDF	8.7	0.0000087	8.7E-06	0.3	2.61	2.6E-06
1,2,3,4,7,8-HxCDF	39	0.000039	3.9E-05	0.1	3.90	3.9E-06
1,2,3,6,7,8-HxCDF	35.7	0.0000357	3.6E-05	0.1	3.57	3.6E-06
2,3,4,6,7,8-HxCDF	26.6	0.0000266	2.7E-05	0.1	2.66	2.7E-06
1,2,3,7,8,9-HxCDF	1.5	0.0000015	1.5E-06	0.1	0.15	1.5E-07
1,2,3,4,6,7,8-HpCDF	805	0.000805	8.1E-04	0.01	8.05	8.1E-06
1,2,3,4,7,8,9-HpCDF	27.1	0.0000271	2.7E-05	0.01	0.271	2.7E-07
OCDF	658	0.000658	6.6E-04	0.0003	0.197	2.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					96	9.6E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					96	9.6E-05
2,3,7,8-TCDD TEQ (without no-detects)					96	9.6E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1r
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-200ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.446	0.000000446	4.5E-07	1	0.45	4.5E-07
1,2,3,7,8-PeCDD	2.49	0.00000249	2.5E-06	1	2.5	2.5E-06
1,2,3,4,7,8-HxCDD	4.06	0.00000406	4.1E-06	0.1	0.41	4.1E-07
1,2,3,6,7,8-HxCDD	154	0.000154	1.5E-04	0.1	15.4	1.5E-05
1,2,3,7,8,9-HxCDD	16.4	0.0000164	1.6E-05	0.1	1.64	1.6E-06
1,2,3,4,6,7,8-HpCDD	1,400	0.0014	1.4E-03	0.01	14.0	1.4E-05
OCDD	7,720	0.00772	7.7E-03	0.0003	2.32	2.3E-06
2,3,7,8-TCDF	8.53	0.00000853	8.5E-06	0.1	0.85	8.5E-07
1,2,3,7,8-PeCDF	4.29	0.00000429	4.3E-06	0.03	0.129	1.3E-07
2,3,4,7,8-PeCDF	5.04	0.00000504	5.0E-06	0.3	1.5	1.5E-06
1,2,3,4,7,8-HxCDF	22.7	0.0000227	2.3E-05	0.1	2.27	2.3E-06
1,2,3,6,7,8-HxCDF	17.3	0.0000173	1.7E-05	0.1	1.73	1.7E-06
2,3,4,6,7,8-HxCDF	13.3	0.0000133	1.3E-05	0.1	1.3	1.3E-06
1,2,3,7,8,9-HxCDF	0.865	0.000000865	8.7E-07	0.1	0.09	8.7E-08
1,2,3,4,6,7,8-HpCDF	367	0.000367	3.7E-04	0.01	3.7	3.7E-06
1,2,3,4,7,8,9-HpCDF	12.6	0.0000126	1.3E-05	0.01	0.126	1.3E-07
OCDF	347	0.000347	3.5E-04	0.0003	0.104	1.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					49	4.9E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					49	4.9E-05
2,3,7,8-TCDD TEQ (without no-detects)					49	4.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1s
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-200AC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.127	0.000000127	1.3E-07	1	0.13	1.3E-07
1,2,3,7,8-PeCDD	0.4	0.0000004	4.0E-07	1	0.4	4.0E-07
1,2,3,4,7,8-HxCDD	0.685	0.000000685	6.9E-07	0.1	0.07	6.9E-08
1,2,3,6,7,8-HxCDD	15.7	0.0000157	1.6E-05	0.1	2	1.6E-06
1,2,3,7,8,9-HxCDD	2.12	0.00000212	2.1E-06	0.1	0.2	2.1E-07
1,2,3,4,6,7,8-HpCDD	132	0.000132	1.3E-04	0.01	1	1.3E-06
OCDD	717	0.000717	7.2E-04	0.0003	0.2	2.2E-07
2,3,7,8-TCDF	0.905	0.000000905	9.1E-07	0.1	0.09	9.1E-08
1,2,3,7,8-PeCDF	0.463	0.000000463	4.6E-07	0.03	0.01	1.4E-08
2,3,4,7,8-PeCDF	0.495	0.000000495	5.0E-07	0.3	0.1	1.5E-07
1,2,3,4,7,8-HxCDF	1.73	0.00000173	1.7E-06	0.1	0.2	1.7E-07
1,2,3,6,7,8-HxCDF	1.67	0.00000167	1.7E-06	0.1	0.2	1.7E-07
2,3,4,6,7,8-HxCDF	1.6	0.0000016	1.6E-06	0.1	0.2	1.6E-07
1,2,3,7,8,9-HxCDF	0.161 U	0.000000161	1.6E-07 U	0.1	0.02 U	1.6E-08 U
1,2,3,4,6,7,8-HpCDF	68.4	0.0000684	6.8E-05	0.01	0.7	6.8E-07
1,2,3,4,7,8,9-HpCDF	2.08	0.00000208	2.1E-06	0.01	0.02	2.1E-08
OCDF	67.7	0.0000677	6.8E-05	0.0003	0.020	2.0E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					5.4	5.4E-06
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					5.4	5.4E-06
2,3,7,8-TCDD TEQ (without no-detects)					5.4	5.4E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1t
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-201ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.97	0.00000197	2.0E-06	1	1.97	2.0E-06
1,2,3,7,8-PeCDD	18.7	0.0000187	1.9E-05	1	18.7	1.9E-05
1,2,3,4,7,8-HxCDD	40.6	0.0000406	4.1E-05	0.1	4.1	4.1E-06
1,2,3,6,7,8-HxCDD	833	0.000833	8.3E-04	0.1	83	8.3E-05
1,2,3,7,8,9-HxCDD	104	0.000104	1.0E-04	0.1	10.4	1.0E-05
1,2,3,4,6,7,8-HpCDD	7,340	0.00734	7.3E-03	0.01	73	7.3E-05
OCDD	47,900	0.0479	4.8E-02	0.0003	14.4	1.4E-05
2,3,7,8-TCDF	38	0.000038	3.8E-05	0.1	3.80	3.8E-06
1,2,3,7,8-PeCDF	25.7	0.0000257	2.6E-05	0.03	0.77	7.7E-07
2,3,4,7,8-PeCDF	29.2	0.0000292	2.9E-05	0.3	8.8	8.8E-06
1,2,3,4,7,8-HxCDF	106	0.000106	1.1E-04	0.1	10.6	1.1E-05
1,2,3,6,7,8-HxCDF	85.6	0.0000856	8.6E-05	0.1	8.6	8.6E-06
2,3,4,6,7,8-HxCDF	83.8	0.0000838	8.4E-05	0.1	8.4	8.4E-06
1,2,3,7,8,9-HxCDF	4.01	0.00000401	4.0E-06	0.1	0.4	4.0E-07
1,2,3,4,6,7,8-HpCDF	1,720	0.00172	1.7E-03	0.01	17.2	1.7E-05
1,2,3,4,7,8,9-HpCDF	53.4	0.0000534	5.3E-05	0.01	0.53	5.3E-07
OCDF	1,350	0.00135	1.4E-03	0.0003	0.405	4.1E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					266	2.7E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					266	2.7E-04
2,3,7,8-TCDD TEQ (without no-detects)					266	2.7E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1u
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-201ABC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	2.11	0.00000211	2.1E-06	1	2.11	2.1E-06
1,2,3,7,8-PeCDD	3.19	0.00000319	3.2E-06	1	3.2	3.2E-06
1,2,3,4,7,8-HxCDD	5.31	0.00000531	5.3E-06	0.1	0.53	5.3E-07
1,2,3,6,7,8-HxCDD	144	0.000144	1.4E-04	0.1	14	1.4E-05
1,2,3,7,8,9-HxCDD	18.5	0.0000185	1.9E-05	0.1	1.9	1.9E-06
1,2,3,4,6,7,8-HpCDD	1,180	0.00118	1.2E-03	0.01	12	1.2E-05
OCDD	6,000	0.006	6.0E-03	0.0003	1.8	1.8E-06
2,3,7,8-TCDF	8.63	0.00000863	8.6E-06	0.1	0.86	8.6E-07
1,2,3,7,8-PeCDF	3.67	0.00000367	3.7E-06	0.03	0.11	1.1E-07
2,3,4,7,8-PeCDF	3.94	0.00000394	3.9E-06	0.3	1.2	1.2E-06
1,2,3,4,7,8-HxCDF	30.3	0.0000303	3.0E-05	0.1	3.0	3.0E-06
1,2,3,6,7,8-HxCDF	24.8	0.0000248	2.5E-05	0.1	2.5	2.5E-06
2,3,4,6,7,8-HxCDF	14.3	0.0000143	1.4E-05	0.1	1.4	1.4E-06
1,2,3,7,8,9-HxCDF	1.19	0.00000119	1.2E-06	0.1	0.12	1.2E-07
1,2,3,4,6,7,8-HpCDF	800	0.0008	8.0E-04	0.01	8.0	8.0E-06
1,2,3,4,7,8,9-HpCDF	24.7	0.0000247	2.5E-05	0.01	0.25	2.5E-07
OCDF	1,000	0.001	1.0E-03	0.0003	0.300	3.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					53	5.3E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					53	5.3E-05
2,3,7,8-TCDD TEQ (without no-detects)					53	5.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1v
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-202ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.146 U	0.000000146 U	1.5E-07 U	1	0.15 U	1.5E-07 U
1,2,3,7,8-PeCDD	2.33	0.00000233	2.3E-06	1	2.33	2.3E-06
1,2,3,4,7,8-HxCDD	3.54	0.00000354	3.5E-06	0.1	0.35	3.5E-07
1,2,3,6,7,8-HxCDD	98.9	0.0000989	9.9E-05	0.1	9.9	9.9E-06
1,2,3,7,8,9-HxCDD	12.5	0.0000125	1.3E-05	0.1	1.25	1.3E-06
1,2,3,4,6,7,8-HpCDD	713	0.000713	7.1E-04	0.01	7.1	7.1E-06
OCDD	3,610	0.00361	3.6E-03	0.0003	1.08	1.1E-06
2,3,7,8-TCDF	4.12	0.00000412	4.1E-06	0.1	0.41	4.1E-07
1,2,3,7,8-PeCDF	2.85	0.00000285	2.9E-06	0.03	0.086	8.6E-08
2,3,4,7,8-PeCDF	3.49	0.00000349	3.5E-06	0.3	1.05	1.0E-06
1,2,3,4,7,8-HxCDF	11.4	0.0000114	1.1E-05	0.1	1.14	1.1E-06
1,2,3,6,7,8-HxCDF	11.1	0.0000111	1.1E-05	0.1	1.11	1.1E-06
2,3,4,6,7,8-HxCDF	11.8	0.0000118	1.2E-05	0.1	1.18	1.2E-06
1,2,3,7,8,9-HxCDF	0.523	0.000000523	5.2E-07	0.1	0.05	5.2E-08
1,2,3,4,6,7,8-HpCDF	438	0.000438	4.4E-04	0.01	4.38	4.4E-06
1,2,3,4,7,8,9-HpCDF	12	0.000012	1.2E-05	0.01	0.120	1.2E-07
OCDF	351	0.000351	3.5E-04	0.0003	0.105	1.1E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					32	3.2E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					32	3.2E-05
2,3,7,8-TCDD TEQ (without no-detects)					32	3.2E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1w
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-203ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.741	0.000000741	7.4E-07	1	0.74	7.4E-07
1,2,3,7,8-PeCDD	7.26	0.00000726	7.3E-06	1	7.26	7.3E-06
1,2,3,4,7,8-HxCDD	14.9	0.0000149	1.5E-05	0.1	1.49	1.5E-06
1,2,3,6,7,8-HxCDD	343	0.000343	3.4E-04	0.1	34.3	3.4E-05
1,2,3,7,8,9-HxCDD	45.5	0.0000455	4.6E-05	0.1	4.55	4.6E-06
1,2,3,4,6,7,8-HpCDD	3,320	0.00332	3.3E-03	0.01	33.2	3.3E-05
OCDD	25,100	0.0251	2.5E-02	0.0003	7.53	7.5E-06
2,3,7,8-TCDF	15.5	0.0000155	1.6E-05	0.1	1.55	1.6E-06
1,2,3,7,8-PeCDF	8.87	0.00000887	8.9E-06	0.03	0.266	2.7E-07
2,3,4,7,8-PeCDF	9.7	0.0000097	9.7E-06	0.3	2.91	2.9E-06
1,2,3,4,7,8-HxCDF	48.4	0.0000484	4.8E-05	0.1	4.84	4.8E-06
1,2,3,6,7,8-HxCDF	49.5	0.0000495	5.0E-05	0.1	4.95	5.0E-06
2,3,4,6,7,8-HxCDF	33.5	0.0000335	3.4E-05	0.1	3.35	3.4E-06
1,2,3,7,8,9-HxCDF	1.48	0.00000148	1.5E-06	0.1	0.15	1.5E-07
1,2,3,4,6,7,8-HpCDF	1,190	0.00119	1.2E-03	0.01	11.90	1.2E-05
1,2,3,4,7,8,9-HpCDF	33.4	0.0000334	3.3E-05	0.01	0.334	3.3E-07
OCDF	1,310	0.00131	1.3E-03	0.0003	0.393	3.9E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					120	1.2E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					120	1.2E-04
2,3,7,8-TCDD TEQ (without no-detects)					120	1.2E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1x
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-203AC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.107 U	0.000000107 U	1.1E-07 U	1	0.11 U	1.1E-07 U
1,2,3,7,8-PeCDD	0.8	0.0000008	8.0E-07	1	0.80	8.0E-07
1,2,3,4,7,8-HxCDD	1.29	0.00000129	1.3E-06	0.1	0.13	1.3E-07
1,2,3,6,7,8-HxCDD	30.9	0.0000309	3.1E-05	0.1	3.1	3.1E-06
1,2,3,7,8,9-HxCDD	3.79	0.00000379	3.8E-06	0.1	0.38	3.8E-07
1,2,3,4,6,7,8-HpCDD	251	0.000251	2.5E-04	0.01	2.5	2.5E-06
OCDD	725	0.000725	7.3E-04	0.0003	0.22	2.2E-07
2,3,7,8-TCDF	1.38	0.00000138	1.4E-06	0.1	0.14	1.4E-07
1,2,3,7,8-PeCDF	0.805	0.000000805	8.1E-07	0.03	0.024	2.4E-08
2,3,4,7,8-PeCDF	1.04	0.00000104	1.0E-06	0.3	0.31	3.1E-07
1,2,3,4,7,8-HxCDF	4.57	0.00000457	4.6E-06	0.1	0.46	4.6E-07
1,2,3,6,7,8-HxCDF	4.44	0.00000444	4.4E-06	0.1	0.44	4.4E-07
2,3,4,6,7,8-HxCDF	4.81	0.00000481	4.8E-06	0.1	0.48	4.8E-07
1,2,3,7,8,9-HxCDF	0.244	0.000000244	2.4E-07	0.1	0.02	2.4E-08
1,2,3,4,6,7,8-HpCDF	198	0.000198	2.0E-04	0.01	1.98	2.0E-06
1,2,3,4,7,8,9-HpCDF	5.18	0.00000518	5.2E-06	0.01	0.052	5.2E-08
OCDF	180	0.00018	1.8E-04	0.0003	0.054	5.4E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					11	1.1E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					11	1.1E-05
2,3,7,8-TCDD TEQ (without no-detects)					11	1.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1y
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-204ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	2.14	0.00000214	2.1E-06	1	2.14	2.1E-06
1,2,3,7,8-PeCDD	15.3	0.0000153	1.5E-05	1	15.30	1.5E-05
1,2,3,4,7,8-HxCDD	37.3	0.0000373	3.7E-05	0.1	3.73	3.7E-06
1,2,3,6,7,8-HxCDD	706	0.000706	7.1E-04	0.1	70.6	7.1E-05
1,2,3,7,8,9-HxCDD	66.6	0.0000666	6.7E-05	0.1	6.66	6.7E-06
1,2,3,4,6,7,8-HpCDD	3,950	0.00395	4.0E-03	0.01	39.5	4.0E-05
OCDD	14,400	0.0144	1.4E-02	0.0003	4.32	4.3E-06
2,3,7,8-TCDF	22.5	0.0000225	2.3E-05	0.1	2.25	2.3E-06
1,2,3,7,8-PeCDF	14.1	0.0000141	1.4E-05	0.03	0.423	4.2E-07
2,3,4,7,8-PeCDF	12.2	0.0000122	1.2E-05	0.3	3.66	3.7E-06
1,2,3,4,7,8-HxCDF	145	0.000145	1.5E-04	0.1	14.50	1.5E-05
1,2,3,6,7,8-HxCDF	99.9 U	0.0000999 U	1.0E-04 U	0.1	9.99 U	1.0E-05 U
2,3,4,6,7,8-HxCDF	74.8	0.0000748	7.5E-05	0.1	7.48	7.5E-06
1,2,3,7,8,9-HxCDF	5.82	0.00000582	5.8E-06	0.1	0.58	5.8E-07
1,2,3,4,6,7,8-HpCDF	3,720	0.00372	3.7E-03	0.01	37.20	3.7E-05
1,2,3,4,7,8,9-HpCDF	103	0.000103	1.0E-04	0.01	1.030	1.0E-06
OCDF	2,670	0.00267	2.7E-03	0.0003	0.801	8.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					220	2.2E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					215	2.2E-04
2,3,7,8-TCDD TEQ (without no-detects)					210	2.1E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1z
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-204AC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.42	0.00000142	1.4E-06	1	1.42	1.4E-06
1,2,3,7,8-PeCDD	14.1	0.0000141	1.4E-05	1	14.10	1.4E-05
1,2,3,4,7,8-HxCDD	20.1	0.0000201	2.0E-05	0.1	2.01	2.0E-06
1,2,3,6,7,8-HxCDD	372	0.000372	3.7E-04	0.1	37.2	3.7E-05
1,2,3,7,8,9-HxCDD	69.3	0.0000693	6.9E-05	0.1	6.93	6.9E-06
1,2,3,4,6,7,8-HpCDD	253	0.000253	2.5E-04	0.01	2.5	2.5E-06
OCDD	1,630	0.00163	1.6E-03	0.0003	0.49	4.9E-07
2,3,7,8-TCDF	19.2	0.0000192	1.9E-05	0.1	1.92	1.9E-06
1,2,3,7,8-PeCDF	11.3	0.0000113	1.1E-05	0.03	0.339	3.4E-07
2,3,4,7,8-PeCDF	12.4	0.0000124	1.2E-05	0.3	3.72	3.7E-06
1,2,3,4,7,8-HxCDF	43.6	0.0000436	4.4E-05	0.1	4.36	4.4E-06
1,2,3,6,7,8-HxCDF	48.1 U	0.0000481 U	4.8E-05 U	0.1	4.81 U	4.8E-06 U
2,3,4,6,7,8-HxCDF	40.4	0.0000404	4.0E-05	0.1	4.04	4.0E-06
1,2,3,7,8,9-HxCDF	1.81	0.00000181	1.8E-06	0.1	0.18	1.8E-07
1,2,3,4,6,7,8-HpCDF	1,260	0.00126	1.3E-03	0.01	12.60	1.3E-05
1,2,3,4,7,8,9-HpCDF	42.7 U	0.0000427 U	4.3E-05 U	0.01	0.427 U	4.3E-07 U
OCDF	1,090	0.00109	1.1E-03	0.0003	0.327	3.3E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					97	9.7E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					95	9.5E-05
2,3,7,8-TCDD TEQ (without no-detects)					92	9.2E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1aa
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-205ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.939	0.000000939	9.4E-07	1	0.94	9.4E-07
1,2,3,7,8-PeCDD	5.99	0.00000599	6.0E-06	1	5.99	6.0E-06
1,2,3,4,7,8-HxCDD	12.8	0.0000128	1.3E-05	0.1	1.28	1.3E-06
1,2,3,6,7,8-HxCDD	256	0.000256	2.6E-04	0.1	25.6	2.6E-05
1,2,3,7,8,9-HxCDD	41.6	0.0000416	4.2E-05	0.1	4.16	4.2E-06
1,2,3,4,6,7,8-HpCDD	1,980	0.00198	2.0E-03	0.01	19.8	2.0E-05
OCDD	11,700	0.0117	1.2E-02	0.0003	3.51	3.5E-06
2,3,7,8-TCDF	17.1	0.0000171	1.7E-05	0.1	1.71	1.7E-06
1,2,3,7,8-PeCDF	5.8	0.0000058	5.8E-06	0.03	0.174	1.7E-07
2,3,4,7,8-PeCDF	6.25	0.00000625	6.3E-06	0.3	1.88	1.9E-06
1,2,3,4,7,8-HxCDF	51.7	0.0000517	5.2E-05	0.1	5.17	5.2E-06
1,2,3,6,7,8-HxCDF	45.8 U	0.0000458 U	4.6E-05 U	0.1	4.58 U	4.6E-06 U
2,3,4,6,7,8-HxCDF	27.1	0.0000271	2.7E-05	0.1	2.71	2.7E-06
1,2,3,7,8,9-HxCDF	1.41	0.00000141	1.4E-06	0.1	0.14	1.4E-07
1,2,3,4,6,7,8-HpCDF	1,440	0.00144	1.4E-03	0.01	14.40	1.4E-05
1,2,3,4,7,8,9-HpCDF	44.7	0.0000447	4.5E-05	0.01	0.447	4.5E-07
OCDF	1,780	0.00178	1.8E-03	0.0003	0.534	5.3E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					93	9.3E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					91	9.1E-05
2,3,7,8-TCDD TEQ (without no-detects)					88	8.8E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1ab
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-206ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.3	0.0000013	1.3E-06	1	1.30	1.3E-06
1,2,3,7,8-PeCDD	10.8	0.0000108	1.1E-05	1	10.80	1.1E-05
1,2,3,4,7,8-HxCDD	15.4	0.0000154	1.5E-05	0.1	1.54	1.5E-06
1,2,3,6,7,8-HxCDD	297	0.000297	3.0E-04	0.1	29.7	3.0E-05
1,2,3,7,8,9-HxCDD	54	0.000054	5.4E-05	0.1	5.40	5.4E-06
1,2,3,4,6,7,8-HpCDD	2,420	0.00242	2.4E-03	0.01	24.2	2.4E-05
OCDD	13,600	0.0136	1.4E-02	0.0003	4.08	4.1E-06
2,3,7,8-TCDF	16.4	0.0000164	1.6E-05	0.1	1.64	1.6E-06
1,2,3,7,8-PeCDF	9.21	0.00000921	9.2E-06	0.03	0.276	2.8E-07
2,3,4,7,8-PeCDF	9.97	0.00000997	1.0E-05	0.3	2.99	3.0E-06
1,2,3,4,7,8-HxCDF	34.6	0.0000346	3.5E-05	0.1	3.46	3.5E-06
1,2,3,6,7,8-HxCDF	38.7	0.0000387	3.9E-05	0.1	3.87	3.9E-06
2,3,4,6,7,8-HxCDF	34	0.000034	3.4E-05	0.1	3.40	3.4E-06
1,2,3,7,8,9-HxCDF	1.61	0.00000161	1.6E-06	0.1	0.16	1.6E-07
1,2,3,4,6,7,8-HpCDF	843	0.000843	8.4E-04	0.01	8.43	8.4E-06
1,2,3,4,7,8,9-HpCDF	29.5	0.0000295	3.0E-05	0.01	0.295	3.0E-07
OCDF	671	0.000671	6.7E-04	0.0003	0.201	2.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					102	1.0E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					102	1.0E-04
2,3,7,8-TCDD TEQ (without no-detects)					102	1.0E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1ac
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-207ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.666	0.000000666	6.7E-07	1	0.67	6.7E-07
1,2,3,7,8-PeCDD	4.14	0.00000414	4.1E-06	1	4.14	4.1E-06
1,2,3,4,7,8-HxCDD	6.99	0.00000699	7.0E-06	0.1	0.70	7.0E-07
1,2,3,6,7,8-HxCDD	172	0.000172	1.7E-04	0.1	17.2	1.7E-05
1,2,3,7,8,9-HxCDD	22.5	0.0000225	2.3E-05	0.1	2.25	2.3E-06
1,2,3,4,6,7,8-HpCDD	1,230	0.00123	1.2E-03	0.01	12.3	1.2E-05
OCDD	4,390	0.00439	4.4E-03	0.0003	1.32	1.3E-06
2,3,7,8-TCDF	13.8	0.0000138	1.4E-05	0.1	1.38	1.4E-06
1,2,3,7,8-PeCDF	4.23	0.00000423	4.2E-06	0.03	0.127	1.3E-07
2,3,4,7,8-PeCDF	4.69	0.00000469	4.7E-06	0.3	1.41	1.4E-06
1,2,3,4,7,8-HxCDF	23.2	0.0000232	2.3E-05	0.1	2.32	2.3E-06
1,2,3,6,7,8-HxCDF	24.3	0.0000243	2.4E-05	0.1	2.43	2.4E-06
2,3,4,6,7,8-HxCDF	22.9	0.0000229	2.3E-05	0.1	2.29	2.3E-06
1,2,3,7,8,9-HxCDF	1.45	0.00000145	1.5E-06	0.1	0.15	1.5E-07
1,2,3,4,6,7,8-HpCDF	713	0.000713	7.1E-04	0.01	7.13	7.1E-06
1,2,3,4,7,8,9-HpCDF	27.7	0.0000277	2.8E-05	0.01	0.277	2.8E-07
OCDF	699	0.000699	7.0E-04	0.0003	0.210	2.1E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					56	5.6E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					56	5.6E-05
2,3,7,8-TCDD TEQ (without no-detects)					56	5.6E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1ad
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-207ABC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	6.3	0.0000063	6.3E-06	1	6.30	6.3E-06
1,2,3,7,8-PeCDD	11.9	0.0000119	1.2E-05	1	11.90	1.2E-05
1,2,3,4,7,8-HxCDD	37	0.000037	3.7E-05	0.1	3.70	3.7E-06
1,2,3,6,7,8-HxCDD	1,160	0.00116	1.2E-03	0.1	116.0	1.2E-04
1,2,3,7,8,9-HxCDD	157	0.000157	1.6E-04	0.1	15.70	1.6E-05
1,2,3,4,6,7,8-HpCDD	10,800	0.0108	1.1E-02	0.01	108.0	1.1E-04
OCDD	23,400	0.0234	2.3E-02	0.0003	7.02	7.0E-06
2,3,7,8-TCDF	95.6	0.0000956	9.6E-05	0.1	9.56	9.6E-06
1,2,3,7,8-PeCDF	16.2	0.0000162	1.6E-05	0.03	0.486	4.9E-07
2,3,4,7,8-PeCDF	12.5	0.0000125	1.3E-05	0.3	3.75	3.8E-06
1,2,3,4,7,8-HxCDF	224	0.000224	2.2E-04	0.1	22.40	2.2E-05
1,2,3,6,7,8-HxCDF	151 U	0.000151 U	1.5E-04 U	0.1	15.10 U	1.5E-05 U
2,3,4,6,7,8-HxCDF	139	0.000139	1.4E-04	0.1	13.90	1.4E-05
1,2,3,7,8,9-HxCDF	8.96	0.00000896	9.0E-06	0.1	0.90	9.0E-07
1,2,3,4,6,7,8-HpCDF	6,220	0.00622	6.2E-03	0.01	62.20	6.2E-05
1,2,3,4,7,8,9-HpCDF	317	0.000317	3.2E-04	0.01	3.170	3.2E-06
OCDF	7,280	0.00728	7.3E-03	0.0003	2.184	2.2E-06
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					402	4.0E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					395	3.9E-04
2,3,7,8-TCDD TEQ (without no-detects)					387	3.9E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1ae
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-208ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.712	0.000000712	7.1E-07	1	0.71	7.1E-07
1,2,3,7,8-PeCDD	3.63	0.00000363	3.6E-06	1	3.63	3.6E-06
1,2,3,4,7,8-HxCDD	5.34	0.00000534	5.3E-06	0.1	0.53	5.3E-07
1,2,3,6,7,8-HxCDD	122	0.000122	1.2E-04	0.1	12.2	1.2E-05
1,2,3,7,8,9-HxCDD	19.1	0.0000191	1.9E-05	0.1	1.91	1.9E-06
1,2,3,4,6,7,8-HpCDD	1,000	0.001	1.0E-03	0.01	10.0	1.0E-05
OCDD	6,350	0.00635	6.4E-03	0.0003	1.91	1.9E-06
2,3,7,8-TCDF	7.82	0.00000782	7.8E-06	0.1	0.78	7.8E-07
1,2,3,7,8-PeCDF	4.05	0.00000405	4.1E-06	0.03	0.122	1.2E-07
2,3,4,7,8-PeCDF	4.91	0.00000491	4.9E-06	0.3	1.47	1.5E-06
1,2,3,4,7,8-HxCDF	13.3	0.0000133	1.3E-05	0.1	1.33	1.3E-06
1,2,3,6,7,8-HxCDF	13.1	0.0000131	1.3E-05	0.1	1.31	1.3E-06
2,3,4,6,7,8-HxCDF	13.3	0.0000133	1.3E-05	0.1	1.33	1.3E-06
1,2,3,7,8,9-HxCDF	0.746	0.000000746	7.5E-07	0.1	0.07	7.5E-08
1,2,3,4,6,7,8-HpCDF	349	0.000349	3.5E-04	0.01	3.49	3.5E-06
1,2,3,4,7,8,9-HpCDF	11.2	0.0000112	1.1E-05	0.01	0.112	1.1E-07
OCDF	288	0.000288	2.9E-04	0.0003	0.086	8.6E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					41	4.1E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					41	4.1E-05
2,3,7,8-TCDD TEQ (without no-detects)					41	4.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1af
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-208ABC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.269	0.000000269	2.7E-07	1	0.27	2.7E-07
1,2,3,7,8-PeCDD	0.861	0.000000861	8.6E-07	1	0.86	8.6E-07
1,2,3,4,7,8-HxCDD	1.37	0.00000137	1.4E-06	0.1	0.14	1.4E-07
1,2,3,6,7,8-HxCDD	24.9	0.0000249	2.5E-05	0.1	2.5	2.5E-06
1,2,3,7,8,9-HxCDD	3.88	0.00000388	3.9E-06	0.1	0.39	3.9E-07
1,2,3,4,6,7,8-HpCDD	212	0.000212	2.1E-04	0.01	2.1	2.1E-06
OCDD	1,100	0.0011	1.1E-03	0.0003	0.33	3.3E-07
2,3,7,8-TCDF	1.25	0.00000125	1.3E-06	0.1	0.13	1.3E-07
1,2,3,7,8-PeCDF	0.72	0.00000072	7.2E-07	0.03	0.022	2.2E-08
2,3,4,7,8-PeCDF	0.829	0.000000829	8.3E-07	0.3	0.25	2.5E-07
1,2,3,4,7,8-HxCDF	3.45	0.00000345	3.5E-06	0.1	0.35	3.5E-07
1,2,3,6,7,8-HxCDF	3.82	0.00000382	3.8E-06	0.1	0.38	3.8E-07
2,3,4,6,7,8-HxCDF	3.42	0.00000342	3.4E-06	0.1	0.34	3.4E-07
1,2,3,7,8,9-HxCDF	0.474	0.000000474	4.7E-07	0.1	0.05	4.7E-08
1,2,3,4,6,7,8-HpCDF	144	0.000144	1.4E-04	0.01	1.44	1.4E-06
1,2,3,4,7,8,9-HpCDF	4.4	0.0000044	4.4E-06	0.01	0.044	4.4E-08
OCDF	127	0.000127	1.3E-04	0.0003	0.038	3.8E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					9.6	9.6E-06
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					9.6	9.6E-06
2,3,7,8-TCDD TEQ (without no-detects)					9.6	9.6E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1ag
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-209ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.47	0.00000147	1.5E-06	1	1.47	1.5E-06
1,2,3,7,8-PeCDD	16.2	0.0000162	1.6E-05	1	16.20	1.6E-05
1,2,3,4,7,8-HxCDD	23.4	0.0000234	2.3E-05	0.1	2.34	2.3E-06
1,2,3,6,7,8-HxCDD	422	0.000422	4.2E-04	0.1	42.2	4.2E-05
1,2,3,7,8,9-HxCDD	73.8	0.0000738	7.4E-05	0.1	7.38	7.4E-06
1,2,3,4,6,7,8-HpCDD	3,220	0.00322	3.2E-03	0.01	32.2	3.2E-05
OCDD	14,200	0.0142	1.4E-02	0.0003	4.26	4.3E-06
2,3,7,8-TCDF	20.8	0.0000208	2.1E-05	0.1	2.08	2.1E-06
1,2,3,7,8-PeCDF	14.2	0.0000142	1.4E-05	0.03	0.426	4.3E-07
2,3,4,7,8-PeCDF	15.4	0.0000154	1.5E-05	0.3	4.62	4.6E-06
1,2,3,4,7,8-HxCDF	56.5	0.0000565	5.7E-05	0.1	5.65	5.7E-06
1,2,3,6,7,8-HxCDF	62.5	0.0000625	6.3E-05	0.1	6.25	6.3E-06
2,3,4,6,7,8-HxCDF	55.8	0.0000558	5.6E-05	0.1	5.58	5.6E-06
1,2,3,7,8,9-HxCDF	2.28	0.00000228	2.3E-06	0.1	0.23	2.3E-07
1,2,3,4,6,7,8-HpCDF	1,920	0.00192	1.9E-03	0.01	19.20	1.9E-05
1,2,3,4,7,8,9-HpCDF	61	0.000061	6.1E-05	0.01	0.610	6.1E-07
OCDF	1,710	0.00171	1.7E-03	0.0003	0.513	5.1E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					151	1.5E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					151	1.5E-04
2,3,7,8-TCDD TEQ (without no-detects)					151	1.5E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1ah
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-209AB (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.208 U	0.000000208 U	2.1E-07 U	1	0.21 U	2.1E-07 U
1,2,3,7,8-PeCDD	1.4	0.0000014	1.4E-06	1	1.40	1.4E-06
1,2,3,4,7,8-HxCDD	3.17	0.00000317	3.2E-06	0.1	0.32	3.2E-07
1,2,3,6,7,8-HxCDD	50.8	0.0000508	5.1E-05	0.1	5.1	5.1E-06
1,2,3,7,8,9-HxCDD	8.21	0.00000821	8.2E-06	0.1	0.82	8.2E-07
1,2,3,4,6,7,8-HpCDD	426	0.000426	4.3E-04	0.01	4.3	4.3E-06
OCDD	1,600	0.0016	1.6E-03	0.0003	0.48	4.8E-07
2,3,7,8-TCDF	1.22	0.00000122	1.2E-06	0.1	0.12	1.2E-07
1,2,3,7,8-PeCDF	1.36	0.00000136	1.4E-06	0.03	0.041	4.1E-08
2,3,4,7,8-PeCDF	1.27	0.00000127	1.3E-06	0.3	0.38	3.8E-07
1,2,3,4,7,8-HxCDF	12.4	0.0000124	1.2E-05	0.1	1.24	1.2E-06
1,2,3,6,7,8-HxCDF	15.3	0.0000153	1.5E-05	0.1	1.53	1.5E-06
2,3,4,6,7,8-HxCDF	10.8	0.0000108	1.1E-05	0.1	1.08	1.1E-06
1,2,3,7,8,9-HxCDF	0.693 U	0.000000693 U	6.9E-07 U	0.1	0.07 U	6.9E-08 U
1,2,3,4,6,7,8-HpCDF	744	0.000744	7.4E-04	0.01	7.44	7.4E-06
1,2,3,4,7,8,9-HpCDF	20.3	0.0000203	2.0E-05	0.01	0.203	2.0E-07
OCDF	673	0.000673	6.7E-04	0.0003	0.202	2.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					25	2.5E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					25	2.5E-05
2,3,7,8-TCDD TEQ (without no-detects)					25	2.5E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1ai
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-210ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.369	0.000000369	3.7E-07	1	0.37	3.7E-07
1,2,3,7,8-PeCDD	3.81	0.00000381	3.8E-06	1	3.81	3.8E-06
1,2,3,4,7,8-HxCDD	6.08	0.00000608	6.1E-06	0.1	0.61	6.1E-07
1,2,3,6,7,8-HxCDD	114	0.000114	1.1E-04	0.1	11.4	1.1E-05
1,2,3,7,8,9-HxCDD	19.5	0.0000195	2.0E-05	0.1	1.95	2.0E-06
1,2,3,4,6,7,8-HpCDD	822	0.000822	8.2E-04	0.01	8.2	8.2E-06
OCDD	2,560	0.00256	2.6E-03	0.0003	0.77	7.7E-07
2,3,7,8-TCDF	4.33	0.00000433	4.3E-06	0.1	0.43	4.3E-07
1,2,3,7,8-PeCDF	3.25	0.00000325	3.3E-06	0.03	0.098	9.8E-08
2,3,4,7,8-PeCDF	3.77	0.00000377	3.8E-06	0.3	1.13	1.1E-06
1,2,3,4,7,8-HxCDF	21.9	0.0000219	2.2E-05	0.1	2.19	2.2E-06
1,2,3,6,7,8-HxCDF	29.7	0.0000297	3.0E-05	0.1	2.97	3.0E-06
2,3,4,6,7,8-HxCDF	21.2	0.0000212	2.1E-05	0.1	2.12	2.1E-06
1,2,3,7,8,9-HxCDF	0.748	0.000000748	7.5E-07	0.1	0.07	7.5E-08
1,2,3,4,6,7,8-HpCDF	862	0.000862	8.6E-04	0.01	8.62	8.6E-06
1,2,3,4,7,8,9-HpCDF	28.1	0.0000281	2.8E-05	0.01	0.281	2.8E-07
OCDF	740	0.00074	7.4E-04	0.0003	0.222	2.2E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					45	4.5E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					45	4.5E-05
2,3,7,8-TCDD TEQ (without no-detects)					45	4.5E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1aj
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-211ABC (0-1) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.49	0.00000149	1.5E-06	1	1.49	1.5E-06
1,2,3,7,8-PeCDD	7.56	0.00000756	7.6E-06	1	7.56	7.6E-06
1,2,3,4,7,8-HxCDD	13.8	0.0000138	1.4E-05	0.1	1.38	1.4E-06
1,2,3,6,7,8-HxCDD	298	0.000298	3.0E-04	0.1	29.8	3.0E-05
1,2,3,7,8,9-HxCDD	39.8	0.0000398	4.0E-05	0.1	3.98	4.0E-06
1,2,3,4,6,7,8-HpCDD	2,390	0.00239	2.4E-03	0.01	23.9	2.4E-05
OCDD	11,900	0.0119	1.2E-02	0.0003	3.57	3.6E-06
2,3,7,8-TCDF	10.9	0.0000109	1.1E-05	0.1	1.09	1.1E-06
1,2,3,7,8-PeCDF	8.78	0.00000878	8.8E-06	0.03	0.263	2.6E-07
2,3,4,7,8-PeCDF	9.07	0.00000907	9.1E-06	0.3	2.72	2.7E-06
1,2,3,4,7,8-HxCDF	44.2	0.0000442	4.4E-05	0.1	4.42	4.4E-06
1,2,3,6,7,8-HxCDF	40.7	0.0000407	4.1E-05	0.1	4.07	4.1E-06
2,3,4,6,7,8-HxCDF	36.4	0.0000364	3.6E-05	0.1	3.64	3.6E-06
1,2,3,7,8,9-HxCDF	2.52	0.00000252	2.5E-06	0.1	0.25	2.5E-07
1,2,3,4,6,7,8-HpCDF	1,620	0.00162	1.6E-03	0.01	16.20	1.6E-05
1,2,3,4,7,8,9-HpCDF	47.4	0.0000474	4.7E-05	0.01	0.474	4.7E-07
OCDF	1,350	0.00135	1.4E-03	0.0003	0.405	4.1E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					105	1.1E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					105	1.1E-04
2,3,7,8-TCDD TEQ (without no-detects)					105	1.1E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1ak
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-211ABC (0-1) COMP Duplicate (SED-250), October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.43	0.00000143	1.4E-06	1	1.43	1.4E-06
1,2,3,7,8-PeCDD	7.81	0.00000781	7.8E-06	1	7.81	7.8E-06
1,2,3,4,7,8-HxCDD	13.9	0.0000139	1.4E-05	0.1	1.39	1.4E-06
1,2,3,6,7,8-HxCDD	274	0.000274	2.7E-04	0.1	27.4	2.7E-05
1,2,3,7,8,9-HxCDD	37.8	0.0000378	3.8E-05	0.1	3.78	3.8E-06
1,2,3,4,6,7,8-HpCDD	2,170	0.00217	2.2E-03	0.01	21.7	2.2E-05
OCDD	11,600	0.0116	1.2E-02	0.0003	3.48	3.5E-06
2,3,7,8-TCDF	11.4	0.0000114	1.1E-05	0.1	1.14	1.1E-06
1,2,3,7,8-PeCDF	8.68	0.00000868	8.7E-06	0.03	0.260	2.6E-07
2,3,4,7,8-PeCDF	8.58	0.00000858	8.6E-06	0.3	2.57	2.6E-06
1,2,3,4,7,8-HxCDF	43.3	0.0000433	4.3E-05	0.1	4.33	4.3E-06
1,2,3,6,7,8-HxCDF	48.4	0.0000484	4.8E-05	0.1	4.84	4.8E-06
2,3,4,6,7,8-HxCDF	38.2	0.0000382	3.8E-05	0.1	3.82	3.8E-06
1,2,3,7,8,9-HxCDF	2.43	0.00000243	2.4E-06	0.1	0.24	2.4E-07
1,2,3,4,6,7,8-HpCDF	1,680	0.00168	1.7E-03	0.01	16.80	1.7E-05
1,2,3,4,7,8,9-HpCDF	50.5	0.0000505	5.1E-05	0.01	0.505	5.1E-07
OCDF	1,420	0.00142	1.4E-03	0.0003	0.426	4.3E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					102	1.0E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					102	1.0E-04
2,3,7,8-TCDD TEQ (without no-detects)					102	1.0E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-1al
Bear Creek Sediment Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample SED-211ABC (1-2) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.08 U	0.00000108 U	1.1E-06 U	1	1.08 U	1.1E-06 U
1,2,3,7,8-PeCDD	6.23	0.00000623	6.2E-06	1	6.23	6.2E-06
1,2,3,4,7,8-HxCDD	12.2	0.0000122	1.2E-05	0.1	1.22	1.2E-06
1,2,3,6,7,8-HxCDD	212	0.000212	2.1E-04	0.1	21.2	2.1E-05
1,2,3,7,8,9-HxCDD	33.3	0.0000333	3.3E-05	0.1	3.33	3.3E-06
1,2,3,4,6,7,8-HpCDD	1,770	0.00177	1.8E-03	0.01	17.7	1.8E-05
OCDD	8,640	0.00864	8.6E-03	0.0003	2.59	2.6E-06
2,3,7,8-TCDF	8.25	0.00000825	8.3E-06	0.1	0.83	8.3E-07
1,2,3,7,8-PeCDF	7.19	0.00000719	7.2E-06	0.03	0.216	2.2E-07
2,3,4,7,8-PeCDF	6.81	0.00000681	6.8E-06	0.3	2.04	2.0E-06
1,2,3,4,7,8-HxCDF	36.7	0.0000367	3.7E-05	0.1	3.67	3.7E-06
1,2,3,6,7,8-HxCDF	45	0.000045	4.5E-05	0.1	4.50	4.5E-06
2,3,4,6,7,8-HxCDF	33.2	0.0000332	3.3E-05	0.1	3.32	3.3E-06
1,2,3,7,8,9-HxCDF	2.01	0.00000201	2.0E-06	0.1	0.20	2.0E-07
1,2,3,4,6,7,8-HpCDF	1,460	0.00146	1.5E-03	0.01	14.60	1.5E-05
1,2,3,4,7,8,9-HpCDF	49.8	0.0000498	5.0E-05	0.01	0.498	5.0E-07
OCDF	1,340	0.00134	1.3E-03	0.0003	0.402	4.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					84	8.4E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					83	8.3E-05
2,3,7,8-TCDD TEQ (without no-detects)					83	8.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 1-2
Bear Creek Sediment Analytical Results - Metals (mg/Kg)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
AB-22	-	02/02/2010	4.21 U	8.43 U	-	4.21 U	4.21 U	33.8	46.5	12.7	0.337 U	22.6	8.43 U	4.21 U	4.21 U	272
AB-23	-	02/02/2010	2.88 U	5.75 U	-	2.88 U	2.88 U	57.5	40.9	10.7	0.230 U	27.6	5.75 U	2.88 U	2.88 U	159
AB-24	-	02/02/2010	3.21 U	6.43 U	-	3.21 U	3.21 U	44.9	42.5	15.9	0.643	25.5	6.43 U	3.21 U	3.21 U	288
AB-25	-	02/02/2010	5.09 U	10.2 U	-	5.09 U	5.09 U	45.2	55.3	23.8	0.407 U	30.8	10.2 U	5.09 U	5.09 U	329
AB-26	-	02/02/2010	4.31 U	8.61 U	-	4.31 U	4.31 U	48.4	65.9	31.5	0.431	35.9	8.61 U	4.31 U	4.31 U	443
AB-27	-	02/02/2010	1.36 U	5.64	-	1.36 U	1.36 U	44.4	33.7	14.0	0.109	24.3	2.73 U	1.36 U	1.36 U	105
AB-28	-	02/02/2010	2.28 U	10.7	-	2.28 U	2.28 U	45.3	45.5	110	0.183 U	23.0	4.57 U	2.28 U	2.28 U	122
SED-COMP-1	-	04/13/2012	1.26 U	4.75	105 J[1]	1.26 U	1.26 U	28.3	21	9.45	0.121	7.25	2.51 U	1.26 U	1.26 U	114 J[1]
SED-COMP-2	-	04/13/2012	1.55 U	3.11 U	78.9 J[1]	1.55 U	1.55 U	11.6	38.4	5.6	0.124 U	11.6	3.11 U	1.55 U	1.55 U	169 J[1]
SED-COMP-3	-	04/12/2012	1.43 UJ[1]	3.54	306 J[1]	1.43 U	1.43 U	28.3 J[1]	40.5	7.75	0.115 U	18.8	2.87 U	1.43 U	1.43 U	72.7 J[1]
SED-COMP-99 (SED-3 Dup)	-	04/12/2012	1.73 UJ[1]	3.46 U	259 J[1]	1.73 U	1.73 U	30.3 J[1]	26.7	6.95	1.30	15.5	3.46 U	1.73 U	1.73 U	97 J[1]
SED-COMP-4	-	04/11/2012	1.35 UJ[1]	2.69 U	218 J[1]	1.35 U	1.35 U	35.3 J[1]	17.8	6.69	0.108 U	14.6	2.69 U	1.35 U	1.35 U	25.3 J[1]
SED-COMP-5	-	04/11/2012	1.26 UJ[1]	6.07	126 J[1]	1.91	1.26 U	98.8 J[1]	26.3	20.6	0.101 U	15	2.53 U	1.26 U	1.26 U	92.2 J[1]
SED-COMP-6	-	04/11/2012	1.12 UJ[1]	3.42	113 J[1]	1.49	1.12 U	70.6 J[1]	23.5	10.6	0.089 U	13.9	2.23 U	1.12 U	1.12 U	75.5 J[1]
SED-COMP-7	-	04/11/2012	1.46 UJ[1]	6.84	121 J[1]	1.83	1.46 U	83.5 J[1]	24.4	10.6	0.117 U	12.2	2.93 U	1.46 U	1.46 U	80.4 J[1]
SED-COMP-8	-	04/12/2012	1.64 U	6.02	159 J[1]	1.64 U	1.64 U	37.2 J[1]	26.1	10.5	0.131 U	14.2	3.27 U	1.64 U	1.64 U	110 J[1]
SED-200ABC(0-1) COMP	0-1	10/15/2015	-	1.3 U	208	-	1.3 U	25	-	3.7	0.053 U	-	2.6 U	0.66 U	-	-
SED-201ABC(0-1) COMP	0-1	10/15/2015	-	1.8	122	-	1.7 U	23	-	7.9	0.071	-	3.4 U	0.85 U	-	-
SED-203ABC(0-1) COMP	0-1	10/16/2015	-	1.6 U	150	-	1.6 U	21	-	6.0	0.10	-	3.3 U	0.81 U	-	-
SED-205ABC(0-1) COMP	0-1	10/16/2015	-	2.2	187	-	1.6 U	31	-	8.3	0.097	-	3.3 U	0.81 U	-	-
SED-211ABC(0-1) COMP	0-1	10/19/2015	-	3.9	129	-	1.4 U	40	-	10	0.26	-	2.8 U	0.71 U	-	-
Default Background Concentrations																
Freshwater (sediment)[h]			1	7.9	NA	NA	<0.5	30	12	2	0.2	20	0.4	0.4	NA	53

Notes:
Metals analyzed by EPA Method 6020
[h] DEQ Human Health Risk Assessment Guidance, Table 1 - Oregon Default Background Concentrations for Inorganic Chemicals. (DEQ, October 2010)
mg/Kg = Milligrams per kilogram
NA = Not applicable (no screening levels published for these chemicals)
U = Not detected at the method reporting limit shown
- = Not analyzed for this parameter
J = (Laboratory Qualifier) Estimated value. The analyte was detected above the method detection limit, but below the method reporting limit.
J[1] = (PNG Qualifier) The analyte was not detected, but the reported quantitation limit should be considered an estimate. See corresponding data validation report for further information.

Table 1-3
Bear Creek Sediment Analytical Results - TCLP Metals (mg/Kg)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
SED-200ABC(0-1) COMP	0-1	10/15/2015	0.10 U	1.7	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
SED-201ABC(0-1) COMP	0-1	10/15/2015	0.10 U	1.0	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
SED-203ABC(0-1) COMP	0-1	10/16/2015	0.10 U	1.5	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
SED-205ABC(0-1) COMP	0-1	10/16/2015	0.10 U	1.7	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
SED-211ABC(0-1) COMP	0-1	10/19/2015	0.10 U	1.1	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U

Notes:
TCLP Metals analyzed by EPA Method 1311/6020
TCLP = Toxicity Characteristic Leaching Procedure
mg/Kg = Milligrams per kilogram
U = Not detected at the method reporting limit shown

Table 1-4
Bear Creek Sediment Analytical Results - Conventional Parameters
Phase 3 Remedial Investiagion
Floragon Property
Molalla, Oregon

Sample ID	Date	TOC (mg/kg)	Wet Density (lbs/ft^3)	Dry Density (lbs/ft^3)	% Solids	%Gravel	% Sand	%Silt	%Clay	USCS
SED - 1B / SED-COMP-1	04/13/2012	47,000	122.4	92.1	69.2	31.9	60.4	5.0	2.8	SW/SP
SED - 2B / SED-COMP-2	04/13/2012	37,000	123.5	94.8	68.2	50.9	44.2	3.1	1.8	GW/GP
SED - 3B / SED-COMP-3	04/12/2012	28,000	116.7	84.3	63.6	33.1	46.4	11.1	9.3	SW/SP
SED - 3B Dup (SED-COMP-99)	04/12/2012	27,000	124.1	99.3	58.9	44.7	38.9	9.8	6.8	GW/GP
SED - 4B / SED-COMP-4	04/11/2012	9,700	110.0	74.6	70.8	27.9	28.9	13.6	29.7	SW/SP
SED - 5B / SED-COMP-5	04/11/2012	28,000	127.6	100.6	69.6	36.9	53.0	4.5	5.7	SW/SP
SED - 6B / SED-COMP-6	04/11/2012	6,500	135.7	109.4	83.9	31.9	59.2	3.3	5.6	SW/SP
SED - 7B / SED-COMP-7	04/11/2012	12,000	130.4	104.1	77.4	29.8	58.8	5.1	6.4	SW/SP
SED - 8B / SED-COMP-8	04/12/2012	36,000	125.5	100.3	51.5	52.0	35.3	6.7	6.1	GW/GP
SED-200 (0-1)	10/15/2015	-	112.4	93.0	-	86.9	7.33	5.4	0.40	GP/GM
SED-200ABC (0-1) COMP	10/15/2015	2,600	-	-	74.0	-	-	-	-	-
SED-200AC (1-2) COMP	10/15/2015	2,100	-	-	71.0	-	-	-	-	-
SED-201 (0-1)	10/15/2015	-	92.1	61.3	-	65.6	20.7	11.0	2.8	GW/GM
SED-201ABC (0-1) COMP	10/15/2015	15,000	-	-	57.3	-	-	-	-	-
SED-201 (1-2)	10/15/2015	-	97.3	70.7	-	44.8	30.4	18.5	6.4	GM
SED-201ABC (1-2) COMP	10/15/2015	5,400	-	-	67.1	-	-	-	-	-
SED-202 (0-1)	10/15/2015	-	100.1	73.3	-	24.2	24.1	28.9	22.8	ML/CL
SED-202ABC (0-1) COMP	10/15/2015	6,000	-	-	67.6	-	-	-	-	-
SED-203 (0-1)	10/16/2015	-	98.9	70.1	-	63.0	18.4	14.3	4.3	GM
SED-203ABC (0-1) COMP	10/16/2015	6,500	-	-	60.9	-	-	-	-	-
SED-203 (1-2)	10/16/2015	-	99.2	70.7	-	46.7	20.7	22.4	10.2	GM/GC
SED-203AC (1-2) COMP	10/16/2015	2,000	-	-	66.6	-	-	-	-	-
SED-204 (0-1)	10/16/2015	-	94.2	64.2	-	63.8	11.3	19.7	5.2	GM
SED-204ABC (0-1) COMP	10/16/2015	8,800	-	-	58.5	-	-	-	-	-
SED-204 (1-2)	10/16/2015	-	100.1	73.5	-	64.6	15.7	15.7	4.0	GM
SED-204AC (1-2) COMP	10/16/2015	9,400	-	-	65.8	-	-	-	-	-
SED-205 (0-1)	10/16/2015	-	101.5	76.1	-	62.2	15.1	17.8	5.0	GM
SED-205ABC (0-1) COMP	10/16/2015	7,600	-	-	59.4	-	-	-	-	-
SED-206 (0-1)	10/16/2015	-	100.2	76.2	-	88.3	8.48	3.1	0.20	GP
SED-206ABC (0-1) COMP	10/16/2015	19,000	-	-	59.8	-	-	-	-	-
SED-207 (0-1)	10/16/2015	-	110.1	91.4	-	28.0	22.6	30.1	19.3	ML
SED-207ABC (0-1) COMP	10/16/2015	8,200	-	-	59.7	-	-	-	-	-
SED-207 (1-2)	10/16/2015	-	92.7	63.3	-	64.5	11.6	18.0	5.9	GM
SED-207AC (1-2) COMP	10/16/2015	7,500	-	-	60.5	-	-	-	-	-
SED-208 (0-1)	10/19/2015	-	90.3	63.5	-	41.6	29.2	21.2	8.1	GM
SED-208ABC (0-1) COMP	10/19/2015	16,000	-	-	62.7	-	-	-	-	-
SED-208 (1-2)	10/19/2015	-	101.3	75.1	-	43.3	27.8	20.3	8.6	GM
SED-208ABC (1-2) COMP	10/19/2015	7,400	-	-	71.3	-	-	-	-	-
SED-209 (0-1)	10/19/2015	-	87.2	64.5	-	48.4	28.5	18.3	4.8	GM
SED-209ABC (0-1) COMP	10/19/2015	21,000	-	-	28.6	-	-	-	-	-
SED-209 (1-2)	10/19/2015	-	99.1	73.1	-	61.6	20.1	14.3	4.0	GM
SED-209AB (1-2) COMP	10/19/2015	7,100	-	-	73.2	-	-	-	-	-
SED-210 (0-1)	10/19/2015	-	91.0	61.9	-	38.6	26.1	24.0	11.4	GM
SED-210ABC (0-1) COMP	10/19/2015	5,200	-	-	64.9	-	-	-	-	-
SED-210 (1-2)	10/19/2015	-	97.4	72.1	-	-	-	-	-	-
SED-210ABC (1-2) COMP	10/19/2015	-	-	-	-	-	-	-	-	-

Table 1-4
Bear Creek Sediment Analytical Results - Conventional Parameters
Phase 3 Remedial Investiagion
Floragon Property
Molalla, Oregon

Sample ID	Date	TOC (mg/kg)	Wet Density (lbs/ft^3)	Dry Density (lbs/ft^3)	% Solids	%Gravel	% Sand	%Silt	%Clay	USCS
SED-211 (0-1)	10/19/2015	-	98.4	72.5	-	59.8	21.5	14.6	4.1	GM
SED-211ABC (0-1) COMP	10/19/2015	9,200	-	-	70.2	-	-	-	-	-
SED-211ABC (0-1) COMP Dup (SED-250	10/19/2015	16,000	-	-	63.2	-	-	-	-	-
SED-211 (1-2)	10/19/2015	-	100.0	75.5	-	60.1	24.3	12.9	2.6	GM
SED-211ABC (1-2) COMP	10/19/2015	2,800	-	-	71.8	-	-	-	-	-

Notes:
mg/kg = milligrams per kilogram
lbs/ft^3 = pounds per cubic foot
USCS = Unified Soil Classification System
TOC = Total organic carbon analyzed by EPA Method SM 5310B MOD
Percent Soilids measured by EPA Method 8000C
Grain size measured by Method ASTM D 422m
CL = Inorganic clay
GC = Clayey gravel
GM = Silty gravel
GP = Poorly graded gravel
GW = Well graded gravel
ML = Inorganic silt
SP = Poorly graded sands
SW = Well graded sands
- = not analyzed / not available

Table 2-1
Dip Tank Area Soil Analytical Results Summary - Dioxin Equivalent Concentrations - Mammalian TEQ (pg/g)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	2,3,7,8-TCDD TEQ with detection limits	2,3,7,8-TCDD TEQ with 1/2 detection limits	2,3,7,8-TCDD TEQ without non-detects
AB-03/1	1	02/02/2010	152	152	152
AB-05/0-6	0.5	02/03/2010	328	328	328
AB-06/0-6	0.5	02/03/2010	2,221	2,221	2,221
AB-08/0-6	0.5	02/03/2010	43	43	43
B1-4 (0.5) COMP	0.5	10/14/2015	41	41	41
B1-4 (1.5) COMP	1.5	10/14/2015	14	14	14
B5-8 (0.5) COMP	0.5	10/14/2015	19	19	19
B5-8 (1.5) COMP	1.5	10/14/2015	6.0	6.0	6.0
B9-12 (0.5) COMP	0.5	10/13/2015	19	19	19
B9-12 (1.5) COMP	1.5	10/13/2015	20	19	19
B13-16 (0.5) COMP	0.5	10/13/2015	489	489	489
B13-16 (1.5) COMP	1.5	10/13/2015	172	171	171
B17-20 (0.5) COMP	0.5	10/14/2015	51	51	51
B17-20 (1.5) COMP	1.5	10/14/2015	63	63	63
B21-24 (0.5) COMP	0.5	10/14/2015	29	29	29
B21-24 (1.5) COMP	1.5	10/14/2015	3.6	3.5	3.5
B25-28 (0.5) COMP	0.5	10/14/2015	5.6	5.5	5.5
B25-28 (1.5) COMP	1.5	10/14/2015	0.58	0.44	0.29
B29-32 (0.5) COMP	0.5	10/14/2015	44	44	44
B29-32 (1.5) COMP	1.5	10/14/2015	4.7	4.6	4.5
Catch Basin Samples					
AB-19A**	-	02/02/2010	109	109	109
AB-19B**	-	02/02/2010	1,115	1,115	1,115

Notes:
** Catch Basin Sample
pg/g = picograms per gram
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Ractors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)
TCDD = Tetrachlorinated Dibenzo-p-Dioxin(s)

Table 2-1a
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-03/1', February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.65 J	0.00000165 J	1.7E-06 J	1	1.65 J	1.7E-06 J
1,2,3,7,8-PeCDD	6.37 J	0.00000637 J	6.4E-06 J	1	6.4 J	6.4E-06 J
1,2,3,4,7,8-HxCDD	13.2	0.0000132	1.3E-05	0.1	1.32	1.3E-06
1,2,3,6,7,8-HxCDD	264	0.000264	2.6E-04	0.1	26.4	2.6E-05
1,2,3,7,8,9-HxCDD	67.9	0.0000679	6.8E-05	0.1	6.79	6.8E-06
1,2,3,4,6,7,8-HpCDD	7,980	0.00798	8.0E-03	0.01	79.8	8.0E-05
OCDD	46,800	0.0468	4.7E-02	0.0003	14.04	1.4E-05
2,3,7,8-TCDF	7.76	0.00000776	7.8E-06	0.1	0.78	7.8E-07
1,2,3,7,8-PeCDF	6.44 J	0.00000644 J	6.4E-06 J	0.03	0.193 J	1.9E-07 J
2,3,4,7,8-PeCDF	8.36 J	0.00000836 J	8.4E-06 J	0.3	2.5 J	2.5E-06 J
1,2,3,4,7,8-HxCDF	18.3	0.0000183	1.8E-05	0.1	1.83	1.8E-06
1,2,3,6,7,8-HxCDF	20.3	0.0000203	2.0E-05	0.1	2.03	2.0E-06
2,3,4,6,7,8-HxCDF	21.8	0.0000218	2.2E-05	0.1	2.2	2.2E-06
1,2,3,7,8,9-HxCDF	1.24 J	0.00000124 J	1.2E-06 J	0.1	0.12 J	1.2E-07 J
1,2,3,4,6,7,8-HpCDF	565	0.000565	5.7E-04	0.01	5.7	5.7E-06
1,2,3,4,7,8,9-HpCDF	17.3	0.0000173	1.7E-05	0.01	0.173	1.7E-07
OCDF	320	0.00032	3.2E-04	0.0003	0.096	9.6E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					152	1.5E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					152	1.5E-04
2,3,7,8-TCDD TEQ (without no-detects)					152	1.5E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1b
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-05/0-6", February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.52 J	0.00000152 J	1.5E-06 J	1	1.52 J	1.5E-06 J
1,2,3,7,8-PeCDD	33.6	0.0000336	3.4E-05	1	33.60	3.4E-05
1,2,3,4,7,8-HxCDD	33.8	0.0000338	3.4E-05	0.1	3.380	3.4E-06
1,2,3,6,7,8-HxCDD	991	0.000991	9.9E-04	0.1	99.10	9.9E-05
1,2,3,7,8,9-HxCDD	241	0.000241	2.4E-04	0.1	24.10	2.4E-05
1,2,3,4,6,7,8-HpCDD	7,470	0.00747	7.5E-03	0.01	74.70	7.5E-05
OCDD	8,720	0.00872	8.7E-03	0.0003	2.616	2.6E-06
2,3,7,8-TCDF	20.2	0.0000202	2.0E-05	0.1	2.020	2.0E-06
1,2,3,7,8-PeCDF	18.3	0.0000183	1.8E-05	0.03	0.549	5.5E-07
2,3,4,7,8-PeCDF	17.1	0.0000171	1.7E-05	0.3	5.130	5.1E-06
1,2,3,4,7,8-HxCDF	103	0.000103	1.0E-04	0.1	10.300	1.0E-05
1,2,3,6,7,8-HxCDF	161	0.000161	1.6E-04	0.1	16.100	1.6E-05
2,3,4,6,7,8-HxCDF	122	0.000122	1.2E-04	0.1	12.200	1.2E-05
1,2,3,7,8,9-HxCDF	7.29 J	0.00000729 J	7.3E-06 J	0.1	0.729 J	7.3E-07 J
1,2,3,4,6,7,8-HpCDF	3,960	0.00396	4.0E-03	0.01	39.60	4.0E-05
1,2,3,4,7,8,9-HpCDF	133	0.000133	1.3E-04	0.01	1.3300	1.3E-06
OCDF	1,870	0.00187	1.9E-03	0.0003	0.5610	5.6E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					328	3.3E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					328	3.3E-04
2,3,7,8-TCDD TEQ (without no-detects)					328	3.3E-04

Notes:
pg/g = picogram per gram
mg/Kg = milligram per kilogram
U = Undetected at method reporting limit shown
J = Sample result is qualified as an estimated value, below the method reporting limit.
E = Estimated concentration. Reported value is above the instrument calibration range.
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1c
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-06/0-6", February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	24.3 J	0.0000243 J	2.4E-05 J	1	24.30 J	2.4E-05 J
1,2,3,7,8-PeCDD	294	0.000294	2.9E-04	1	294.0	2.9E-04
1,2,3,4,7,8-HxCDD	157 J	0.000157 J	1.6E-04 J	0.1	15.70 J	1.6E-05 J
1,2,3,6,7,8-HxCDD	5,000	0.005	5.0E-03	0.1	500.0	5.0E-04
1,2,3,7,8,9-HxCDD	680	0.00068	6.8E-04	0.1	68.00	6.8E-05
1,2,3,4,6,7,8-HpCDD	85,000	0.085	8.5E-02	0.01	850.0	8.5E-04
OCDD	162,000	0.162	1.6E-01	0.0003	48.60	4.9E-05
2,3,7,8-TCDF	346	0.000346	3.5E-04	0.1	34.60	3.5E-05
1,2,3,7,8-PeCDF	106 J	0.000106 J	1.1E-04 J	0.03	3.180 J	3.2E-06 J
2,3,4,7,8-PeCDF	188 J	0.000188 J	1.9E-04 J	0.3	56.4 J	5.6E-05 J
1,2,3,4,7,8-HxCDF	640	0.00064	6.4E-04	0.1	64.00	6.4E-05
1,2,3,6,7,8-HxCDF	333	0.000333	3.3E-04	0.1	33.30	3.3E-05
2,3,4,6,7,8-HxCDF	274	0.000274	2.7E-04	0.1	27.4	2.7E-05
1,2,3,7,8,9-HxCDF	13.6 J	0.0000136 J	1.4E-05 J	0.1	1.36 J	1.4E-06 J
1,2,3,4,6,7,8-HpCDF	14,900	0.0149	1.5E-02	0.01	149.0	1.5E-04
1,2,3,4,7,8,9-HpCDF	2,640	0.00264	2.6E-03	0.01	26.400	2.6E-05
OCDF	82,000	0.082	8.2E-02	0.0003	24.600	2.5E-05
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					2,221	2.2E-03
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					2,221	2.2E-03
2,3,7,8-TCDD TEQ (without no-detects)					2,221	2.2E-03

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1d
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-08/0-6", February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.88 J	0.00000188 J	1.9E-06 J	1	1.88 J	1.9E-06 J
1,2,3,7,8-PeCDD	13.3	0.0000133	1.3E-05	1	13.3	1.3E-05
1,2,3,4,7,8-HxCDD	6.85 J	0.00000685 J	6.9E-06 J	0.1	0.69 J	6.9E-07 J
1,2,3,6,7,8-HxCDD	79.7	0.0000797	8.0E-05	0.1	8.0	8.0E-06
1,2,3,7,8,9-HxCDD	22.3	0.0000223	2.2E-05	0.1	2.23	2.2E-06
1,2,3,4,6,7,8-HpCDD	368	0.000368	3.7E-04	0.01	3.7	3.7E-06
OCDD	988	0.000988	9.9E-04	0.0003	0.30	3.0E-07
2,3,7,8-TCDF	22.6	0.0000226	2.3E-05	0.1	2.26	2.3E-06
1,2,3,7,8-PeCDF	12.2	0.0000122	1.2E-05	0.03	0.366	3.7E-07
2,3,4,7,8-PeCDF	9.65 J	0.00000965 J	9.7E-06 J	0.3	2.9 J	2.9E-06 J
1,2,3,4,7,8-HxCDF	11.9	0.0000119	1.2E-05	0.1	1.19	1.2E-06
1,2,3,6,7,8-HxCDF	20.5	0.0000205	2.1E-05	0.1	2.05	2.1E-06
2,3,4,6,7,8-HxCDF	11.2	0.0000112	1.1E-05	0.1	1.1	1.1E-06
1,2,3,7,8,9-HxCDF	1.52 J	0.00000152 J	1.5E-06 J	0.1	0.15 J	1.5E-07 J
1,2,3,4,6,7,8-HpCDF	309	0.000309	3.1E-04	0.01	3.1	3.1E-06
1,2,3,4,7,8,9-HpCDF	13.4	0.0000134	1.3E-05	0.01	0.134	1.3E-07
OCDF	181	0.000181	1.8E-04	0.0003	0.054	5.4E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					43	4.3E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					43	4.3E-05
2,3,7,8-TCDD TEQ (without no-detects)					43	4.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1e
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B1-4 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.186	0.000000186	1.9E-07	1	0.19	1.9E-07
1,2,3,7,8-PeCDD	1.54	0.00000154	1.5E-06	1	1.5	1.5E-06
1,2,3,4,7,8-HxCDD	90.9	0.0000909	9.1E-05	0.1	9.09	9.1E-06
1,2,3,6,7,8-HxCDD	87.6	0.0000876	8.8E-05	0.1	8.8	8.8E-06
1,2,3,7,8,9-HxCDD	10.1	0.0000101	1.0E-05	0.1	1.01	1.0E-06
1,2,3,4,6,7,8-HpCDD	791	0.000791	7.9E-04	0.01	7.9	7.9E-06
OCDD	3,120	0.00312	3.1E-03	0.0003	0.94	9.4E-07
2,3,7,8-TCDF	0.972	0.000000972	9.7E-07	0.1	0.10	9.7E-08
1,2,3,7,8-PeCDF	1.11	0.00000111	1.1E-06	0.03	0.033	3.3E-08
2,3,4,7,8-PeCDF	1.01	0.00000101	1.0E-06	0.3	0.3	3.0E-07
1,2,3,4,7,8-HxCDF	18.5	0.0000185	1.9E-05	0.1	1.85	1.9E-06
1,2,3,6,7,8-HxCDF	12.4	0.0000124	1.2E-05	0.1	1.24	1.2E-06
2,3,4,6,7,8-HxCDF	7.68	0.00000768	7.7E-06	0.1	0.8	7.7E-07
1,2,3,7,8,9-HxCDF	0.672	0.000000672	6.7E-07	0.1	0.07	6.7E-08
1,2,3,4,6,7,8-HpCDF	673	0.000673	6.7E-04	0.01	6.7	6.7E-06
1,2,3,4,7,8,9-HpCDF	22.1	0.0000221	2.2E-05	0.01	0.221	2.2E-07
OCDF	882	0.000882	8.8E-04	0.0003	0.265	2.6E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					41	4.1E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					41	4.1E-05
2,3,7,8-TCDD TEQ (without no-detects)					41	4.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1f
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B1-4 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.28	0.00000028	2.8E-07	1	0.28	2.8E-07
1,2,3,7,8-PeCDD	1.46	0.00000146	1.5E-06	1	1.5	1.5E-06
1,2,3,4,7,8-HxCDD	1.78	0.00000178	1.8E-06	0.1	0.18	1.8E-07
1,2,3,6,7,8-HxCDD	47.7	0.0000477	4.8E-05	0.1	5	4.8E-06
1,2,3,7,8,9-HxCDD	5.71	0.00000571	5.7E-06	0.1	0.6	5.7E-07
1,2,3,4,6,7,8-HpCDD	259	0.000259	2.6E-04	0.01	3	2.6E-06
OCDD	1,060	0.00106	1.1E-03	0.0003	0.3	3.2E-07
2,3,7,8-TCDF	2.75	0.00000275	2.8E-06	0.1	0.28	2.8E-07
1,2,3,7,8-PeCDF	0.895	0.000000895	9.0E-07	0.03	0.03	2.7E-08
2,3,4,7,8-PeCDF	1.14	0.00000114	1.1E-06	0.3	0.3	3.4E-07
1,2,3,4,7,8-HxCDF	3.96	0.00000396	4.0E-06	0.1	0.4	4.0E-07
1,2,3,6,7,8-HxCDF	4.64	0.00000464	4.6E-06	0.1	0.5	4.6E-07
2,3,4,6,7,8-HxCDF	3.29	0.00000329	3.3E-06	0.1	0.3	3.3E-07
1,2,3,7,8,9-HxCDF	0.099 U	0.000000099 U	9.9E-08 U	0.1	0.01 U	9.9E-09 U
1,2,3,4,6,7,8-HpCDF	222	0.000222	2.2E-04	0.01	2.2	2.2E-06
1,2,3,4,7,8,9-HpCDF	7.14	0.00000714	7.1E-06	0.01	0.07	7.1E-08
OCDF	335	0.000335	3.4E-04	0.0003	0.101	1.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					14	1.4E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					14	1.4E-05
2,3,7,8-TCDD TEQ (without no-detects)					14	1.4E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1g
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B5-8 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.187 U	0.000000187 U	1.9E-07 U	1	0.19 U	1.9E-07 U
1,2,3,7,8-PeCDD	0.943	0.000000943	9.4E-07	1	0.9	9.4E-07
1,2,3,4,7,8-HxCDD	1.7	0.0000017	1.7E-06	0.1	0.2	1.7E-07
1,2,3,6,7,8-HxCDD	46.9	0.0000469	4.7E-05	0.1	5	4.7E-06
1,2,3,7,8,9-HxCDD	7.82	0.00000782	7.8E-06	0.1	0.8	7.8E-07
1,2,3,4,6,7,8-HpCDD	445	0.000445	4.5E-04	0.01	4	4.5E-06
OCDD	3,630	0.00363	3.6E-03	0.0003	1.1	1.1E-06
2,3,7,8-TCDF	0.755	0.000000755	7.6E-07	0.1	0.08	7.6E-08
1,2,3,7,8-PeCDF	0.782	0.000000782	7.8E-07	0.03	0.02	2.3E-08
2,3,4,7,8-PeCDF	0.939	0.000000939	9.4E-07	0.3	0.3	2.8E-07
1,2,3,4,7,8-HxCDF	6.58	0.00000658	6.6E-06	0.1	0.7	6.6E-07
1,2,3,6,7,8-HxCDF	5.16	0.00000516	5.2E-06	0.1	0.5	5.2E-07
2,3,4,6,7,8-HxCDF	4.43	0.00000443	4.4E-06	0.1	0.4	4.4E-07
1,2,3,7,8,9-HxCDF	0.296	0.000000296	3.0E-07	0.1	0.0	3.0E-08
1,2,3,4,6,7,8-HpCDF	418	0.000418	4.2E-04	0.01	4.2	4.2E-06
1,2,3,4,7,8,9-HpCDF	7.3	0.0000073	7.3E-06	0.01	0.07	7.3E-08
OCDF	328	0.000328	3.3E-04	0.0003	0.098	9.8E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					19	1.9E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					19	1.9E-05
2,3,7,8-TCDD TEQ (without no-detects)					19	1.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1h
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B5-8 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.426	0.000000426	4.3E-07	1	0.43	4.3E-07
1,2,3,7,8-PeCDD	0.984	0.000000984	9.8E-07	1	1.0	9.8E-07
1,2,3,4,7,8-HxCDD	1.37	0.00000137	1.4E-06	0.1	0.14	1.4E-07
1,2,3,6,7,8-HxCDD	12.4	0.0000124	1.2E-05	0.1	1	1.2E-06
1,2,3,7,8,9-HxCDD	2.61	0.00000261	2.6E-06	0.1	0.3	2.6E-07
1,2,3,4,6,7,8-HpCDD	108	0.000108	1.1E-04	0.01	1	1.1E-06
OCDD	971	0.000971	9.7E-04	0.0003	0.3	2.9E-07
2,3,7,8-TCDF	0.454	0.000000454	4.5E-07	0.1	0.05	4.5E-08
1,2,3,7,8-PeCDF	0.248	0.000000248	2.5E-07	0.03	0.01	7.4E-09
2,3,4,7,8-PeCDF	0.268	0.000000268	2.7E-07	0.3	0.1	8.0E-08
1,2,3,4,7,8-HxCDF	2.45	0.00000245	2.5E-06	0.1	0.2	2.5E-07
1,2,3,6,7,8-HxCDF	1.69	0.00000169	1.7E-06	0.1	0.2	1.7E-07
2,3,4,6,7,8-HxCDF	1.07	0.00000107	1.1E-06	0.1	0.1	1.1E-07
1,2,3,7,8,9-HxCDF	0.117 U	0.000000117 U	1.2E-07 U	0.1	0.01 U	1.2E-08 U
1,2,3,4,6,7,8-HpCDF	83.3	0.0000833	8.3E-05	0.01	0.8	8.3E-07
1,2,3,4,7,8,9-HpCDF	2.94	0.00000294	2.9E-06	0.01	0.03	2.9E-08
OCDF	133	0.000133	1.3E-04	0.0003	0.040	4.0E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					6.0	6.0E-06
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					6.0	6.0E-06
2,3,7,8-TCDD TEQ (without no-detects)					6.0	6.0E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1i
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B9-12 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.101 U	0.000000101 U	1.0E-07 U	1	0.10 U	1.0E-07 U
1,2,3,7,8-PeCDD	0.925	0.000000925	9.3E-07	1	0.93	9.3E-07
1,2,3,4,7,8-HxCDD	1.12	0.00000112	1.1E-06	0.1	0.11	1.1E-07
1,2,3,6,7,8-HxCDD	77.1	0.0000771	7.7E-05	0.1	7.7	7.7E-06
1,2,3,7,8,9-HxCDD	24.5	0.0000245	2.5E-05	0.1	2.45	2.5E-06
1,2,3,4,6,7,8-HpCDD	475	0.000475	4.8E-04	0.01	4.8	4.8E-06
OCDD	2,170	0.00217	2.2E-03	0.0003	0.65	6.5E-07
2,3,7,8-TCDF	0.354	0.000000354	3.5E-07	0.1	0.04	3.5E-08
1,2,3,7,8-PeCDF	0.449	0.000000449	4.5E-07	0.03	0.013	1.3E-08
2,3,4,7,8-PeCDF	0.445	0.000000445	4.5E-07	0.3	0.13	1.3E-07
1,2,3,4,7,8-HxCDF	2.64	0.00000264	2.6E-06	0.1	0.26	2.6E-07
1,2,3,6,7,8-HxCDF	2.85	0.00000285	2.9E-06	0.1	0.29	2.9E-07
2,3,4,6,7,8-HxCDF	2.41	0.00000241	2.4E-06	0.1	0.24	2.4E-07
1,2,3,7,8,9-HxCDF	0.189	0.000000189	1.9E-07	0.1	0.02	1.9E-08
1,2,3,4,6,7,8-HpCDF	157	0.000157	1.6E-04	0.01	1.57	1.6E-06
1,2,3,4,7,8,9-HpCDF	4	0.000004	4.0E-06	0.01	0.040	4.0E-08
OCDF	135	0.000135	1.4E-04	0.0003	0.041	4.1E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					19	1.9E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					19	1.9E-05
2,3,7,8-TCDD TEQ (without no-detects)					19	1.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1j
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B9-12 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.0834 U	8.34E-08 U	8.3E-08 U	1	0.08 U	8.3E-08 U
1,2,3,7,8-PeCDD	0.602	0.000000602	6.0E-07	1	0.60	6.0E-07
1,2,3,4,7,8-HxCDD	1.8	0.0000018	1.8E-06	0.1	0.18	1.8E-07
1,2,3,6,7,8-HxCDD	85.5	0.0000855	8.6E-05	0.1	8.6	8.6E-06
1,2,3,7,8,9-HxCDD	34.5	0.0000345	3.5E-05	0.1	3.45	3.5E-06
1,2,3,4,6,7,8-HpCDD	476	0.000476	4.8E-04	0.01	4.8	4.8E-06
OCDD	2,640	0.00264	2.6E-03	0.0003	0.79	7.9E-07
2,3,7,8-TCDF	0.182	0.000000182	1.8E-07	0.1	0.02	1.8E-08
1,2,3,7,8-PeCDF	0.227	0.000000227	2.3E-07	0.03	0.007	6.8E-09
2,3,4,7,8-PeCDF	0.182 U	0.000000182 U	1.8E-07 U	0.3	0.05 U	5.5E-08 U
1,2,3,4,7,8-HxCDF	1.16	0.00000116	1.2E-06	0.1	0.12	1.2E-07
1,2,3,6,7,8-HxCDF	1.35	0.00000135	1.4E-06	0.1	0.14	1.4E-07
2,3,4,6,7,8-HxCDF	1.16	0.00000116	1.2E-06	0.1	0.12	1.2E-07
1,2,3,7,8,9-HxCDF	0.116	0.000000116	1.2E-07	0.1	0.01	1.2E-08
1,2,3,4,6,7,8-HpCDF	59.3	0.0000593	5.9E-05	0.01	0.59	5.9E-07
1,2,3,4,7,8,9-HpCDF	1.78	0.00000178	1.8E-06	0.01	0.018	1.8E-08
OCDF	69.5	0.0000695	7.0E-05	0.0003	0.021	2.1E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					20	2.0E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					19	4.2E-02
2,3,7,8-TCDD TEQ (without no-detects)					19	1.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1k
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B13-16 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	2.36	0.00000236	2.4E-06	1	2.36	2.4E-06
1,2,3,7,8-PeCDD	58.3	0.0000583	5.8E-05	1	58.30	5.8E-05
1,2,3,4,7,8-HxCDD	84.7	0.0000847	8.5E-05	0.1	8.47	8.5E-06
1,2,3,6,7,8-HxCDD	1,530	0.00153	1.5E-03	0.1	153.0	1.5E-04
1,2,3,7,8,9-HxCDD	307	0.000307	3.1E-04	0.1	30.70	3.1E-05
1,2,3,4,6,7,8-HpCDD	10,400	0.0104	1.0E-02	0.01	104.0	1.0E-04
OCDD	64,100	0.0641	6.4E-02	0.0003	19.23	1.9E-05
2,3,7,8-TCDF	64.7	0.0000647	6.5E-05	0.1	6.47	6.5E-06
1,2,3,7,8-PeCDF	58.8	0.0000588	5.9E-05	0.03	1.764	1.8E-06
2,3,4,7,8-PeCDF	60.1	0.0000601	6.0E-05	0.3	18.03	1.8E-05
1,2,3,4,7,8-HxCDF	188	0.000188	1.9E-04	0.1	18.80	1.9E-05
1,2,3,6,7,8-HxCDF	201	0.000201	2.0E-04	0.1	20.10	2.0E-05
2,3,4,6,7,8-HxCDF	135	0.000135	1.4E-04	0.1	13.50	1.4E-05
1,2,3,7,8,9-HxCDF	14.9	0.0000149	1.5E-05	0.1	1.49	1.5E-06
1,2,3,4,6,7,8-HpCDF	3,030	0.00303	3.0E-03	0.01	30.30	3.0E-05
1,2,3,4,7,8,9-HpCDF	143	0.000143	1.4E-04	0.01	1.430	1.4E-06
OCDF	2,340	0.00234	2.3E-03	0.0003	0.702	7.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					489	4.9E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					489	4.9E-04
2,3,7,8-TCDD TEQ (without no-detects)					489	4.9E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1l
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B13-16 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.834	0.000000834	8.3E-07	1	0.83	8.3E-07
1,2,3,7,8-PeCDD	11.7	0.0000117	1.2E-05	1	11.70	1.2E-05
1,2,3,4,7,8-HxCDD	22.1	0.0000221	2.2E-05	0.1	2.21	2.2E-06
1,2,3,6,7,8-HxCDD	542	0.000542	5.4E-04	0.1	54.2	5.4E-05
1,2,3,7,8,9-HxCDD	72.3	0.0000723	7.2E-05	0.1	7.23	7.2E-06
1,2,3,4,6,7,8-HpCDD	4,060	0.00406	4.1E-03	0.01	40.6	4.1E-05
OCDD	23,300	0.0233	2.3E-02	0.0003	6.99	7.0E-06
2,3,7,8-TCDF	43.2	0.0000432	4.3E-05	0.1	4.32	4.3E-06
1,2,3,7,8-PeCDF	26.2	0.0000262	2.6E-05	0.03	0.786	7.9E-07
2,3,4,7,8-PeCDF	30.6	0.0000306	3.1E-05	0.3	9.18	9.2E-06
1,2,3,4,7,8-HxCDF	65.5	0.0000655	6.6E-05	0.1	6.55	6.6E-06
1,2,3,6,7,8-HxCDF	44.4	0.0000444	4.4E-05	0.1	4.44	4.4E-06
2,3,4,6,7,8-HxCDF	56.7	0.0000567	5.7E-05	0.1	5.67	5.7E-06
1,2,3,7,8,9-HxCDF	2.4	0.0000024	2.4E-06	0.1	0.24	2.4E-07
1,2,3,4,6,7,8-HpCDF	1,540	0.00154	1.5E-03	0.01	15.40	1.5E-05
1,2,3,4,7,8,9-HpCDF	67.9	0.0000679	6.8E-05	0.01	0.679	6.8E-07
OCDF	2,390 U	0.00239 U	2.4E-03 U	0.0003	0.717 U	7.2E-07 U
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					172	1.7E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					171	1.7E-04
2,3,7,8-TCDD TEQ (without no-detects)					171	1.7E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1m
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B17-20 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.317	0.000000317	3.2E-07	1	0.32	3.2E-07
1,2,3,7,8-PeCDD	3.81	0.00000381	3.8E-06	1	3.81	3.8E-06
1,2,3,4,7,8-HxCDD	5.51	0.00000551	5.5E-06	0.1	0.55	5.5E-07
1,2,3,6,7,8-HxCDD	161	0.000161	1.6E-04	0.1	16.1	1.6E-05
1,2,3,7,8,9-HxCDD	22.8	0.0000228	2.3E-05	0.1	2.28	2.3E-06
1,2,3,4,6,7,8-HpCDD	1,250	0.00125	1.3E-03	0.01	12.5	1.3E-05
OCDD	10,200	0.0102	1.0E-02	0.0003	3.06	3.1E-06
2,3,7,8-TCDF	3.6	0.0000036	3.6E-06	0.1	0.36	3.6E-07
1,2,3,7,8-PeCDF	4.54	0.00000454	4.5E-06	0.03	0.136	1.4E-07
2,3,4,7,8-PeCDF	5.36	0.00000536	5.4E-06	0.3	1.61	1.6E-06
1,2,3,4,7,8-HxCDF	19.6	0.0000196	2.0E-05	0.1	1.96	2.0E-06
1,2,3,6,7,8-HxCDF	17.1	0.0000171	1.7E-05	0.1	1.71	1.7E-06
2,3,4,6,7,8-HxCDF	14.3	0.0000143	1.4E-05	0.1	1.43	1.4E-06
1,2,3,7,8,9-HxCDF	0.982	0.000000982	9.8E-07	0.1	0.10	9.8E-08
1,2,3,4,6,7,8-HpCDF	486	0.000486	4.9E-04	0.01	4.86	4.9E-06
1,2,3,4,7,8,9-HpCDF	9.81	0.00000981	9.8E-06	0.01	0.098	9.8E-08
OCDF	339	0.000339	3.4E-04	0.0003	0.102	1.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					51	5.1E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					51	5.1E-05
2,3,7,8-TCDD TEQ (without no-detects)					51	5.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1n
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B17-20 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.275	0.000000275	2.8E-07	1	0.28	2.8E-07
1,2,3,7,8-PeCDD	5.13	0.00000513	5.1E-06	1	5.13	5.1E-06
1,2,3,4,7,8-HxCDD	7.65	0.00000765	7.7E-06	0.1	0.77	7.7E-07
1,2,3,6,7,8-HxCDD	218	0.000218	2.2E-04	0.1	21.8	2.2E-05
1,2,3,7,8,9-HxCDD	28.4	0.0000284	2.8E-05	0.1	2.84	2.8E-06
1,2,3,4,6,7,8-HpCDD	1,530	0.00153	1.5E-03	0.01	15.3	1.5E-05
OCDD	11,800	0.0118	1.2E-02	0.0003	3.54	3.5E-06
2,3,7,8-TCDF	6.92	0.00000692	6.9E-06	0.1	0.69	6.9E-07
1,2,3,7,8-PeCDF	7.22	0.00000722	7.2E-06	0.03	0.217	2.2E-07
2,3,4,7,8-PeCDF	8.74	0.00000874	8.7E-06	0.3	2.62	2.6E-06
1,2,3,4,7,8-HxCDF	22.5	0.0000225	2.3E-05	0.1	2.25	2.3E-06
1,2,3,6,7,8-HxCDF	20	0.00002	2.0E-05	0.1	2.00	2.0E-06
2,3,4,6,7,8-HxCDF	18.5	0.0000185	1.9E-05	0.1	1.85	1.9E-06
1,2,3,7,8,9-HxCDF	0.823	0.000000823	8.2E-07	0.1	0.08	8.2E-08
1,2,3,4,6,7,8-HpCDF	352	0.000352	3.5E-04	0.01	3.52	3.5E-06
1,2,3,4,7,8,9-HpCDF	10.1	0.0000101	1.0E-05	0.01	0.101	1.0E-07
OCDF	255	0.000255	2.6E-04	0.0003	0.077	7.7E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					63	6.3E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					63	6.3E-05
2,3,7,8-TCDD TEQ (without no-detects)					63	6.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1o
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B21-24 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.162 U	0.000000162 U	1.6E-07 U	1	0.16 U	1.6E-07 U
1,2,3,7,8-PeCDD	2.64	0.00000264	2.6E-06	1	2.64	2.6E-06
1,2,3,4,7,8-HxCDD	4.47	0.00000447	4.5E-06	0.1	0.45	4.5E-07
1,2,3,6,7,8-HxCDD	79.6	0.0000796	8.0E-05	0.1	8.0	8.0E-06
1,2,3,7,8,9-HxCDD	18.9	0.0000189	1.9E-05	0.1	1.89	1.9E-06
1,2,3,4,6,7,8-HpCDD	595	0.000595	6.0E-04	0.01	6.0	6.0E-06
OCDD	3,840	0.00384	3.8E-03	0.0003	1.15	1.2E-06
2,3,7,8-TCDF	1.33	0.00000133	1.3E-06	0.1	0.13	1.3E-07
1,2,3,7,8-PeCDF	1.64	0.00000164	1.6E-06	0.03	0.049	4.9E-08
2,3,4,7,8-PeCDF	1.85	0.00000185	1.9E-06	0.3	0.56	5.6E-07
1,2,3,4,7,8-HxCDF	9.73	0.00000973	9.7E-06	0.1	0.97	9.7E-07
1,2,3,6,7,8-HxCDF	10.4	0.0000104	1.0E-05	0.1	1.04	1.0E-06
2,3,4,6,7,8-HxCDF	7.99	0.00000799	8.0E-06	0.1	0.80	8.0E-07
1,2,3,7,8,9-HxCDF	0.313	0.000000313	3.1E-07	0.1	0.03	3.1E-08
1,2,3,4,6,7,8-HpCDF	470	0.00047	4.7E-04	0.01	4.70	4.7E-06
1,2,3,4,7,8,9-HpCDF	12	0.000012	1.2E-05	0.01	0.120	1.2E-07
OCDF	469	0.000469	4.7E-04	0.0003	0.141	1.4E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					29	2.9E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					29	2.9E-05
2,3,7,8-TCDD TEQ (without no-detects)					29	2.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1p
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B21-24 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.0725 U	7.25E-08 U	7.3E-08 U	1	0.07 U	7.3E-08 U
1,2,3,7,8-PeCDD	0.479	0.000000479	4.8E-07	1	0.48	4.8E-07
1,2,3,4,7,8-HxCDD	0.873	0.000000873	8.7E-07	0.1	0.09	8.7E-08
1,2,3,6,7,8-HxCDD	7.85	0.00000785	7.9E-06	0.1	0.8	7.9E-07
1,2,3,7,8,9-HxCDD	2.27	0.00000227	2.3E-06	0.1	0.23	2.3E-07
1,2,3,4,6,7,8-HpCDD	81.5	0.0000815	8.2E-05	0.01	0.8	8.2E-07
OCDD	889	0.000889	8.9E-04	0.0003	0.27	2.7E-07
2,3,7,8-TCDF	0.306	0.000000306	3.1E-07	0.1	0.03	3.1E-08
1,2,3,7,8-PeCDF	0.305	0.000000305	3.1E-07	0.03	0.009	9.2E-09
2,3,4,7,8-PeCDF	0.319	0.000000319	3.2E-07	0.3	0.10	9.6E-08
1,2,3,4,7,8-HxCDF	1.06	0.00000106	1.1E-06	0.1	0.11	1.1E-07
1,2,3,6,7,8-HxCDF	1.27	0.00000127	1.3E-06	0.1	0.13	1.3E-07
2,3,4,6,7,8-HxCDF	0.886	0.000000886	8.9E-07	0.1	0.09	8.9E-08
1,2,3,7,8,9-HxCDF	0.0827 U	8.27E-08 U	8.3E-08 U	0.1	0.01 U	8.3E-09 U
1,2,3,4,6,7,8-HpCDF	36.1	0.0000361	3.6E-05	0.01	0.36	3.6E-07
1,2,3,4,7,8,9-HpCDF	1.42	0.00000142	1.4E-06	0.01	0.014	1.4E-08
OCDF	48.7	0.0000487	4.9E-05	0.0003	0.015	1.5E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					3.6	3.6E-06
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					3.5	3.5E-06
2,3,7,8-TCDD TEQ (without no-detects)					3.5	3.5E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1q
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B25-28 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.0945 U	9.45E-08 U	9.5E-08 U	1	0.09 U	9.5E-08 U
1,2,3,7,8-PeCDD	0.822	0.000000822	8.2E-07	1	0.82	8.2E-07
1,2,3,4,7,8-HxCDD	0.936	0.000000936	9.4E-07	0.1	0.09	9.4E-08
1,2,3,6,7,8-HxCDD	16.5	0.0000165	1.7E-05	0.1	1.7	1.7E-06
1,2,3,7,8,9-HxCDD	4.13	0.00000413	4.1E-06	0.1	0.41	4.1E-07
1,2,3,4,6,7,8-HpCDD	110	0.00011	1.1E-04	0.01	1.1	1.1E-06
OCDD	642	0.000642	6.4E-04	0.0003	0.19	1.9E-07
2,3,7,8-TCDF	0.692	0.000000692	6.9E-07	0.1	0.07	6.9E-08
1,2,3,7,8-PeCDF	0.537	0.000000537	5.4E-07	0.03	0.016	1.6E-08
2,3,4,7,8-PeCDF	0.511	0.000000511	5.1E-07	0.3	0.15	1.5E-07
1,2,3,4,7,8-HxCDF	1.43	0.00000143	1.4E-06	0.1	0.14	1.4E-07
1,2,3,6,7,8-HxCDF	2.76	0.00000276	2.8E-06	0.1	0.28	2.8E-07
2,3,4,6,7,8-HxCDF	1.24	0.00000124	1.2E-06	0.1	0.12	1.2E-07
1,2,3,7,8,9-HxCDF	0.0953 U	9.53E-08 U	9.5E-08 U	0.1	0.01 U	9.5E-09 U
1,2,3,4,6,7,8-HpCDF	38.9	0.0000389	3.9E-05	0.01	0.39	3.9E-07
1,2,3,4,7,8,9-HpCDF	1.31	0.00000131	1.3E-06	0.01	0.013	1.3E-08
OCDF	29.8	0.0000298	3.0E-05	0.0003	0.009	8.9E-09
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					5.6	5.6E-06
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					5.5	5.5E-06
2,3,7,8-TCDD TEQ (without no-detects)					5.5	5.5E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1r
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B25-28 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.109 U	0.000000109 U	1.1E-07 U	1	0.11 U	1.1E-07 U
1,2,3,7,8-PeCDD	0.11 U	0.00000011 U	1.1E-07 U	1	0.11 U	1.1E-07 U
1,2,3,4,7,8-HxCDD	0.119 U	0.000000119 U	1.2E-07 U	0.1	0.01 U	1.2E-08 U
1,2,3,6,7,8-HxCDD	0.692	0.000000692	6.9E-07	0.1	0.1	6.9E-08
1,2,3,7,8,9-HxCDD	0.406	0.000000406	4.1E-07	0.1	0.04	4.1E-08
1,2,3,4,6,7,8-HpCDD	9.67	0.00000967	9.7E-06	0.01	0.1	9.7E-08
OCDD	98.5	0.0000985	9.9E-05	0.0003	0.03	3.0E-08
2,3,7,8-TCDF	0.105 U	0.000000105 U	1.1E-07 U	0.1	0.01 U	1.1E-08 U
1,2,3,7,8-PeCDF	0.116 U	0.000000116 U	1.2E-07 U	0.03	0.003 U	3.5E-09 U
2,3,4,7,8-PeCDF	0.113 U	0.000000113 U	1.1E-07 U	0.3	0.03 U	3.4E-08 U
1,2,3,4,7,8-HxCDF	0.113	0.000000113	1.1E-07	0.1	0.01	1.1E-08
1,2,3,6,7,8-HxCDF	0.151	0.000000151	1.5E-07	0.1	0.02	1.5E-08
2,3,4,6,7,8-HxCDF	0.095	0.000000095	9.5E-08	0.1	0.01	9.5E-09
1,2,3,7,8,9-HxCDF	0.0852 U	8.52E-08 U	8.5E-08 U	0.1	0.01 U	8.5E-09 U
1,2,3,4,6,7,8-HpCDF	1.87	0.00000187	1.9E-06	0.01	0.02	1.9E-08
1,2,3,4,7,8,9-HpCDF	0.137	0.000000137	1.4E-07	0.01	0.001	1.4E-09
OCDF	2.05	0.00000205	2.1E-06	0.0003	0.001	6.2E-10
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					0.58	5.8E-07
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					0.44	4.4E-07
2,3,7,8-TCDD TEQ (without no-detects)					0.29	2.9E-07

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1s
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B29-32 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.144 U	0.000000144 U	1.4E-07 U	1	0.14 U	1.4E-07 U
1,2,3,7,8-PeCDD	1.72	0.00000172	1.7E-06	1	1.72	1.7E-06
1,2,3,4,7,8-HxCDD	8.66	0.00000866	8.7E-06	0.1	0.87	8.7E-07
1,2,3,6,7,8-HxCDD	165	0.000165	1.7E-04	0.1	16.5	1.7E-05
1,2,3,7,8,9-HxCDD	38.1	0.0000381	3.8E-05	0.1	3.81	3.8E-06
1,2,3,4,6,7,8-HpCDD	1,220	0.00122	1.2E-03	0.01	12.2	1.2E-05
OCDD	12,400	0.0124	1.2E-02	0.0003	3.72	3.7E-06
2,3,7,8-TCDF	4.39	0.00000439	4.4E-06	0.1	0.44	4.4E-07
1,2,3,7,8-PeCDF	2.15	0.00000215	2.2E-06	0.03	0.065	6.5E-08
2,3,4,7,8-PeCDF	2.58	0.00000258	2.6E-06	0.3	0.77	7.7E-07
1,2,3,4,7,8-HxCDF	5.78	0.00000578	5.8E-06	0.1	0.58	5.8E-07
1,2,3,6,7,8-HxCDF	7.07	0.00000707	7.1E-06	0.1	0.71	7.1E-07
2,3,4,6,7,8-HxCDF	7.2	0.0000072	7.2E-06	0.1	0.72	7.2E-07
1,2,3,7,8,9-HxCDF	0.447	0.000000447	4.5E-07	0.1	0.04	4.5E-08
1,2,3,4,6,7,8-HpCDF	112	0.000112	1.1E-04	0.01	1.12	1.1E-06
1,2,3,4,7,8,9-HpCDF	12.4	0.0000124	1.2E-05	0.01	0.124	1.2E-07
OCDF	434	0.000434	4.3E-04	0.0003	0.130	1.3E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					44	4.4E-05
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					44	4.4E-05
2,3,7,8-TCDD TEQ (without no-detects)					44	4.4E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1t
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample B29-32 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.185 U	0.000000185 U	1.9E-07 U	1	0.19 U	1.9E-07 U
1,2,3,7,8-PeCDD	0.384	0.000000384	3.8E-07	1	0.38	3.8E-07
1,2,3,4,7,8-HxCDD	0.604	0.000000604	6.0E-07	0.1	0.06	6.0E-08
1,2,3,6,7,8-HxCDD	13.6	0.0000136	1.4E-05	0.1	1.4	1.4E-06
1,2,3,7,8,9-HxCDD	3.32	0.00000332	3.3E-06	0.1	0.33	3.3E-07
1,2,3,4,6,7,8-HpCDD	140	0.00014	1.4E-04	0.01	1.4	1.4E-06
OCDD	1,530	0.00153	1.5E-03	0.0003	0.46	4.6E-07
2,3,7,8-TCDF	0.45	0.00000045	4.5E-07	0.1	0.05	4.5E-08
1,2,3,7,8-PeCDF	0.308	0.000000308	3.1E-07	0.03	0.009	9.2E-09
2,3,4,7,8-PeCDF	0.319	0.000000319	3.2E-07	0.3	0.10	9.6E-08
1,2,3,4,7,8-HxCDF	0.726	0.000000726	7.3E-07	0.1	0.07	7.3E-08
1,2,3,6,7,8-HxCDF	0.755	0.000000755	7.6E-07	0.1	0.08	7.6E-08
2,3,4,6,7,8-HxCDF	0.740	0.00000074	7.4E-07	0.1	0.07	7.4E-08
1,2,3,7,8,9-HxCDF	0.121	0.000000121	1.2E-07	0.1	0.01	1.2E-08
1,2,3,4,6,7,8-HpCDF	14.9	0.0000149	1.5E-05	0.01	0.15	1.5E-07
1,2,3,4,7,8,9-HpCDF	0.879 U	0.000000879 U	8.8E-07 U	0.01	0.009 U	8.8E-09 U
OCDF	29.2	0.0000292	2.9E-05	0.0003	0.009	8.8E-09
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					4.7	4.7E-06
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					4.6	4.6E-06
2,3,7,8-TCDD TEQ (without no-detects)					4.5	4.5E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1u
Dip Tank Area Catch Basin Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-19A**, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	3.17	0.00000317	3.2E-06	1	3.17	3.2E-06
1,2,3,7,8-PeCDD	29.3	0.0000293	2.9E-05	1	29.3	2.9E-05
1,2,3,4,7,8-HxCDD	29.4	0.0000294	2.9E-05	0.1	2.94	2.9E-06
1,2,3,6,7,8-HxCDD	200	0.0002	2.0E-04	0.1	20.0	2.0E-05
1,2,3,7,8,9-HxCDD	112	0.000112	1.1E-04	0.1	11.20	1.1E-05
1,2,3,4,6,7,8-HpCDD	1,980	0.00198	2.0E-03	0.01	19.8	2.0E-05
OCDD	11,300	0.0113	1.1E-02	0.0003	3.39	3.4E-06
2,3,7,8-TCDF	16.9	0.0000169	1.7E-05	0.1	1.69	1.7E-06
1,2,3,7,8-PeCDF	10.5	0.0000105	1.1E-05	0.03	0.315	3.2E-07
2,3,4,7,8-PeCDF	13.1	0.0000131	1.3E-05	0.3	3.9	3.9E-06
1,2,3,4,7,8-HxCDF	22.2	0.0000222	2.2E-05	0.1	2.22	2.2E-06
1,2,3,6,7,8-HxCDF	38.9	0.0000389	3.9E-05	0.1	3.89	3.9E-06
2,3,4,6,7,8-HxCDF	26.2	0.0000262	2.6E-05	0.1	2.6	2.6E-06
1,2,3,7,8,9-HxCDF	0.889 J	0.000000889 J	8.9E-07 J	0.1	0.09 J	8.9E-08 J
1,2,3,4,6,7,8-HpCDF	424	0.000424	4.2E-04	0.01	4.2	4.2E-06
1,2,3,4,7,8,9-HpCDF	24.1	0.0000241	2.4E-05	0.01	0.241	2.4E-07
OCDF	553	0.000553	5.5E-04	0.0003	0.166	1.7E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					109	1.1E-04
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					109	1.1E-04
2,3,7,8-TCDD TEQ (without no-detects)					109	1.1E-04

Notes:

** Catch Basin Sample

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at method reporting limit shown

J = Sample result is qualified as an estimated value, below the method reporting limit.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-1v
Dip Tank Area Catch Basin Analytical Results - Dioxins - Mammalian TEQ
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample AB-19B**, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	27.2	0.0000272	2.7E-05	1	27.20	2.7E-05
1,2,3,7,8-PeCDD	297	0.000297	3.0E-04	1	297.0	3.0E-04
1,2,3,4,7,8-HxCDD	269	0.000269	2.7E-04	0.1	26.90	2.7E-05
1,2,3,6,7,8-HxCDD	2,370	0.00237	2.4E-03	0.1	237.0	2.4E-04
1,2,3,7,8,9-HxCDD	899	0.000899	9.0E-04	0.1	89.90	9.0E-05
1,2,3,4,6,7,8-HpCDD	21,500	0.0215	2.2E-02	0.01	215.0	2.2E-04
OCDD	98,300	0.0983	9.8E-02	0.0003	29.49	2.9E-05
2,3,7,8-TCDF	152	0.000152	1.5E-04	0.1	15.20	1.5E-05
1,2,3,7,8-PeCDF	116	0.000116	1.2E-04	0.03	3.480	3.5E-06
2,3,4,7,8-PeCDF	136	0.000136	1.4E-04	0.3	40.8	4.1E-05
1,2,3,4,7,8-HxCDF	215	0.000215	2.2E-04	0.1	21.50	2.2E-05
1,2,3,6,7,8-HxCDF	419	0.000419	4.2E-04	0.1	41.90	4.2E-05
2,3,4,6,7,8-HxCDF	270	0.00027	2.7E-04	0.1	27.0	2.7E-05
1,2,3,7,8,9-HxCDF	9.63 J	0.00000963 J	9.6E-06 J	0.1	0.96 J	9.6E-07 J
1,2,3,4,6,7,8-HpCDF	3,880	0.00388	3.9E-03	0.01	38.8	3.9E-05
1,2,3,4,7,8,9-HpCDF	196	0.000196	2.0E-04	0.01	1.960	2.0E-06
OCDF	1,920	0.00192	1.9E-03	0.0003	0.576	5.8E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with detection limits)					1,115	1.1E-03
2,3,7,8-TCDD TEQ (with 1/2 detection limits)					1,115	1.1E-03
2,3,7,8-TCDD TEQ (without no-detects)					1,115	1.1E-03

Notes:

pg/g = picogram per gram
mg/Kg = milligram per kilogram
U = Undetected at method reporting limit shown
J = Sample result is qualified as an estimated value, below the method reporting limit.
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

Table 2-2
Dip Tank Area Soil Analytical Results - Total Petroleum Hydrocarbons (mg/Kg)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Gasoline	Diesel	Oil
GP5-8*	8	10/05/2005	3.4 U	20 U	68 U
GP6-8*	8	10/05/2005	3.6 U	21 U	71 U
GP7-7*	7	10/05/2005	3.3 U	20 U	65 U
GP8-8*	8	10/05/2005	3.2 U	19 U	65 U
AB-02/MW-02	1	02/02/2010	18 U	25 U[a]	51 U[a]
AB-03/MW-03	1	02/02/2010	18 U	221 [a]	1,030 [a]
IMW-1-1	1	03/04/2013	-	8.6 U[a]	29 [a],X
IMW-2-1	1	03/05/2013	-	11 U[a]	21 U[a]
IMW-2-6	6	03/05/2013	-	9.7 U[a]	20 U[a]
MW-7-1	1	03/07/2013	-	19 U[a]	486 [a],J
MW-7-3	3	03/07/2013	-	8.4 U[a]	17 U[a],UJ
B1-4(0.5) COMP	0.5	10/13/2015	-	25 U	98
B1-4(1.5) COMP	1.5	10/13/2015	-	25 U	50 U
B5-8(0.5) COMP	0.5	10/13/2015	-	104 U	817
B5-8(1.5) COMP	1.5	10/13/2015	-	25 U	153
B9-12(0.5 COMP	0.5	10/13/2015	-	96 U	1,040
B9-12(1.5) COMP	1.5	10/13/2015	-	25 U	231
B13-16(0.5) COMP	0.5	10/13/2015	-	191 U	3,860
B13-16(1.5) COMP	1.5	10/13/2015	-	182 U	3,550
B17-20(0.5) COMP	0.5	10/14/2015	-	25 U	210
B17-20(1.5) COMP	1.5	10/14/2015	-	25 U	81
B21-24(0.5) COMP	0.5	10/14/2015	-	92 U	1,320
B21-24(1.5) COMP	1.5	10/14/2015	-	25 U	52
B25-28(0.5) COMP	0.5	10/14/2015	-	202 U	2,540
B25-28(1.5) COMP	1.5	10/14/2015	-	25 U	50 U
B29-32(0.5) COMP	0.5	10/14/2015	-	204 U	2,210
B29-32(1.5) COMP	1.5	10/14/2015	-	25 U	110
Catch Basin Samples					
AB-19A**	-	02/02/2010	156 U	390 U	4,190 [a1]
AB-19B**	-	02/02/2010	30 U	701 [a]	4,260 [a]
RBC Screening Level Criteria for Soil					
Ingestion, Dermal Contact, & Inhalation:					
Occupational[b]			20,000	14,000	14,000
Construction Worker[c]			9,700	4,600	4,600
Excavation Worker[d]			>Max	>Max	>Max
Volatilization to Outdoor Air:					
Occupational[e]			69,000	>Max	>Max
Vapor Intrusion into Buildings:			.		
Occupational[f]			>Max	>Max	>Max

Table 2-2
Dip Tank Area Soil Analytical Results - Total Petroleum Hydrocarbons (mg/Kg)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Notes:

* Data from NWES Assessment (2005)

** Catch Basin Sediment

Gasoline, Diesel and Oil Range hydrocarbon identification screen by Method NWTPH-HCID unless indicated otherwise

[a] Diesel and Oil Range Hydrocarbons by Method NWTPH-Dx (with silica-gel cleanup[a1])

[b] Oregon Department of Environmental Quality (DEQ), Generic Risk Based Concentration (RBC) for ingestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)

[c] DEQ, RBC for ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)

[d] DEQ, RBC for ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)

[e] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)

[f] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

mg/Kg = Milligrams per kilogram

>Max = The constituent RBC for this pathway is greater than 100,000 mg/kg or 100,000 mg/L and is considered unlikely to be encountered.

- = Not analyzed for this parameter

X = (Laboratory Qualifier) No fuel pattern detected.

J = (PNG Qualifier) Result is estimated. See corresponding data validation report for further explanation.

UJ = (PNG Qualifier) Analyte was not detected, but should be considered estimated. See corresponding data validation report for further explanation.

U = Undetected at the method reporting limit shown

Table 2-3
Dip Tank Area Soil Analytical Results - Chlorophenols (mg/Kg)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Pentachlorophenol	2-Chlorophenol	3+4-Chlorophenols	2,4-Dichlorophenol	3,4-Dichlorophenol	2,3,4,5-Tetrachlorophenol	2,3,4,6-Tetrachlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol
GP5-8*	8	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
GP6-8*	8	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
GP7-7*	7	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
GP8-8*	8	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
AB-02/MW-02	1	02/02/2010	0.0506 U	0.0506 U	0.101 U	0.0506 U	0.0506 U	0.0506 U	0.0506 U	0.0506 U	0.0506 U
AB-03/MW-02	1	02/02/2010	3.63	0.0506 U	0.127 U	0.0506 U	0.466	0.0651	0.637	0.0896	0.0506 U
AB-05	0-0.5	02/03/2010	2.57	0.460 U	0.921 U	0.460 U	0.460 U	0.460 U	6.96	0.460 U	0.460 U
AB-05	1-2	02/03/2010	0.0903 U	0.0903 U	0.181 U	0.0903 U	0.0903 U	0.0903 U	0.0903 U	0.0903 U	0.0903 U
AB-05	2-3	02/03/2010	0.0236 U	0.0236 U	0.0473 U	0.0236 U	0.0236 U	0.0236 U	0.0236 U	0.0236 U	0.0236 U
AB-05	3-5	02/03/2010	0.105	0.0725 U	0.145 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U
AB-06	0-0.5	02/03/2010	5.10	0.259 U	0.518 U	0.259 U	0.259 U	0.259 U	0.259 U	0.259 U	0.259 U
AB-06	1-2	02/03/2010	3.28	0.105 U	0.210 U	0.105 U	0.105 U	0.105 U	0.240	0.105 U	0.105 U
AB-06	2-3	02/03/2010	0.914	0.120 U	0.240 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U
AB-06	3-5	02/03/2010	0.143	0.0639 U	0.128 U	0.0639 U	0.0639 U	0.0639 U	0.0639 U	0.0639 U	0.0639 U
AB-07	0-0.5	02/03/2010	0.436 U	0.436 U	0.873 U	0.436 U	0.436 U	0.436 U	0.436 U	0.436 U	0.436 U
AB-08	0-0.5	02/03/2010	0.471 U	0.471 U	0.943 U	0.471 U	0.471 U	0.471 U	0.471 U	0.471 U	0.471 U
AB-09	0-0.5	02/03/2010	0.0235 U	0.0235 U	0.047 U	0.0235 U	0.0235 U	0.0235 U	0.0235 U	0.0235 U	0.0235 U
AB-09 (DUP)	0-0.5	02/03/2010	0.0231 U	0.0231 U	0.0461 U	0.0231 U	0.0231 U	0.0231 U	0.0231 U	0.0231 U	0.0231 U
IMW-1-1	1	03/04/2013	0.106 U	0.0317 U	0.106 U	0.0317 U	0.0200 J	0.0317 U	0.0317 U	0.0317 U	0.0317 U
IMW-2-1	1	03/05/2013	0.100 U	0.0301 U	0.100 U	0.0301 U	0.0301 U	0.0301 U	0.0301 U	0.0301 U	0.0301 U
IMW-2-6	6	03/05/2013	0.102 U	0.0306 U	0.102 U	0.0306 U	0.0306 U	0.0306 U	0.0306 U	0.0306 U	0.0306 U
MW-7-1	1	03/07/2013	0.209 U	0.0626 U	0.209 U	0.0626 U	0.0626 U	0.0626 U	0.0626 U	0.0626 U	0.0626 U
MW-7-3	3	03/07/2013	0.094 U	0.0282 U	0.094 U	0.0282 U	0.0282 U	0.0282 U	0.0282 U	0.0282 U	0.0282 U
B1-4(0.5) COMP	0.5	10/13/2015	0.193 J	-	-	-	-	-	-	-	-
B1-4(1.5) COMP	1.5	10/13/2015	0.021 J	0.0074 U	0.0037 U	0.00735 U	-	-	0.0287	0.0112 J	0.00735 U
B1-4(3) COMP	3	10/13/2015	0.017 J	-	-	-	-	-	-	-	-
B5-8(1.5) COMP	1.5	10/13/2015	0.057 U	0.0284 U	0.014 U	0.0284 U	-	-	0.0284 U	0.0284 U	0.0284 U
B9-12(1.5) COMP	1.5	10/13/2015	0.139 U	0.0697 U	0.035 U	0.0697 U	-	-	0.0697 U	0.0697 U	0.0697 U
B13-16(1.5) COMP	1.5	10/13/2015	0.560 U	0.281 U	0.140 U	0.281 U	-	-	0.281 U	0.281 U	0.281 U
B17-20(1.5) COMP	1.5	10/14/2015	0.090 J	-	-	-	-	-	-	-	-
B21-24(1.5) COMP	1.5	10/14/2015	0.059 U	-	-	-	-	-	-	-	-
B25-28(1.5) COMP	1.5	10/14/2015	0.014 U	-	-	-	-	-	-	-	-
B29-32(1.5) COMP	1.5	10/14/2015	0.142 U	-	-	-	-	-	-	-	-
Catch Basin Samples											
AB-19A**	-	02/02/2010	0.585 U	0.585 U	1.17 U	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U
AB-19B**	-	02/02/2010	0.598 U	0.598 U	1.2 U	0.598 U	0.598 U	0.598 U	0.598 U	0.598 U	0.598 U
RBC Screening Level Criteria for Soil											
Ingestion, Dermal Contact, and Inhalation:											
Occupational[a]			4	NA	NA	NA	NA	NA	NA	NA	210
Construction Worker[b]			34	NA	NA	NA	NA	NA	NA	NA	270
Excavation Worker[c]			960	NA	NA	NA	NA	NA	NA	NA	7,400
Volatilization to Outdoor Air											
Occupational[d]			NV	NA	NA	NA	NA	NA	NA	NA	NV
Vapor Intrustion into Buildings											
Occupational[e]			NV	NA	NA	NA	NA	NA	NA	NA	NV

Table 2-3
Dip Tank Area Soil Analytical Results - Chlorophenols (mg/Kg)
Ph 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Notes:

* Data from NWES Assessment (2005)

** Catch Basin Sample

Chlorophenols by EPA Method 8270C SIM

[a]Oregon Department of Environmental Quality (DEQ), Generic Risk Based Concentration (RBC) for soil injestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)

[b] DEQ, RBC for soil ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)

[c] DEQ, RBC for soil ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)

[d] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)

[e] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

Phenols by EPA Method 8270D was used for April 2012 sampling event (4-Chloro-3-methylphenol, 2,4-Dimethylphenol, 4,6-Dinitro-2-methylphenol, 2,4-Dinitrophenol, 2-Methylphenol, 3+4-Methylphenol, 2-Nitrophenol, 4-Nitrophenol, Phenol and 2,3,5,6-Tetrachlorophenol were not detected by the laboratory).

mg/Kg = Milligrams per kilogram

NA = Not applicable (no screening levels published for these chemicals)

NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations

- = Undetected at method reporting limit shown

U = Not detected at the method reporting limit shown

J = (Laboratory Qualifier) Estimated concentration. Reported result is below the reporting limit, but above the Method Detection Limit (MDL).

UJ = (PNG Qualifier) Analyte was not detected, but should be considered estimated. See corresponding data validation report for further explanation.

UX = (PNG Qualifier) Estimated values, results should be used for screening purposes only. See corresponding laboratory report and data validation report for further information.

Table 2-4
Dip Tank Area Soil Analytical Results - Metals (mg/Kg)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium[a1]	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
AB-02/MW-02	1	02/02/2010	1.13 U	2.26 U	-	1.13 U	1.13 U	28.2	65.2	4.62	0.090 U	23.5	2.26 U	1.13 U	1.13 U	42.4
AB-03/MW-03	1	02/02/2010	1.35	2.45 U	-	1.23 U	1.23 U	37.8	53.2	69.4	0.098 U	17.5	2.45 U	1.23 U	1.23 U	127
IMW-1-1	1	03/04/2013	0.174 J	4.13	-	1.23 J	0.362	52.7	34.2	12.2	0.061 J	22.8	0.724 J	1.34 U	0.161 J	45.3
IMW-2-1	1	03/05/2013	1.42 U	2.79 J	-	1.08 J	0.385	44.2	31.0	7.28	0.057 U	22.4	2.85 U	1.42 U	1.42 U	39.3
IMW-2-6	6	03/05/2013	1.46 U	4.80	-	1.36 J	0.423	56.4	23.3	10.9	0.117 U	10.4	1.18 J	1.46 U	1.46 U	31.7
MW-7-1	1	03/07/2013	0.268 U	1.92 J	-	0.752 J	0.403 J[1]	25.7	22.8	8.39	0.107 U	14.8	1.34 U	0.268 U	0.268 U	83.2
MW-7-3	3	03/07/2013	0.246 U	1.32 J	-	0.725 J	0.211 J	19.9	13.8	5.68	0.098 U	10.6	1.23 U	0.246 U	0.246 U	19.0
B1-4(1.5) COMP	1.5	10/13/2015	-	1.2 U	52	-	0.23 U	18	-	3.4	0.092 U	-	2.3 U	0.23 U	-	-
B5-8(1.5) COMP	1.5	10/13/2015	-	1.1	67	-	0.22 U	18	-	5.8	0.088 U	-	2.2 U	0.22 U	-	-
B9-12(1.5) COMP	1.5	10/13/2015	-	9.4	67	-	0.22 U	24	-	11	0.087 U	-	2.2 U	0.22 U	-	-
B13-16(1.5) COMP	1.5	10/13/2015	-	1.2 U	36	-	0.23 U	19	-	2.8	0.092 U	-	2.3 U	0.23 U	-	-
Catch Basin Samples																
AB-19A**	-	02/02/2010	10.8 U	21.6 U	-	10.8 U	10.8 U	68.5	263	25.0	0.973	32.8	21.6 U	10.8 U	10.8 U	3,680
AB-19B**	-	02/02/2010	2.29	3.73	-	1.85 U	3.84	39.7	109	100	0.203	29.7	3.69 U	1.85 U	1.85 U	707
RBC Screening Level Criteria for Soil																
Ingestion, Dermal Contact, and Inhalation:																
Occupational[b]			NA	1.9	220,000	2,300	1,100	6.3[a2]/>Max[a3]	47,000	800 L	350	22,000	NA	5,800	NA	NA
Construction Worker[c]			NA	15	69,000	700	350	49[a2]/530,000[a3]	14,000	800 L	110	7,000	NA	1,800	NA	NA
Excavation Worker[d]			NA	420	>Max	19,000	9,700	1,400[a2]/>Max[a3]	390,000	800 L	2,900	190,000	NA	49,000	NA	NA
Volatilization to Outdoor Air																
Occupational[e]			NA	NV	NV	NV	NV	NV[a2]/NV[a3]	NV	NV	NV	NV	NA	NV	NA	NA
Vapor Intrusion into Buildings																
Occupational[f]			NA	NV	NV	NV	NV	NV[a2]/NV[a3]	NV	NV	NV	NV	NA	NV	NA	NA
Default Background Concentrations																
Oregon (soil)[g]			0.56	8.8	790	2	0.63	76[a3]	34	79	0.23	47	0.71	0.82	5.2	180
Freshwater (sediment)[h]			1	7.9	-[1]	NA	<0.5	30	12	2	0.2	20	0.4	0.4	NA	53

Notes:
Metals analyzed by EPA Method 6020
[a1] Total Chromium (III + VI)
[a2] Chromium (VI)
[a3] Chromium (III)
[b] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for soil ingestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)
[c] DEQ, RBC for soil ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)
[d] DEQ, RBC for soil ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)
[d] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)
[d] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)
[g] DEQ Default Background Concentrations for Metals Fact Sheet (March 20, 2013)
[h] DEQ Human Health Risk Assessment Guidance, Table 1 - Oregon Default Background Concentrations for Inorganic Chemicals. (DEQ, October 2010)
mg/Kg = Milligrams per kilogram
NA = Not applicable (no screening levels published for these chemicals)
- = Leaching to groundwater RBCs not provided for inorganic chemicals
L = Values for lead reported as milligrams per liter rather than mg/Kg since they are the results of leaching tests, not soil measurements
U = Not detected at the method reporting limit shown
J = (Laboratory Qualifier) Estimated value. The analyte was detected above the method detection limit, but below the method reporting limit.
J[1] = (PNG Qualifier) The analyte was not detected, but the reported quantitation limit should be considered an estimate. See corresponding data validation report for further information.
>Max = The constituent RBC for this pathway is greater than 100,000 mg/kg or 100,000 mg/L and is considered unlikely to be encountered.

Table 2-5
Dip Tank Area Soil Analytical Results - TCLP Metals (mg/Kg)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
B1-4(1.5) COMP	1.5	10/13/2015	0.10 U	0.60	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
B5-8(1.5) COMP	1.5	10/13/2015	0.10 U	0.50	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
B9-12(1.5) COMP	1.5	10/13/2015	0.10 U	0.69	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
B13-16(1.5) COMP	1.5	10/13/2015	0.10 U	0.50 U	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U

Notes:
TCLP Metals analyzed by EPA Method 1311/6020
TCLP = Toxicity Characteristic Leaching Procedure
mg/Kg = Milligrams per kilogram
U = Not detected at the method reporting limit shown

Table 2-6
Dip Tank Area Soil Analytical Results - Semivolatile Organic Compounds (mg/Kg)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Date Sampled	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene
GP5-8*	8	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
GP6-8*	8	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
GP7-7*	7	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
GP8-8*	8	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
AB-02/MW-02	1	02/02/2010	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U
AB-03/MW-03	1	02/02/2010	0.0169 U	0.0169 U	0.0169 U	0.0236	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0241	0.0169 U	0.0169 U	0.0169 U	0.0169 U
IMW-1-1	1	03/04/2013	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0031 J[1]	0.0052 U	0.0052 U
MW-7-1	1	03/07/2013	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0638 U,X,UJ	0.0638 U,X,UJ	0.0425 U,X,UJ	0.0638 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ
B1-4(1.5) COMP	1.5	10/13/2015	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0022 U	0.0022 U	0.0015 U	0.0022 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
B5-8(1.5) COMP	1.5	10/13/2015	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0085 U	0.0085 U	0.0057 U	0.0085 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U
B9-12(1.5) COMP	1.5	10/13/2015	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0209 U	0.0209 U	0.0139 U	0.0209 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U
B13-16(1.5) COMP	1.5	10/13/2015	0.0560 U	0.0560 U	0.0560 U	0.0560 U	0.0842 U	0.0842 U	0.0560 U	0.0842 U	0.1730 U	0.0560 U	0.0560 U	0.0560 U	0.0560 U
Catch Basin Samples															
AB-19A**	-	02/02/2010	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U
AB-19B**	-	02/02/2010	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
RBC Screening Level Criteria for Soil															
Ingestion, Dermal Contact, and Inhalation:															
Occupational[a]			70,000	NA	350,000	2.9	0.29	2.9	NA	29	290	0.29	30,000	47,000	2.9
Construction Worker[b]			21,000	NA	110,000	24	2.4	24	NA	240	2,400	2.4	10,000	14,000	24
Excavation Worker[c]			590,000	NA	>Max	660	67	670	NA	6,700	67,000	67	280,000	390,000	670
Volatilization to Outdoor Air															
Occupational[d]			>Max	NA	>Max	>Csat	NV	>Csat	NA	NV	NV	NV	NV	>Max	NV
Vapor Intrusion in to Buildings															
Occupational[e]			>Max	NA	>Max	>Csat	NV	>Csat	NA	NV	NV	NV	NV	>Max	NV

Table 2-6
Dip Tank Area Soil Analytical Results - Semivolatile Organic Compounds (mg/Kg)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Date Sampled	Naphthalene	Phenanthrene	Pyrene	Benzo(b+k) fluoranthene(s)	Bis (2-ethylhexyl) phthalate	Carbazole
GP5-8*	8	10/05/2005	-	0.067 U	-	-	-	-
GP6-8*	8	10/05/2005	-	0.067 U	-	-	-	-
GP7-7*	7	10/05/2005	-	0.067 U	-	-	-	-
GP8-8*	8	10/05/2005	-	0.067 U	-	-	0.131	-
AB-02/MW-02	1	02/02/2010	0.0337 U	0.0169 U	0.0169 U	-	-	-
AB-03/MW-03	1	02/02/2010	0.0483	0.0169 U	0.0169 U	-	-	-
IMW-1-1	1	03/04/2013	0.0058 J[1]	0.0031 J[1]	0.0031 J[1]	-	-	-
MW-7-1	1	03/07/2013	0.0850 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	-	-	-
B1-4(1.5) COMP	1.5	10/13/2015	0.0068	0.0019 J[1]	0.0015 U	-	-	-
B5-8(1.5) COMP	1.5	10/13/2015	0.0114 U	0.0057 U	0.0057 U	-	-	-
B9-12(1.5) COMP	1.5	10/13/2015	0.0279 U	0.0139 U	0.0139 U	-	-	-
B13-16(1.5) COMP	1.5	10/13/2015	0.1120 U	0.0560 U	0.0560 U	-	-	-
Catch Basin Samples								
AB-19A**	-	02/02/2010	0.389 U	0.195 U	0.195 U	-	-	-
AB-19B**	-	02/02/2010	0.398 U	0.200 U	0.200 U	-	-	-
RBC Screening Level Criteria for Soil								
Ingestion, Dermal Contact, and Inhalation:								
Occupational[a]			23	NA	23,000	NA	NA	NA
Construction Worker[b]			580	NA	7,500	NA	NA	NA
Excavation Worker[c]			16,000	NA	210,000	NA	NA	NA
Volatilization to Outdoor Air								
Occupational[d]			83	NA	>Csat	NA	NA	NA
Vapor Intrusion in to Buildings								
Occupational[e]			83	NA	>Csat	NA	NA	NA

Table 2-6
Dip Tank Area Soil Analytical Results - Semivolatile Organic Compounds (mg/Kg)
Phase 3 Remedial Investigation
Floragon Property
Molalla, Oregon

Notes:

* Data from NWES Assessment (2005)

** Catch Basin Sample

Polynuclear aromatic hydrocarbons (PAHs) analyzed by EPA Method 8270C SIM

[a] Oregon Department of Environmental Quality (DEQ), Generic Risk Based Concentration (RBC) for soil ingestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)

[b] DEQ, RBC for soil ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)

[c] DEQ, RBC for soil ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)

[d] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)

[e] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

[f] Peak separation for Benzo(b) and Benzo(k)fluoranthenes does not meet method specified criteria.
Reported laboratory result includes the combined area of the two isomers and should be considered the total of Benzo(b+k)fluoranthenes.

mg/Kg = Milligrams per kilogram

- = Not analyzed for this parameter

NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations

NA = Not applicable (no screening levels published for these chemicals)

>Max = The constituent RBC for this pathway is greater than 100,000 mg/kg or 100,000 mg/L and is considered unlikely to be encountered.

>Csat = This soil RBC exceeds the limit of three-phase equilibrium partitioning. Soil concentrations in excess of Csat indicate that free product might be present. See Section B.2.1.4 for additional information.

UJ = (PNG Qualifier) Analyte was not detected, but should be considered estimated. See corresponding data validation report for further explanation.

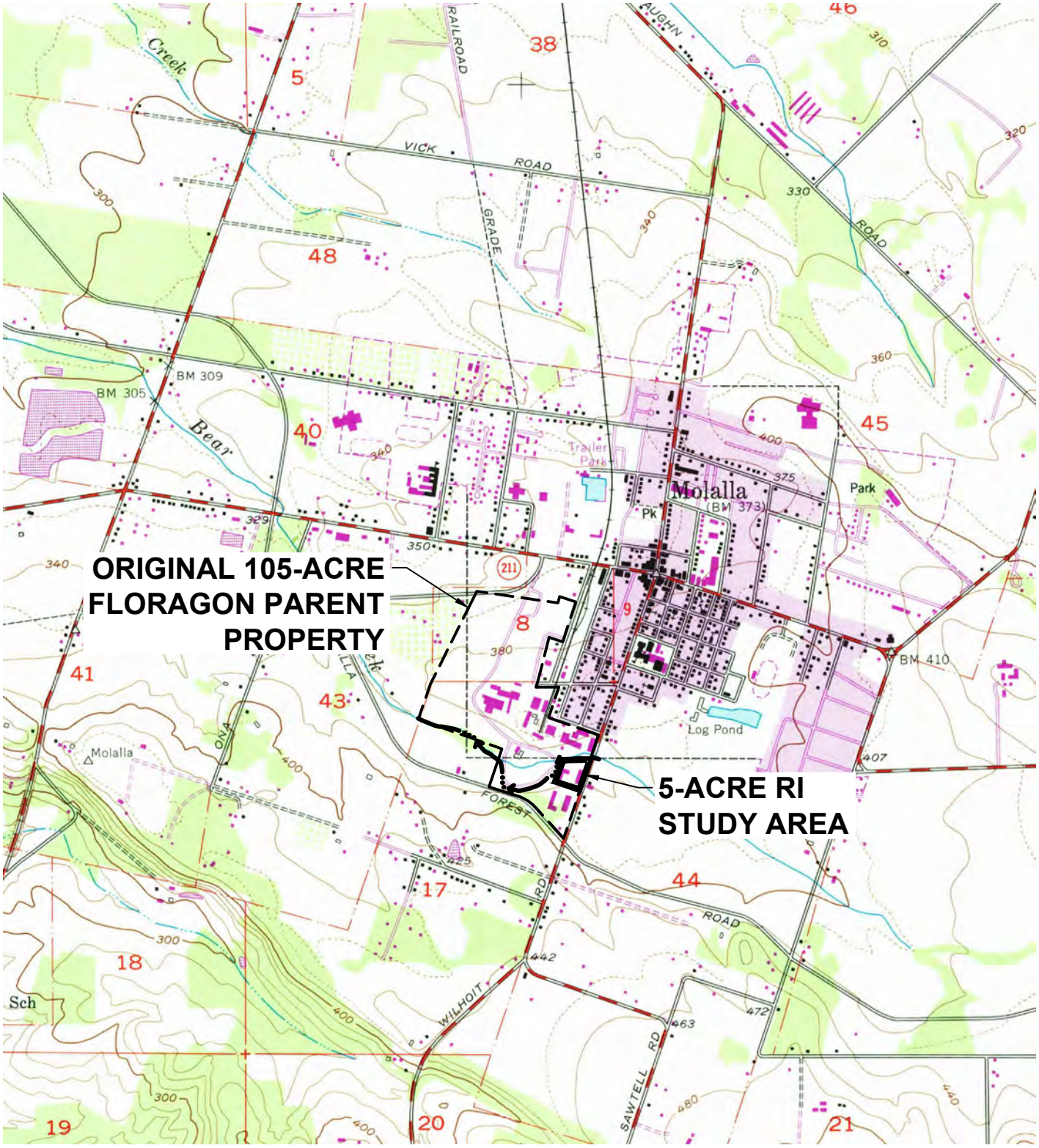
J = (PNG Qualifier) Result is estimated. See corresponding data validation report for further explanation.

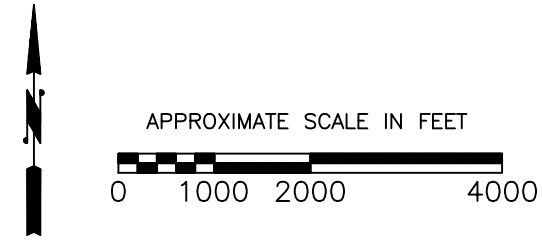
J^1 = (Laboratory Qualifier) Result is estimated. Reported detection is below the reporting limit, but above the Method Detection Limit (MDL).

U = Not detected at the method reporting limit shown

X = (Laboratory Qualifier) Sample was extracted past the recommended holding time.

FIGURES





NOTE: USGS, MOLALLA QUADRANGLE
OREGON - CLACKAMAS CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

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FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

SITE VICINITY MAP

Project No. 1177-01
Figure No. 1

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APPROXIMATE SCALE IN FEET

0 250 500

N

North Drainage Ditch

84-Acre
North Parcels
Upland Area
(NFA March 2014)

HART AVENUE

7TH STREET

Bear Creek

Beaver Pond

PHASE 3 RI
STUDY AREA

Bear Creek

FORMER
DIP TANK
AREA

16-Acre
SE Corner Area
(NFA Pending)

S. MOLALLA FOREST ROAD

S. MOLALLA AVENUE

LEGEND

- Property Boundary
- Tax Lots
- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Former Building Footprints
- Current Building Footprints
- Culvert
- Beaver Pond
- RI Study Area

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FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

PHASE 3 RI
STUDY AREA

Project No. 1177-01

Figure No. 2

APPROXIMATE SCALE IN FEET

0 250 500

N

North Drainage Ditch

01093658

01089592

01089609

01107947

01107974

01108349

01108330

01107331

01107359

01107340

01107368

01107956

05002348

HART AVENUE

7TH STREET

S. MOLALLA FOREST ROAD

S. MOLALLA AVENUE

SED-7/BCF-8
49

SED-6
4.4**
(4.2)

SED-5
122**
(119)

Bear Creek

Beaver Pond

Beaver Dam #3

SED-4
8.0

Beaver Dam #2

SED-8
43

Beaver Dam #1

AB-23
182

SED-3
71*

SED-2/BCF-2
46

SED-1
19

165
AB-28

AB-25
413

FORMER DIP TANK AREA

LEGEND

- Property Boundary
- Tax Lots
- 01107368 — Tax Lot Parcel Numbers
- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- AB-25 — Sediment Sample (2010)
- SED-1 — Sediment Sample Locations (2012)
- Beaver Pond
- **182** — Results in pg/g

* = Max value based on duplicate sampling

** = Estimated Maximum Potential Concentration is biased high due to numerous non-detect concentrations. See table 1-1.
(TEQ Concentrations using 50% laboratory detection limit shown in parentheses)

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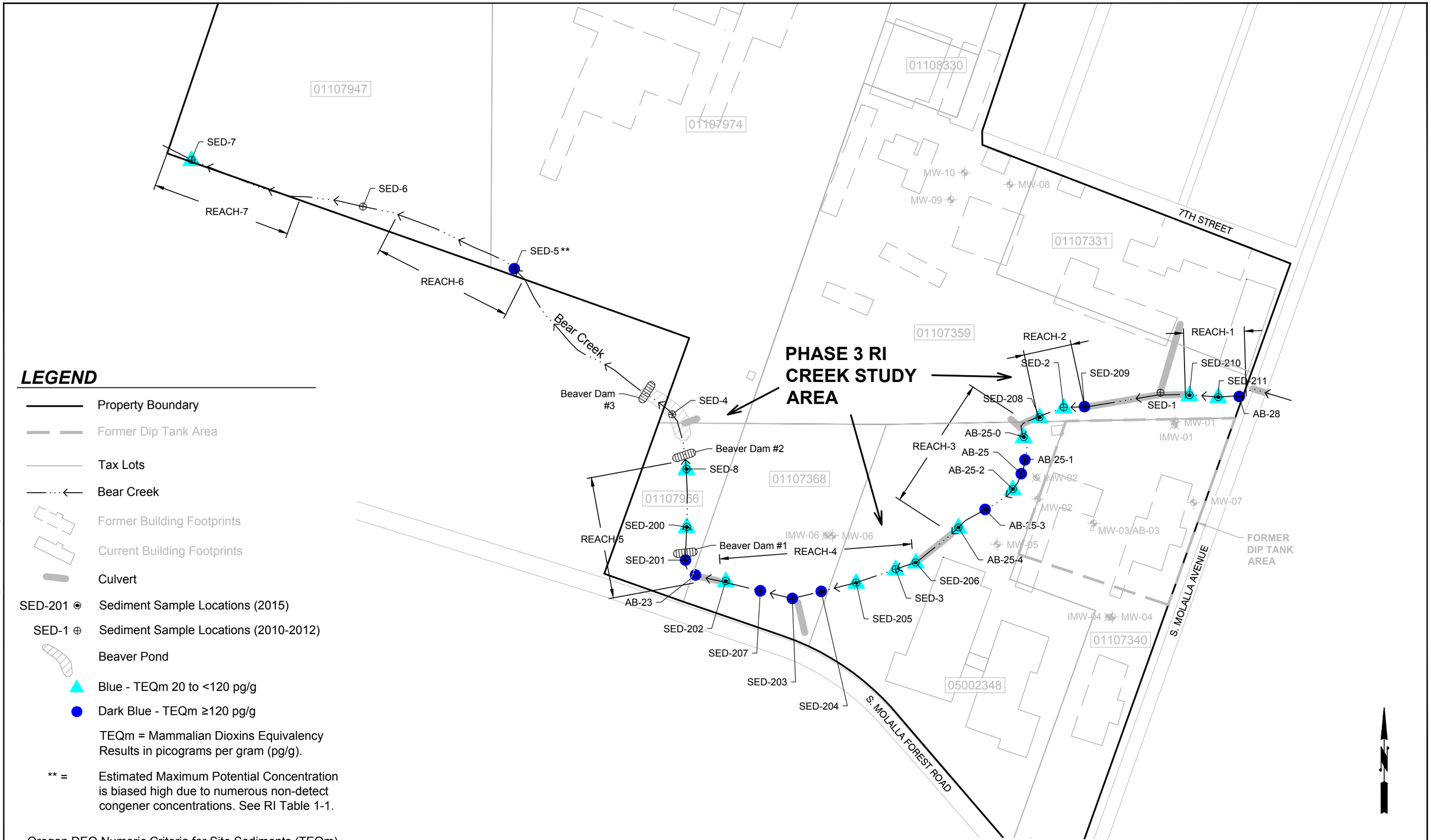
FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

INITIAL BEAR CREEK SEDIMENT SAMPLING LOCATIONS (2010-2012)

Project No. 1177-01

Figure No. 3



LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Former Building Footprints
- Current Building Footprints
- Culvert
- SED-201 ⊙ Sediment Sample Locations (2015)
- SED-1 ⊕ Sediment Sample Locations (2010-2012)
- Beaver Pond
- Blue - TEQm 20 to <120 pg/g
- Dark Blue - TEQm ≥120 pg/g

TEQm = Mammalian Dioxins Equivalency Results in picograms per gram (pg/g).

** = Estimated Maximum Potential Concentration is biased high due to numerous non-detect congener concentrations. See RI Table 1-1.

Oregon DEQ Numeric Criteria for Site Sediments (TEQm)
Remedial Action Goal = 20 pg/g
Remedial Action Level = 120 pg/g

APPROXIMATE SCALE IN FEET
0 100 200 400

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MOLALLA, OREGON

BEAR CREEK SEDIMENT
SAMPLING LOCATIONS
(2010-2015)

Project No. 1177-01
Figure No. 4

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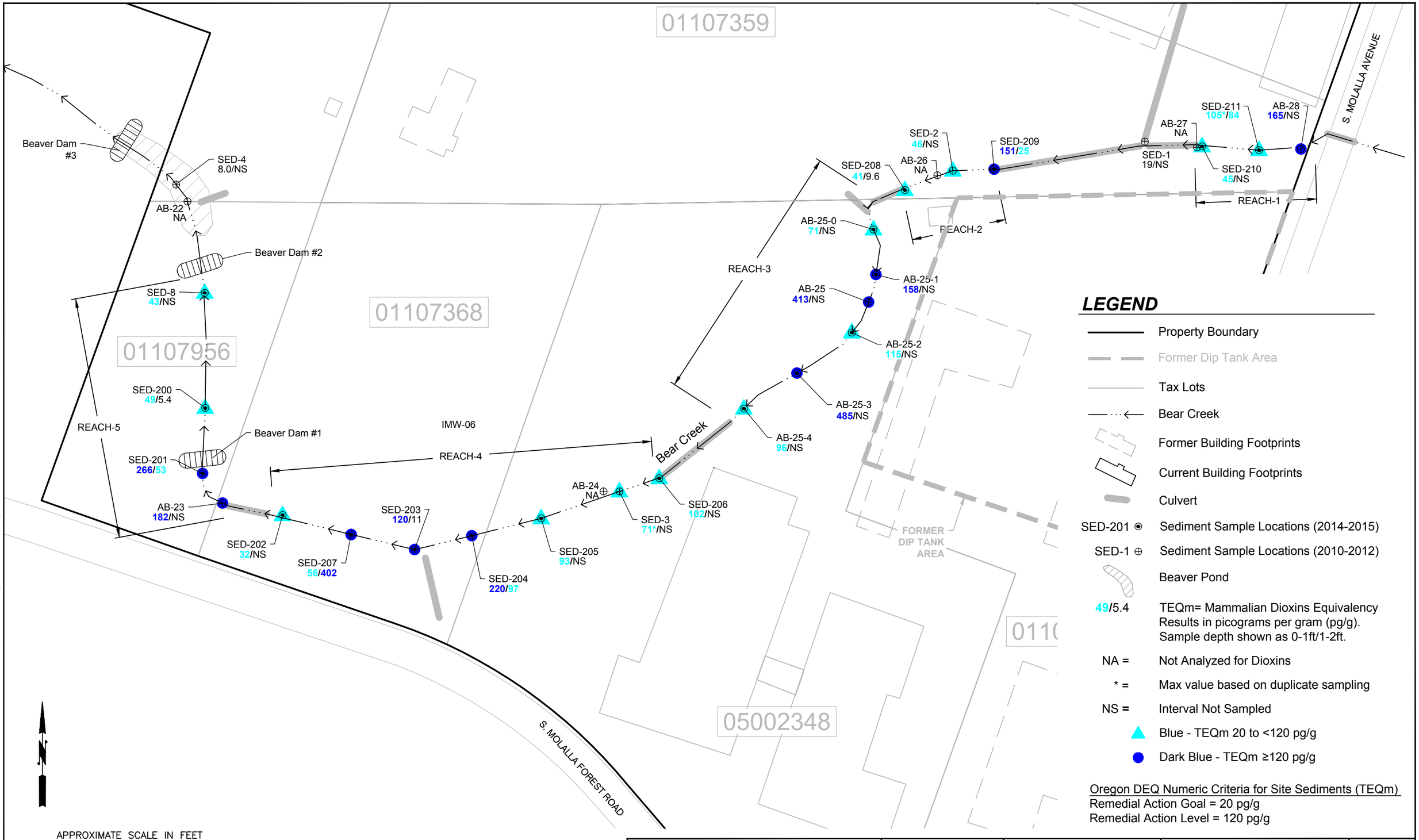

LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Former Building Footprints
- Current Building Footprints
- Culvert
- SED-201 — Sediment Sample Locations (2014-2015)
- SED-1 — Sediment Sample Locations (2010-2012)
- Beaver Pond
- 49/5.4 — TEQm= Mammalian Dioxins Equivalency Results in picograms per gram (pg/g). Sample depth shown as 0-1ft/1-2ft.
- NA = Not Analyzed for Dioxins
- * = Max value based on duplicate sampling
- NS = Interval Not Sampled
- Blue - TEQm 20 to <120 pg/g
- Dark Blue - TEQm ≥120 pg/g

Oregon DEQ Numeric Criteria for Site Sediments (TEQm)
Remedial Action Goal = 20 pg/g
Remedial Action Level = 120 pg/g

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FLORAGON PROPERTY
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DIOXIN TEQm
BEAR CREEK SEDIMENTS

Project No. 1177-01
Figure No. 5

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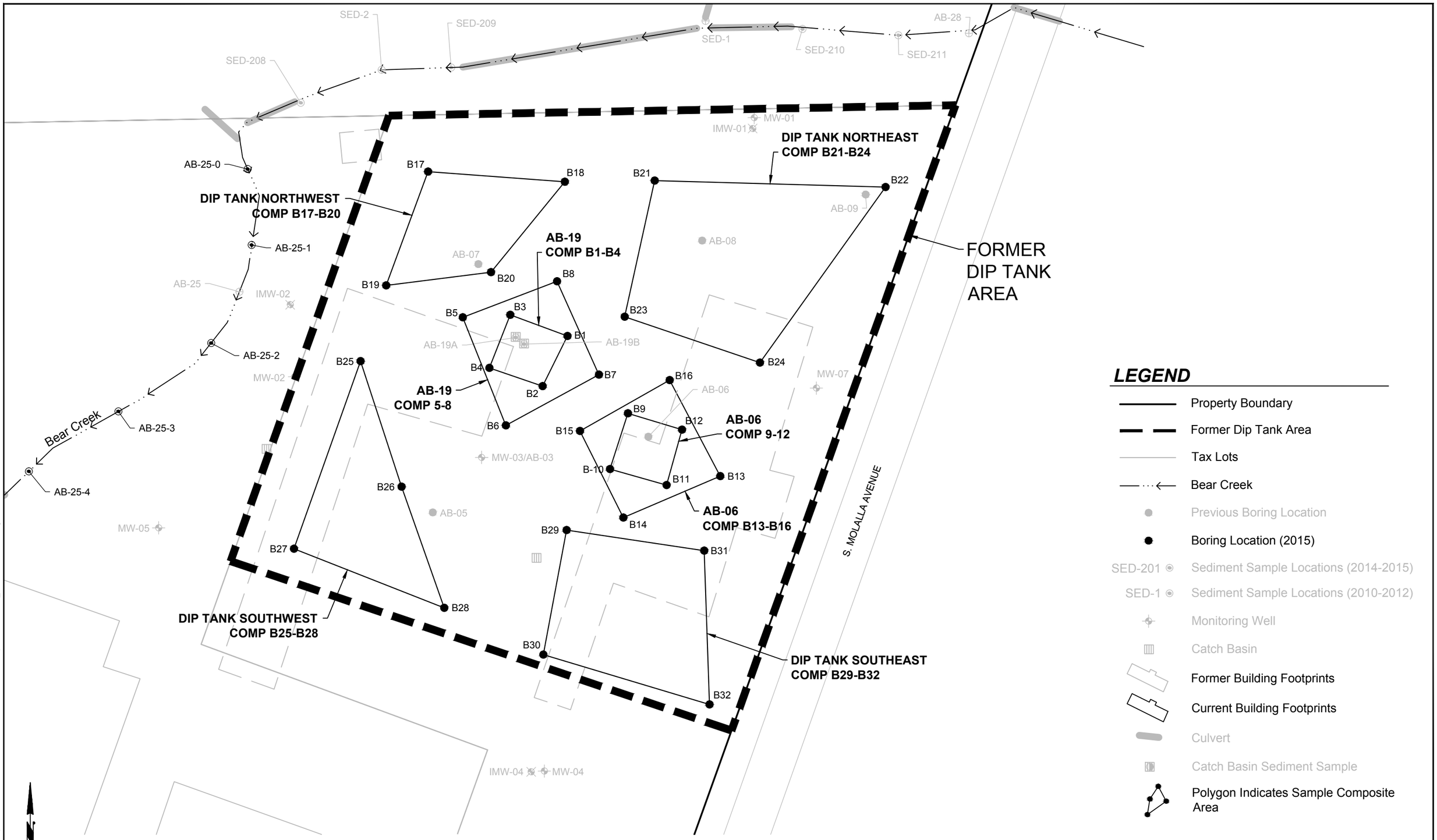

LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Previous Boring Location
- Boring Location (2015)
- SED-201 Sediment Sample Locations (2014-2015)
- SED-1 Sediment Sample Locations (2010-2012)
- Monitoring Well
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Catch Basin Sediment Sample
- Polygon Indicates Sample Composite Area

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FLORAGON PROPERTY
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DIP TANK AREA
SOIL BORING LOCATIONS

Project No. 1177-01
Figure No. 6

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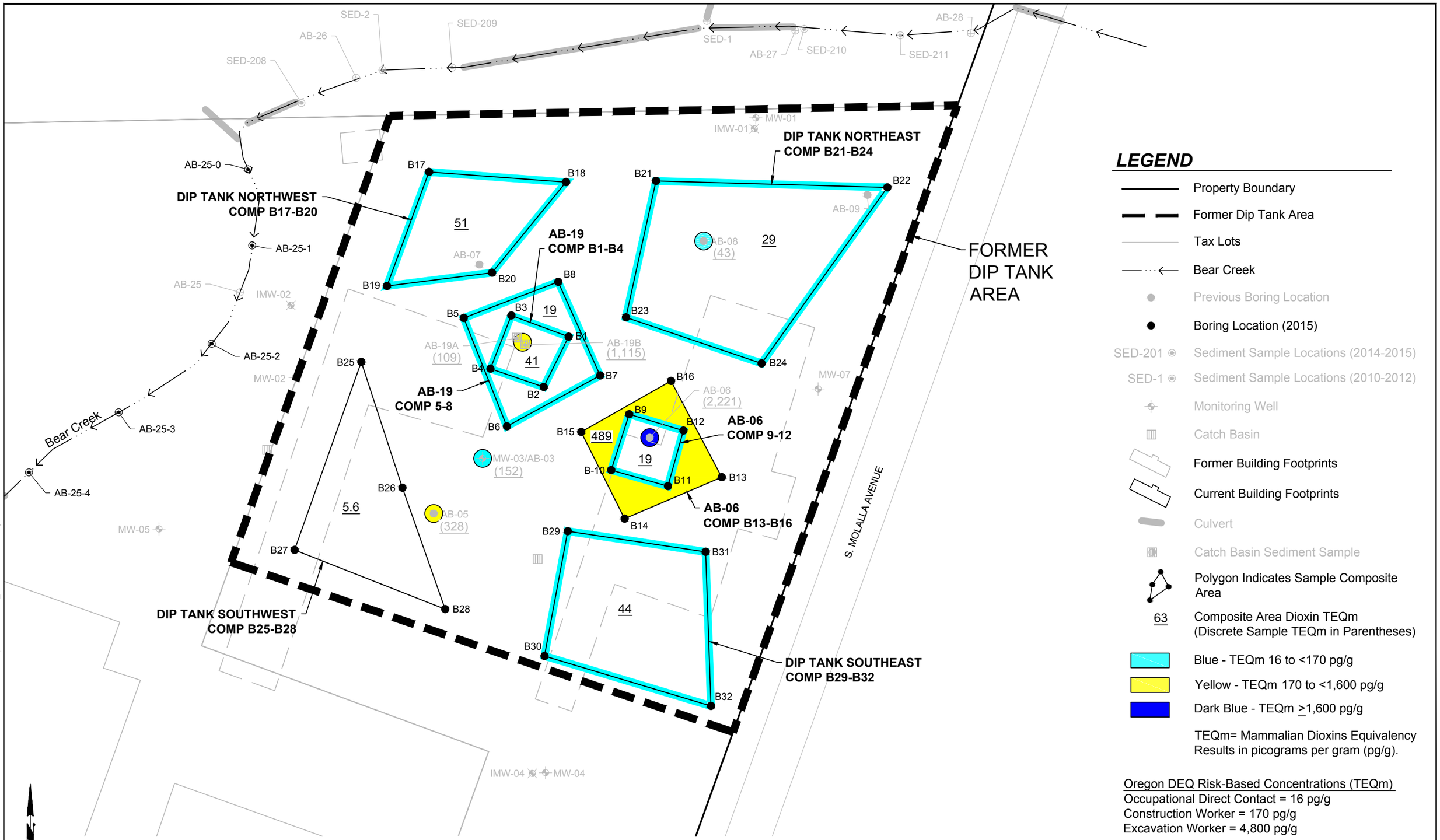

LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Previous Boring Location
- Boring Location (2015)
- SED-201 Sediment Sample Locations (2014-2015)
- SED-1 Sediment Sample Locations (2010-2012)
- Monitoring Well
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Catch Basin Sediment Sample
- Polygon Indicates Sample Composite Area
- 63 Composite Area Dioxin TEQm (Discrete Sample TEQm in Parentheses)
- Blue - TEQm 16 to <170 pg/g
- Yellow - TEQm 170 to <1,600 pg/g
- Dark Blue - TEQm ≥1,600 pg/g

TEQm= Mammalian Dioxins Equivalency Results in picograms per gram (pg/g).

Oregon DEQ Risk-Based Concentrations (TEQm)
Occupational Direct Contact = 16 pg/g
Construction Worker = 170 pg/g
Excavation Worker = 4,800 pg/g

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FLORAGON PROPERTY
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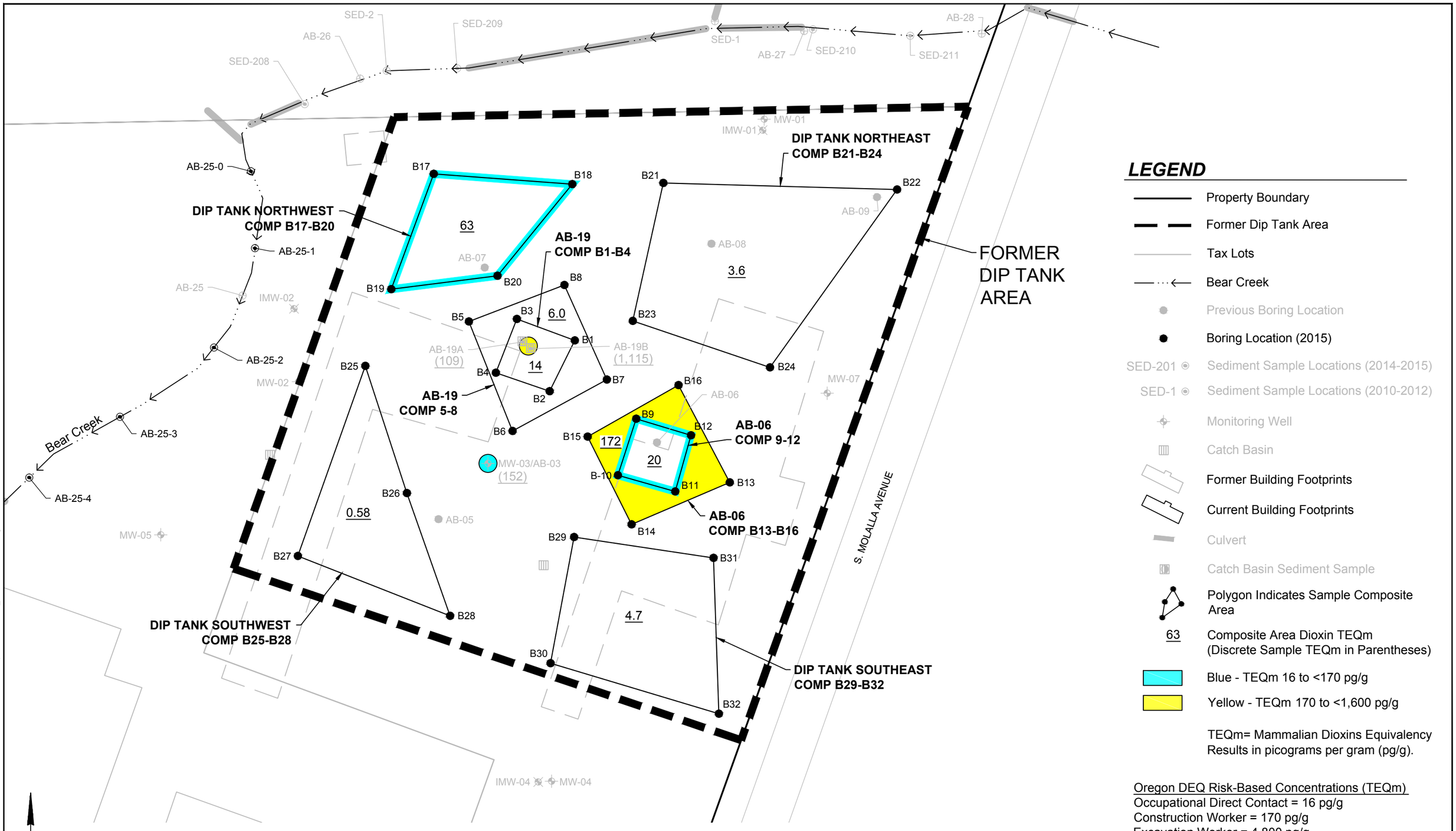
SOIL DIOXIN TEQm
IN DIP TANK AREA SOILS
0.5 FEET DEPTH

Project No. 1177-01
Figure No. 7



LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Previous Boring Location
- Boring Location (2015)
- SED-201 Sediment Sample Locations (2014-2015)
- SED-1 Sediment Sample Locations (2010-2012)
- Monitoring Well
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Catch Basin Sediment Sample
- Polygon Indicates Sample Composite Area
- 63 Composite Area Dioxin TEQm (Discrete Sample TEQm in Parentheses)
- Blue - TEQm 16 to <170 pg/g
- Yellow - TEQm 170 to <1,600 pg/g

TEQm= Mammalian Dioxins Equivalency Results in picograms per gram (pg/g).

Oregon DEQ Risk-Based Concentrations (TEQm)
Occupational Direct Contact = 16 pg/g
Construction Worker = 170 pg/g
Excavation Worker = 4,800 pg/g

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FLORAGON PROPERTY
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SOIL DIOXIN TEQm
IN DIP TANK AREA SOILS
1.5 FEET DEPTH

Project No. 1177-01
Figure No. 8

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Beaver Dam #3
Beaver Pond
Wetland 5-B
Beaver Dam #2
WTL-5B-DP03
WTL-5B-DP04
TL 5280
REACH-5
Beaver Dam #1
REACH-4
Breached Culvert
S. MOLALLA FOREST RD
TL 290
IMW-06
MW-06
Bear Creek
Wetland 2-A
WTL-2A-DP02
WTL-2A-DP01
REACH-3
REACH-2
REACH-1
MW-01
IMW-01
376.00
375.00
377.00
IMW-02
MW-02
MW-03/AB-03
IMW-07
S. MOLALLA AVE
MW-05
TL 101
TL 102
378.00
IMW-04
MW-04
379.00
390.00

APPROXIMATE SCALE IN FEET
0 50 100 200

LEGEND

- Property Boundary
- Tax Lots
- TL 101 — Tax Lot ID Numbers (Tax Map 5 2E 17A)
- Bear Creek Flow Direction
- Former Building Footprints
- Current Building Footprints
- Culvert
- MW-01 — Monitoring Well
- Study Area Boundary Line
- Ordinary High Water Mark (OHWM)
- Wetland Boundary
- REACH-3 concurred by DSL under WD#2015-0279
- REACH-1, -2, -4 and -5 concurred by DSL under WD#2016-0177
- WTL-2A-DP02 ⊗ Wetland Data Point

SURVEY NOTES:

THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM. THE HORIZONTAL ACCURACY FOR THE SITE IS 1 FOOT IN 50,000 FEET. THE HORIZONTAL ACCURACY AT ANY LOCATION IS ABOUT 0.10 OF ONE FOOT.

THE VERTICAL DATUM FOR THIS SURVEY IS BASED UPON OSHD BENCHMARK RAIT. THE ELEVATION IS 240.377' NGVD 29 DATUM. STUDY AREA AND DATA PLOT POINT ACCURACY IS +/- 0.5 FEET.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A LOOP FIELD TRAVERSE.

SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014, NOVEMBER 9-13 AND DECEMBER 3, 2015.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014 (REACH 3), NOVEMBER 2 AND 23, 2015 (REACH-1, -2, -4, AND -5).

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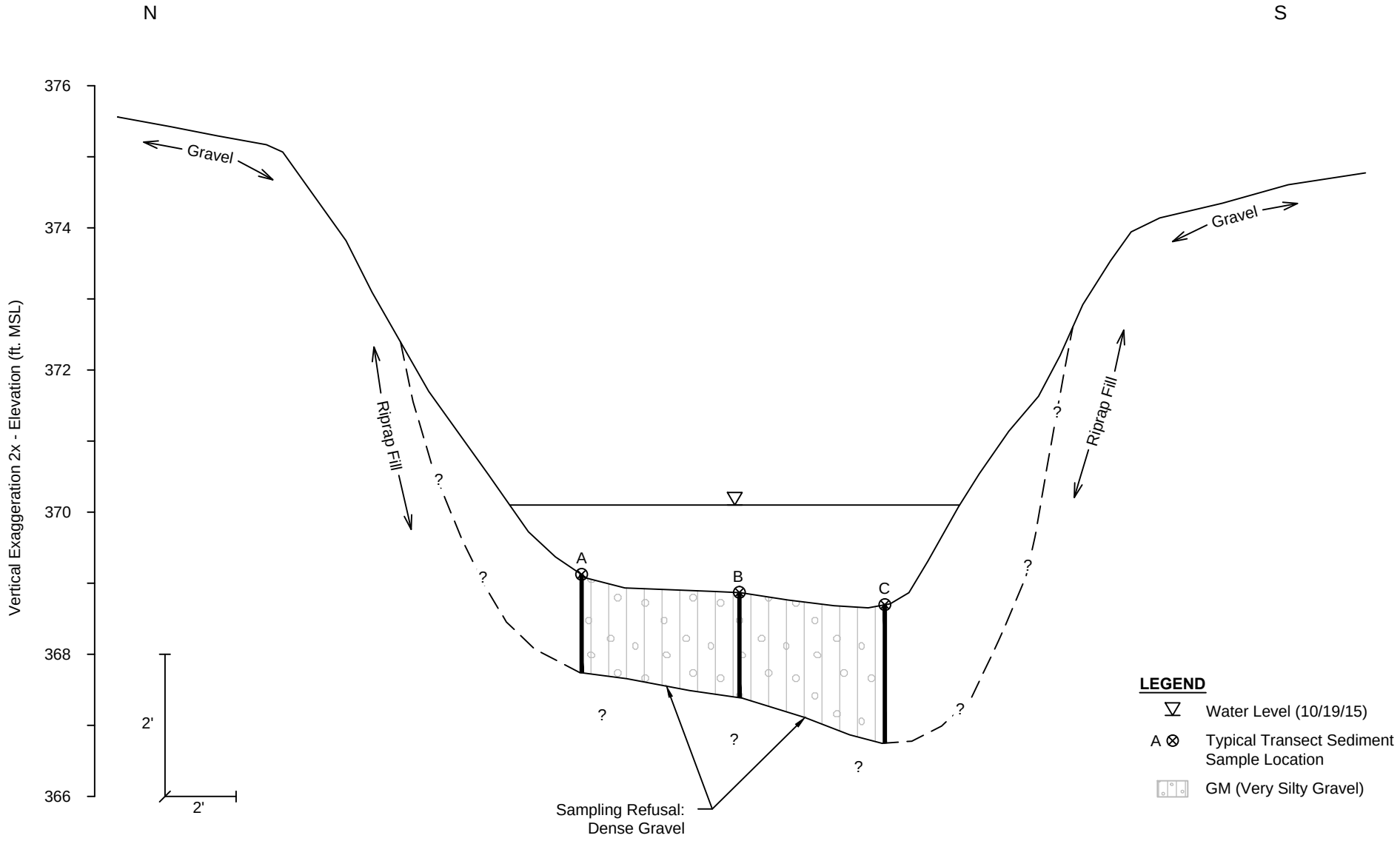
FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

BEAR CREEK WETLAND
AND WATER SURVEY

Project No. 1177-01
Figure No. 9

APPENDIX 1

REACH 1
GENERALIZED PROFILE



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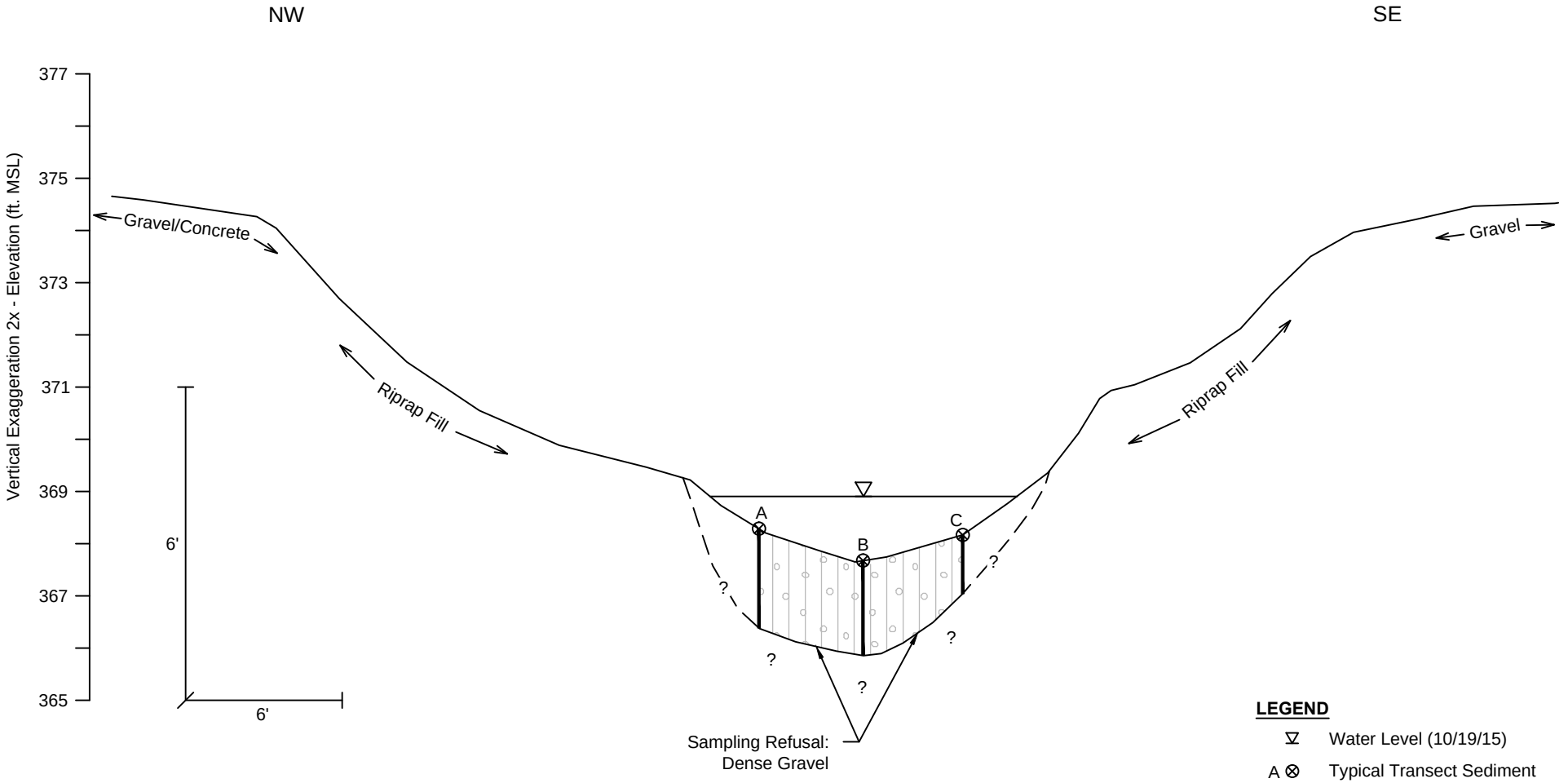
MOLALLA, OR.

BEAR CREEK
CROSS SECTION
(REACH 1)

Project No. 1177-01

Figure No. 1

REACH 2
GENERALIZED PROFILE



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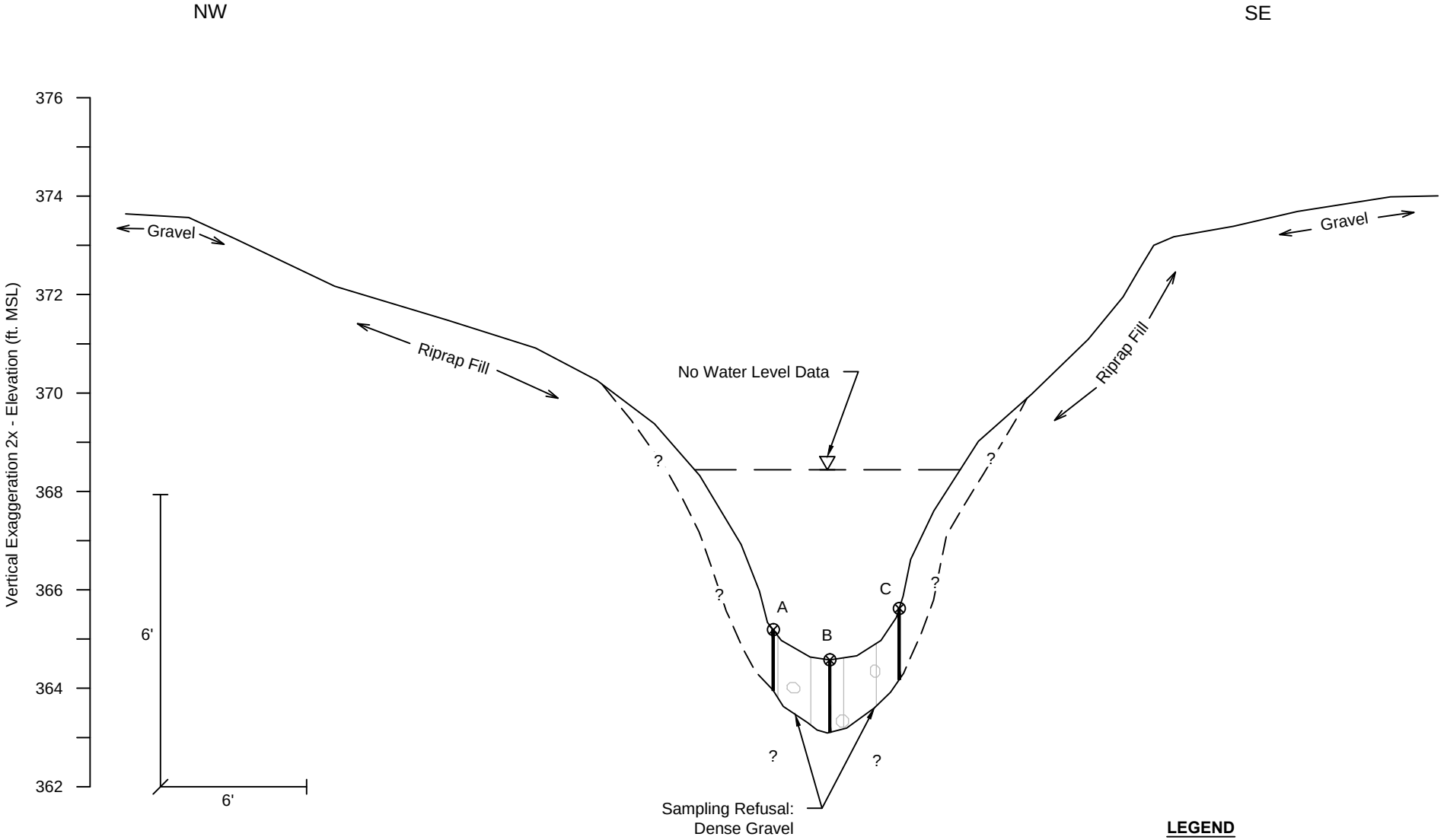
FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OR.

BEAR CREEK
CROSS SECTION
(REACH 2)

Project No. 1177-01

Figure No. 2

REACH 3
GENERALIZED PROFILE



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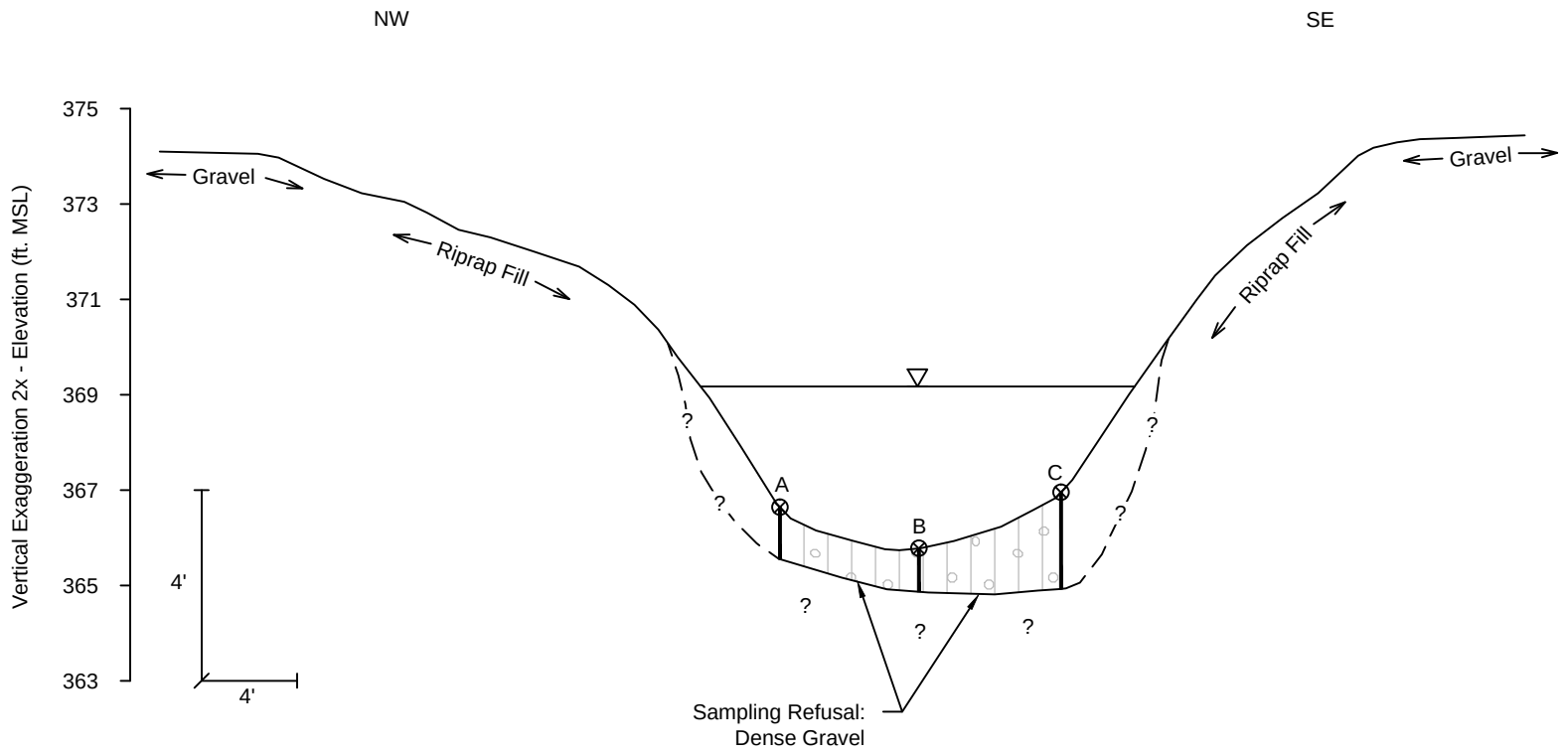
FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OR.

BEAR CREEK
CROSS SECTION
(REACH 3)

Project No. 1177-01

Figure No. 3

REACH 4
GENERALIZED PROFILE



LEGEND

- ▽ Water Level (10/19/15)
- A⊗ Typical Transect Sediment Sample Location
- GM (Very Silty Gravel)

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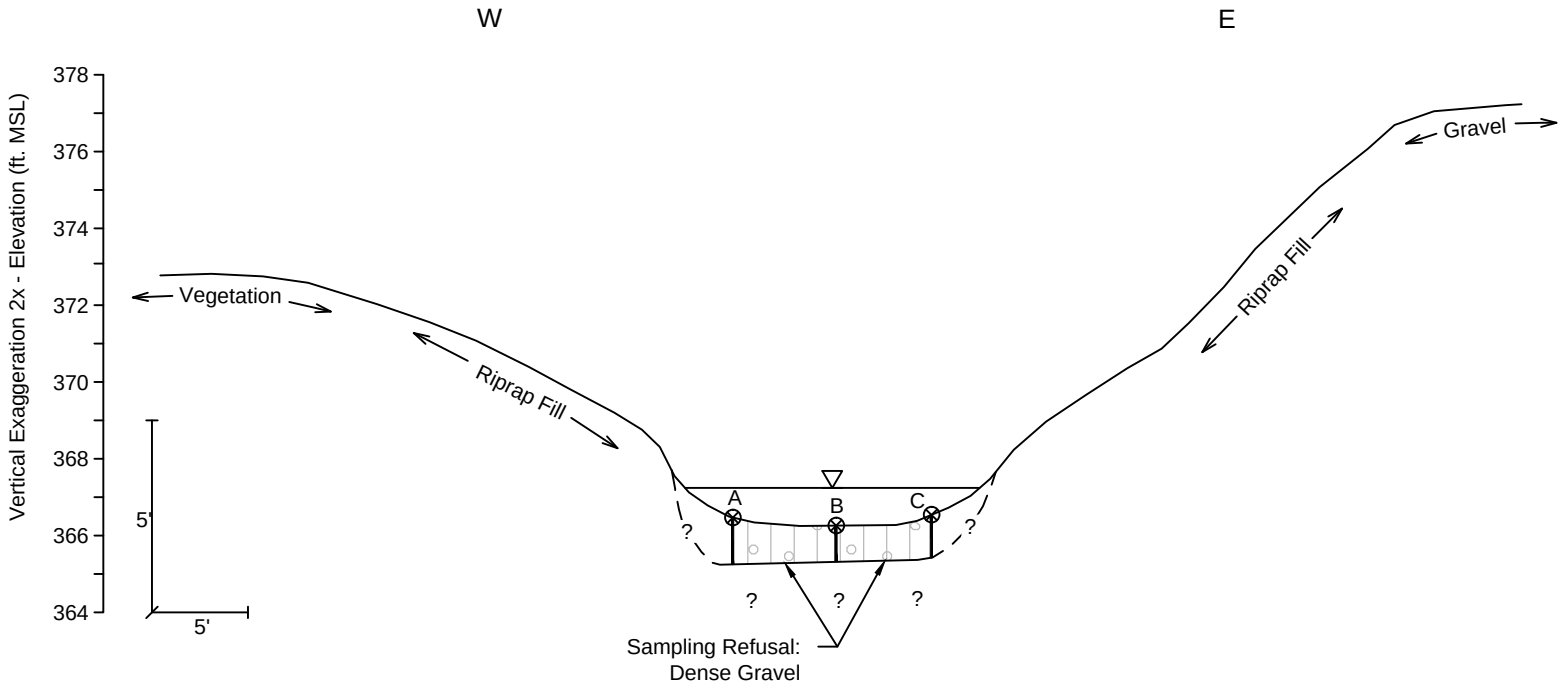
FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OR.

BEAR CREEK
CROSS SECTION
(REACH 4)

Project No. 1177-01

Figure No. 4

REACH 5
GENERALIZED PROFILE



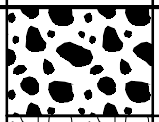
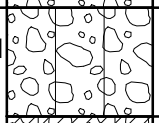
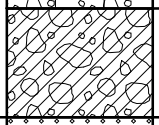
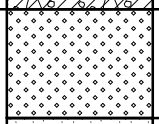
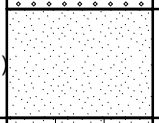
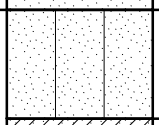
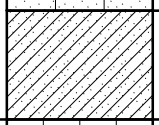
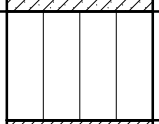
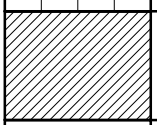
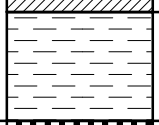
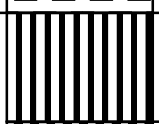
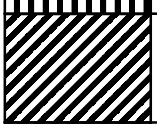
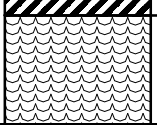
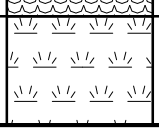
LEGEND

- ▽ Water Level (10/15/15)
- A⊗ Typical Transect Sediment Sample Location
- GM (Very Silty Gravel)

PNG ENVIRONMENTAL, INC. 6665 SW Hampton St., Ste. 101 TEL (503) 620-2387 Tigard, OR 97223 FAX (503) 620-2977	DATE: 2-23-16 FILE NAME: 1177-01 DRAWN BY: JJT APPROVED BY: CR	FLORAGON PROPERTY 7TH & HART STREET MOLALLA, OR.	BEAR CREEK CROSS SECTION (REACH 5)	Project No. 1177-01 Figure No. 5

APPENDIX 2

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

EES Environmental Consulting Inc.
240 N. Broadway #203
Portland, OR 97227
Telephone: 503.847.2740

BORING NO. **Typical Borings (Asphalt)** PAGE **1** OF **1**
PROJECT **Floragon Property, Molalla, Oregon**
LOCATION **Former Dip Tank Area**
PROJECT NO. **1177-01**
LOGGED BY **CJR**

START CARD **--** WELL ID **--**
COORDINATES
SURFACE ELEVATION **--** DATUM **--**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
			0.0	NS			Asphalt (4 inches).		
			0.0	NS			Brown GRAVEL with some sand and silt (GP); clast size approximately 3/4-inch or less in diameter; moist.		
			0.0	NS	100			Boring backfilled with bentonite and completed at ground surface with asphalt.	
							Dark gray to brown SILT (ML) with gravel, some woody debris, and trace sand; moist.		
							Moist to wet soil conditions.		
5			0.0	NS			Boring complete at 5 feet. No water encountered.		

DRILLING CONTRACTOR **Cascade Drilling**
DRILLING METHOD **Sonic**
DRILLING EQUIPMENT **Boart Longyear DB320**
DRILLING STARTED **10/13/15** ENDED **10/13/15**

REMARKS **Log illustrates general conditions encountered in borings B1 to B3, B5 to B10, B15 to B23, B26, B28 to B30, and B32. Discrete soil samples collected at depths of 0.5, 1.5, 3, and 4.5 feet at each location.**

See key sheet for symbols and abbreviations used above.

EES Environmental Consulting Inc.
240 N. Broadway #203
Portland, OR 97227
Telephone: 503.847.2740

BORING NO. **Typical Borings (Concrete)** PAGE **1** OF **1**
PROJECT **Floragon Property, Molalla, Oregon**
LOCATION **Former Dip Tank Area**
PROJECT NO. **1177-01**
LOGGED BY **CJR**

START CARD -- WELL ID --
COORDINATES
SURFACE ELEVATION -- DATUM --

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
			0.0	NS			Concrete (6 inches).		
			0.0	NS	100		Brown to gray GRAVEL with some sand and silt (GP); clast size approximately 3/4-inch or less in diameter; moist.	Boring backfilled with bentonite and completed at ground surface with asphalt or concrete to match surface conditions.	
			0.0	NS			Occasional gravel.		
5			0.0	NS			Boring complete at 5 feet. No water encountered.		

DRILLING CONTRACTOR **Cascade Drilling**
DRILLING METHOD **Sonic**
DRILLING EQUIPMENT **Boart Longyear DB320**
DRILLING STARTED **10/13/15** ENDED **10/13/15**

REMARKS **Log illustrates general conditions encountered in borings B4, B11 to B14, B24, B25, B27, and B31, located within former building footprints. Discrete soil samples collected at depths of 0.5, 1.5, 3, and 4.5 feet at each location.**

See key sheet for symbols and abbreviations used above.

APPENDIX 3

Oregon
Kate Brown, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

August 24, 2015

Avison Lumber Company
Attn: Bill Avison
500 E 5th Street
PO Box 419
Molalla, OR 97038

Re: WD #2015-0279 Wetland Delineation Report for the Proposed Floragon Property Bear Creek Reach 3
DEQ Soil Remediation Project, Clackamas County;
T 5S R 2E S 17A Portion of TL 100, 101, and 102
City of Molalla Local Wetlands Inventory, Bear Creek Segment R-BC-9

Dear Mr. Avison:

The Department of State Lands has reviewed the wetland delineation report prepared by SWCA Environmental Consultants for the site referenced above. Please note that the study area includes only a portion of the tax lots described above (see the attached map). Based upon the information presented in the report, we concur with the waterway boundaries as mapped in Figure 5 of the report. Within the study area, one waterway, a segment of Bear Creek, was identified.

The creek is subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined).

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. Please phone me at 503-986-5232 if you have any questions.

Sincerely,

Peter Ryan, PWS
Jurisdiction Coordinator

Approved by

Kathy Verble, CPSS
Aquatic Resource Specialist

Enclosures

ec: C. Mirth Walker, PWS, SWCA Environmental Consultants
City of Molalla Planning Department (Map enclosed for updating LWI)
Dominic Yballe, Corps of Engineers
Anita Huffman, DSL

WD# 2015-0279

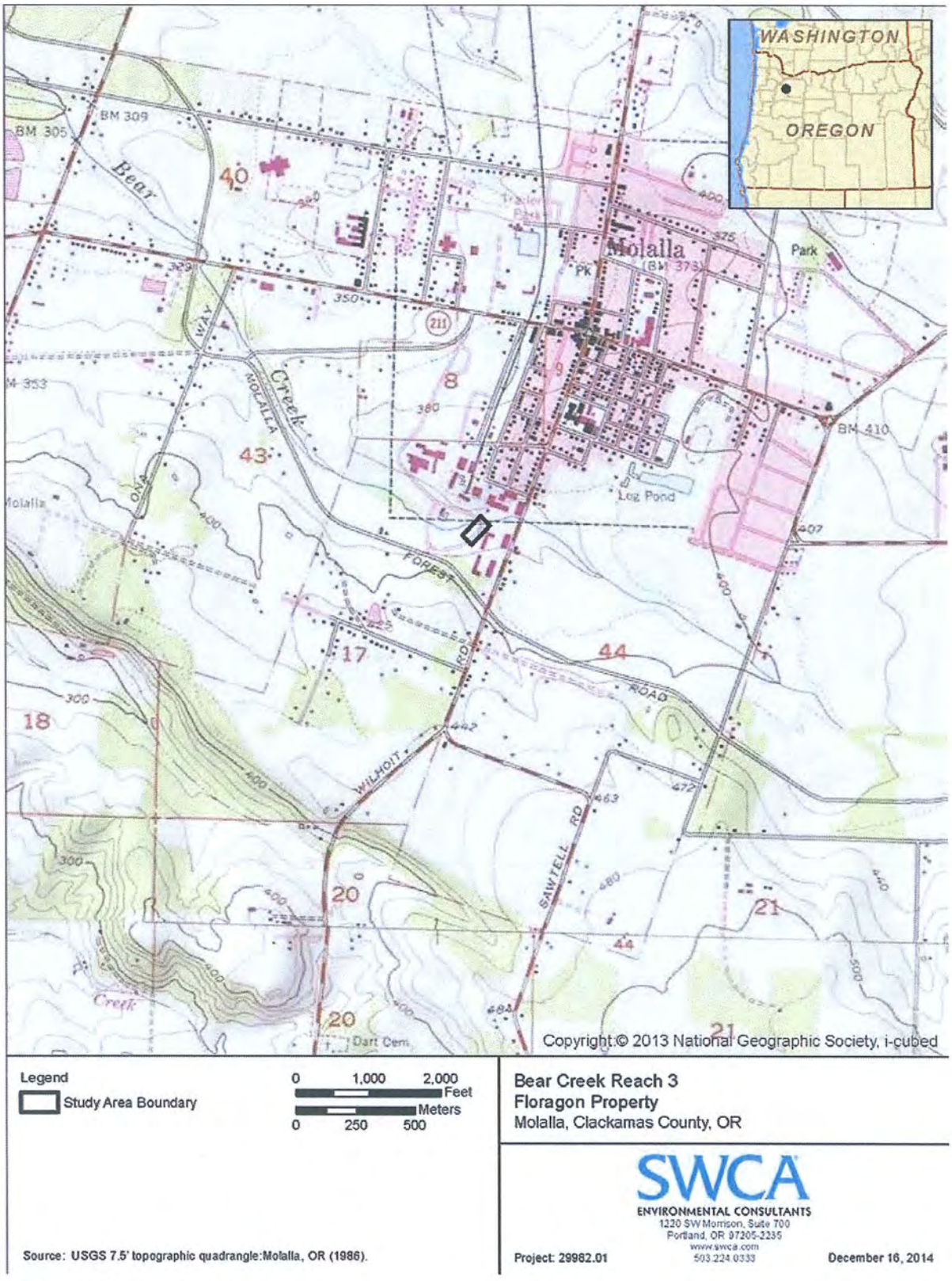
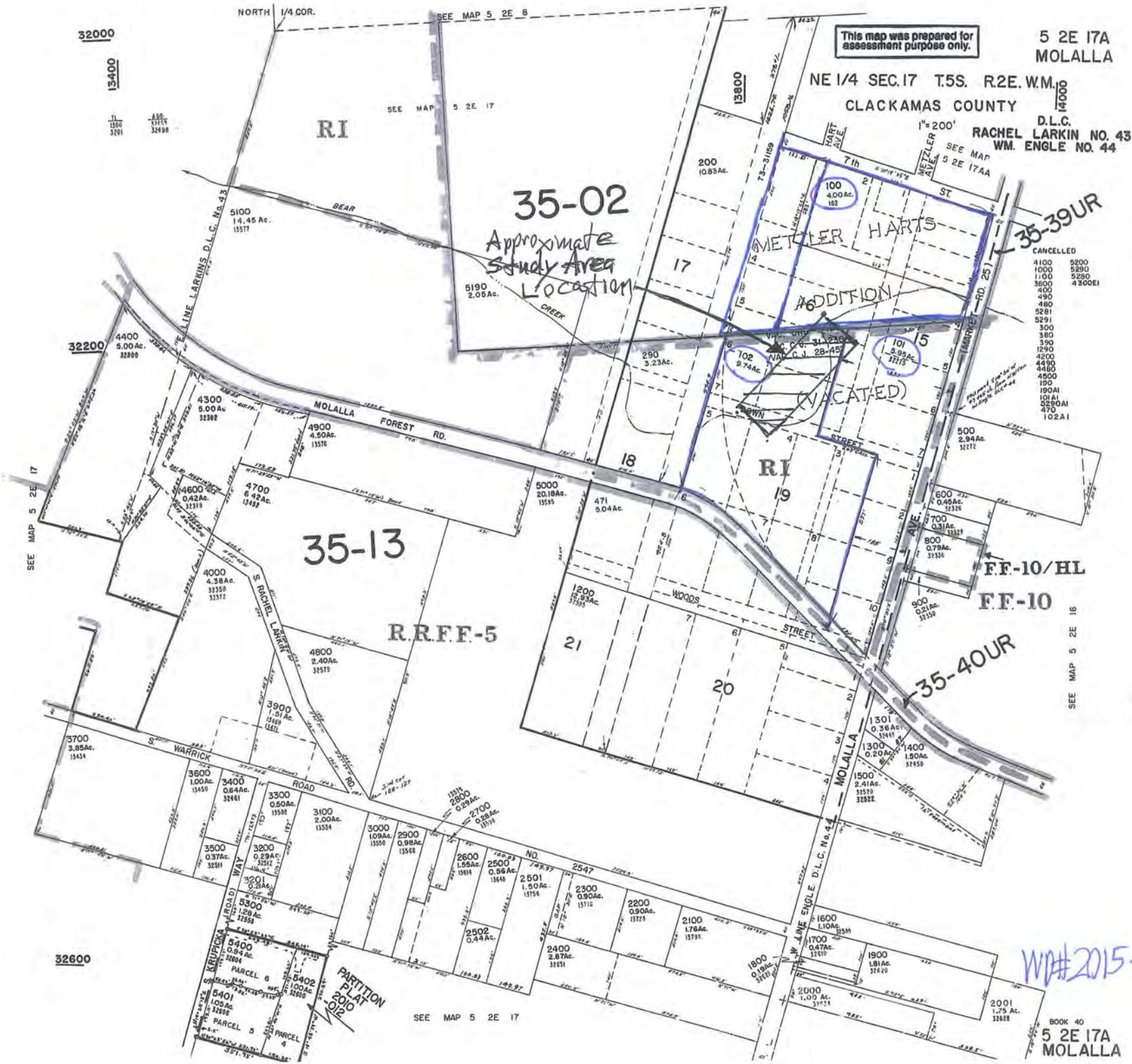
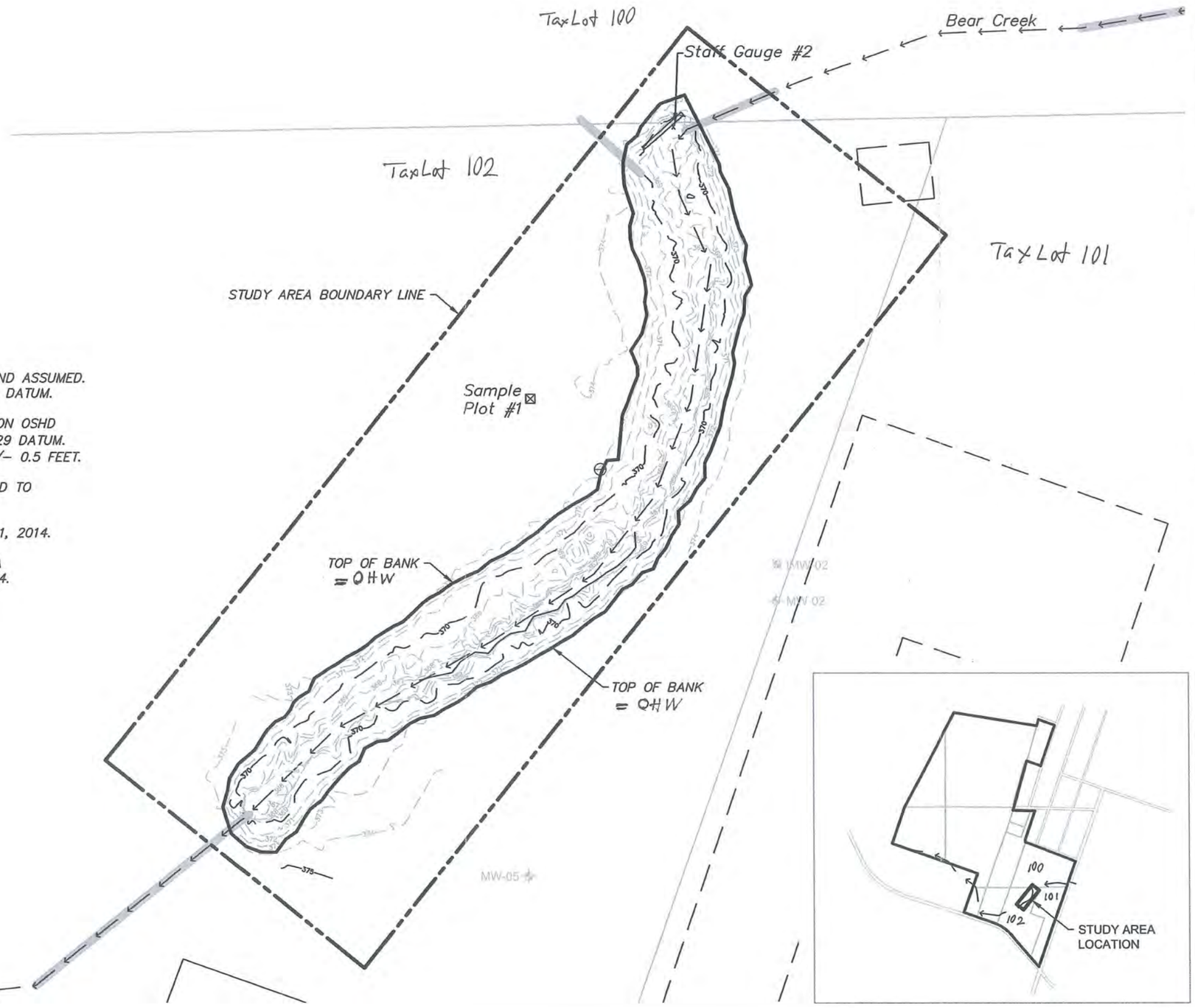


Figure 1. Site location map.


This map was prepared for assessment purpose only.
5 2E 17A
MOLALLA
NE 1/4 SEC. 17 T.5S. R.2E. W.M.
CLACKAMAS COUNTY
1"= 200'
D.L.C.
RACHEL LARKIN NO. 43
WM. ENGLE NO. 44
NORTH 1/4 COR.
SEE MAP 5 2E 8
SEE MAP 5 2E 17
SEE MAP 5 2E 17AA
RI
35-02
Approximate Study Area Location
35-13
R.R.F.F-5
F.F-10/HL
F.F-10
35-39UR
35-40UR
METZLER
HARTS
ADDITION
(VACATED)
MOLALLA FOREST RD.
S. RACHEL LARKIN RD.
S. WARRICK ROAD
KRUPICKA (ROAD) WAY
PARTITION PLAT 2010-012
PARCEL 6
PARCEL 5
PARCEL 4
W. LINE ENGLE D.L.C. NO. 44
E. LINE LARKINS D.L.C. NO. 43
MARKET RD. 25
HART AVE.
METZLER AVE.
7th ST.
WOODS STREET
BEAR CREEK
CANCELLED
BOOK 40
5 2E 17A
MOLALLA
WP#2015-0279

LEGEND

- Top of Bank (TOB) = Ordinary High Water Mark (OHWM)
- Bear Creek Flow Direction
- Former Building Footprints
- Current Building Footprints
- Culvert
- MW-01 Monitoring Well
- Sample Plot
- Study Area Boundary Line



SURVEY NOTES:

THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM.

THE VERTICAL DATUM FOR THIS SURVEY IS BASED UPON OSHD BENCHMARK RAIT. THE ELEVATION IS 240.377' NGVD 29 DATUM. STUDY AREA AND DATA PLOT POINT ACCURACY IS +/- 0.5 FEET.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A LOOP FIELD TRAVERSE.

SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014.

DSL WD # 2015-0279

Approval Issued 8/24/2015

Approval Expires 8/24/2020

N

APPROXIMATE SCALE IN FEET

0 20 40 80

PROJECT NO.	2015-01
DATE: 12-10-14	FIGURE NO. 5
FILE: 2015-01	
DRAWN: JJT	
APPROVED: CR	

BEAR CREEK
WATERS SURVEY

FLORAGON PROPERTY
7TH & HART ST.
MOLALLA, OREGON

EES
ENVIRONMENTAL CONSULTING, INC.
240 N Broadway #203, Portland, OR 97227
(503) 847-2740
www.ees-environmental.com

D:\Client Autocad\EES-Autocad\2015-01 Floragon (2)\Nov 2014\2015-01_BM - 112514.dwg 2.17.2014

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

This form must be included with any wetland delineation report submitted to the Department of State Lands for review and approval. A wetland delineation report submittal is not "complete" unless the fully completed and signed report cover form and the required fee are submitted. Attach this form to the front of an unbound report or include a hard copy of the completed form with a CD/DVD that includes a single PDF file of the report cover form and report (minimum 300 dpi resolution) and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279.** A single PDF attachment of the completed cover from and report may be e-mailed to **Wetland_Delineation@dsl.state.or.us**. For submittal of PDF files larger than 10 MB, e-mail instructions on how to access the file from your ftp or other file sharing website. Fees can be paid by check or credit card. Make the check payable to the Oregon Department of State Lands. To pay the fee by credit card, call 503-986-5200.

☒ Applicant ☐ Owner Name, Firm and Address: **Bill Avison** **Avison Lumber Company** **500 E 5th St.** **PO Box 419,** **Molalla, OR 97038**	Business phone # Mobile phone # (optional) E-mail: **bill@avison.com**
☒ Authorized Legal Agent, Name and Address: **C. Mirth Walker, PWS** **SWCA Environmental Consultants** **1220 SW Morrison St., Suite 700, Portland, OR 97205**	Business phone # **503-224-0333 ext. 6250** Mobile phone # **503-860-1708** E-mail: **cmwalker@swca.com**

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: **C. Mirth Walker** Signature: C. Mirth Walker

Date: **6/10/2015** Special instructions regarding site access: **Contact consultant to arrange site access.**

Project and Site Information (using decimal degree format for lat/long.,enter centroid of site or start & end points of linear project)

Project Name: **Floragon Property Bear Creek Reach 3**	Latitude: **45.139887**	Longitude: **-122.582838**
Proposed Use: **DEQ soil remediation**	Tax Map # **5 2E 17A**	
Project Street Address (or other descriptive location): **Approximately 500 feet northwest of the intersection between S. Molalla Avenue and S. Molalla Forest Road.**	Township **5S** Range **2E** Section **17A** QQ **NE** Tax Lot(s) **100, 102 (Portions)**	
City: **Molalla** County: **Clackamas**	Waterway: **Bear Creek** River Mile: **NA** NWI Quad(s): **Molalla**	

Wetland Delineation Information

Wetland Consultant Name, Firm and Address: **C. Mirth Walker, PWS** SWCA Environmental Consultants 1220 SW Morrison Street, Suite 700 Portland, OR 97205	Phone # **503-224-0333 ext. 6250** Mobile phone # **503-860-1708** E-mail: **cmwalker@swca.com**

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: C. Mirth Walker Date: **June 10, 2015**

Primary Contact for report review and site access is ☒ Consultant ☐ Applicant/Owner ☐ Authorized Agent

Wetland/Waters Present? ☒ Yes ☐ No | Study Area size: **0.93 acre** Total Wetland Acreage:**0 (0.28 ac water)**

Check Box Below if Applicable:	**Fees:**
☐ R-F permit application submitted	☒ Fee payment submitted **$396 to be paid by c.c.**
☐ Mitigation bank site	☐ Fee ($100) for resubmittal of rejected report
☐ Wetland restoration/enhancement project (not mitigation)	☐ No fee for request for reissuance of an expired report
☐ Industrial Land Certification Program Site	
☐ Reissuance of a recently expired delineation Previous DSL # Expiration date _____	

Other Information:	Y	N	
Has previous delineation/application been made on parcel?	☐	☒	If known, previous DSL #
Does LWI, if any, show wetland or waters on parcel?	☒	☐	

For Office Use Only

DSL Reviewer: _____	Fee Paid Date: ____ / ____ / ____	DSL WD # _____
Date Delineation Received: ___ / ____ / ____	DSL Project # _____	DSL Site # _____
Scanned: ☐ Final Scan: ☐	DSL WN # _____	DSL App. # _____

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FLORAGON FOREST PRODUCTS SITE
WATERS DELINEATION REPORT
TAX MAP 5 2E 17A, PORTION OF TAX LOTS 100 AND 102, NORTHWEST OF THE INTERSECTION BETWEEN S. MOLALLA AVENUE AND S. MOLALLA FOREST ROAD MOLALLA, CLACKAMAS COUNTY, OREGON

Prepared for

PNG Environmental, Inc.
6665 SW Hampton Street, Suite 101
Tigard, OR 97223

and

EES Environmental Consulting
240 N Broadway #203
Portland, OR 97227

Prepared by

SWCA Environmental Consultants
1220 SW Morrison Street, Suite 700
Portland, OR 97205
503-224-0333
www.swca.com

June 10, 2015

SWCA Project No. 29982

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K. LIST OF PREPARERS 6

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INTRODUCTION AND BACKGROUND

SWCA Environmental Consultants (SWCA) was contracted by PNG Environmental, Inc., in association with EES Environmental Consulting, Inc. to conduct a wetland and waters delineation on the subject site, which is a very small area within the southern portion of the Floragon Forest Products (Floragon) property (Figure 1, Appendix A). The Floragon property is located west of Molalla Avenue and north of the South Molalla Forest Road, and is accessed via an entrance near the intersection of Shaver Avenue and Section Street. The study area for this wetland and waters delineation consists of a small portion of tax lots 100 and 102 on tax map 5-2E-17A, located in Molalla, Clackamas County, Oregon (Figures 2a and 2b, Appendix A).

The delineation of "Reach 3" of Bear Creek is presented in this report. No wetlands were observed within the study area. This report was prepared in support of the ongoing Remedial Investigation (RI) and related ecological risk assessment addressing Bear Creek sediments, which are being evaluated with the participation of a voluntary agreement between the former property owner and the Oregon Department of Environmental Quality (DEQ).

A. LANDSCAPE SETTING AND LAND USE

OAR141-090-0035(7)(a)

The subject site is located in the southern portion of a larger parent property which was previously owned and operated by the Avison Lumber Company (Avison). Floragon, the current site owner, acquired the property in 1998. Floragon conducted site operations on the property and also leased portions of the property to third parties. Bear Creek flows through the southern portion of the site in reaches separated by culverts. The site is zoned I2 (Clackamas County Light Industrial Use).

The study area, designated as Reach 3 of Bear Creek, covers approximately 336 linear feet and is defined by upstream and downstream culverts, as illustrated on the site survey in Appendix A. The subject property is being investigated and remediated in accordance with Oregon's environmental cleanup rules (Oregon Administrative Rules [OAR] 340-122) and with direct participation by the DEQ. The DEQ-administered environmental investigation and cleanup process is intended to facilitate site and local redevelopment and to provide new industrial-related jobs.

The topography on the site is generally flat. Land surrounding the Floragon property is rural residential and residential/mixed use. The site is at an approximate elevation of 380 feet, based on the U.S. Geological Survey (USGS) topographic map (Figure 1).

B. SITE ALTERATIONS

OAR141-090-0035 (7)(c)

The Floragon property currently includes approximately 20 acres located at the southern portion of what historically was a much larger lumber mill and forest products manufacturing facility that covered approximately 102 acres. The study area (Reach 3 of Bear Creek) covers 0.93 acres and is located in the southern portion of the Floragon property.

According to a fact sheet issued by the DEQ (DEQ 2011), lumber-related manufacturing occurred at the Floragon site from approximately 1947 to 2009. From 1947 to the late 1990s, Avison operated at the facility. Floragon purchased the property in 1998, after which limited manufacturing continued through 2009. Most site buildings have been demolished, although vacant buildings related to recent glue-lam manufacturing remain in the southern portion of the site, to the east of the Reach 3 study area. Northern portions of the former mill site were purchased from Floragon by Tillamook Fiber in 2014 and are currently being used for log storage and chipping. Recently another operator has moved onto the northern site and has paved a large section to be used for bark and mulch processing.

From approximately 1970 to 1986, Avison Lumber applied a pentachlorophenol (PCP)-based chemical solution on lumber for anti-fungal purposes prior to shipment. This solution often contained a family of related chemicals called chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans, commonly referred to as dioxins/furans. Lumber was prepared with the water-based dipping solution at two dip tanks located in the southern portion of the site. The PCP solution was switched in the late 1980s to a detergent based anti-fungal treating solution.

A series of investigation and cleanup activities were performed at the site starting in the 1980s, and included early investigation by Avison and the Environmental Protection Agency (EPA) Region 10. EPA investigation under the superfund program identified contamination at the site, but concluded that it was not significant enough to require further action by EPA. DEQ identified the site as a low priority for further action based on these results.

In the late 1990s, Floragon removed underground storage tanks, and performed additional soil and groundwater investigation. In 2007, DEQ elevated the site priority based on the detection of residual dioxins/furans in soil and sediment. Floragon subsequently entered into the Voluntary Cleanup Program and began site investigation under a Consent Order with DEQ to complete a comprehensive site investigation and risk assessment. Floragon submitted a work proposal for site-wide investigation and risk assessment in 2008. In 2009 DEQ approved the plan. Floragon initiated work in 2010, sampling soil and groundwater across the site, and sediment within Bear Creek and perimeter ditches. Samples were analyzed for multiple chemical contaminants. Avison completed the report and presented it to DEQ in July 2011. Avison is working with DEQ and the owner to continue investigation work at the site.

In the southern portion of the site, low levels of phenols were detected in soil and groundwater around former dip tanks, well away from residential development. Dioxins/furans have also been detected in soil, and within Bear Creek sediments.

The site is listed in the DEQ Environmental Cleanup Site Information (ECSI) Database as ECSI Site Number 9 (DEQ 2014). Primary concern is exposure of site occupants and ecological receptors to dip tank area soil and sediment within Bear Creek on the site. Trespasser analysis by DEQ has shown that there is no significant risk associated with short-term exposure to site contamination. Much of the site is paved, fenced, and posted with “no trespassing” signs; however, direct contact with hazardous substances in exposed areas of soil by on-site workers or future construction workers is a potential pathway of concern for the site. Human health and ecological risk issues are being evaluated as part of the ongoing RI and risk assessment evaluation.

Environmental characterization for a major portion of the site has been completed and DEQ issued a No Further Action determination for the northern portion of the site (which consists of approximately 80 acres) on March 4, 2014. Human health risks at the remaining 20-acre portion of the site have been substantially evaluated and supporting documentation (although not yet finalized) has been

coordinated with and reviewed by DEQ. Ecological risk assessment and related RI efforts are ongoing for the southern portion of the site, which includes Bear Creek and related sediments.

An aerial photograph showing site conditions dating from 2011 is included in Appendix B.

C. PRECIPITATION DATA AND ANALYSIS

OAR141-090-0035 (7)(i)

The WETS (short for wetlands climate analysis) station used to obtain precipitation data for the project site was the North Willamette Experimental station in Aurora, Oregon. Average annual rainfall according to the WETS table for the North Willamette station is 59.48 inches. Precipitation data were obtained from the Aurora weather station via the National Weather Service (NWS). Table 1 shows the monthly precipitation averages according to the Aurora station for the three months prior to SWCA's November 19, 2014, site visit. The raw data are included in Appendix C.

Table 1. Precipitation Data – Monthly Averages Based on the Climate Period 1971–2000 (inches)

Month	Average	30% Chance Will Have		Observed Precipitation	Within Normal Range?
		Less Than	More Than		
August	0.83	0.18	0.96	0.17	Below normal (20%)
September	1.77	0.80	2.21	1.07	Within normal (60%)
October	3.36	1.69	4.10	6.72	Above normal (200%)
November	6.48	4.39	7.75	3.17	Below normal (48%)

Source: North Willamette Experimental Station WETS table and Aurora NWS 2014.

According to the NWS Aurora weather station, rainfall received on November 19, 2014, was 0.08 inch, and rainfall received for the two weeks prior to the site visit was 0.38 inch (received from November 5 through 18, 2014). Rainfall received for the water year-to-date was 7.66 inches. Rainfall received since January 1, 2014, in Aurora was recorded at 32.66 inches on November 19, 2014.

The WETS table for the North Willamette Experiment Station lists the growing season from March 1 to November 22 (265 days). Our site visit was conducted near the end of the growing season.

D. METHODS

OAR141-090-0035 (7)(d-e), (g-h), (16)(a-b), (f), (d) or (g), (17), and (19-20)

The methodology used for determining the presence of wetlands followed the routine approach of the U.S. Army Corps of Engineers' (Corps') *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers' Wetland Delineation Manual for the Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010), used by both the Corps and the Oregon Department of State Lands (DSL). Mirth Walker conducted a scoping site visit on November 12, 2014, with Brad Berggren, PE, RG, of PNG Environmental, Inc. and Paul Ecker, RG, LHG, of EES Environmental Consulting, Inc. Fieldwork for documenting site conditions and delineating the water boundaries was conducted on November 19, 2014, by Tony Vingiello. Mirth Walker conducted a brief site visit that day.

SWCA flagged the ordinary high water mark (OHWM) of Bear Creek in Reach 3 along the riprapped banks. The OHWM for the creek was determined by the level of reed canary grass (*Phalaris arundinacea*) growth and where sediment deposits had occurred.

According to the Natural Resources Conservation Service (NRCS 2006, 2014) Clackamas County Area Soil Survey map (Figure 3, Appendix A), the entire study area is mapped as the hydric Dayton silt loam (Unit 29), though only gravel fill and pavement were observed adjacent to Bear Creek.

Representative ground-level site photographs are included in Appendix E. References cited are included in Appendix F.

E. DESCRIPTION OF WATERS AND SURROUNDING AREA

OAR141-090-0035 (2), (7)(b), and (17)

Wetlands

There are no wetlands within the study area. The land immediately surrounding Bear Creek is uniformly upland, generally gravel fill or pavement with scattered Himalayan blackberry (*Rubus armeniacus*) and weeds.

Non-wetland Waters

Bear Creek enters the site from the east and flows in a westerly direction through southern portions of the site. Reach 3 of Bear Creek is lined with riprap and surrounded by gravel fill and asphalt access roads. A water depth gauge is present at the north end of the creek, where two culverts enter the reach. A 5-foot-wide culvert closes the reach at the southwest end of the study area.

The stream had no noticeable flow at the time of the site visit due to the presence of a downstream beaver dam which was backwatering flow. The ordinary high water mark (OHWM) of the creek was delineated and surveyed, and labeled top of bank (TOB) in the field. The stream in this reach is 336 linear feet long and comprises an area of 11,990 square feet (0.28 acre). The bank-to-bank distance (bankfull width) was typically 20 to 35 feet wide. The water width on November 29, 2014, ranged from 10 to 20 feet, and the water was up to 8 feet deep in the center channel.

The primary vegetation above the OHWM/TOB included Himalayan blackberry and reed canary grass; both were growing extensively among the large and small diameter riprap lining the banks. The stream substrate was typically a sandy loam or sandy clay with gravels, rooted vegetation, and sand fill.

Uplands

The uplands on the site surrounding Bear Creek have weedy vegetation dominated by moss and weedy grasses and forbs. Dominant weeds included common velvet grass (*Holcus lanatus*), Queen Anne's-lace (*Daucus carota*), colonial bentgrass (*Agrostis capillaris*), and hairy-cat's-ear (*Hypochaeris radicata*).

F. DEVIATION FROM LWI OR NWI

OAR141-090-0035 (16)(e)

The City of Molalla Local Wetland Inventory (LWI; Pacific Habitat Services [PHS] 2001) did not map any wetlands within the study area, only a narrow riparian corridor along the stream (Figure 4, Appendix A). The LWI and the Molalla National Wetlands Inventory (NWI) map both map wetlands to the west of the study area. The LWI summary sheets for the site are included in Appendix G.

G. MAPPING METHOD

OAR141-090-0035 (7)(f), (11), (12), (13), (18), and (22)

The OHWM and one sample plot location were professionally land surveyed by Centerline Concepts Land Surveying, Inc. The surveyed delineation maps are shown in Figures 5 and 6 in Appendix A.

H. ADDITIONAL INFORMATION

No fish were observed during fieldwork. The site does not contain a 100-year floodplain according to Community Panel 41005C0540D by the Federal Emergency Management Agency (FEMA 2008), but the creek reportedly floods regularly (personal communication Brad Berggren, Senior Environmental Engineer with PNG Environmental, Inc., on November 12, 2014, with Mirth Walker, SWCA; see also Tetra Tech/KCM 2003).

Bear Creek is a tributary of the Pudding River, which in turn enters the Molalla River near its mouth at the Willamette River. The Pudding River is listed as rearing and migration habitat for Coho, spring-run Chinook salmon, and winter Steelhead, and is cited as habitat for Pacific Lamprey (DEQ 2014). Chinook salmon and Steelhead are listed as Federal threatened species. Coho salmon is listed by Oregon as a state endangered species and as a Federal species of special concern. Pacific Lamprey is listed as a State species of concern.

Bear Creek is not identified as DSL Essential Salmon Habitat (ESH). Essential salmonid habitat is defined as the habitat necessary to prevent the depletion of native salmon species (chum, sockeye, Chinook and Coho salmon, and steelhead and cutthroat trout) during their life history stages of spawning and rearing. The ESH designation identifies streams supporting species listed as sensitive, threatened, or endangered by state or federal authority. Bear Creek is not identified as anadromous fish habitat in the Lower Molalla River and Milk Creek Watershed Assessment (ABR, Inc. 2004). According to the Molalla Watershed Analysis (Bureau of Land Management [BLM] and U.S. Forest Service [USFS] 1999), use by steelhead in the lower mile of Bear Creek was suspected; however access for these fish would be limited to very high flows because of a steep cascade near the mouth. The Molalla Watershed Analysis assessed Bear Creek as having low restoration potential due to limited use by anadromous fish.

Bear Creek within the study area and downstream portions dry up during the summer months (personal communication from Bill Avison to Paul Ecker, email dated June 1, 2015). Mr. Avison photodocuments every summer that Bear Creek dries up over a mile downstream of the study area. Photodocumentation of the dry Bear Creek channel at the Highway 213 crossing, approximately 1.5 miles downstream of the study area, is available upon request.

I. RESULTS AND CONCLUSIONS

OAR141-090-0035 (7)(j)

The boundary of Bear Creek (336 linear feet/0.28 acre) was delineated in the study area. No wetlands were present within the study area.

The latitude and longitude of the centroid of Reach 3 are 45.139887 °N and −122.582838 °W.

J. REQUIRED DISCLAIMER

OAR141-009-0035 (7)(k)

This report documents the investigation, best professional judgment, and conclusions of the investigators. It is correct and complete to the best of our knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Oregon DSL in accordance with Oregon Administrative Rules 141-090-0005 through 141-090-0055.

K. LIST OF PREPARERS

Tony Vingiello
Wetland Scientist
Fieldwork and Report Preparation

and

C. Mirth Walker, PWS
Senior Wetland Scientist
Report Preparation and QA/QC Review

APPENDIX A

Figures

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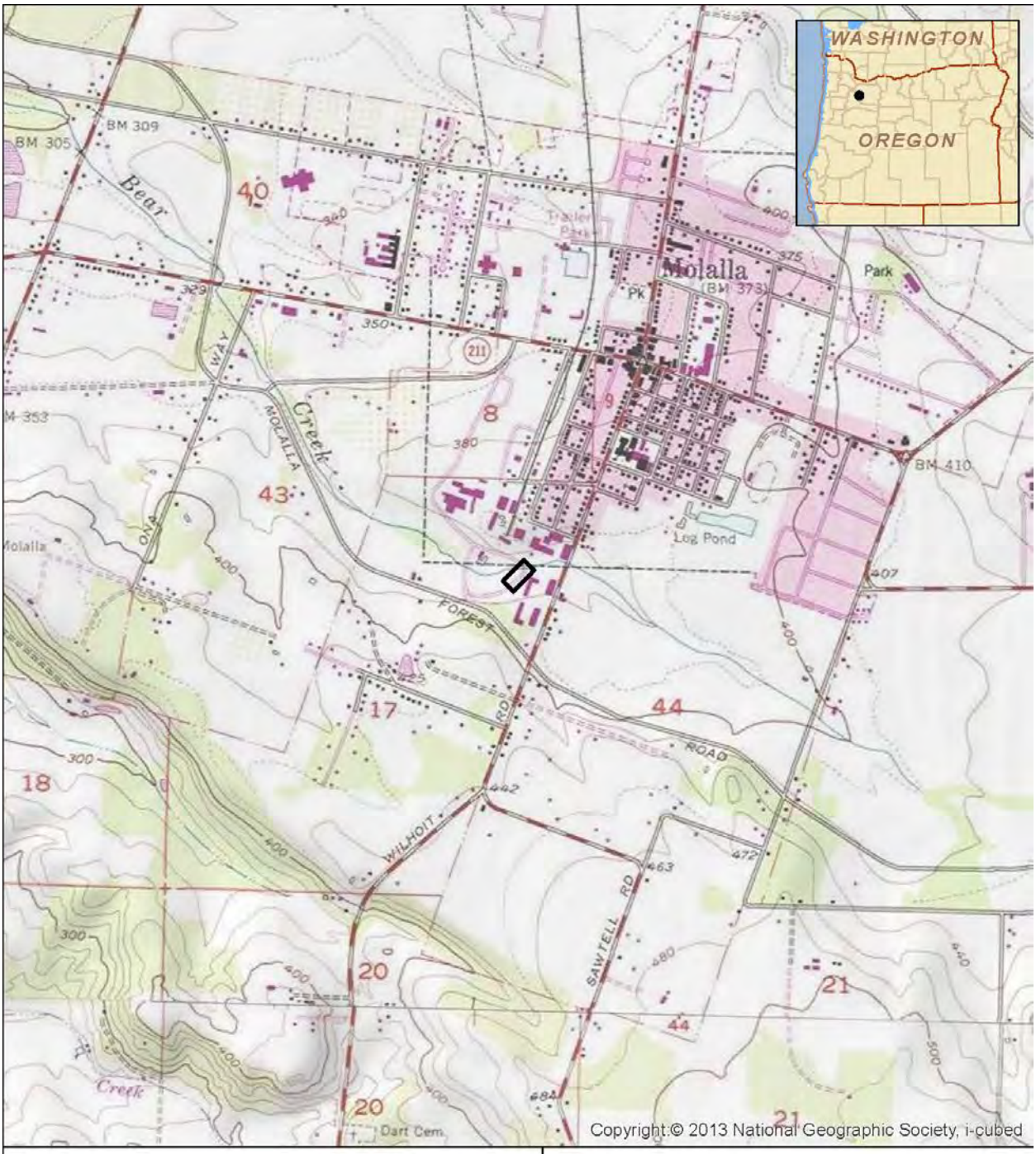

Figure 1. Site location map.

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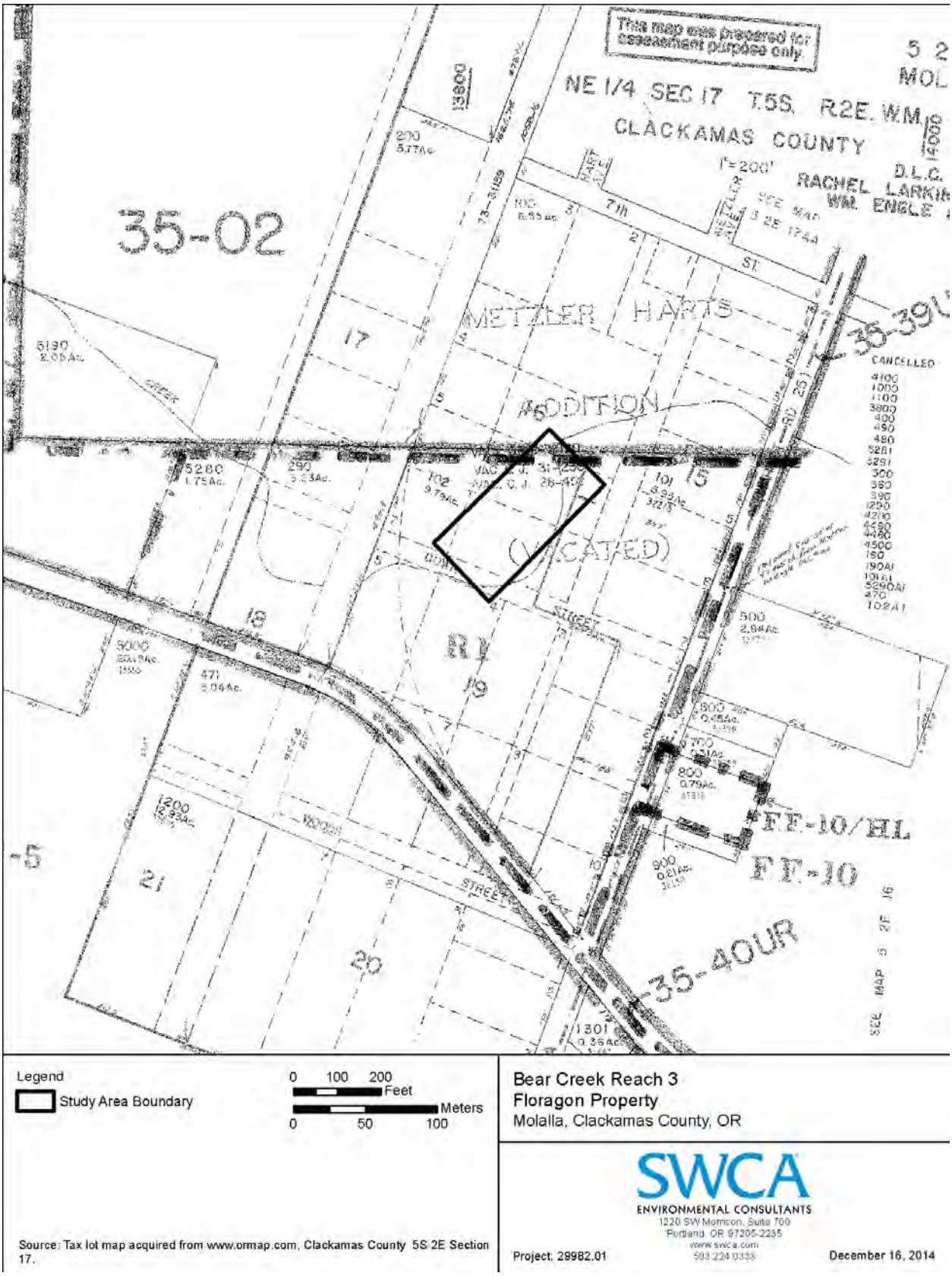

Figure 2a. Tax lot map (OrMap base).

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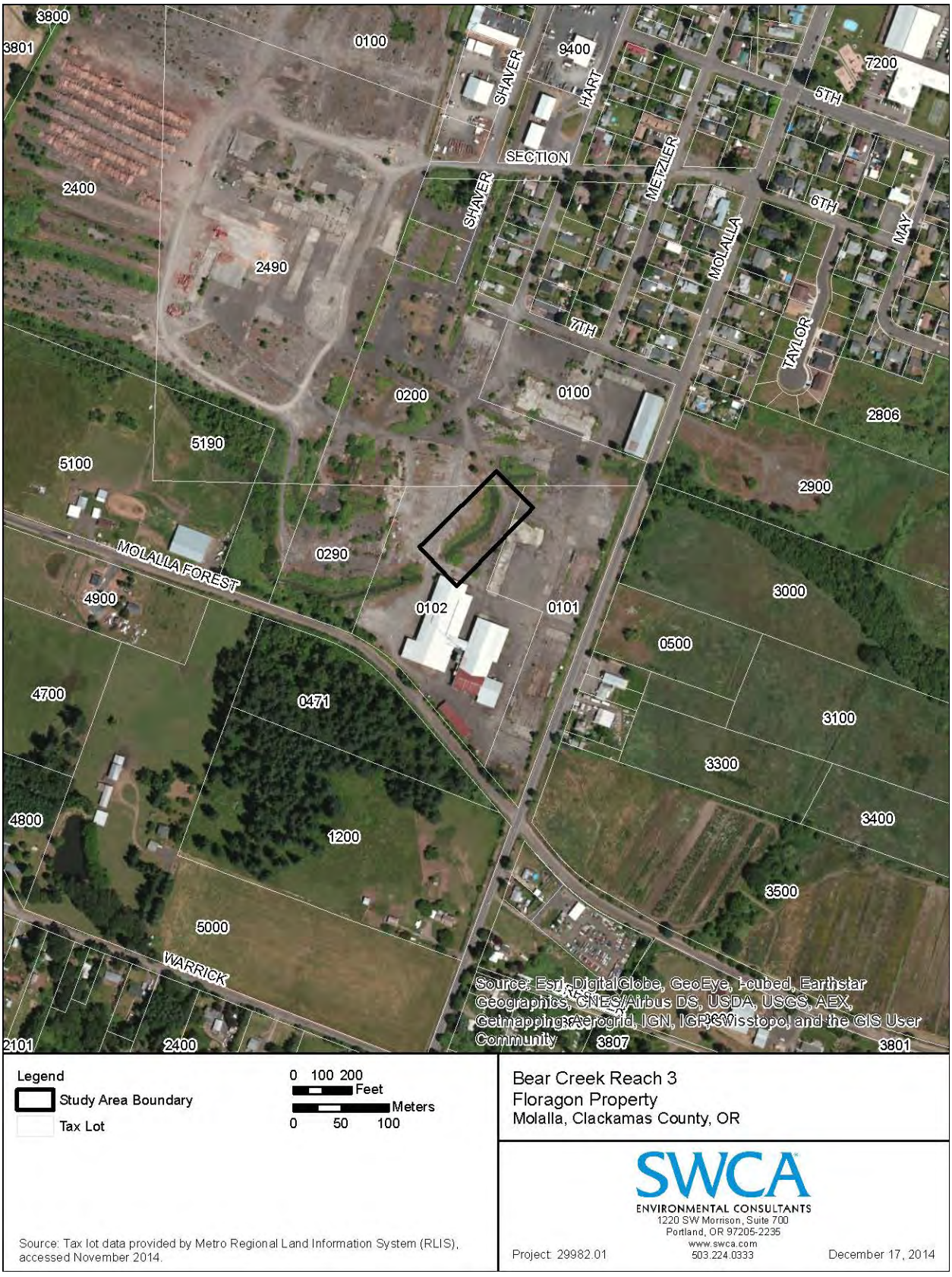

Figure 2b. Tax lot map (Metro RLIS base).

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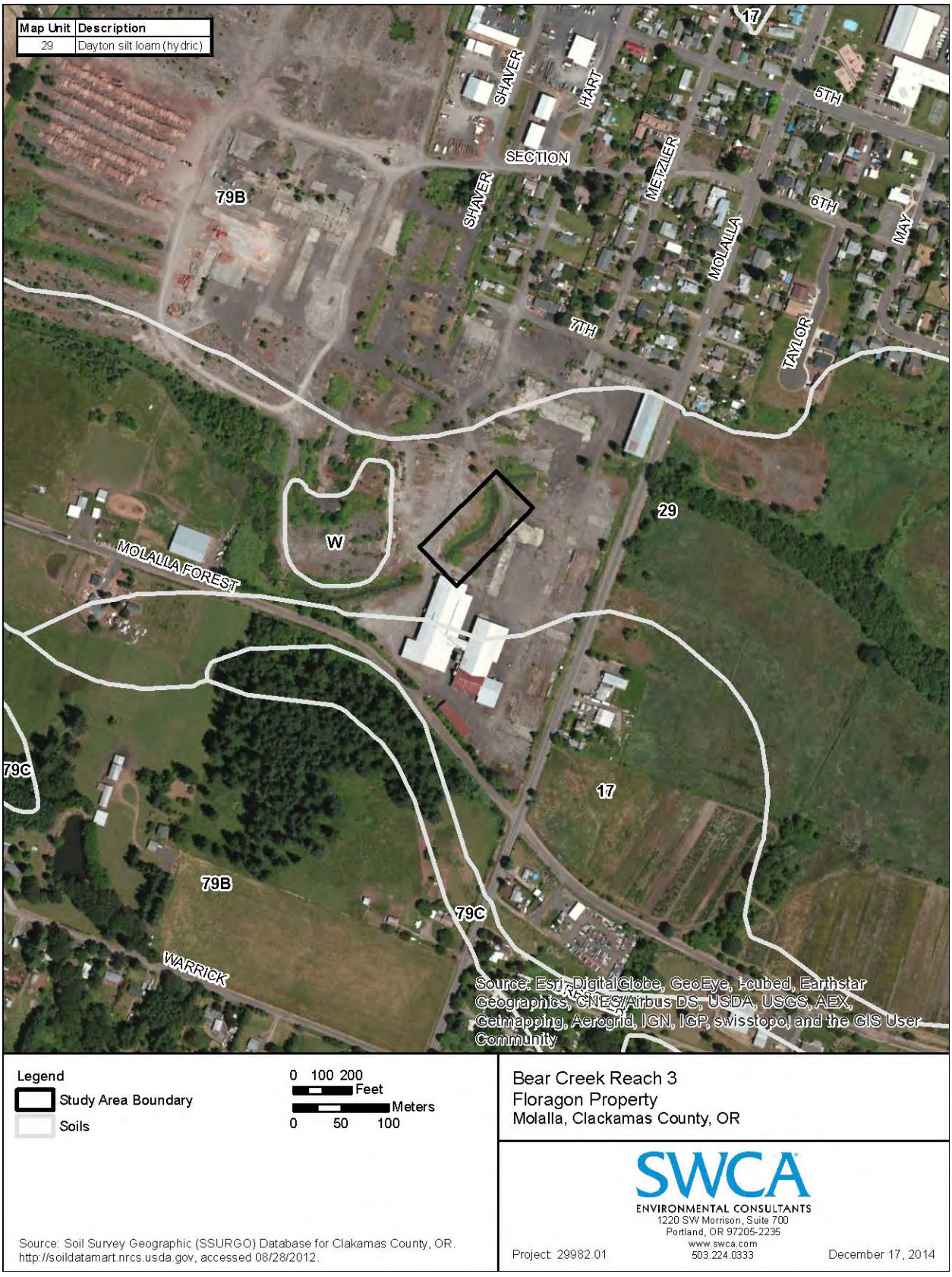

Figure 3. Soils map.

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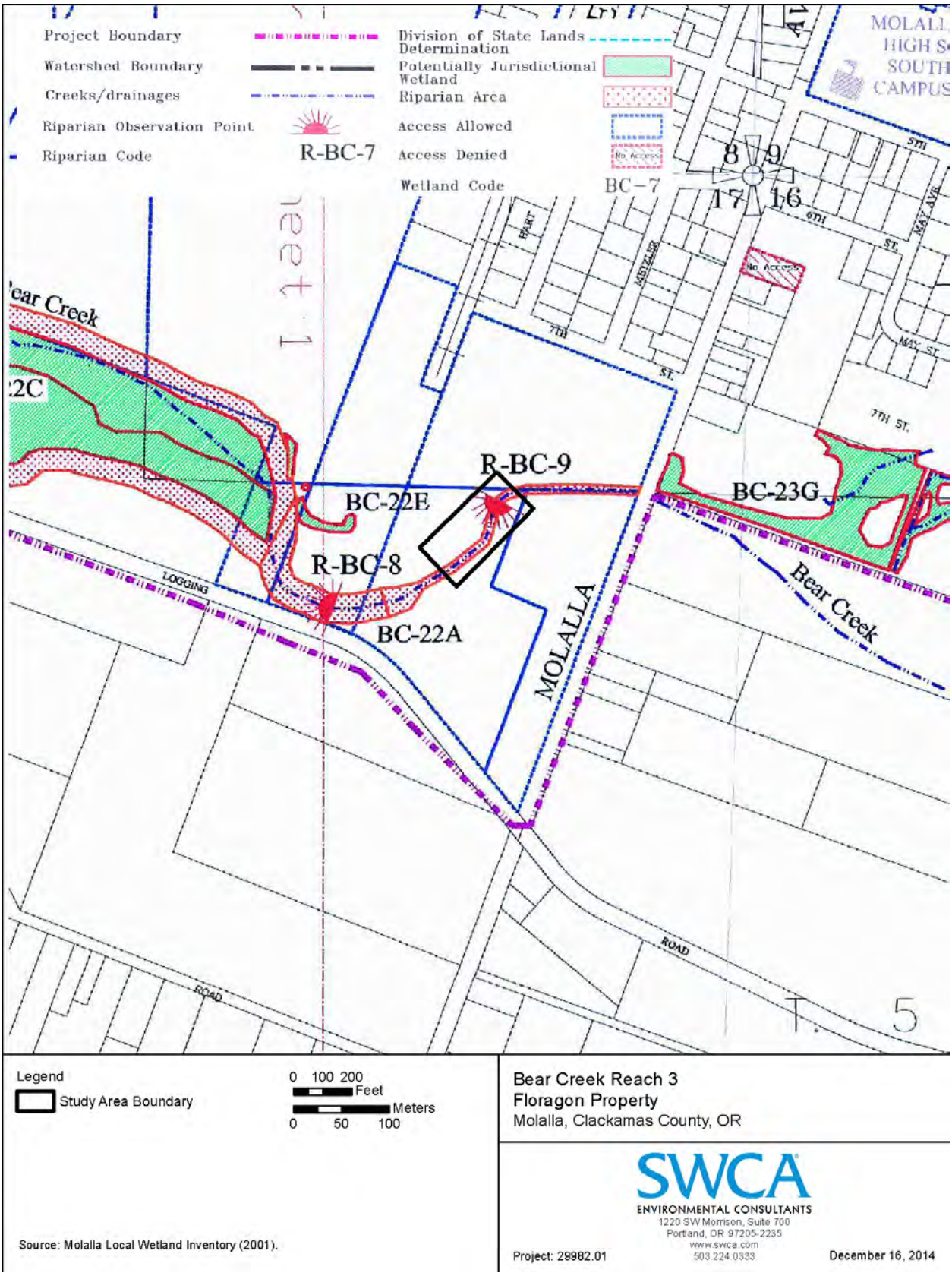

Figure 4. Local Wetland Inventory map.

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LEGEND

- Top of Bank (TOB) = Ordinary High Water Mark (OHWM)
- Bear Creek Flow Direction
- Former Building Footprints
- Current Building Footprints
- Culvert
- MW-01 Monitoring Well
- Sample Plot
- Study Area Boundary Line

SURVEY NOTES:

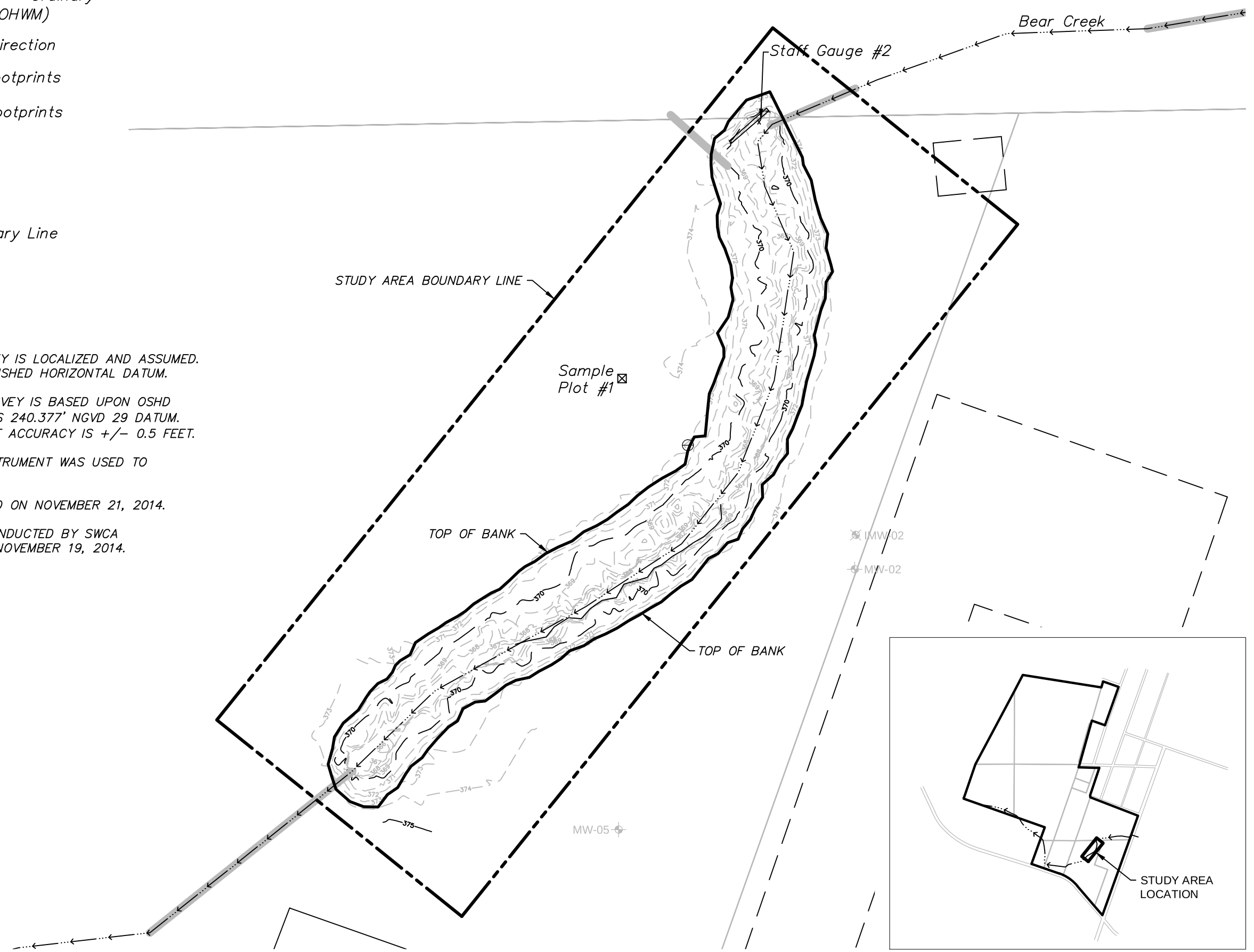
THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM.

THE VERTICAL DATUM FOR THIS SURVEY IS BASED UPON OSHD BENCHMARK RAIT. THE ELEVATION IS 240.377' NGVD 29 DATUM. STUDY AREA AND DATA PLOT POINT ACCURACY IS +/– 0.5 FEET.

A TRIMBLE S6–SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A LOOP FIELD TRAVERSE.

SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014.



N

APPROXIMATE SCALE IN FEET

0 20 40 80

PROJECT NO.	2015-01
DATE: 12-10-14	FIGURE NO. 5
FILE: 2015-01	
DRAWN: JJT	
APPROVED: CR	

BEAR CREEK
WATERS SURVEY

FLORAGON PROPERTY
7TH & HART ST.
MOLALLA, OREGON

EES
ENVIRONMENTAL CONSULTING, INC.
240 N Broadway #203, Portland, OR 97227
(503) 847-2740
www.ees-environmental.com

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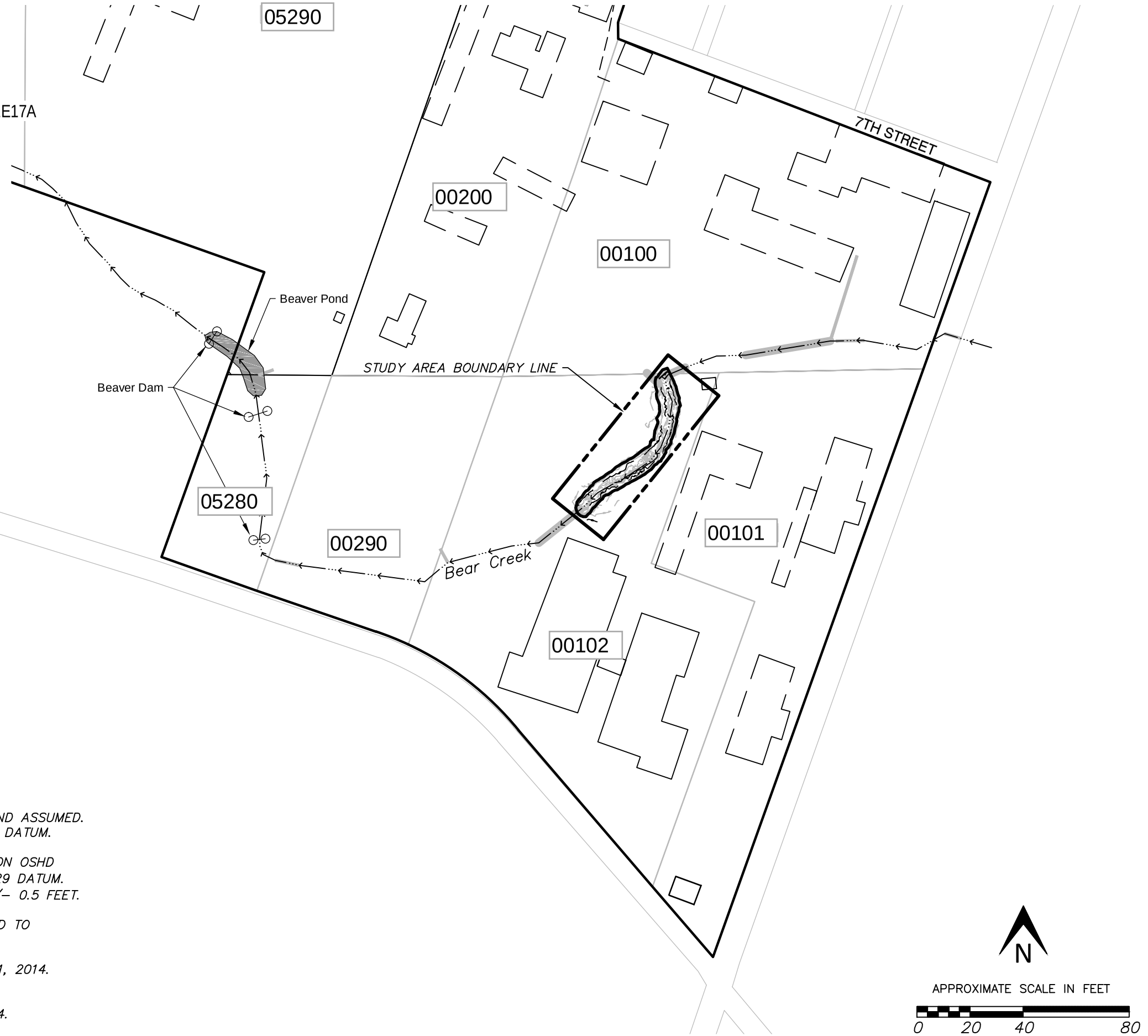
LEGEND

- Property Boundary
- Tax Lots
- 00100 Tax Lot ID Numbers from Tax Map 52E17A
- Bear Creek Flow Direction
- Former Building Footprints
- Current Building Footprints
- Culvert
- MW-01 Monitoring Well
- Sample Plot
- Study Area Boundary Line
- Top of Bank (TOB) = Ordinary High Water Mark (OHWM)



SURVEY NOTES:

THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM.

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SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014.

N

APPROXIMATE SCALE IN FEET

0 20 40 80

DATE:	12–17–14
FILE:	2015–01
DRAWN:	JJT
APPROVED:	CR
PROJECT NO.	2015–01
FIGURE NO.	6

BEAR CREEK
WATERS SURVEY

FLORAGON PROPERTY
7TH & HART ST.
MOLALLA, OREGON

EES
ENVIRONMENTAL CONSULTING, INC.
240 N Broadway #203, Portland, OR 97227
(503) 847-2740
www.ees-environmental.com

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APPENDIX B

Aerial Photograph

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Floragon Forest Products - Molalla
Site Map

State of Oregon
Department of
Environmental
Quality

0 250 500 750 1,000 Feet

Scale = 1 : 2,000

N

G:\GIS_Projects\Northwest_Region\Sites-ClackamasCounty\MXDs\Floragon_SiteMap.mxd

Date: 12/13/2011

APPENDIX C

Precipitation Data

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These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

Climatological Report (Daily)

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000
CDUS46 KPQR 201241
CLIUAO


CLIMATE REPORT
NATIONAL WEATHER SERVICE PORTLAND OREGON
440 AM PST THU NOV 20 2014


.....................................

...THE AURORA STATE OR CLIMATE SUMMARY FOR NOVEMBER 19 2014...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 9999 TO 9999


WEATHER ITEM   OBSERVED TIME       LAST
                VALUE   (LST)      YEAR
.........................................
TEMPERATURE (F)
 YESTERDAY
  MAXIMUM         50    305 PM
  MINIMUM         33    335 AM

PRECIPITATION (IN)
  YESTERDAY        0.08            0.64
  MONTH TO DATE    0.94            3.26
  SINCE OCT 1      7.66            4.25
  SINCE JAN 1     32.66           25.22

DEGREE DAYS
 HEATING
  YESTERDAY       23              20
  MONTH TO DATE  385             317
  SINCE SEP 1    615             824
  SINCE JUL 1    621             834

 COOLING
  YESTERDAY        0               0
```

MONTH TO DATE	0	0
SINCE SEP 1	94	64
SINCE JAN 1	538	426

.....

WIND (MPH)

HIGHEST WIND SPEED	8	HIGHEST WIND DIRECTION	NE (50)
HIGHEST GUST SPEED	10	HIGHEST GUST DIRECTION	N (10)
AVERAGE WIND SPEED	2.8		

SKY COVER

AVERAGE SKY COVER 0.3

WEATHER CONDITIONS

THE FOLLOWING WEATHER WAS RECORDED YESTERDAY.

LIGHT RAIN
FOG
HAZE

RELATIVE HUMIDITY (PERCENT)

HIGHEST	92	1000 PM
LOWEST	42	200 PM
AVERAGE	67	

.....

SUNRISE AND SUNSET

NOVEMBER 20 2014.....	SUNRISE	716 AM PST	SUNSET	437 PM PST
NOVEMBER 21 2014.....	SUNRISE	718 AM PST	SUNSET	436 PM PST

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

The U.S. Naval Observatory (USNO) computes astronomical data. Therefore, the NWS does not record, certify, or authenticate astronomical data. Computed times of sunrise, sunset, moonrise, moonset; and twilight, moon phases and other astronomical data are available from USNO's Astronomical Applications Department (http://www.usno.navy.mil). See http://www.usno.navy.mil/USNO/astronomical-applications/astronomical-information-center/litigation for information on using these data for legal purposes.

[Explanation of the Preliminary Monthly Climate Data (F6) Product]

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

```
000
CXUS56 KPQR 011230
CF6UAO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                                STATION:   AURORA STATE OR
                                                MONTH:     AUGUST
                                                YEAR:      2014
                                                LATITUDE:   45 15 N
                                                LONGITUDE: 122 46 W
```

TEMPERATURE IN F:							:PCPN:	SNOW:		WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	91	64	78	9	0	13	0.07	0.0	0	4.6	20	230	M	M	1	3	28	230
2	87	59	73	4	0	8	0.00	0.0	0	2.5	9	150	M	M	0		12	160
3	91	58	75	6	0	10	0.00	0.0	0	2.8	12	10	M	M	0		15	10
4	95	61	78	9	0	13	0.00	0.0	0	3.6	13	330	M	M	0	8	20	320
5	85	58	72	3	0	7	0.00	0.0	0	4.9	12	350	M	M	0		M	M
6	84	57	71	2	0	6	0.00	0.0	0	5.1	15	350	M	M	1		20	40
7	83	54	69	0	0	4	0.00	0.0	0	5.4	14	360	M	M	0		19	350
8	81	54	68	-1	0	3	0.00	0.0	0	6.2	15	20	M	M	0		19	350
9	86	52	69	0	0	4	0.00	0.0	0	7.0	20	20	M	M	0		24	20
10	95	58	77	8	0	12	0.00	0.0	0	7.1	15	10	M	M	0		18	360
11	93	67	80	11	0	15	0.00	0.0	0	3.7	17	360	M	M	0		22	360
12	77	62	70	1	0	5	0.02	0.0	0	5.6	13	360	M	M	3		17	180
13	77	59	68	-1	0	3	0.00	0.0	0	5.0	13	350	M	M	7		20	330
14	80	57	69	0	0	4	0.00	0.0	0	3.1	12	150	M	M	4	1	16	140
15	80	62	71	3	0	6	0.00	0.0	0	3.6	9	350	M	M	6		21	150
16	86	60	73	5	0	8	0.00	0.0	0	5.7	12	20	M	M	1		15	50
17	89	61	75	7	0	10	0.00	0.0	0	6.1	18	10	M	M	0		23	10
18	92	59	76	8	0	11	0.00	0.0	0	4.6	13	20	M	M	0		16	350
19	88	62	75	7	0	10	0.00	0.0	0	4.3	18	350	M	M	1		23	350
20	78	57	68	0	0	3	0.00	0.0	0	3.7	13	20	M	M	4	8	16	20
21	80	50	65	-3	0	0	0.00	0.0	0	2.1	8	260	M	M	1		13	110
22	82	55	69	1	0	4	0.00	0.0	0	3.6	16	10	M	M	4		19	10
23	88	54	71	3	0	6	0.00	0.0	0	6.9	15	10	M	M	0		23	30
24	84	54	69	1	0	4	0.00	0.0	0	5.7	15	20	M	M	0		19	350
25	90	56	73	6	0	8	0.00	0.0	0	8.2	15	20	M	M	0		22	10
26	94	59	77	10	0	12	0.00	0.0	0	3.9	10	360	M	M	0		14	350
27	91	59	75	8	0	10	0.00	0.0	0	3.5	14	20	M	M	0		17	350
28	85	59	72	5	0	7	0.00	0.0	0	5.0	10	350	M	M	0		14	340
29	77	58	68	1	0	3	0.00	0.0	0	2.4	14	10	M	M	6	1	15	20
30	71	57	64	-3	1	0	0.08	0.0	0	6.9	17	180	M	M	9	1	24	190

```
31  76  56  66  -1   0   1 0.00  0.0    0  2.9 13 180   M    M   8        17 190
================================================================================
SM 2636 1798         1 210  0.17     0.0 145.7          M       56
================================================================================
AV 85.0 58.0                                  4.7 FASTST   M    M   2    MAX(MPH)
                                  MISC ---->  # 20 230                # 28  230
================================================================================
```

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: AURORA STATE OR
MONTH: AUGUST
YEAR: 2014
LATITUDE: 45 15 N
LONGITUDE: 122 46 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 71.5
DPTR FM NORMAL: 3.2
HIGHEST: 95 ON 10, 4
LOWEST: 50 ON 21

[PRECIPITATION DATA]

TOTAL FOR MONTH: 0.17
DPTR FM NORMAL: -0.49
GRTST 24HR 0.08 ON 30-30

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 0.0 INCH
GRTST 24HR 0.0
GRTST DEPTH: 0

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 9
MIN 32 OR BELOW: 0
MIN 0 OR BELOW: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 3
0.10 INCH OR MORE: 0
0.50 INCH OR MORE: 0
1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 1
DPTR FM NORMAL -21
TOTAL FM JUL 1 6
DPTR FM NORMAL -41

CLEAR (SCALE 0-3) 23
PTCLDY (SCALE 4-7) 7
CLOUDY (SCALE 8-10) 1

[CDD (BASE 65)]

TOTAL THIS MO. 210
DPTR FM NORMAL 87
TOTAL FM JAN 1 444
DPTR FM NORMAL 154

[PRESSURE DATA]

HIGHEST SLP 30.16 ON 6
LOWEST SLP 29.78 ON 18

[REMARKS]
#FINAL-08-14#

[Explanation of the Preliminary Monthly Climate Data (F6) Product]

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

```
000
CXUS56 KPQR 011230
CF6UAO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                                STATION:   AURORA STATE OR
                                                MONTH:     SEPTEMBER
                                                YEAR:      2014
                                                LATITUDE:   45 15 N
                                                LONGITUDE: 122 46 W
```

TEMPERATURE IN F:							:PCPN:	SNOW:		WIND				:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	
									12Z	AVG	MX	2MIN							
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR	
1	82	52	67	1	0	2	0.00	0.0	0	3.4	13	360	M	M	2		17	20	
2	78	51	65	-1	0	0	0.00	0.0	0	4.3	14	260	M	M	4		22	260	
3	74	46	60	-6	5	0	0.00	0.0	0	4.4	10	360	M	M	2		14	260	
4	85	50	68	2	0	3	0.00	0.0	0	11.2	20	10	M	M	0		25	30	
5	92	59	76	10	0	11	0.00	0.0	0	10.4	22	40	M	M	0		31	40	
6	97	60	79	13	0	14	0.00	0.0	0	6.5	15	10	M	M	0		20	30	
7	85	49	67	2	0	2	0.00	0.0	0	1.8	7	160	M	M	0	8	8	200	
8	79	51	65	0	0	0	0.00	0.0	0	4.8	15	350	M	M	3	1	20	360	
9	74	56	65	0	0	0	0.00	0.0	0	2.5	10	350	M	M	5		15	190	
10	79	50	65	0	0	0	0.00	0.0	0	6.5	14	40	M	M	0		19	30	
11	79	62	71	6	0	6	0.00	0.0	0	15.5	25	50	M	M	0		39	70	
12	85	58	72	8	0	7	0.00	0.0	0	9.3	16	10	M	M	0		20	20	
13	90	46	68	4	0	3	0.00	0.0	0	3.6	12	20	M	M	0		14	10	
14	90	47	69	5	0	4	0.00	0.0	0	1.2	8	360	M	M	1		12	80	
15	86	49	68	4	0	3	0.00	0.0	0	2.0	9	190	M	M	2	8	14	180	
16	78	53	66	3	0	1	0.00	0.0	0	4.7	10	200	M	M	1		15	200	
17	74	60	67	4	0	2	0.00	0.0	0	3.5	9	220	M	M	1		12	240	
18	73	59	66	3	0	1	0.03	0.0	0	2.3	10	200	M	M	9	18	12	210	
19	82	55	69	7	0	4	0.00	0.0	0	4.3	12	20	M	M	2		16	30	
20	95	56	76	14	0	11	0.00	0.0	0	7.6	16	20	M	M	0		21	360	
21	85	59	72	10	0	7	0.00	0.0	0	5.9	14	230	M	M	0		19	230	
22	70	57	64	2	1	0	0.00	0.0	0	3.5	12	180	M	M	5		16	210	
23	67	57	62	1	3	0	0.50	0.0	0	2.6	8	260	M	M	7	1	12	260	
24	66	58	62	1	3	0	0.39	0.0	0	4.7	14	180	M	M	7	1	16	180	
25	72	56	64	3	1	0	T	0.0	0	5.0	18	180	M	M	5	12	23	210	
26	73	53	63	3	2	0	0.00	0.0	0	5.6	18	180	M	M	5		23	180	
27	71	53	62	2	3	0	0.00	0.0	0	3.5	10	20	M	M	6		14	360	
28	80	48	64	4	1	0	0.00	0.0	0	3.1	10	30	M	M	0		14	20	
29	67	50	59	0	6	0	0.06	0.0	0	5.0	16	180	M	M	5	1	20	170	
30	65	49	57	-2	8	0	0.09	M	0	2.4	8	190	M	M	6	1	10	240	

```
==============================================================================
SM 2373 1609        33  81  1.07     0.0 151.1          M       78
==============================================================================
AV 79.1 53.6                                5.0 FASTST   M    M   3    MAX(MPH)
                                 MISC ----->  # 25  50               # 39   70
==============================================================================
NOTES:
# LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

                                          STATION:  AURORA STATE OR
                                          MONTH:    SEPTEMBER
                                          YEAR:     2014
                                          LATITUDE:   45 15 N
                                          LONGITUDE: 122 46 W

[TEMPERATURE DATA]      [PRECIPITATION DATA]       SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 66.4   TOTAL FOR MONTH:   1.07    1 = FOG OR MIST
DPTR FM NORMAL:   3.2   DPTR FM NORMAL:   -0.66    2 = FOG REDUCING VISIBILITY
HIGHEST:    97 ON  6    GRTST 24HR  0.86 ON 23-24      TO 1/4 MILE OR LESS
LOWEST:     46 ON 13, 3                            3 = THUNDER
                        SNOW, ICE PELLETS, HAIL    4 = ICE PELLETS
                        TOTAL MONTH:   0.0 INCH    5 = HAIL
                        GRTST 24HR     0.0         6 = FREEZING RAIN OR DRIZZLE
                        GRTST DEPTH:   0           7 = DUSTSTORM OR SANDSTORM:
                                                       VSBY 1/2 MILE OR LESS
                                                   8 = SMOKE OR HAZE
[NO. OF DAYS WITH]      [WEATHER - DAYS WITH]      9 = BLOWING SNOW
                                                   X = TORNADO
MAX 32 OR BELOW:   0    0.01 INCH OR MORE:   5
MAX 90 OR ABOVE:   5    0.10 INCH OR MORE:   2
MIN 32 OR BELOW:   0    0.50 INCH OR MORE:   1
MIN  0 OR BELOW:   0    1.00 INCH OR MORE:   0

[HDD (BASE 65) ]
TOTAL THIS MO.    33    CLEAR  (SCALE 0-3)  19
DPTR FM NORMAL   -66    PTCLDY (SCALE 4-7)  10
TOTAL FM JUL 1    39    CLOUDY (SCALE 8-10)  1
DPTR FM NORMAL  -107

[CDD (BASE 65) ]
TOTAL THIS MO.    81
DPTR FM NORMAL    37    [PRESSURE DATA]
TOTAL FM JAN 1   525    HIGHEST SLP 30.21 ON 30
DPTR FM NORMAL   191    LOWEST  SLP 29.69 ON 17

[REMARKS]
#FINAL-09-14#
```

[Explanation of the Preliminary Monthly Climate Data (F6) Product]

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

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000
CXUS56 KPQR 011230
CF6UAO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                                STATION:   AURORA STATE OR
                                                MONTH:     OCTOBER
                                                YEAR:      2014
                                                LATITUDE:   45 15 N
                                                LONGITUDE: 122 46 W
```

TEMPERATURE IN F:							:PCPN:		SNOW:	WIND				:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	68	44	56	-3	9	0	0.00	0.0	0	2.1	13	30	M	M	5	12	16	30
2	72	45	59	1	6	0	0.00	0.0	0	4.0	12	360	M	M	1	1	15	350
3	82	46	64	6	1	0	0.00	0.0	0	2.7	12	10	M	M	0		14	360
4	84	48	66	8	0	1	0.00	0.0	0	1.7	8	60	M	M	0		13	360
5	86	51	69	12	0	4	0.00	0.0	0	3.8	10	40	M	M	0		14	360
6	86	54	70	13	0	5	0.00	0.0	0	2.7	9	40	M	M	0		12	50
7	82	54	68	12	0	3	0.00	0.0	0	1.2	8	60	M	M	0		11	50
8	77	51	64	8	1	0	0.00	0.0	0	1.7	8	360	M	M	0		11	350
9	76	49	63	7	2	0	0.00	0.0	0	1.0	7	50	M	M	2	12	9	360
10	71	47	59	3	6	0	0.00	0.0	0	2.6	8	250	M	M	4	128	11	270
11	71	50	61	6	4	0	0.15	0.0	0	5.9	14	250	M	M	6	1	20	230
12	67	45	56	1	9	0	0.00	0.0	0	2.5	12	10	M	M	4	12	13	10
13	73	46	60	6	5	0	0.18	M	0	5.9	17	190	M	M	5	12	25	180
14	60	53	57	3	8	0	0.22	0.0	0	3.3	12	220	M	M	8	1	20	230
15	58	52	55	1	10	0	0.82	0.0	0	11.4	24	190	M	M	9	1	36	200
16	69	47	58	4	7	0	0.00	0.0	0	1.2	7	160	M	M	1		9	190
17	59	52	56	3	9	0	0.43	0.0	0	2.7	10	60	M	M	10	1	13	60
18	74	56	65	12	0	0	T	0.0	0	2.8	14	190	M	M	5	1	20	180
19	73	53	63	10	2	0	0.00	0.0	0	3.0	9	250	M	M	6	12	13	260
20	65	53	59	7	6	0	0.14	0.0	0	7.7	22	180	M	M	7	1	27	190
21	61	52	57	5	8	0	0.01	0.0	0	10.4	22	180	M	M	9		29	170
22	59	54	57	5	8	0	1.11	0.0	0	9.0	21	180	M	M	8	1	26	170
23	60	49	55	3	10	0	0.34	M	0	4.0	21	190	M	M	7	13	27	180
24	54	48	51	0	14	0	0.19	M	0	4.9	12	30	M	M	5	1	16	350
25	66	46	56	5	9	0	0.27	M	0	10.3	40	180	M	M	9	12	57	170
26	58	46	52	1	13	0	0.76	M	0	6.2	15	190	M	M	8	1	21	170
27	60	46	53	3	12	0	0.01	M	0	1.2	8	210	M	M	5	1	15	220
28	59	51	55	5	10	0	0.26	0.0	0	6.7	21	180	M	M	9	1	27	180
29	61	55	58	8	7	0	0.36	0.0	0	3.7	18	180	M	M	9	1	24	190
30	59	54	57	7	8	0	0.90	0.0	0	3.4	10	120	M	M	8	1	12	130

```
31  58  45  52   3  13   0 0.57    M    0  4.2 13 180   M    M   6 1      16 160
=============================================================================
SM 2108 1542       197  13  6.72     0.0 133.9          M      156
=============================================================================
AV 68.0 49.7                                  4.3 FASTST   M    M   5    MAX(MPH)
                                  MISC ---->  # 40 180               # 57  170
=============================================================================
```

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: AURORA STATE OR
MONTH: OCTOBER
YEAR: 2014
LATITUDE: 45 15 N
LONGITUDE: 122 46 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 58.9
DPTR FM NORMAL: 5.2
HIGHEST: 86 ON 6, 5
LOWEST: 44 ON 1

[PRECIPITATION DATA]

TOTAL FOR MONTH: 6.72
DPTR FM NORMAL: 3.49
GRTST 24HR 1.46 ON 30-31

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 0.0 INCH
GRTST 24HR 0.0
GRTST DEPTH: 0

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 0
MIN 32 OR BELOW: 0
MIN 0 OR BELOW: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 17
0.10 INCH OR MORE: 15
0.50 INCH OR MORE: 5
1.00 INCH OR MORE: 1

[HDD (BASE 65)]

TOTAL THIS MO. 197
DPTR FM NORMAL -155
TOTAL FM JUL 1 236
DPTR FM NORMAL -262

CLEAR (SCALE 0-3) 9
PTCLDY (SCALE 4-7) 13
CLOUDY (SCALE 8-10) 9

[CDD (BASE 65)]

TOTAL THIS MO. 13
DPTR FM NORMAL 11
TOTAL FM JAN 1 538
DPTR FM NORMAL 202

[PRESSURE DATA]

HIGHEST SLP 30.31 ON 12
LOWEST SLP 29.36 ON 25

[REMARKS]
#FINAL-10-14#

[Explanation of the Preliminary Monthly Climate Data (F6) Product]

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WFO Monthly/Daily Climate Data

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000
CXUS56 KPQR 011330
CF6UAO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                                STATION:   AURORA STATE OR
                                                MONTH:     NOVEMBER
                                                YEAR:      2014
                                                LATITUDE:   45 15 N
                                                LONGITUDE: 122 46 W
```

TEMPERATURE IN F:							:PCPN:	SNOW:	WIND				:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	52	45	49	0	16	0	0.01	M	0	3.6	8	220	M	M	10	12	11	180
2	54	46	50	1	15	0	0.06	M	0	9.2	20	180	M	M	10	1	25	190
3	57	52	55	6	10	0	0.14	0.0	0	10.1	18	190	M	M	10		26	190
4	60	54	57	9	8	0	0.26	0.0	0	8.7	22	190	M	M	9	1	31	180
5	63	52	58	10	7	0	T	0.0	0	0.6	6	20	M	M	8	12	6	30
6	60	44	52	4	13	0	0.26	M	0	6.9	24	180	M	M	8	12	33	220
7	57	42	50	2	15	0	0.00	0.0	0	3.5	12	10	M	M	6	12	15	310
8	55	37	46	-2	19	0	0.00	0.0	0	2.0	7	180	M	M	3	12	9	190
9	56	42	49	2	16	0	0.01	M	0	5.0	16	190	M	M	8	12	24	190
10	57	37	47	0	18	0	0.00	0.0	0	7.3	17	30	M	M	4	1	23	20
11	49	36	43	-4	22	0	0.00	0.0	0	16.9	29	60	M	M	0		44	50
12	45	33	39	-8	26	0	0.00	0.0	0	15.6	23	50	M	M	0		30	50
13	39	32	36	-10	29	0	0.12	M	0	10.4	21	50	M	M	10	16	28	40
14	44	29	37	-9	28	0	0.00	0.0	0	7.5	13	20	M	M	4		15	30
15	45	27	36	-10	29	0	0.00	0.0	0	11.5	21	40	M	M	0		31	60
16	48	22	35	-11	30	0	0.00	0.0	0	5.6	13	10	M	M	0		14	10
17	49	22	36	-9	29	0	0.00	0.0	0	4.2	12	350	M	M	0		14	10
18	43	22	33	-12	32	0	0.00	0.0	0	1.8	9	10	M	M	1	18	11	10
19	50	33	42	-3	23	0	0.08	M	0	2.8	8	50	M	M	3	18	10	10
20	49	38	44	-1	21	0	0.03	M	0	2.7	8	20	M	M	9	18	10	10
21	55	43	49	5	16	0	0.56	M	0	6.5	29	190	M	M	10	1	40	190
22	55	40	48	4	17	0	0.39	M	0	5.7	15	190	M	M	3	1	22	250
23	55	46	51	7	14	0	0.30	M	0	10.1	23	190	M	M	8	1	37	170
24	55	40	48	4	17	0	T	M	0	5.9	20	190	M	M	8	12	26	190
25	61	54	58	15	7	0	T	0.0	0	9.3	16	190	M	M	10	1	23	220
26	62	54	58	15	7	0	0.00	0.0	0	3.8	10	200	M	M	5		14	170
27	60	52	56	13	9	0	0.11	0.0	0	12.8	24	190	M	M	10	1	36	200
28	55	44	50	7	15	0	0.79	M	0	11.9	26	190	M	M	10	1	37	190
29	44	28	36	-6	29	0	0.05	M	0	7.2	14	360	M	M	6	18	18	360
30	40	28	34	-8	31	0	0.00	0.0	0	12.6	22	20	M	M	1		28	30

```
==============================================================================
SM 1574 1174       568   0  3.17     0.0 221.7          M      174
==============================================================================
AV 52.5 39.1                                7.4 FASTST   M    M   6    MAX(MPH)
                                 MISC ----->  # 29  60                # 44   50
==============================================================================
NOTES:
# LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

                                          STATION:  AURORA STATE OR
                                          MONTH:    NOVEMBER
                                          YEAR:     2014
                                          LATITUDE:   45 15 N
                                          LONGITUDE: 122 46 W

[TEMPERATURE DATA]      [PRECIPITATION DATA]       SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 45.8   TOTAL FOR MONTH:   3.17    1 = FOG OR MIST
DPTR FM NORMAL:   0.1   DPTR FM NORMAL:   -3.46    2 = FOG REDUCING VISIBILITY
HIGHEST:    63 ON  5    GRTST 24HR  0.80 ON 27-28      TO 1/4 MILE OR LESS
LOWEST:     22 ON 18,17                            3 = THUNDER
                        SNOW, ICE PELLETS, HAIL    4 = ICE PELLETS
                        TOTAL MONTH:   0.0 INCH    5 = HAIL
                        GRTST 24HR     0.0         6 = FREEZING RAIN OR DRIZZLE
                        GRTST DEPTH:   0           7 = DUSTSTORM OR SANDSTORM:
                                                       VSBY 1/2 MILE OR LESS
                                                   8 = SMOKE OR HAZE
[NO. OF DAYS WITH]      [WEATHER - DAYS WITH]      9 = BLOWING SNOW
                                                   X = TORNADO
MAX 32 OR BELOW:   0    0.01 INCH OR MORE:  15
MAX 90 OR ABOVE:   0    0.10 INCH OR MORE:   9
MIN 32 OR BELOW:   8    0.50 INCH OR MORE:   2
MIN  0 OR BELOW:   0    1.00 INCH OR MORE:   0

[HDD (BASE 65) ]
TOTAL THIS MO.   568    CLEAR  (SCALE 0-3)   9
DPTR FM NORMAL   -11    PTCLDY (SCALE 4-7)   8
TOTAL FM JUL 1   804    CLOUDY (SCALE 8-10) 13
DPTR FM NORMAL  -273

[CDD (BASE 65) ]
TOTAL THIS MO.     0
DPTR FM NORMAL     0    [PRESSURE DATA]
TOTAL FM JAN 1   538    HIGHEST SLP 30.47 ON 15
DPTR FM NORMAL   202    LOWEST  SLP 29.45 ON 21

[REMARKS]
#FINAL-11-14#
```

USDA Field Office Climate Data

WETS Station : N WILLAMETTE EXP STN, OR6151 Creation Date: 12/10/2014
Latitude: 4517 Longitude: 12245 Elevation: 00150
State FIPS/County(FIPS): 41005 County Name: Clackamas
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	Temperature (Degrees F.) avg daily min	Temperature (Degrees F.) avg	Precipitation (Inches) avg	Precipitation (Inches) 30% chance will have less than	Precipitation (Inches) 30% chance will have more than	avg # of days w/.1 or more	avg total snow fall
January	46.9	33.0	40.0	5.94	3.86	7.14	13	0.5
February	51.0	34.5	42.8	5.07	3.26	6.11	12	0.3
March	55.9	36.8	46.4	4.28	3.26	4.98	12	0.0
April	60.5	39.7	50.1	3.14	2.10	3.75	9	0.0
May	66.9	44.5	55.7	2.50	1.59	3.02	7	0.0
June	73.0	49.3	61.2	1.75	1.00	2.13	5	0.0
July	80.1	52.8	66.5	0.73	0.20	0.87	2	0.0
August	80.4	52.7	66.6	0.83	0.18	0.96	2	0.0
September	75.3	48.7	62.0	1.77	0.80	2.21	5	0.0
October	64.1	41.8	53.0	3.36	1.69	4.10	8	0.0
November	52.3	37.6	45.0	6.48	4.39	7.75	14	0.1
December	46.2	33.1	39.7	6.75	4.57	8.07	13	0.6
Annual	-----	-----	-----	------	37.33	46.92	--	----
Average	62.7	42.0	52.4	------	------	------	--	----
Average	-----	-----	-----	42.60	------	------	101	1.7

GROWING SEASON DATES

Probability	Temperature 24 F or higher	Temperature 28 F or higher	Temperature 32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	1/26 to 1/ 1 340 days	3/ 1 to 11/22 265 days	4/13 to 10/28 197 days
70 percent *	> 365 days > 365 days	2/20 to 12/ 1 283 days	4/ 6 to 11/ 4 211 days

---

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1963-2007 prcp

Station : OR6151, N WILLAMETTE EXP STN
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
63	M1.14	4.02	6.48		4.34	1.62	0.81	0.36	1.11	3.09	5.86	4.45	33.28
64	11.36	0.83	2.93	1.21	0.94	1.67	0.74	0.58	1.49	1.52	7.21	13.84	44.32
65	8.51	M2.07	1.09	3.23	1.30	0.66	0.23	0.99	0.05	2.79	6.63	6.78	34.33
66	7.84	1.92	5.96	1.22	0.93	1.18	1.16	0.31	1.41	2.97	5.62	6.57	37.09
67	6.77	1.53	4.79	2.58	2.12	0.72	0.00	0.00	0.26	5.58	2.04	5.65	32.04
68	4.68	8.20	3.06	2.04	2.99	2.34	0.98	4.17	M2.75	M6.88	7.02	M12.46	57.57
69	7.41	M3.03	M1.45	2.99	1.76	M3.20	0.11	0.08	3.42	M4.69	2.94	M8.53	39.61
70	M11.72	M5.12	M2.30	2.36	1.30	M0.31	0.07	0.00	1.38	3.49	6.94	8.92	43.91
71	7.59	3.49	5.59	3.71	1.77	2.92	0.08	0.43	3.51	3.69	6.49	M8.02	47.29
72	6.59	4.78	5.77	3.61	2.65	0.60	0.47	0.65	3.50	0.87	5.07	8.81	43.37
73	4.45	1.96	M2.67	1.28	1.56	1.47	0.01	0.82	2.58	2.94	13.04	10.02	42.80
74	8.24	5.48	6.28	2.23	1.98	0.96	2.31	0.02	0.26	1.62	6.56	6.53	42.47
75	6.84	4.24	2.22	2.46	1.86	1.27	0.65	2.53	0.00	5.61	4.37	6.66	38.71
76	6.32	6.68	2.82	3.00	1.48	0.57	0.95	2.41	1.18	0.85	M1.67	1.48	29.41
77	1.37	M2.80	4.26	0.64	3.82	1.54	0.83	2.69	3.23	2.45	6.61	10.52	40.76
78	5.35	3.59	1.69	3.50	4.52	1.69	0.90	2.08	2.74	0.37	4.92	M3.54	34.89
79	3.45	7.36	3.22	3.35	2.36	0.47	0.82	0.82	3.25	5.35	3.77	6.75	40.97
80	9.99	4.68	3.59	4.07	1.23	2.52	0.14	0.49	1.69	1.67	6.87	11.90	48.84
81	2.01	4.11	3.48	2.29	2.23	4.27	0.19	0.03	2.68	4.14	M5.39	10.27	41.09
82	6.24	6.94	3.12	8.98	M0.89	0.86	0.34	0.99	3.61	3.74	5.04	8.92	49.67
83	7.18	9.54	7.18	2.67	2.13	2.60	2.68	2.52	0.86	2.25	9.04	6.33	54.98
84	3.05	4.69	4.46	4.09	4.59	5.35	0.00	0.03	1.99	5.78	12.90	3.68	50.61
85	0.45	3.49	4.54	1.42	0.97	2.48	0.45	0.79	1.93	3.17	5.00	2.46	27.15
86	6.26	7.65	2.95	2.09	2.74	0.38	1.28	0.04	2.93	2.81	6.71	4.13	39.97
87	6.75	4.94	5.55	2.19	1.66	0.30	2.00	0.10	0.53	0.23	2.40	10.55	37.20
88	7.88	1.71	3.73	4.63	2.56	2.94	0.21	0.03	1.25	0.20	9.88	3.28	38.30
89	4.24	3.16	7.02	1.24	2.27	0.91	0.52	1.37	1.34	2.15	3.72	4.15	32.09
90	8.98	4.97	3.42	2.22	1.71	2.94	0.54	1.09	0.50	M6.18	5.00	3.39	40.94
91	2.83	3.69	4.39	4.62	4.58	2.42	0.16	0.75	0.30	3.70	7.31	5.53	40.28
92	5.34	5.23	1.46	4.28	0.19	0.63	1.31	0.48	1.88	4.83	5.15	6.71	37.49
93	M2.96	M0.26	5.32	6.30	4.25	2.20	2.44	0.30	0.00	1.35	1.39	6.90	33.67
94	4.78	6.93	3.58	1.88	1.63	1.57	0.06	0.02	1.12	6.94	8.32	7.70	44.53
95	7.65	M4.45	4.42	5.14	1.84	2.07	M0.60	1.55	1.52	5.63	10.18	7.66	52.71
96	9.09	M12.04	3.91	6.76	4.63	1.05	0.80	0.14	3.06	5.51	11.39	15.72	74.10
97	9.55	3.34	8.59	4.59	2.47	2.97	0.80	1.11	M3.38	M6.25	4.65	3.41	51.11
98	M8.98	5.73	4.91	1.42	5.57	1.27	0.22	0.25	0.90	4.69	10.96	0.54	45.44
99	7.58	9.08	4.68	1.35	2.53	1.23	0.18	0.47	0.05	2.47	7.68	4.35	41.65
0	6.21	5.15	3.46	2.15	2.39	1.40	0.01	0.00		3.21	3.04	3.16	30.18
1	1.55	1.28	3.51	0.69	1.05	1.67	0.73	1.19	0.69	3.80			16.16
2			5.59	2.44	1.35	1.83	0.07	0.24	1.95		3.22	10.02	26.71
3	8.73	2.99	7.14	5.64	1.05	0.28	0.00	0.42	0.95	2.45	4.31	9.84	43.80
4	6.19	4.04	1.09	1.07	1.92	1.63	0.12	2.52	1.74	4.34	2.71	4.46	31.83
5	1.87	0.58	5.00	2.97	5.02	2.75	0.58	0.00	2.14	M2.63	6.22	10.53	40.29
6	13.70	2.77	4.30	2.77	2.79	0.99	0.07	0.11	0.84	1.68	13.05	7.43	50.50
7	4.75	5.26	5.29	2.26	0.90	0.53	0.63	0.66					20.28

APPENDIX D

Wetland Determination Data Sheet

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WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Bear Creek Reach 3 / Floragon Property City/County: Molalla/Clackamas Sampling Date: 11/19/2014

Applicant/Owner: PNG Environmental, Inc. and EES Environmental Consulting, Inc. State: OR Sampling Point: **P1**

Investigator(s): Tony Vingiello Section, Township, Range: 17A (NE), 5S, R2E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): >3

Subregion (LRR): A, Northwest Forests and Coast Lat: Long: Datum:

Soil Map Unit Name: Dayton silt loam (Unit 29) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ,Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?**	**Yes** **No X**
Hydric Soil Present?	Yes	No X		
Wetland Hydrology Present?	Yes	No X		

Remarks:

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Daucus carota*	10%	Yes	FACU
2. *Holcus lanatus*	10%	Yes	FAC
3. *Agrostis capillaris*	5%	No	FAC
4. *Hypochaeris radicata*	5%	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 70%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	30 (A)		105 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **No X**

Remarks:
80% moss in herbaceous layer.

Entered by: TV QC by: cmw

SOIL

Sampling Point: **P1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					SL	many 1" gravels

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel

Depth (inches): 5

Hydric Soil Present? Yes ___ **No** X

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches): ___
Water Table Present?	Yes	___	No	X	Depth (inches): >5
Saturation Present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): >5

Wetland Hydrology Present? Yes ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: TV QC by: cmw

APPENDIX E

Ground-level Site Photographs

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LEGEND

- Top of Bank (TOB) = Ordinary High Water Mark (OHWM)
- Bear Creek Flow Direction
- Former Building Footprints
- Current Building Footprints
- Culvert
- MW-01 Monitoring Well
- Sample Plot
- Study Area Boundary Line

SURVEY NOTES:

THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM.

THE VERTICAL DATUM FOR THIS SURVEY IS BASED UPON OSHD BENCHMARK RAIT. THE ELEVATION IS 240.377' NGVD 29 DATUM. STUDY AREA AND DATA PLOT POINT ACCURACY IS +/- 0.5 FEET.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A LOOP FIELD TRAVERSE.

SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014.

PROJECT NO.	2015-01
DATE: 12-10-14	FIGURE NO. 5
FILE: 2015-01	
DRAWN: JJT	
APPROVED: CR	

BEAR CREEK
WATERS SURVEY

FLORAGON PROPERTY
7TH & HART ST.
MOLALLA, OREGON

EES
ENVIRONMENTAL CONSULTING, INC.
240 N Broadway #203, Portland, OR 97227
(503) 847-2740
www.ees-environmental.com

D:\Client Autocad\EES-Autocad\2015-01 Floragon (2)\Nov 2014\2015-01_BM - 112514.dwg 2.17.2014

Photo A. View northeast of Reach 3 Bear Creek. Photo by T. Vingiello on November 19, 2014.

Photo B. View southwest of riprap banks along Bear Creek. Photo by C.M. Walker on November 12, 2014.

Photo C. View northwest of Bear Creek. Photo by C.M. Walker on November 12, 2014.

Photo D. View south of OHWM flags. Photo by T. Vingiello on November 19, 2014.

Photo E. View north of OHWM flags. Photo by T. Vingiello on November 19, 2014.

Photo G. View east of sample plot 1. Photo by Tony Vingiello on November 19, 2014.

Photo F. View northeast of creek. Photo by Tony Vingiello on November 19, 2014.

Photo H. Water gauge at north end of survey area in Bear Creek. Photo by Mirth Walker on November 12, 2014.

APPENDIX F

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APPENDIX G

LWI Data Sheets

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City of Molalla
Local Wetlands and Riparian Inventories

Prepared for

City of Molalla
Molalla, Oregon

Prepared by

Pacific Habitat Services, Inc.
Wilsonville, Oregon
(503) 570-0800

June 2001

APPROVED WETLANDS INVENTORY
Oregon Department of State Lands

Meets LWI standards
Date 3/04 Approved by J. Morlan

APPROVED WETLANDS INVENTORY
Oregon Department of State Lands

Meets _____ standards
Date _____ Approved by _____

City of Molalla
Local Wetlands and Riparian Inventories

Prepared for

Dean Madison
City of Molalla
PO Box 248
Molalla, Oregon 97038

Prepared by

John van Staveren
Patricia Farrell
Shawn Eisner
Fred Small
Caroline Rim
Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180
Wilsonville, Oregon 97070
(503) 570-0800
(503) 570-0855 FAX
PHS Project Number: 2250

June 2001

Riparian Characterization Form

City of Molalla Riparian Inventory

GENERAL INFORMATION

Date: 6/6/01 **Riparian Code:** R-BC-9

On-site: ☒ **Off-Site:** ☐ **Reach Length:** 350'

Investigators: PF/SE **Hydrologic Basin:** Bear Creek

WATER RESOURCE INFORMATION

Water Resource:				
Stream/River:	x	**Width:**	20'	feet
Lake/Pond:		**Width:**		feet
Wetland:		**Width:**		feet

LWI Wetland Code: none

Water present year-round: **Yes** ☒ **No** ☐

Are salmonids present in the adjacent water resource? **Yes** ☐ **No** ☒

Is the water resource listed for temperature on DEQ's 303(d) list: **Yes** ☐ **No** ☒

Within FEMA-mapped 100-year floodplain: **Yes** ☐ **No** ☒

Mapped soil series: Dayton silt loam

Adjacent Land Uses? (Check as many as needed)

Agriculture: ☐ **Roads:** ☐

Commercial/Indus.: ☒ **Undeveloped:** ☐

Residential: ☐ **Forestry:** ☐

Woody vegetation (trees, shrubs, vines >1 meter)	**Herbaceous vegetation** (include trees, shrubs, vines <1 meter)
Acer macrophyllum	*Phalaris arundinacea*
Cytisus scoparius	*Rubus discolor*
	Equisetum arvense
	Cirsium vulgare

1 meter = 3.2 feet

Average slope in the riparian area: (Question 1)

<10:1 (10%) ☒ Between 10:1 (10%) and 5:1 (20%) ☐ >5:1 (20%) ☐

Extent of impervious surface within the riparian area. (Question 4)

<10% ☐ 10% - 25% ☐ >25% ☒

Is the reach constricted by man-made features? (Question 8)

Yes ☒ No ☐

Does the orientation of the riparian area allow for shading of the water resource at midday in summer? (Question 9)

Yes ☒ No ☐

Dominant vegetation layer within riparian area? (Question 10)

Woody vegetation ☐ Herbaceous vegetation ☐ Bare ground ☒

Does woody vegetation hang over the edge of the water? (Questions 11 & 14)

Yes ☐ No ☒

Large woody debris in riparian area? (Question 15)

Yes ☐ No ☒

Percent of water resource bordered by vegetated riparian area at least 30 feet wide? (Question 16)

>40% ☐ 10% - 40% ☐ <10% ☒

Degree of development or human caused disturbance. (Question 19)

<25% ☐ 25% - 75% ☐ >75% ☒

How does the NRCS soil survey rank water erosion hazard of the dominant mapped unit in the Riparian Area? (Question 5)

low, slight moderate ☐ high, very high, severe ☒

What is the dominant vegetation at the top of bank (if defined) or edge of water resource? (Question 3)

Woody vegetation ☐ Herbaceous vegetation ☐ Bare ground ☒

Are there flood prone areas (adjacent flat areas, depressions, swales, FEMA mapped 100-year floodplain, etc.) beyond the top of bank or edge of the water resource? (Question 6)

Yes ☐ No ☒

Is woody vegetation (trees, shrubs, vines) greater than 1 meter (3.2 feet) high dominant in the flood prone riparian area?

Yes ☐ No or no flood prone area present ☒

How many vegetation layers (i.e. canopy, mid-story, groundcover) are present?

More than 2 ☐ 2 layers ☐ 1 layer or unvegetated ☒

Riparian Width Determination

City of Molalla Riparian Inventory

RIPARIAN CODE

R-BC-9

Date: 6/6/01 **Investigators:** PF/SE

Dominant tree species: *Fraxinus latifolia* (see other side for list of species)

Potential tree height (PTH)/Width of riparian area : 75 / 10 **feet**

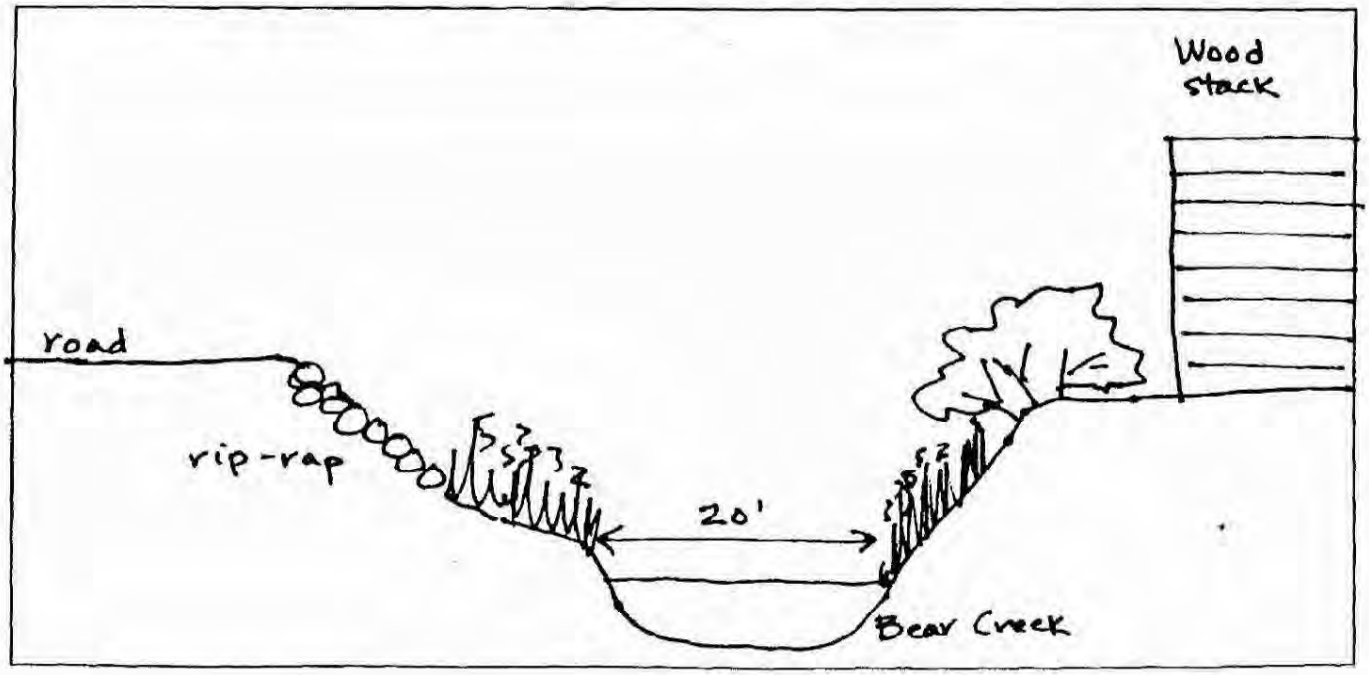
(Width measured horizontally from edge of water resource)

PTH determined by:

On-site vegetation ☒ **Reference site** ☐ **Code** _____

Comments: Bear Creek through Floragon Forest Products property. Severely impaired riparian area with lots of distrubance - rip-rap, fill, wood debris. Culverted extensively throughout.

Typical Cross Section:



Riparian Functional Assessment Answer Sheet

City of Molalla Riparian Inventory

RIPARIAN CODE

R-BC-9

WATER QUALITY

		Score
1. What is the average slope in the riparian area?		
a. Less than 10:1 (10%)	3 pts	
b. Between 10:1 (10%) and 5:1 (20%)	2 pts	3
c. Greater than 5:1 (20%)	1 pt	
2. What is the dominant vegetation cover in the riparian area?		
a. Woody vegetation (trees, shrubs, vines) greater than 1 meter (3.2 feet) high	3 pts	
b. Herbaceous vegetation or woody vegetation less than 1 meter (3.2 feet) high	2 pts	1
c. Bare ground	1 pt	
3. What is the dominant vegetation at the top of bank (if defined) or edge of water resource?		
a. Woody vegetation (trees, shrubs, vines) greater than 1 meter (3.2 feet) high	3 pts	
b. Herbaceous vegetation or woody vegetation less than 1 meter (3.2 feet) high	2 pts	1
c. Bare ground	1 pt	
4. What is the extent of impervious surfaces within the riparian area?		
a. Less than 10%	3 pts	
b. Between 10% and 25%	2 pts	1
c. Greater than 25%	1 pt	
5. How does the Natural Resources Conservation Service (formerly Soil Conservation Service) soil survey rank the water erosion hazard of the dominant mapped unit in the riparian area? Select the highest water erosion hazard description if more than one is listed.		
a. Low, slight, moderate	2 pts	1
b. High, severe, very high	1 pts	
Total Points:		7

Function: **High (12-14 pts)** **Medium (8-11 pts)** **Low (5-7 pts)**

FUNCTION IS: **LOW**

Riparian Functional Assessment Answer Sheet

City of Molalla Riparian Inventory

RIPARIAN CODE

R-BC-9

FLOOD MANAGEMENT

		Score
6. Are there flood prone areas (adjacent flat areas, depressions, swales, FEMA mapped 100-year floodplain, etc.) beyond the top of bank or edge of the water resource?		
a. Yes	3 pts	1
b. No	1 pt	
7. Is woody vegetation (trees, shrubs, vines) greater than 1 meter (3.2 feet) high dominant in the flood prone riparian area?		
a. Yes	3 pts	1
b. No or no flood prone area present	1 pt	
8. Is the stream or water resource constricted by man-made features (e.g. channelization, riprap, concrete wall)?		
a. No	3 pts	1
b. Yes	1 pts	

Total Points: 3

Function: **High (8-9 pts)** **Medium (5-7 pts)** **Low (3-4 pts)**

FUNCTION IS: **LOW**

Riparian Functional Assessment Answer Sheet

City of Molalla Riparian Inventory

RIPARIAN CODE

R-BC-9

THERMAL REGULATION

		Score
9. Does the aspect or orientation of the riparian area allow for shading of water at midday in the summer?		
a. Yes	3 pts	3
b. No	1 pt	
10. What is the dominant vegetation layer in the riparian area?		
a. Woody vegetation (trees, shrubs, vines) greater than 1 meter (3.2 feet) high	3 pts	
b. Herbaceous vegetation or woody vegetation less than 1 meter (3.2 feet) high	2 pts	1
c. Bare ground	1 pt	
11. Does woody vegetation hang over the edge of the water?		
a. Yes	2 pts	1
b. No	1 pts	

Total Points: 5

Function: **High (7-8 pts)** **Medium (5-6 pts)** **Low (3-4 pts)**

FUNCTION IS: **MEDIUM**

Riparian Functional Assessment Answer Sheet

City of Molalla Riparian Inventory

RIPARIAN CODE

R-BC-9

WILDLIFE HABITAT

		Score
12. How many vegetation layers (i.e. canopy, mid-story, groundcover) are present?		
a. More than 2 layers	3 pts	
b. 2 layers	2 pts	1
c. 1 layer, or unvegetated	1 pt	
13. What is the dominant vegetation layer in the riparian area?		
a. Woody vegetation (trees, shrubs, vines) greater than 1 meter (3.2 feet) high	3 pts	
b. Herbaceous vegetation or woody vegetation less than 1 meter (3.2 feet) high	2 pts	1
c. Bare ground	1 pt	
14. Does woody vegetation hang over the edge of the water?		
a. Yes	2 pts	1
b. No	1 pt	
15. Is large woody debris present within the riparian area?		
a. Yes	3 pts	1
b. No	1 pt	
16. What percent of the water resource edge is bordered by a vegetated riparian area at least 30 feet wide?		
a. Greater than 40%	3 pts	
b. Between 10% and 40%	2 pts	1
c. Less than 10%	1 pt	

Questions continued on next page

Riparian Functional Assessment Answer Sheet

City of Mobile Riparian Inventory

RIPARIAN CODE

R-BC-9

WILDLIFE HABITAT (continued)

		Score
17. Is surface water present throughout the year?		
a. Yes	3 pts	
b. No	1 pt	3
18. Is there more than one type of water resource (e.g. stream, wetland, lake/pond) within or immediately adjacent to the riparian reach?		
a. Yes	3 pts	1
b. No	1 pt	
19. What is the degree of development or human-caused disturbance (e.g. buildings, impervious surfaces, lawns, agriculture, trash) in the riparian area?		
a. Less than 25%	3 pts	
b. Between 25% and 75%	2 pts	1
c. Greater than 75%	1 pt	
Total Points:		10

Function: High (19-23 pts) Medium (13-18 pts) Low (8-12 pts)

FUNCTION IS: LOW

Wetland Characterization Sheet

Project Name: Molalla LWI

		Wetland Code:	BC-22A
Date(s) of field work:	6/6/01	Size (acres):	0.71
Data Sheet Numbers:	71	Cowardin Class(es):	PEM
Investigator(s):	PF/SE	HGM Class(es):	RFT

Location -- Legal:	**T. 5S, R. 2E, Section 17**
Other:	**North of Molalla Forest Road, west of Molalla Ave., south of Hwy 211**
Tax Lots:	**52E17A 00100, 00101, 00102**
Hydrologic basin:	**Bear Creek**
Soil -- Mapped series:	**Dayton silt loam**
Hydrologic Source:	**Surface water**

Dominant Wetland Vegetation

TREES	SHRUBS	VINES	HERBS
			Agrostis stolonifera
			Ranunculus repens
			Carex leporina
			Carex stipata
			Myosotis discolor
			Phalaris arundinacea
			Holcus lanatus
			Equisetum arvense
			Veronica americana
			Lotus corniculatus

Comments:

Bear Creek and associated wetlands in narrow channel through Floragon Forest Products site. Disturbed and channelized, with several culverts under access roads. Hydrologically connected to BC-22B by surface water. Zoned heavy industrial. Adjacent land use is heavy industrial.

Adjacent Upland Species: Rubus discolor, Daucus carota, Cirsium arvense, Chrysanthemum leucanthemum, Festuca arundinacea, Taraxacum officinale, Cytisus scoparius, Crataegus monogyna

COWARDIN CODES:	E2FO = estuarine forested	E2SS = estuarine scrub shrub	E2EM = estuarine emergent
PFO = palustrine forested	PSS = palustrine scrub-shrub	PEM = palustrine emergent	POW = palustrine open water
HGM CODES:	EFB = Estuarine Fringe Embayment	EFR = Estuarine Fringe Riverine	RFT = Riverine Flow Through
RI = River Impounding	LFH = Lacustrine Fringe Headwater	LFV = Lacustrine Fringe Valley	DB = Depressional Bog
DA- Depressional Alkaline	DO = Depressional Outflow	DCP = Depressional Closed Permanent	DCNP = Depressional Nonpermanent
HS = Headwater Slope	VS = Valley Slope		

Oregon
Kate Brown, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

June 1, 2016

Avison Lumber Company
Attn: Bill Avison
500 E 5th Street
PO Box 419
Molalla, OR 97038

Re: WD #2016-0177 Wetland Delineation Report for a Proposed DEQ Soil Remediation Project, Clackamas County;
T 5S R 2E S17 Portion of Tax Lot 2480;
S 17A Portion of Tax Lots 100, 101, 102, 200 and 290
City of Molalla Local Wetlands Inventory, Wetland BC-22A and BC-22E

Dear Mr. Avison:

The Department of State Lands has reviewed the wetland delineation report prepared by SWCA Environmental Consultants for the site referenced above. Please note that the two study areas include only a portion of the tax lots described above (see the attached map). Based upon the information presented in the report, we concur with the wetland and waterway boundaries as mapped in Figure 5 of the report. Within the two study areas, two wetlands (totaling approximately 0.09 acres) and several segments of Bear Creek were identified.

The wetlands and the creek are subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in wetlands or below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined).

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you

work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. Please phone me at 503-986-5232 if you have any questions.

Sincerely,

Peter Ryan, PWS
Jurisdiction Coordinator

Approved by

Kathy Verble, CPSS
Aquatic Resource Specialist

Enclosures

ec: C. Mirth Walker, PWS, SWCA Environmental Consultants
City of Molalla Planning Department (Map enclosed for updating LWI)
Dominic Yballe, Corps of Engineers
Anita Huffman, DSL

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

This form must be included with any wetland delineation report submitted to the Department of State Lands for review and approval. A wetland delineation report submittal is not "complete" unless the fully completed and signed report cover form and the required fee are submitted. Attach this form to the front of an unbound report or include a hard copy of the completed form with a CD/DVD that includes a single PDF file of the report cover form and report (minimum 300 dpi resolution) and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279.** A single PDF attachment of the completed cover from and report may be e-mailed to **Wetland_Delineation@dsl.state.or.us**. For submittal of PDF files larger than 10 MB, e-mail instructions on how to access the file from your ftp or other file sharing website. Fees can be paid by check or credit card. Make the check payable to the Oregon Department of State Lands. To pay the fee by credit card, call 503-986-5200.

☒ Applicant ☐ Owner Name, Firm and Address:
Bill Avison
Avison Lumber Company
500 E 5th St.
PO Box 419,
Molalla, OR 97038

Business phone #
Mobile phone # (optional)
E-mail: **bill@avison.com**

☒ Authorized Legal Agent, Name and Address:
C. Mirth Walker, PWS
SWCA Environmental Consultants
1220 SW Morrison St., Suite 700, Portland, OR 97205

Business phone # **503-224-0333 ext. 6250**
Mobile phone # **503-860-1708**
E-mail: **cmwalker@swca.com**

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: **C. Mirth Walker** Signature: [redacted]
Date: **4/7/2016** Special instructions regarding site access: **Contact consultant to arrange site access.**

Project and Site Information (using decimal degree format for lat/long.,enter centroid of site or start & end points of linear project)

Project Name: **Floragon Property Bear Creek Reaches 1-2 and 4-5**	Latitude: **45.13940** Longitude: **-122.58361**
Proposed Use: **DEQ soil remediation**	Tax Map # **5 2E 17A** & 5 2E 17
Project Street Address (or other descriptive location): **Approximately 1000 feet northwest of the intersection between S. Molalla Avenue and S. Molalla Forest Road.**	Township **5S** Range **2E** Section **17A**, 17 QQ **NE** Tax Lot(s) (17A) 100, 101 **200, 102, 290,** (17) **2480,** **(Portions)**
City: **Molalla** County: **Clackamas**	Waterway: **Bear Creek** River Mile: **NA** NWI Quad(s): **Molalla**

Wetland Delineation Information

Wetland Consultant Name, Firm and Address:
C. Mirth Walker, PWS
SWCA Environmental Consultants
1220 SW Morrison Street, Suite 700
Portland, OR 97205

Phone # **503-224-0333 ext. 6250**
Mobile phone # **503-860-1708**
E-mail: **cmwalker@swca.com**

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: [redacted] Date: **April 7, 2016**

Primary Contact for report review and site access is ☒ Consultant ☐ Applicant/Owner ☐ Authorized Agent

Wetland/Waters Present? ☒ Yes ☐ No | Study Area size: **3.90 acres** | Total Wetland Acreage: **0.09 (1.01 water)**

Check Box Below if Applicable:

☐ R-F permit application submitted
☐ Mitigation bank site
☐ Wetland restoration/enhancement project (not mitigation)
☐ Industrial Land Certification Program Site
☐ Reissuance of a recently expired delineation
Previous DSL # Expiration date _____

Fees:

☒ Fee payment submitted **$412 to be paid by c.c.**
☐ Fee ($100) for resubmittal of rejected report
☐ No fee for request for reissuance of an expired report

Other Information:

	Y	N	
Has previous delineation/application been made on parcel?	☒	☐	If known, previous DSL # WD#2015-0279
Does LWI, if any, show wetland or waters on parcel?	☒	☐	

For Office Use Only

DSL Reviewer: PR Fee Paid Date: ___/___/___ DSL WD # 2016-0177
Date Delineation Received: 4 / 7 / 16 DSL Project # ______ DSL Site # ______
Scanned: ☒ Final Scan: ☐ DSL WN # ______ DSL App. # ______

Electronic Submittal

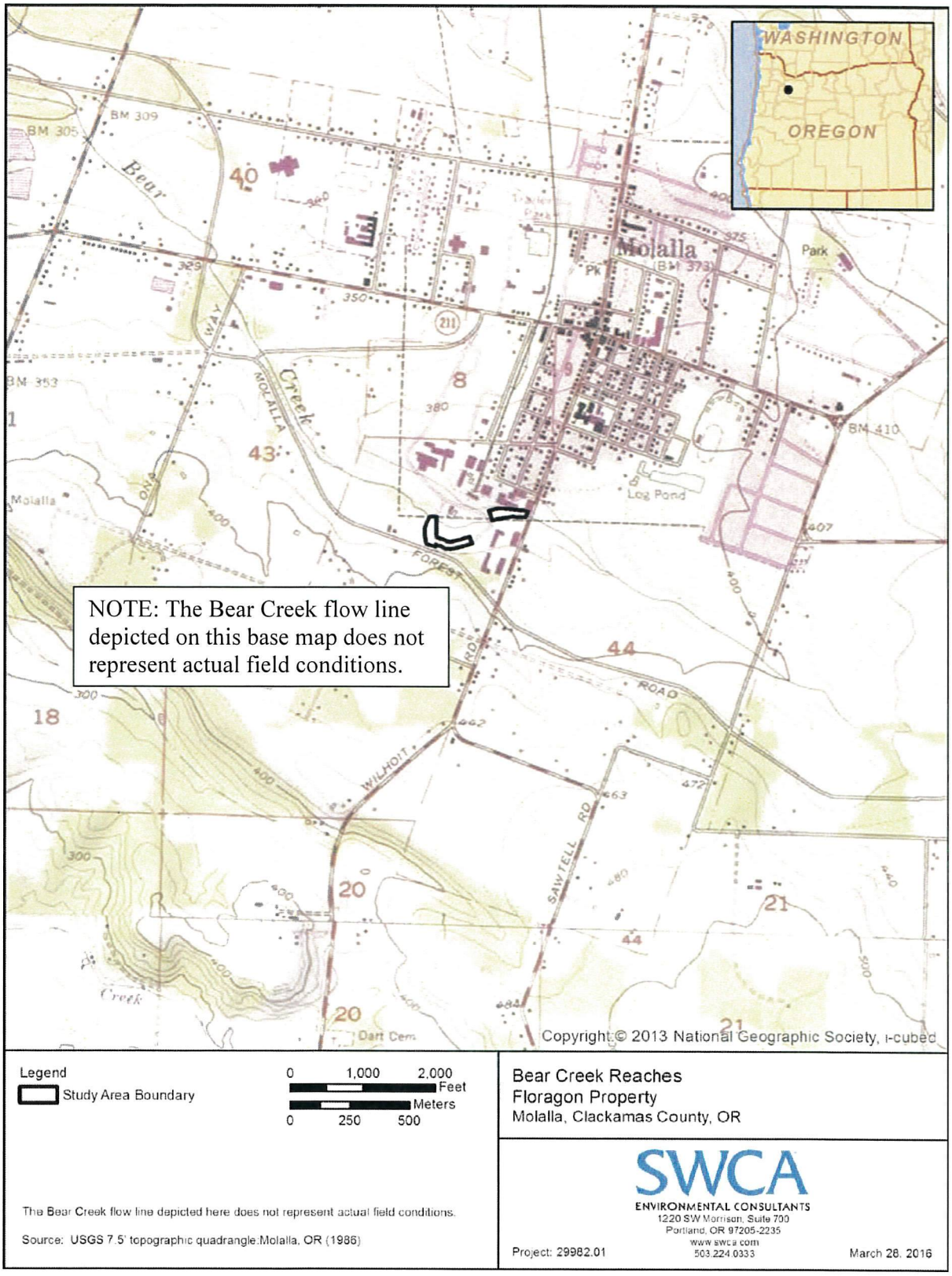
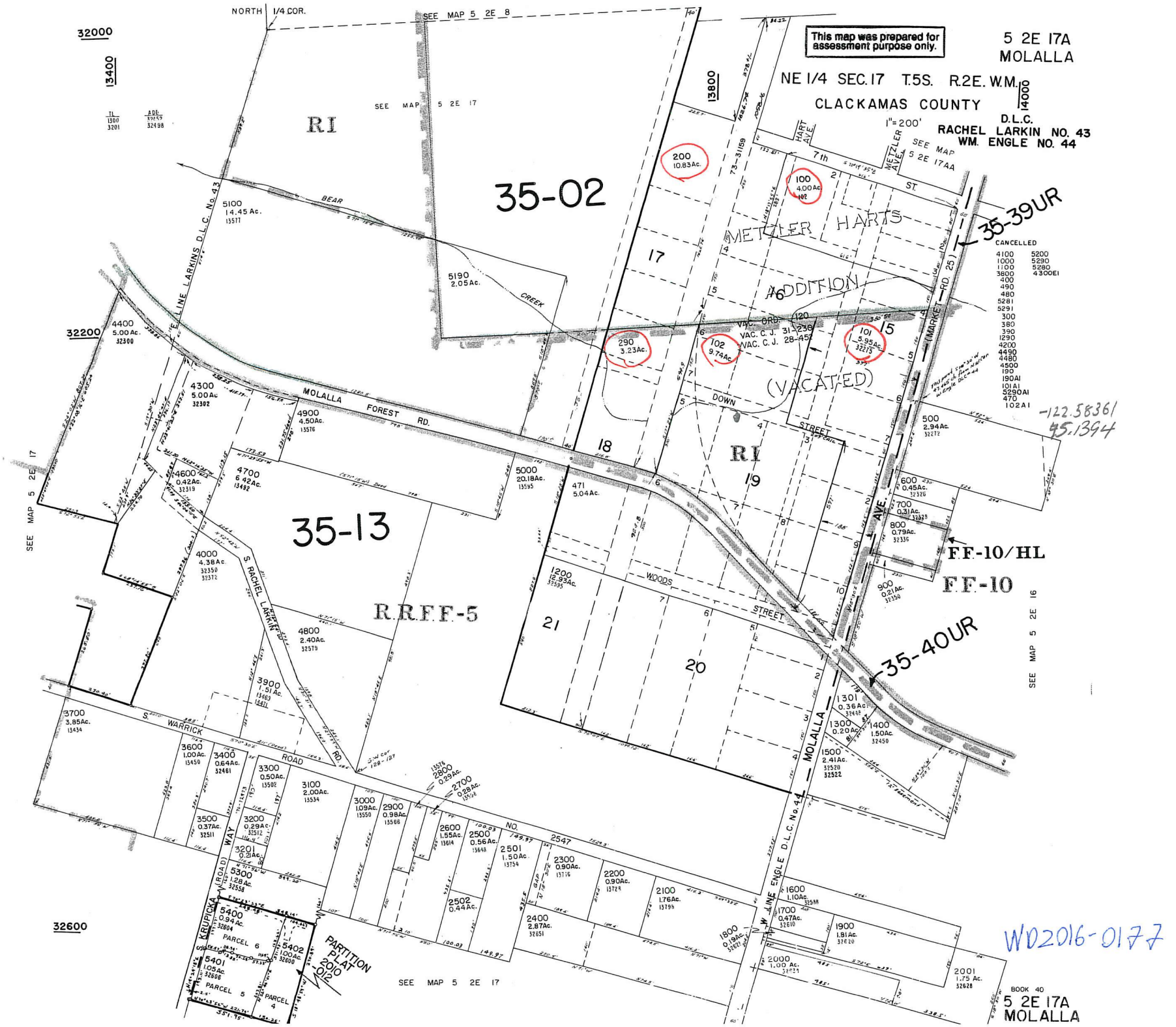
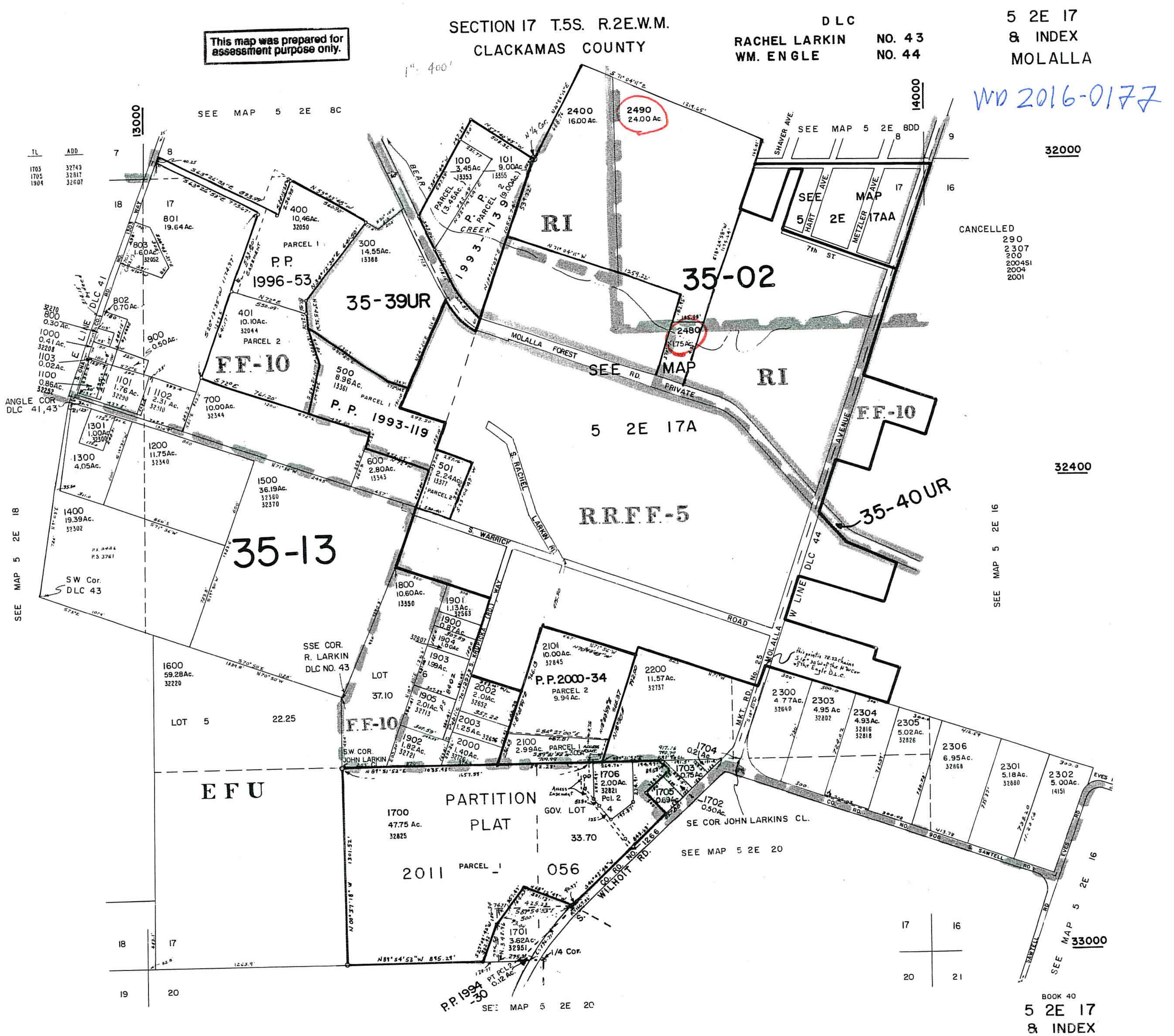
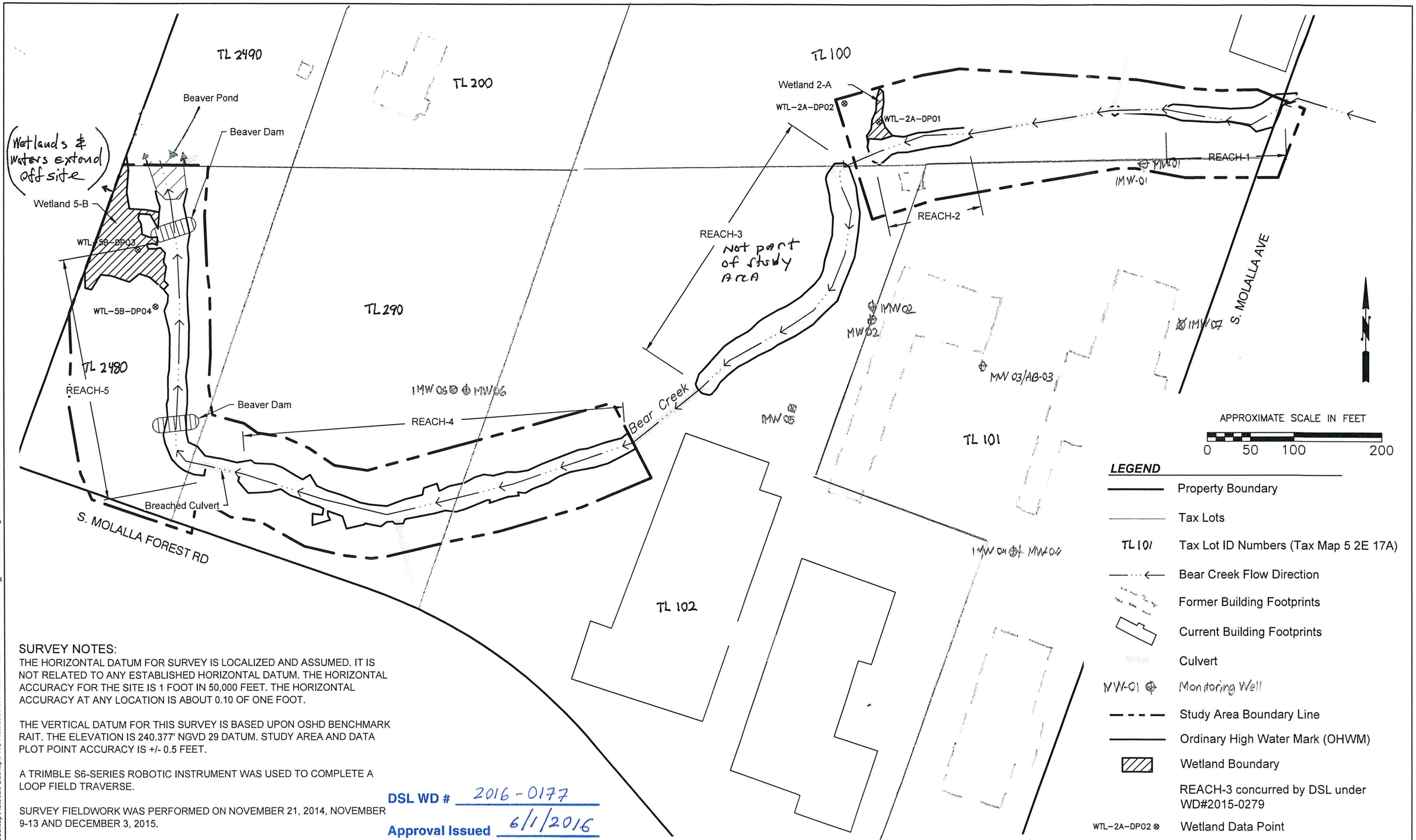


Figure 1. Site location map.

WD 2016-0177


This map was prepared for assessment purpose only.
5 2E 17A
MOLALLA
NE 1/4 SEC. 17 T.5S. R.2E. W.M.
CLACKAMAS COUNTY
1"= 200'
D.L.C.
RACHEL LARKIN NO. 43
WM. ENGLE NO. 44
NORTH 1/4 COR.
SEE MAP 5 2E 8
SEE MAP 5 2E 17
SEE MAP 5 2E 17AA
RI
35-02
35-13
R.R.F.F-5
RI
F.F-10/HL
F.F-10
METZLER HARTS ADDITION
(VACATED)
MOLALLA FOREST RD.
S. WARRICK ROAD
S. RACHEL LARKIN RD.
WOODS STREET
DOWN STREET
HART AVE.
METZLER AVE.
7th ST.
MARKET RD. (CO. RD. NO. 25)
MOLALLA AVE.
35-39UR
35-40UR
BEAR CREEK
T.L. LINE LARKINS D.L.C. No. 43
N. LINE ENGLE D.L.C. No. 44
KRUPICKA WAY (ROAD)
PARCEL 6
PARCEL 5
PARCEL 4
PARTITION PLAT 2010-012
CANCELLED
4100 5200
1000 5290
1100 5280
3800 4300EI
400
490
480
5281
5291
300
380
390
1290
4200
4490
4480
4500
190
190AI
101AI
5290AI
470
102AI
VAC. ORD. 120
VAC. C. J. 31-230
VAC. C. J. 28-453
-122.58361
45.1394
WD2016-0177
BOOK 40
5 2E 17A
MOLALLA


This map was prepared for assessment purpose only.
SECTION 17 T.5S. R.2E.W.M.
CLACKAMAS COUNTY
DLC
RACHEL LARKIN NO. 43
WM. ENGLE NO. 44
5 2E 17
& INDEX
MOLALLA
WD 2016-0177
1" = 400'
SEE MAP 5 2E 8C
SEE MAP 5 2E 8DD
SEE MAP 5 2E 18
SEE MAP 5 2E 16
SEE MAP 5 2E 20
13000
14000
32000
32400
33000
TL ADD
1703 32743
1705 32817
1904 32607
2400 16.00 Ac.
2490 24.00 Ac.
2480 1.75 Ac.
100 3.45Ac. 13353
101 9.00Ac. 13355
400 10.46Ac. 32050
PARCEL 1
P.P. 1996-53
801 19.64Ac.
803 1.60Ac. 32052
802 0.70Ac.
300 14.55Ac. 13388
35-39UR
401 10.10Ac. 32044 PARCEL 2
F.F.-10
500 8.96Ac. 13361
P. P. 1993-119
PARCEL 1
P. P. 1993-139
PARCEL 2
RI
35-02
MOLLALA FOREST RD.
SEE MAP
PRIVATE
5 2E 17A
R.R.F.F.-5
35-13
35-40UR
S. RACHEL LARKIN RD.
S. WARRICK ROAD
S. KRUPICKA (RD.) WAY
MOLALLA
W LINE DLC 44
AVENUE
SHAVER AVE.
HART AVE.
METZLER AVE.
7th ST
SEE MAP 5 2E 17AA
CANCELLED
290
2307
200
2004SI
2004
2001
E LINE DLC 41
S. ONA WAY
ANGLE COR DLC 41,43
800 0.30Ac.
1000 0.41Ac.
1103 0.02Ac.
1100 0.86Ac.
900 0.50Ac.
1101 1.76Ac.
1102 2.31Ac.
700 10.00Ac. 32344
1301 1.00Ac.
1300 4.05Ac.
1200 11.75Ac. 32340
1500 36.19Ac. 32360 32370
600 2.80Ac. 13343
501 2.24Ac. 13377
PARCEL 2
1400 19.39Ac. 32302
SW Cor. DLC 43
1800 10.60Ac. 13350
1901 1.13Ac. 32563
1900 0.87Ac.
1904 1.00Ac.
1903 1.99Ac.
1905 2.01Ac.
1902 1.82Ac.
2002 2.01Ac.
2003 1.25Ac.
2000 1.40Ac.
2101 10.00Ac. 32845
P.P. 2000-34
PARCEL 2 9.94Ac.
2100 2.99Ac. PARCEL 1
2200 11.57Ac. 32737
1600 59.28Ac. 32220
LOT 5 22.25
LOT 37.10
SSE COR. R. LARKIN DLC NO. 43
SW COR. JOHN LARKIN
F.F.-10
EFU
PARTITION PLAT
2011 PARCEL 1 056
1700 47.75 Ac. 32825
GOV. LOT 4 33.70
1706 2.00Ac. 32821 Pcl. 2
1705
1703 0.75Ac.
1704 0.21Ac.
1702 0.50Ac.
1701 3.62Ac. 32951
P.P. 1994-30
1/4 Cor.
SE COR JOHN LARKINS CL.
S. WILHOIT RD. CO. RD. NO. 1266
MKT. RD. No. 25
2300 4.77Ac. 32640
2303 4.95 Ac 32802
2304 4.93Ac. 32816 32818
2305 5.02Ac. 32826
2306 6.95Ac. 32868
2301 5.18Ac. 32880
2302 5.00Ac. 14151
CO. RD. NO. 906
S. SAWTELL RD.
EVES RD.
BOOK 40
5 2E 17
& INDEX



SURVEY NOTES:

THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM. THE HORIZONTAL ACCURACY FOR THE SITE IS 1 FOOT IN 50,000 FEET. THE HORIZONTAL ACCURACY AT ANY LOCATION IS ABOUT 0.10 OF ONE FOOT.

THE VERTICAL DATUM FOR THIS SURVEY IS BASED UPON OSHD BENCHMARK RAIT. THE ELEVATION IS 240.377' NGVD 29 DATUM. STUDY AREA AND DATA PLOT POINT ACCURACY IS +/- 0.5 FEET.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A LOOP FIELD TRAVERSE.

SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014, NOVEMBER 9-13 AND DECEMBER 3, 2015.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014 (REACH 3), NOVEMBER 2 AND 23, 2015 (REACH-1, -2, -4, AND -5).

DSL WD # 2016-0177
Approval Issued 6/1/2016
Approval Expires 6/1/2021

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	1-26-16
FILE NAME:	1177-01
DRAWN BY:	JJT
APPROVED BY:	PE

FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

BEAR CREEK WATER SURVEY

Project No. 1177-01
Figure No. 5

C:\Users\Josh\Desktop\Autocad Backup\PNG-Autocad\1177-01 Avison\2016\Jan 2016\1177-01_WTL-012616.dwg 2.17.2014

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

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☒ Applicant ☐ Owner Name, Firm and Address: **Bill Avison** **Avison Lumber Company** **500 E 5th St.** **PO Box 419,** **Molalla, OR 97038**	Business phone # Mobile phone # (optional) E-mail: **bill@avison.com**
☒ Authorized Legal Agent, Name and Address: **C. Mirth Walker, PWS** **SWCA Environmental Consultants** **1220 SW Morrison St., Suite 700, Portland, OR 97205**	Business phone # **503-224-0333 ext. 6250** Mobile phone # **503-860-1708** E-mail: **cmwalker@swca.com**

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: **C. Mirth Walker** Signature: C. Mirth Walker

Date: **3/17/2016** Special instructions regarding site access: **Contact consultant to arrange site access.**

Project and Site Information (using decimal degree format for lat/long.,enter centroid of site or start & end points of linear project)

Project Name: **Floragon Property Bear Creek Reaches 1-2 and 4-5** Latitude: **45.13940** Longitude: **-122.58361**	
Proposed Use: **DEQ soil remediation**	Tax Map # **5 2E 17A**
Project Street Address (or other descriptive location): **Approximately 1000 feet northwest of the intersection between S. Molalla Avenue and S. Molalla Forest Road.**	Township **5S** Range **2E** Section **17A** QQ **NE** Tax Lot(s) **200, 102, 290, 5280, and 2490 (Portions)**
City: **Molalla** County: **Clackamas**	Waterway: **Bear Creek** River Mile: **NA** NWI Quad(s): **Molalla**

Wetland Delineation Information

Wetland Consultant Name, Firm and Address: **C. Mirth Walker, PWS** SWCA Environmental Consultants 1220 SW Morrison Street, Suite 700 Portland, OR 97205	Phone # **503-224-0333 ext. 6250** Mobile phone # **503-860-1708** E-mail: **cmwalker@swca.com**

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: C. Mirth Walker Date: **March 17, 2016**

Primary Contact for report review and site access is ☒ Consultant ☐ Applicant/Owner ☐ Authorized Agent

Wetland/Waters Present? ☒ Yes ☐ No | Study Area size: **3.90 acres** Total Wetland Acreage:0.17 **(0.55 water)**

Check Box Below if Applicable:	**Fees:**
☐ R-F permit application submitted	☒ Fee payment submitted **$406 to be paid by c.c.**
☐ Mitigation bank site	☐ Fee ($100) for resubmittal of rejected report
☐ Wetland restoration/enhancement project (not mitigation)	☐ No fee for request for reissuance of an expired report
☐ Industrial Land Certification Program Site	
☐ Reissuance of a recently expired delineation Previous DSL # Expiration date _____	

Other Information:	Y	N	
Has previous delineation/application been made on parcel?	☒	☐	If known, previous DSL # WD#2015-0279
Does LWI, if any, show wetland or waters on parcel?	☒	☐	

For Office Use Only

DSL Reviewer: _____	Fee Paid Date: ____ / ____ / ____	DSL WD # _____
Date Delineation Received: ___ / ____ / ____	DSL Project # _____	DSL Site # _____
Scanned: ☐ Final Scan: ☐	DSL WN # _____	DSL App. # _____

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FLORAGON FOREST PRODUCTS SITE
WETLAND AND WATERS DELINEATION REPORT
TAX MAP 5 2E 17A, PORTIONS OF TAX LOTS 200, 102, 290, 5280, and 2490, NORTHWEST OF THE INTERSECTION BETWEEN S. MOLALLA AVENUE AND S. MOLALLA FOREST ROAD MOLALLA, CLACKAMAS COUNTY, OREGON

Prepared for

PNG Environmental, Inc.
6665 SW Hampton Street, Suite 101
Tigard, OR 97223

and

EES Environmental Consulting
240 N Broadway #203
Portland, OR 97227

Prepared by

SWCA Environmental Consultants
1220 SW Morrison Street, Suite 700
Portland, OR 97205
503-224-0333
www.swca.com

March 2016

SWCA Project No. 29982

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INTRODUCTION AND BACKGROUND

SWCA Environmental Consultants (SWCA) was contracted by PNG Environmental, Inc., in association with EES Environmental Consulting, Inc., to conduct a wetland and waters delineation on the subject site, which is located in the southern portion of an industrial property owned by Floragon Forest Products (Appendix A, Figure 1). The Floragon site is located west of Molalla Avenue and north of S Molalla Forest Road, and is accessed from Section Street or from Molalla Forest Road. The study area consists of small portions of Tax Lots 200, 102, 290, 5280, and 2490 on Tax Map 5 2E 17A, located in Molalla, Clackamas County, Oregon (Appendix A, Figures 2a and 2b).

The delineation of Reaches 1, 2, 4, and 5 of Bear Creek is presented in this report. Two wetlands were delineated within isolated portions of the study area directly abutting Bear Creek. An adjoining portion of Bear Creek named Reach 3 was delineated by SWCA in November of 2014. The Reach 3 waters delineation report received concurrence from the Oregon Department of State Lands (DSL) on August 24, 2015 under WD #2015-0279.

This report was prepared in support of the ongoing Remedial Investigation (RI) and related ecological risk assessment addressing Bear Creek sediments, which are being evaluated with the participation of a voluntary agreement between the former property owner and the Oregon Department of Environmental Quality (DEQ).

A. Landscape Setting and Land Use

OAR141-090-0035(7)(a)

The site is located within a larger industrial property which was previously owned and operated by the Avison Lumber Company (Avison). Floragon Forest Products, the current site owner, acquired the property in 1998. Floragon conducted site operations on the property and also leased portions of the property to third parties. The site is zoned I2 (Clackamas County Light Industrial Use). The site is being investigated and remediated in accordance with environmental cleanup rules listed in the Oregon Administrative Rules (OAR 340-122) under an agreement with the DEQ in order to demonstrate protective conditions that will enable commercial/industrial development and re-use of the property.

Bear Creek flows through the southern portion of this property in reaches separated by culverts. The topography on the site is generally flat. Land use surrounding the Floragon property is rural residential and residential/mixed use. The site is at an approximate elevation of 380 feet, based on the U.S. Geological Survey (USGS) topographic map (Figure 1).

B. SITE ALTERATIONS

OAR141-090-0035 (7)(c)

The Floragon property is located at the southern portion of what historically was a much larger lumber mill and forest products manufacturing facility that covered approximately 102 acres. The study area (Reaches 1, 2, 4, and 5 of Bear Creek) covers 3.90acres and is located in the southern portion of the Floragon property.

According to a fact sheet issued by the DEQ (DEQ 2011), lumber-related manufacturing occurred at the Floragon site from approximately 1947 to 2009. From 1947 to the late 1990s, Avison operated at the facility. Floragon purchased the property in 1998, after which limited manufacturing continued through 2009. Most site buildings have been demolished, although vacant buildings related to recent glue-lam manufacturing remain in the southern portion of the site, to the south of theBear Creek study area. Northern portions of the former mill site were purchased from Floragon by Tillamook Fiber in 2014 and are currently being used for log storage and chipping. Recently another operator has moved onto the northern site and has paved a large section to be used for bark and mulch processing.

From approximately 1970 to 1986, Avison Lumber applied a pentachlorophenol (PCP)-containing chemical solution on lumber for anti-fungal purposes prior to shipment. This solution often contained a family of related chemicals called chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans, commonly referred to as dioxins/furans. Lumber was prepared with the water-based solution at two dip tanks located in the southern portion of the site. The PCP-containing solution was switched in the late 1980s to a non-PCPdetergent based anti-fungal treating solution.

A series of investigation and cleanup activities were performed at the site starting in the 1980s, and included early investigation by Avison and the Environmental Protection Agency (EPA) Region 10. EPA investigation under the superfund program identified contamination at the site, but concluded that it was not significant enough to require further action by EPA. DEQ identified the site as a low priority for further action based on these results. The site is listed in the DEQ Environmental Cleanup Site Information (ECSI) Database as ECSI Site Number 9 (DEQ 2014).

In the late 1990s, Floragon removed underground storage tanks and performed additional soil and groundwater investigation. In 2007, DEQ elevated the site priority based on the detection of residual dioxins/furans in soil and sediment. Floragon subsequently entered into the Voluntary Cleanup Program and began site investigation under a Consent Order with DEQ to complete a comprehensive site investigation and risk assessment. Floragon submitted a work proposal for site-wide investigation and risk assessment in 2008. In 2009 DEQ approved the plan. Floragon initiated work in 2010, sampling soil and groundwater across the site, and sediment within Bear Creek and perimeter ditches. Samples were analyzed for multiple chemical contaminants. Avison completed the report and presented it to DEQ in July 2011.

Based on investigation and cleanup work conducted since that time, DEQ has determined that the majority of the original 102-acre site meets protective criteria for human health and ecological receptors, with No Further Action (NFA) determinations issued for the 80-acre northern portion of the site (March 2014) and the 16-acre southeastern area (pending; conditional NFA is expected in 2016). Future environmental work is limited to Bear Creek sediments and an adjacent upland ("former dip tank") area, comprising a total of approximately 4.1 acres.

Low levels of phenols and related oil-range hydrocarbons have been detected in soil and groundwater around former dip tanks located in the southeastern portion of the site, well away from residential development. Dioxins/furans have also been detected in soil at the dip tank area and within Bear Creek sediments. Avison is working with DEQ and the owner to complete investigation and cleanup work as necessary for these two remaining portions of the site.

An aerial photograph showing site conditions dating from 2011 is included in Appendix B.

C. PRECIPITATION DATA AND ANALYSIS

OAR141-090-0035 (7)(i)

The WETS (short for wetlands climate analysis) station used to obtain precipitation data for the project site was the North Willamette Experimental station in Aurora, Oregon. Average annual rainfall according to the WETS table for the North Willamette station is 42.60 inches. Precipitation data were obtained from the Aurora weather station via the National Weather Service (NWS). Table 1 shows the monthly precipitation averages according to the Aurora station for the 3 months prior to SWCA's November 2 and 23, 2015, site visits. The raw data are included in Appendix C.

Table 1. Precipitation Data – Monthly Averages Based on the Climate Period 1971–2000 (inches)

Month	Average	30% Chance Will Have		Observed Precipitation	Within Normal Range?
		Less Than	More Than		
August	0.83	0.18	0.96	0.90	Within normal (108%)
September	1.77	0.80	2.21	1.19	Within normal (67%)
October	3.36	1.69	4.10	4.12	Above normal (123%)

Source: North Willamette Experimental Station WETS table and Aurora NWS 2015.

According to the NWS Aurora weather station, rainfall received on November 2, 2015, was 0.03 inch, and rainfall received for the 2 weeks prior to this site visit was 4.70 inches (received from October 19 through November 1, 2015). Rainfall received on November 23, 2015, was 0.37 inch, and rainfall received for the 2 weeks prior to this site visit was 2.66 inches (received from November 9 through 22). As of November 23, 2015, rainfall received in Aurora for the water year-to-date was 8.90 inches, and rainfall received since January 1, 2015, was 27.58 inches.

The WETS table for the North Willamette Experiment Station lists the growing season as extending from March 1 to November 22 (265 days). Our site visit was conducted near the end of the growing season.

D. METHODS

OAR141-090-0035 (7)(d-e), (g-h), (16)(a-b), (f), (d) or (g), (17), and (19-20)

The methodology used for determining the presence of wetlands followed the routine approach of the U.S. Army Corps of Engineers' (Corps') *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers' Wetland Delineation Manual for the Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010), used by both the Corps and the DSL. Mirth Walker conducted a scoping site visit on August 21, 2015, with Paul Ecker of EES Environmental Consulting, Inc. Fieldwork for documenting site conditions and delineating the water boundaries was conducted on November 2, 2015, by Matt Vesh and Evan Dulin. A second site visit to delineate wetlands was conducted on November 23, 2015, by Evan Dulin.

SWCA flagged the ordinary high water mark (OHWM) of Bear Creek in Reaches 1, 2, 4, and 5 along the riprapped banks. The OHWM for the creek was determined by the level of reed canary grass (*Phalaris arundinacea*) growth and where sediment deposits had occurred.

According to the Natural Resources Conservation Service (NRCS 2006, 2014) Clackamas County Area Soil Survey Map (Appendix A, Figure 3), the entire study area is mapped as the hydric Dayton

silt loam (Unit 29), though mostly gravel fill and pavement were observed adjacent to Reaches 1, 2, and 4 of Bear Creek, with some more natural vegetation and soils along Reach 5. The NRCS mapped a body of water north of the stream in Figure 3; this water, which was likely used as a log pond, is no longer present on the site.

Representative ground-level site photographs are included in Appendix E. References cited are included in Appendix F.

E. DESCRIPTION OF WATERS AND SURROUNDING AREA

OAR141-090-0035 (2), (7)(b), and (17)

Wetlands

Wetland 2-A

On the northwest end of Reach 2 of Bear Creek, Wetland 2-A (0.02 acre) directly abuts the creek and extends north to a culvert under the adjacent paved area. This wetland is fed by runoff from impervious surfaces to the north of the project area through the approximately 2-foot-wide culvert at the north end of the wetland. This wetland consisted of almost entirely reed canary grass with some Himalayan blackberry (*Rubus armeniacus*) extending in from the sides. The soils are disturbed by large fill material from historic development in support of industrial site operation.

Wetland 5-B

Wetland 5-B (0.15 acre) directly abuts and feeds into Reach 5 of Bear Creek. This wetland is primarily fed by runoff from the adjacent horse pasture to the west but may also be periodically inundated by overbank flooding from Bear Creek. The majority of this wetland consists of reed canary grass, but also includes smaller amounts of lamp rush (*Juncus effusus*), English hawthorn (*Crataegus monogyna*), sweetbrier (*Rosa rubiginosa*), and Pacific willow (*Salix lasiandra*). A small northern portion of the wetland is forested with Pacific willow and reed canary grass.

Non-Wetland Waters

Bear Creek enters the site from the east and flows in a westerly direction through the southern portions of the site. Reaches 1, 2, and 4 of Bear Creek are lined with riprap and surrounded by gravel fill and asphalt access roads for the majority of their lengths. Vegetation along these reaches is dominated by Himalayan blackberry and reed canary grass. Vegetation along Reach 5 is dominated by Pacific willow and Douglas-fir (*Pseudotsuga menziesii*) trees and shrubs on the banks, with reed canary grass along the creek's edge. Water depth gauges are present at regular intervals along the creek. Reaches are separated by approximately 5-foot-wide culverts hydrologically connecting all of the reaches under asphalt surfaces, with multiple smaller culverts entering the creek from runoff outlets. Streamflow is partially circumventing the damaged culvert between Reaches 4 and 5. The observed stream substrate was typically a sandy loam or sandy clay with gravels.

There was no noticeable streamflow on the November 2 site visit due to the presence of downstream beaver dams which were backwatering flow. However, there was moderate streamflow during the November 23 site visit due to recent rainfall. The ordinary high water mark (OHWM) of the creek was delineated and surveyed. The total linear feet for Reaches 1–2 and 4–5 of Bear Creek within the project area is approximately 1,191 linear feet long and comprises an area 0.55 acre in size. The

2015, ranged from 10 to 25 feet, and the water was up to 6 feet deep in the center channel. A pipe provides runoff into Reach 4 from S. Molalla Forest Road to the south.

Uplands

The land immediately surrounding Bear Creek is mostly upland, restricted to the area directly adjacent to the stream channel by surrounding gravel fill or pavement. These upland areas directly adjacent to Bear Creek have weedy vegetation dominated by moss, weedy grasses, vines, and some shrubs and trees. Dominant weeds included Queen Anne's-lace (*Daucus carota*), reed canary grass, downy cheat grass (*Bromus tectorum*), Scot's broom (*Cytisus scoparius*), Himalayan blackberry, and California dewberry (*Rubus ursinus*). Dominant shrubs and trees along the Bear Creek included Pacific willow, Douglas-fir, and balsam poplar (*Populus balsamifera*).

F. DEVIATION FROM LWI OR NWI

OAR141-090-0035 (16)(e)

The City of Molalla Local Wetland Inventory (LWI) (PHS 2001) mapped palustrine emergent (PEM) and palustrine forested (PFO) wetlands in the northwestern corner of the study area (Figure 4, Appendix A). These wetlands were confirmed by the site visit on November 23 and appear to extend to the west, as depicted in LWI maps. The Molalla National Wetlands Inventory (NWI) map depicts wetlands to the west of the study area as well. The LWI summary sheets for the site are included in Appendix G.

G. MAPPING METHOD

OAR141-090-0035 (7)(f), (11), (12), (13), (18), and (22)

The OHWM of Bear Creek, two wetlands, and four sample plot locations were professionally land surveyed by Centerline Concepts Land Surveying, Inc. The surveyed delineation map is shown in Figure 5 in Appendix A.

H. ADDITIONAL INFORMATION

No fish were observed during fieldwork. The site does not contain a 100-year floodplain according to Community Panel 41005C0540D by the Federal Emergency Management Agency (FEMA 2008), but the creek reportedly floods regularly (personal communication, Brad Berggren, Senior Environmental Engineer with PNG Environmental, Inc., on November 12, 2014, with Mirth Walker; Tetra Tech/KCM 2003).

Bear Creek is a tributary of the Pudding River, which in turn enters the Molalla River near its mouth at the Willamette River. The Pudding River is listed as rearing and migration habitat for coho and spring-run Chinook salmon, and winter steelhead, and is cited as habitat for Pacific lamprey (DEQ 2014). Chinook salmon and steelhead are listed as a federal threatened species. Coho salmon is listed by Oregon as a state endangered species and as a federal species of special concern. Pacific lamprey is listed as an Oregon State species of concern.

Bear Creek is not identified as DSL Essential Salmon Habitat (ESH). Essential salmonid habitat is defined as the habitat necessary to prevent the depletion of native salmon species (chum, sockeye,

Chinook and Coho salmon, and steelhead and cutthroat trout) during their life history stages of spawning and rearing. The ESH designation identifies streams supporting species listed as sensitive, threatened, or endangered by state or federal authority. Bear Creek is not identified as anadromous fish habitat in the Lower Molalla River and Milk Creek Watershed Assessment (ABR, Inc. 2004). According to the Molalla Watershed Analysis (Bureau of Land Management [BLM] and U.S. Forest Service [USFS] 1999), use by steelhead in the lower mile of Bear Creek was suspected; however access for these fish would be limited to very high flows because of a steep cascade near the mouth. The Molalla Watershed Analysis assessed Bear Creek as having low restoration potential due to limited use by anadromous fish.

Bear Creek within the study area remains perennially wet due to the presence of shallow groundwater on the site, but both downstream and upstream portions of Bear Creek near the study area dry up during the summer months (personal communication from Bill Avison to Paul Ecker, email dated June 1, 2015). Mr. Avison photo-documents every summer that Bear Creek dries up over a mile downstream of the study area. Photo-documentation of the dry Bear Creek channel at the Highway 213 crossing, approximately 1.5 miles downstream of the study area, is available upon request.

I. RESULTS AND CONCLUSIONS

OAR141-090-0035 (7)(j)

The boundary of Bear Creek (1,191 linear feet/0.55 acre) was delineated in the study area. Two wetlands were delineated within the project area (totaling 0.17 acre). The latitude and longitude at the centroid of the project site are 45.13940 °N and −122.58361 °W.

Table 2. Summary of Potentially Jurisdictional Features Delineated in the Study Area

Potentially Jurisdictional Feature	Size (acre)	Latitude (°N), Longitude (°W) of Centroid
Wetland 2-A	0.02	45.140412, −122.582477
Wetland 5-B	0.15	45.139971, −122.585870
Reach 1	0.06	45.140457, −122.580908
Reach 2	0.05	45.140365, −122.582278
Reach 4/5	(0.28+0.16=) 0.44	45.139287, −122.585226

J. REQUIRED DISCLAIMER

OAR141-009-0035 (7)(k)

This report documents the investigation, best professional judgment, and conclusions of the investigators. It is correct and complete to the best of our knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Oregon DSL in accordance with Oregon Administrative Rules 141-090-0005 through 141-090-0055.

K. LIST OF PREPARERS

Evan Dulin
Environmental Scientist
Fieldwork and Report Preparation

and

C. Mirth Walker, PWS
Senior Wetland Scientist
Report Preparation and Review

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APPENDIX A

Figures

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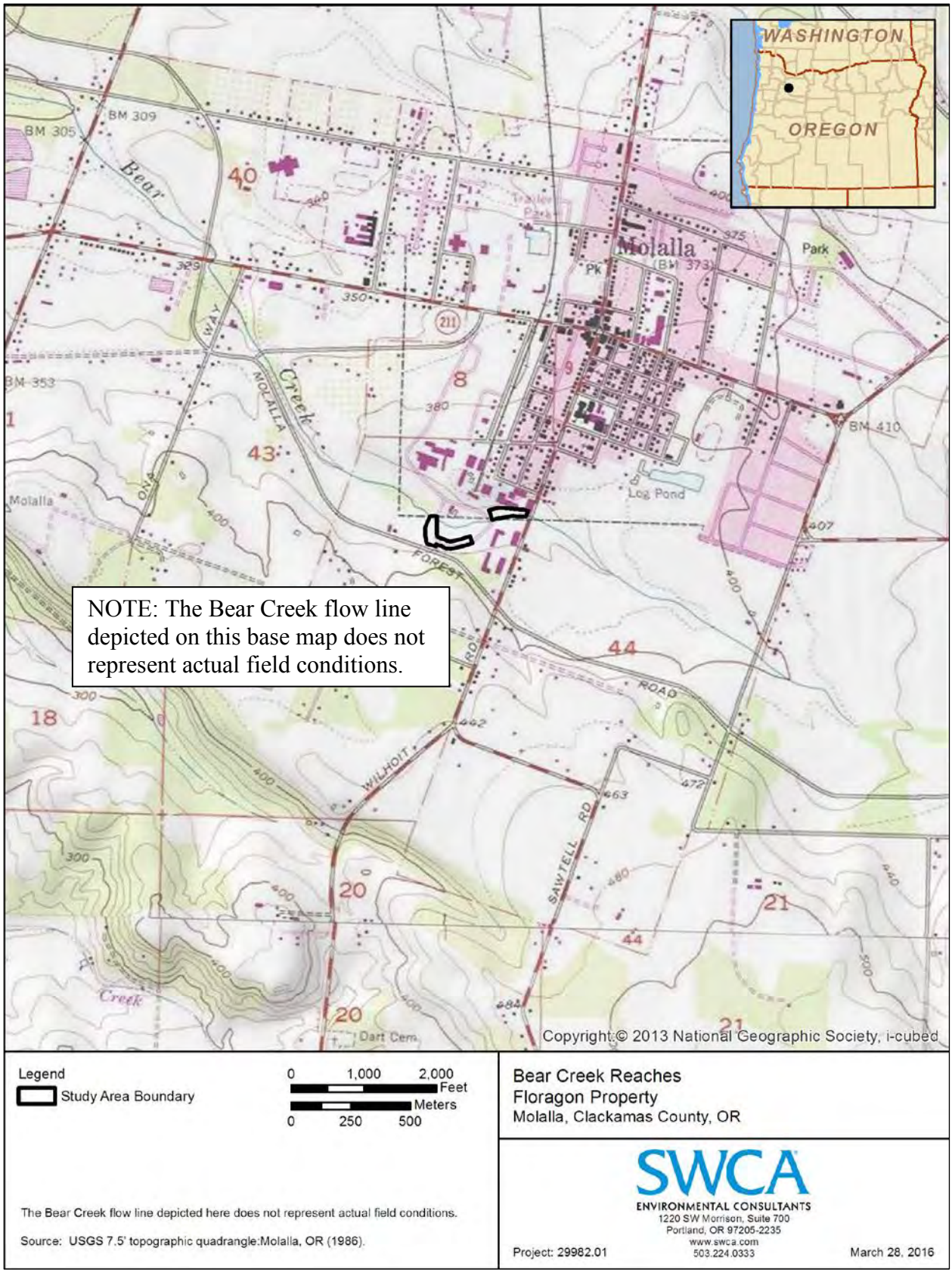

Figure 1. Site location map.

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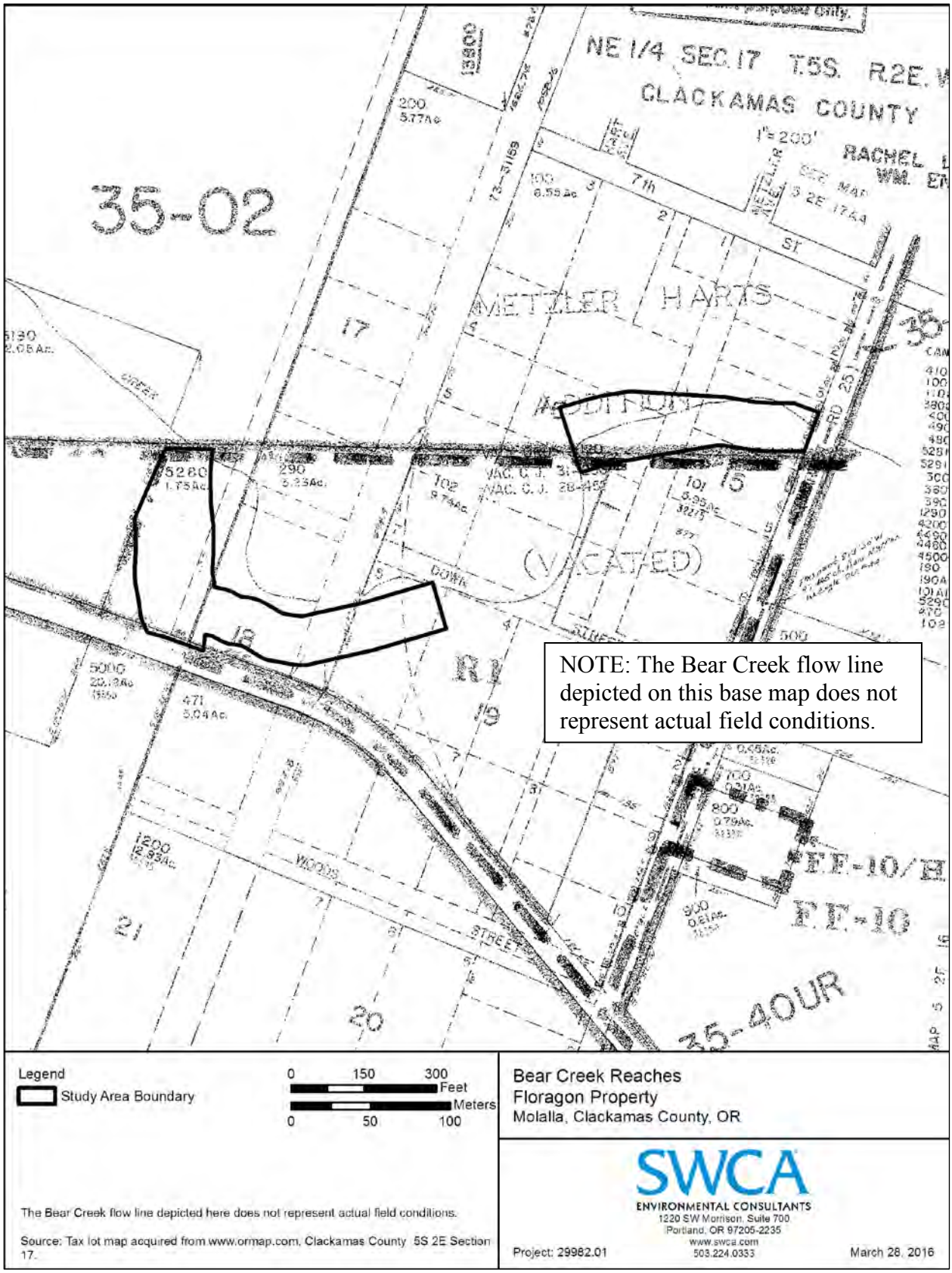

Figure 2a. Tax lot map (OrMap base).

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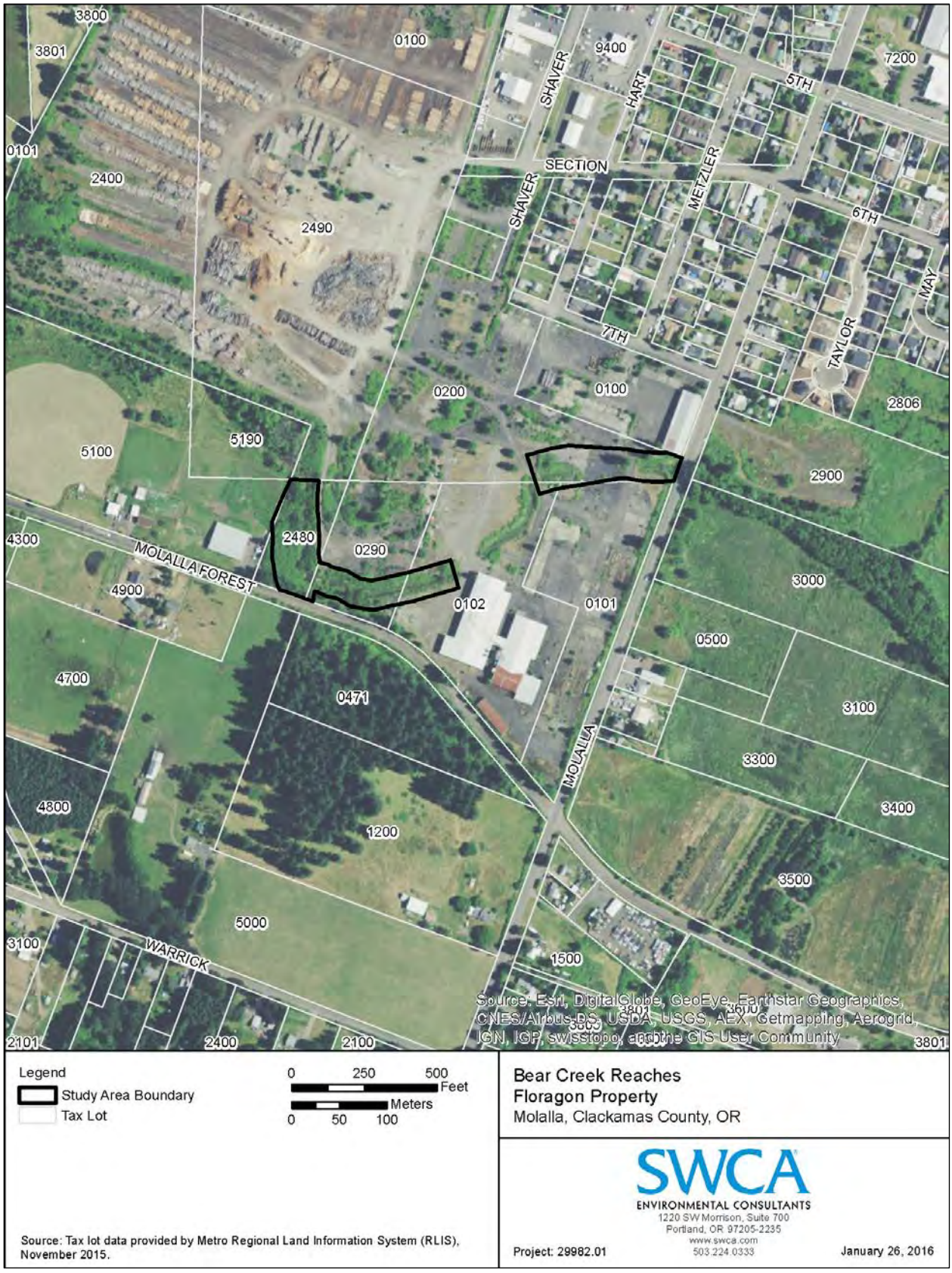

Figure 2b. Tax lot map (Metro RLIS base).

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Figure 3. Soils map.

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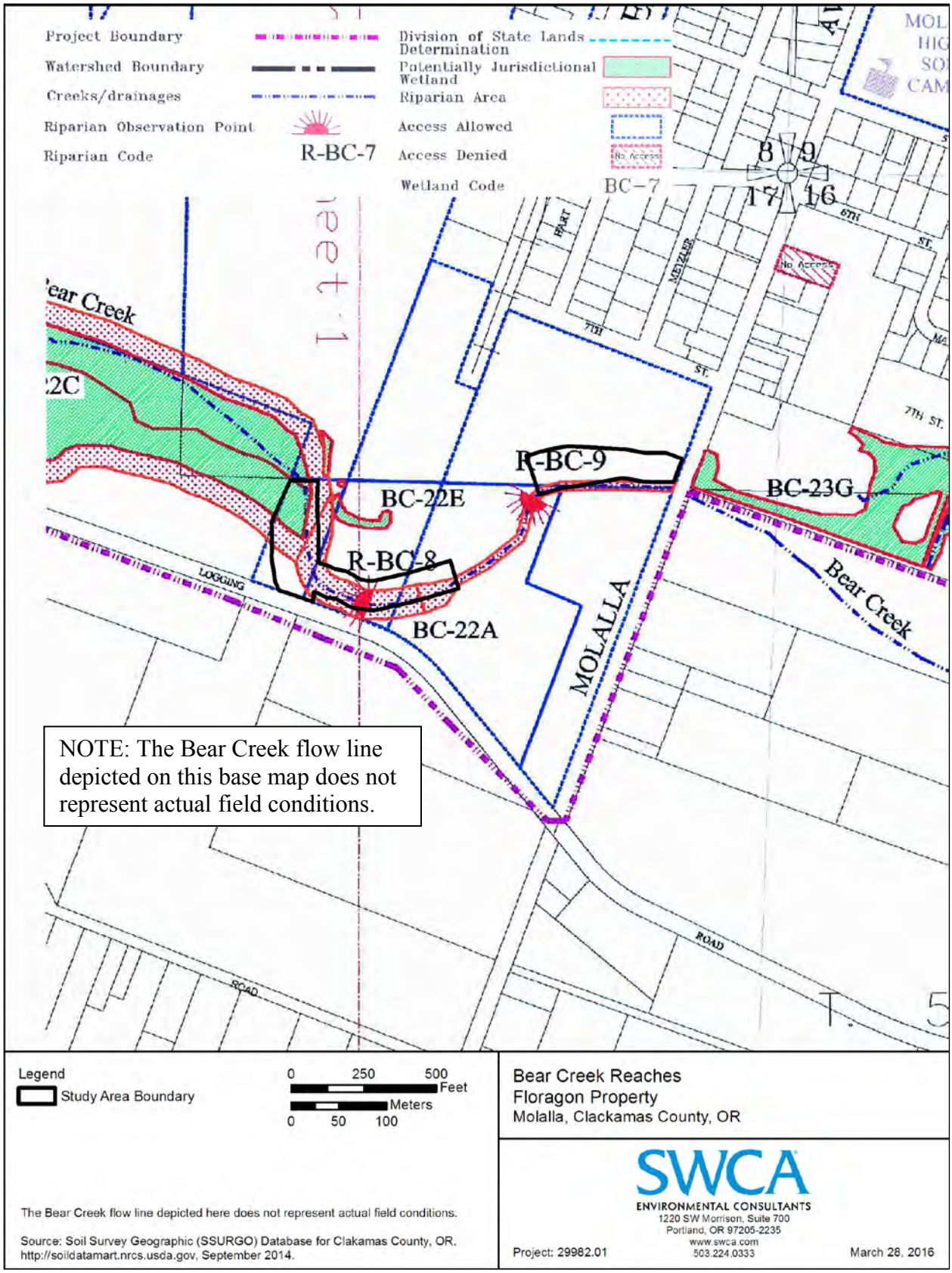

Figure 4. Local Wetland Inventory map.

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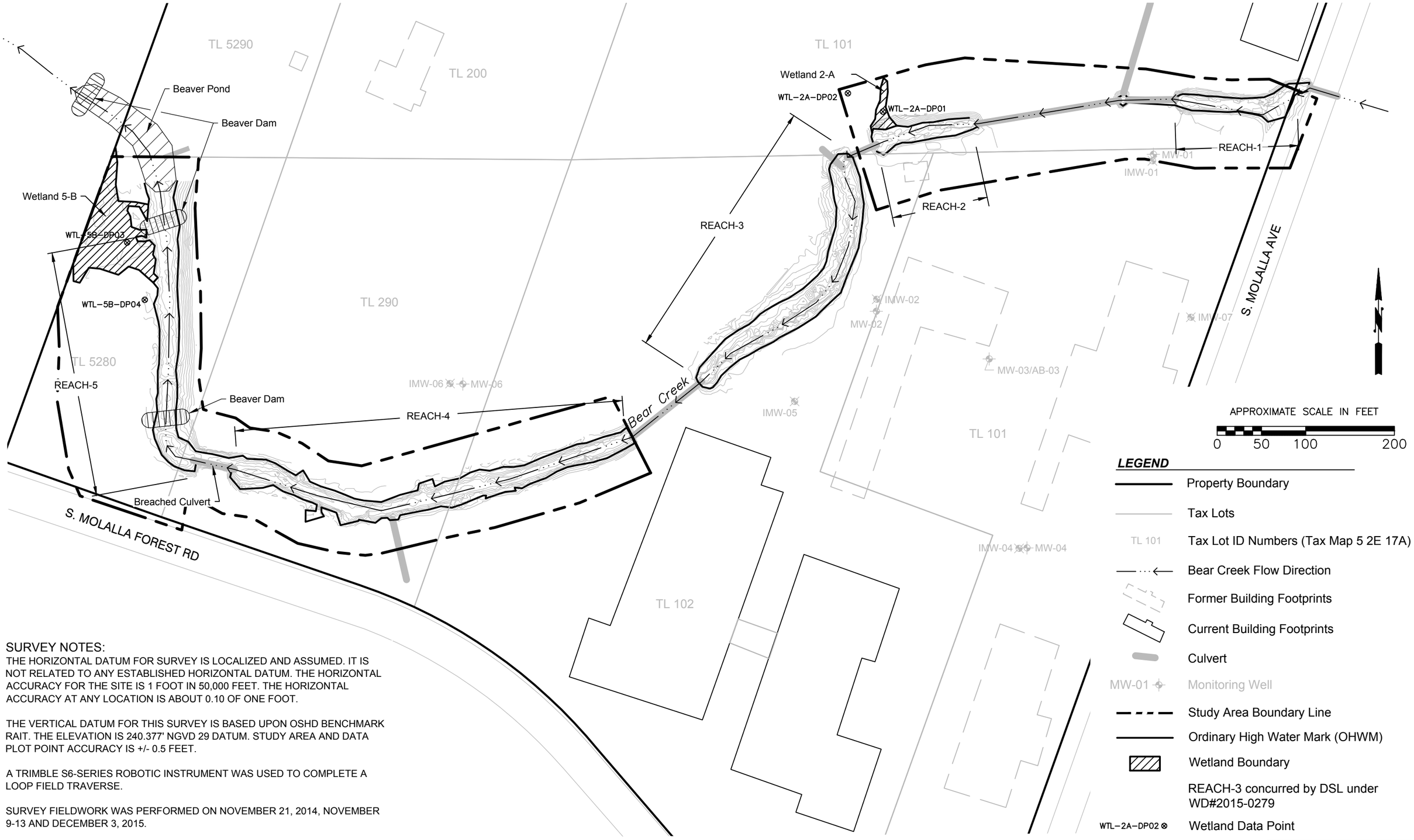

SURVEY NOTES:

THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM. THE HORIZONTAL ACCURACY FOR THE SITE IS 1 FOOT IN 50,000 FEET. THE HORIZONTAL ACCURACY AT ANY LOCATION IS ABOUT 0.10 OF ONE FOOT.

THE VERTICAL DATUM FOR THIS SURVEY IS BASED UPON OSHD BENCHMARK RAIT. THE ELEVATION IS 240.377' NGVD 29 DATUM. STUDY AREA AND DATA PLOT POINT ACCURACY IS +/- 0.5 FEET.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A LOOP FIELD TRAVERSE.

SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014, NOVEMBER 9-13 AND DECEMBER 3, 2015.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014 (REACH 3), NOVEMBER 2 AND 23, 2015 (REACH-1, -2, -4, AND -5).

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	1-26-16
FILE NAME:	1177-01
DRAWN BY:	JJT
APPROVED BY:	PE

FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

BEAR CREEK WATER SURVEY

Project No. 1177-01

Figure No. 5

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APPENDIX B

Aerial Photograph

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Floragon Forest Products - Molalla
Site Map

DEQ
State of Oregon
Department of
Environmental
Quality

0 250 500 750 1,000 Feet

Scale = 1 : 2,000

N

G:\GIS_Projects\Northwest_Region\Sites-ClackamasCounty\MXDs\Floragon_SiteMap.mxd

Date: 12/13/2011

APPENDIX C

Precipitation Data

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USDA Field Office Climate Data

WETS Station : N WILLAMETTE EXP STN, OR6151 Creation Date: 11/16/2015
Latitude: 4517 Longitude: 12245 Elevation: 00150
State FIPS/County(FIPS): 41005 County Name: Clackamas
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	Temperature (Degrees F.) avg daily min	Temperature (Degrees F.) avg	Precipitation (Inches) avg	Precipitation (Inches) 30% chance will have less than	Precipitation (Inches) 30% chance will have more than	avg # of days w/.1 or more	avg total snow fall
January	46.9	33.0	40.0	5.94	3.86	7.14	13	0.5
February	51.0	34.5	42.8	5.07	3.26	6.11	12	0.3
March	55.9	36.8	46.4	4.28	3.26	4.98	12	0.0
April	60.5	39.7	50.1	3.14	2.10	3.75	9	0.0
May	66.9	44.5	55.7	2.50	1.59	3.02	7	0.0
June	73.0	49.3	61.2	1.75	1.00	2.13	5	0.0
July	80.1	52.8	66.5	0.73	0.20	0.87	2	0.0
August	80.4	52.7	66.6	0.83	0.18	0.96	2	0.0
September	75.3	48.7	62.0	1.77	0.80	2.21	5	0.0
October	64.1	41.8	53.0	3.36	1.69	4.10	8	0.0
November	52.3	37.6	45.0	6.48	4.39	7.75	14	0.1
December	46.2	33.1	39.7	6.75	4.57	8.07	13	0.6
Annual	-----	-----	-----	------	37.33	46.92	--	----
Average	62.7	42.0	52.4	------	------	------	--	----
Average	-----	-----	-----	42.60	------	------	101	1.7

GROWING SEASON DATES

Probability	Temperature 24 F or higher	Temperature 28 F or higher	Temperature 32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	1/26 to 1/ 1 340 days	3/ 1 to 11/22 265 days	4/13 to 10/28 197 days
70 percent *	> 365 days > 365 days	2/20 to 12/ 1 283 days	4/ 6 to 11/ 4 211 days

 * Percent chance of the growing season occurring between the Beginning
   and Ending dates.

total 1963-2007 prcp

Station : OR6151, N WILLAMETTE EXP STN
-------   Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
63	M1.14	4.02	6.48		4.34	1.62	0.81	0.36	1.11	3.09	5.86	4.45	33.28
64	11.36	0.83	2.93	1.21	0.94	1.67	0.74	0.58	1.49	1.52	7.21	13.84	44.32
65	8.51	M2.07	1.09	3.23	1.30	0.66	0.23	0.99	0.05	2.79	6.63	6.78	34.33
66	7.84	1.92	5.96	1.22	0.93	1.18	1.16	0.31	1.41	2.97	5.62	6.57	37.09
67	6.77	1.53	4.79	2.58	2.12	0.72	0.00	0.00	0.26	5.58	2.04	5.65	32.04
68	4.68	8.20	3.06	2.04	2.99	2.34	0.98	4.17	M2.75	M6.88	7.02	M12.46	57.57
69	7.41	M3.03	M1.45	2.99	1.76	M3.20	0.11	0.08	3.42	M4.69	2.94	M8.53	39.61
70	M11.72	M5.12	M2.30	2.36	1.30	M0.31	0.07	0.00	1.38	3.49	6.94	8.92	43.91
71	7.59	3.49	5.59	3.71	1.77	2.92	0.08	0.43	3.51	3.69	6.49	M8.02	47.29
72	6.59	4.78	5.77	3.61	2.65	0.60	0.47	0.65	3.50	0.87	5.07	8.81	43.37

73	4.45	1.96	M2.67	1.28	1.56	1.47	0.01	0.82	2.58	2.94	13.04	10.02	42.80
74	8.24	5.48	6.28	2.23	1.98	0.96	2.31	0.02	0.26	1.62	6.56	6.53	42.47
75	6.84	4.24	2.22	2.46	1.86	1.27	0.65	2.53	0.00	5.61	4.37	6.66	38.71
76	6.32	6.68	2.82	3.00	1.48	0.57	0.95	2.41	1.18	0.85	M1.67	1.48	29.41
77	1.37	M2.80	4.26	0.64	3.82	1.54	0.83	2.69	3.23	2.45	6.61	10.52	40.76
78	5.35	3.59	1.69	3.50	4.52	1.69	0.90	2.08	2.74	0.37	4.92	M3.54	34.89
79	3.45	7.36	3.22	3.35	2.36	0.47	0.82	0.82	3.25	5.35	3.77	6.75	40.97
80	9.99	4.68	3.59	4.07	1.23	2.52	0.14	0.49	1.69	1.67	6.87	11.90	48.84
81	2.01	4.11	3.48	2.29	2.23	4.27	0.19	0.03	2.68	4.14	M5.39	10.27	41.09
82	6.24	6.94	3.12	8.98	M0.89	0.86	0.34	0.99	3.61	3.74	5.04	8.92	49.67
83	7.18	9.54	7.18	2.67	2.13	2.60	2.68	2.52	0.86	2.25	9.04	6.33	54.98
84	3.05	4.69	4.46	4.09	4.59	5.35	0.00	0.03	1.99	5.78	12.90	3.68	50.61
85	0.45	3.49	4.54	1.42	0.97	2.48	0.45	0.79	1.93	3.17	5.00	2.46	27.15
86	6.26	7.65	2.95	2.09	2.74	0.38	1.28	0.04	2.93	2.81	6.71	4.13	39.97
87	6.75	4.94	5.55	2.19	1.66	0.30	2.00	0.10	0.53	0.23	2.40	10.55	37.20
88	7.88	1.71	3.73	4.63	2.56	2.94	0.21	0.03	1.25	0.20	9.88	3.28	38.30
89	4.24	3.16	7.02	1.24	2.27	0.91	0.52	1.37	1.34	2.15	3.72	4.15	32.09
90	8.98	4.97	3.42	2.22	1.71	2.94	0.54	1.09	0.50	M6.18	5.00	3.39	40.94
91	2.83	3.69	4.39	4.62	4.58	2.42	0.16	0.75	0.30	3.70	7.31	5.53	40.28
92	5.34	5.23	1.46	4.28	0.19	0.63	1.31	0.48	1.88	4.83	5.15	6.71	37.49
93	M2.96	M0.26	5.32	6.30	4.25	2.20	2.44	0.30	0.00	1.35	1.39	6.90	33.67
94	4.78	6.93	3.58	1.88	1.63	1.57	0.06	0.02	1.12	6.94	8.32	7.70	44.53
95	7.65	M4.45	4.42	5.14	1.84	2.07	M0.60	1.55	1.52	5.63	10.18	7.66	52.71
96	9.09	M12.04	3.91	6.76	4.63	1.05	0.80	0.14	3.06	5.51	11.39	15.72	74.10
97	9.55	3.34	8.59	4.59	2.47	2.97	0.80	1.11	M3.38	M6.25	4.65	3.41	51.11
98	M8.98	5.73	4.91	1.42	5.57	1.27	0.22	0.25	0.90	4.69	10.96	0.54	45.44
99	7.58	9.08	4.68	1.35	2.53	1.23	0.18	0.47	0.05	2.47	7.68	4.35	41.65
0	6.21	5.15	3.46	2.15	2.39	1.40	0.01	0.00		3.21	3.04	3.16	30.18
1	1.55	1.28	3.51	0.69	1.05	1.67	0.73	1.19	0.69	3.80			16.16
2			5.59	2.44	1.35	1.83	0.07	0.24	1.95		3.22	10.02	26.71
3	8.73	2.99	7.14	5.64	1.05	0.28	0.00	0.42	0.95	2.45	4.31	9.84	43.80
4	6.19	4.04	1.09	1.07	1.92	1.63	0.12	2.52	1.74	4.34	2.71	4.46	31.83
5	1.87	0.58	5.00	2.97	5.02	2.75	0.58	0.00	2.14	M2.63	6.22	10.53	40.29
6	13.70	2.77	4.30	2.77	2.79	0.99	0.07	0.11	0.84	1.68	13.05	7.43	50.50
7	4.75	5.26	5.29	2.26	0.90	0.53	0.63	0.66					20.28

Product generated by ACIS - NOAA Regional Climate Centers.

[Explanation of the Preliminary Monthly Climate Data (F6) Product]

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

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000
CXUS56 KPQR 011200
CF6UAO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                          STATION:   AURORA STATE OR
                                          MONTH:     AUGUST
                                          YEAR:      2015
                                          LATITUDE:   45 15 N
                                          LONGITUDE: 122 46 W

  TEMPERATURE IN F:        :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
=================================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                     12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
=================================================================================

 1 101  54  78   9   0  13 0.00  0.0    0  5.1 15  40   M    M   0         19  30
 2  81  61  71   2   0   6 0.00  0.0    0  3.4 10 170   M    M   1         13 170
 3  83  62  73   4   0   8 0.00  0.0    0  3.9 14 350   M    M   0         18 340
 4  84  56  70   1   0   5 0.00  0.0    0  5.8 16 350   M    M   0         23 350
 5  80  53  67  -2   0   2 0.00  0.0    0  5.5 15 360   M    M   1         20  10
 6  80  52  66  -3   0   1 0.00  0.0    0  5.2 15  10   M    M   0 8       28  10
 7  87  52  70   1   0   5 0.00  0.0    0  3.1 12  40   M    M   0         22 310
 8  81  56  69   0   0   4 0.00  0.0    0  5.7 17 180   M    M   2         23 180
 9  84  62  73   4   0   8 0.00  0.0    0  4.0 13 250   M    M   4         15 250
10  85  59  72   3   0   7 0.00  0.0    0  4.1 13 250   M    M   2         18 250
11  88  61  75   6   0  10 0.00  0.0    0  3.4 10  20   M    M   1         13  30
12  89  60  75   6   0  10 0.00  0.0    0  4.9 13 220   M    M   0         16 230
13  85  57  71   2   0   6 0.00  0.0    0  2.9 10 240   M    M   0         14 260
14  72  59  66  -3   0   1    T  0.0    0  8.4 18 190   M    M   8 3       27 190
15  77  61  69   1   0   4 0.00  0.0    0  4.6 13 350   M    M   6         17 350
16  84  51  68   0   0   3 0.00  0.0    0  7.6 16  20   M    M   0         20 360
17  90  54  72   4   0   7 0.00  0.0    0  6.8 16  20   M    M   0         22 360
18  97  53  75   7   0  10 0.00  0.0    0  4.3 12  10   M    M   0         15  40
19  98  58  78  10   0  13 0.00  0.0    0  4.0 15 340   M    M   0         24 350
20  81  58  70   2   0   5 0.00  0.0    0  4.1 16 350   M    M   3         20 360
21  80  53  67  -1   0   2 0.00  0.0    0  4.4 14 350   M    M   3         20 350
22  86  52  69   1   0   4 0.00  0.0    0 10.9 18  10   M    M   7 8       25  10
23  85  53  69   1   0   4 0.00  0.0    0  2.6 10 360   M    M   9 8       14 350
24  83  54  69   1   0   4 0.00  0.0    0  5.2 13  10   M    M   0         15  10
25  85  51  68   1   0   3 0.00  0.0    0  4.1 10  10   M    M   0         14 330
26  87  50  69   2   0   4 0.00  0.0    0  2.0 13 250   M    M   0         16 250
27  87  54  71   4   0   6 0.00  0.0    0  2.6 10 210   M    M   0 8       16 220
28  81  63  72   5   0   7 0.01  0.0    0  3.8 13  20   M    M   4         15  30
29  74  62  68   1   0   3 0.26    M    0 13.8 30 190   M    M   6 13      44 180
30  71  57  64  -3   1   0 0.63    M    M  8.0 16 180   M    M   8 1       20 180
31  73  57  65  -2   0   0 0.00    M    M  5.4 14 180   M    M   9         16 170
=================================================================================
SM 2599 1745          1 165  0.90     0.0 159.6          M       74
=================================================================================
AV 83.8 56.3                              5.1 FASTST   M    M   2    MAX(MPH)
                               MISC ---->  # 30 190                # 44  180
=================================================================================
NOTES:
# LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

                                          STATION:  AURORA STATE OR
                                          MONTH:    AUGUST
                                          YEAR:     2015
                                          LATITUDE:   45 15 N
```

LONGITUDE: 122 46 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 70.1
DPTR FM NORMAL: 1.8
HIGHEST: 101 ON 1
LOWEST: 50 ON 26

[NO. OF DAYS WITH]

MAX 32 OR BELOW:	0
MAX 90 OR ABOVE:	4
MIN 32 OR BELOW:	0
MIN 0 OR BELOW:	0

[HDD (BASE 65)]

TOTAL THIS MO.	1
DPTR FM NORMAL	-21
TOTAL FM JUL 1	6
DPTR FM NORMAL	-41

[CDD (BASE 65)]

TOTAL THIS MO.	165
DPTR FM NORMAL	42
TOTAL FM JAN 1	538
DPTR FM NORMAL	248

[REMARKS]
#FINAL-08-15#

[PRECIPITATION DATA]

TOTAL FOR MONTH: 0.90
DPTR FM NORMAL: 0.24
GRTST 24HR 0.67 ON 29-30

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 0.0 INCH
GRTST 24HR 0.0
GRTST DEPTH: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE:	3
0.10 INCH OR MORE:	2
0.50 INCH OR MORE:	1
1.00 INCH OR MORE:	0

CLEAR (SCALE 0-3)	22
PTCLDY (SCALE 4-7)	7
CLOUDY (SCALE 8-10)	2

[PRESSURE DATA]
HIGHEST SLP 30.27 ON 15
LOWEST SLP 29.55 ON 29

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[Explanation of the Preliminary Monthly Climate Data (F6) Product]

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - [http://www.ncdc.noaa.gov].

WFO Monthly/Daily Climate Data

000
CXUS56 KPQR 011200
CF6UAO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: AURORA STATE OR
MONTH: SEPTEMBER
YEAR: 2015
LATITUDE: 45 15 N
LONGITUDE: 122 46 W

TEMPERATURE IN F:							:PCPN:		SNOW:	WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	76	57	67	1	0	2	T	M	M	5.2	15	250	M	M	7	8	21	240
2	70	54	62	-4	3	0	T	0.0	0	6.0	18	160	M	M	8		24	170
3	68	48	58	-8	7	0	0.01	M	0	2.9	14	260	M	M	6		21	250
4	68	47	58	-8	7	0	T	M	0	3.8	13	350	M	M	5		17	340
5	70	48	59	-7	6	0	0.00	0.0	0	4.1	13	200	M	M	6		16	180
6	71	46	59	-7	6	0	0.03	M	0	4.3	16	200	M	M	6	18	22	230
7	75	51	63	-2	2	0	0.00	0.0	0	4.2	12	30	M	M	4	12	15	10
8	82	52	67	2	0	2	0.00	0.0	0	5.6	14	10	M	M	0		18	350
9	84	57	71	6	0	6	0.00	0.0	0	5.7	13	40	M	M	2		16	30
10	87	52	70	5	0	5	0.00	0.0	0	3.7	10	40	M	M	0		14	30
11	94	54	74	9	0	9	0.00	0.0	0	1.6	8	20	M	M	0		11	350
12	90	56	73	9	0	8	0.00	0.0	0	2.7	13	330	M	M	0		16	320
13	78	55	67	3	0	2	0.00	0.0	0	5.4	16	350	M	M	0		22	350
14	60	50	55	-9	10	0	T	0.0	0	2.6	12	340	M	M	4		14	10
15	63	46	55	-9	10	0	0.02	M	0	3.5	13	200	M	M	4		16	240
16	71	52	62	-1	3	0	T	0.0	0	4.4	16	180	M	M	9		25	170
17	69	52	61	-2	4	0	0.85	0.0	0	7.3	15	290	M	M	7	1	22	280
18	75	51	63	0	2	0	0.00	0.0	0	1.5	8	360	M	M	1		10	360
19	78	48	63	1	2	0	0.00	0.0	0	1.3	8	50	M	M	0		10	230
20	77	52	65	3	0	0	0.00	0.0	0	4.1	10	240	M	M	2		17	260
21	72	52	62	0	3	0	0.08	0.0	0	6.0	16	20	M	M	4	1	27	340
22	70	44	57	-5	8	0	0.00	0.0	0	1.7	9	90	M	M	0		13	40
23	74	41	58	-3	7	0	0.00	0.0	0	2.0	8	190	M	M	2		10	250
24	76	48	62	1	3	0	0.00	0.0	0	2.7	10	10	M	M	0		13	170
25	67	55	61	0	4	0	0.18	0.0	0	4.7	10	360	M	M	7	1	13	10
26	70	50	60	0	5	0	0.02	0.0	0	5.4	13	350	M	M	4	1	17	10
27	71	39	55	-5	10	0	0.00	0.0	0	7.4	15	360	M	M	0		19	10
28	82	47	65	5	0	0	0.00	0.0	0	7.0	13	360	M	M	0		17	360
29	79	46	63	4	2	0	0.00	0.0	0	2.2	8	180	M	M	0	8	12	210
30	69	47	58	-1	7	0	0.00	0.0	0	1.4	7	250	M	M	2		12	240
SM	2236	1497		111	34	1.19		0.0	120.4				M		90			
AV	74.5	49.9								4.0	FASTST		M	M	3		MAX(MPH)	
							MISC ---->		# 18	160						# 27	340	

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: AURORA STATE OR
MONTH: SEPTEMBER
YEAR: 2015
LATITUDE: 45 15 N
LONGITUDE: 122 46 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 62.2
DPTR FM NORMAL: -1.0
HIGHEST: 94 ON 11
LOWEST: 39 ON 27

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 2
MIN 32 OR BELOW: 0
MIN 0 OR BELOW: 0

[HDD (BASE 65)]
TOTAL THIS MO. 111
DPTR FM NORMAL 12
TOTAL FM JUL 1 117
DPTR FM NORMAL -29

[CDD (BASE 65)]
TOTAL THIS MO. 34
DPTR FM NORMAL -10
TOTAL FM JAN 1 572
DPTR FM NORMAL 238

[REMARKS]
#FINAL-09-15#

[PRECIPITATION DATA]

TOTAL FOR MONTH: 1.19
DPTR FM NORMAL: -0.54
GRTST 24HR 0.85 ON 17-17

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 0.0 INCH
GRTST 24HR 0.0
GRTST DEPTH: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 7
0.10 INCH OR MORE: 2
0.50 INCH OR MORE: 1
1.00 INCH OR MORE: 0

CLEAR (SCALE 0-3) 16
PTCLDY (SCALE 4-7) 13
CLOUDY (SCALE 8-10) 1

[PRESSURE DATA]
HIGHEST SLP 30.23 ON 7
LOWEST SLP 29.80 ON 14

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

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WFO Monthly/Daily Climate Data

000
CXUS56 KPQR 011200
CF6UAO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: AURORA STATE OR
MONTH: OCTOBER
YEAR: 2015
LATITUDE: 45 15 N
LONGITUDE: 122 46 W

TEMPERATURE IN F:							:PCPN:		SNOW:	WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	12Z DPTH	AVG SPD	MX SPD	2MIN DIR	MIN	PSBL	S-S	WX	SPD	DR
1	75	44	60	1	5	0	0.00	0.0	0	1.4	7	180	M	M	1	1	10	30
2	61	45	53	-5	12	0	0.00	0.0	0	2.9	12	340	M	M	7		16	340
3	70	44	57	-1	8	0	0.00	0.0	0	5.0	16	10	M	M	3		21	10
4	81	48	65	7	0	0	0.00	0.0	0	9.2	16	360	M	M	0		21	360
5	85	47	66	9	0	1	0.00	0.0	0	3.4	12	360	M	M	0		13	10
6	75	47	61	4	4	0	0.00	0.0	0	3.5	13	230	M	M	2		18	190
7	66	56	61	5	4	0	0.11	0.0	0	2.2	8	30	M	M	6	1	12	220
8	71	52	62	6	3	0	0.00	0.0	0	0.8	6	110	M	M	4	128	7	130
9	72	49	61	5	4	0	0.01	M	0	2.3	9	200	M	M	9	12	13	210
10	72	55	64	8	1	0	0.22	0.0	0	8.1	21	260	M	M	7	1	33	220
11	67	48	58	3	7	0	0.00	0.0	0	3.6	12	350	M	M	4	12	13	330
12	70	48	59	4	6	0	0.00	M	0	0.7	7	150	M	M	6	128	8	140
13	74	46	60	6	5	0	0.00	M	0	4.1	M	M	M	M	0	1	M	M
14	71	47	59	5	6	0	0.00	M	0	6.8	12	40	M	M	3		15	360
15	81	45	63	9	2	0	0.00	0.0	0	2.3	10	350	M	M	2	1	13	10
16	70	48	59	5	6	0	0.00	0.0	0	2.4	10	180	M	M	1		12	180
17	64	55	60	7	5	0	0.05	0.0	0	1.7	9	190	M	M	8	138	11	190
18	67	56	62	9	3	0	0.03	0.0	0	1.4	9	350	M	M	9	18	11	340
19	62	54	58	5	7	0	0.09	0.0	0	5.9	13	200	M	M	9	1	18	200
20	65	47	56	4	9	0	0.00	0.0	0	1.6	9	350	M	M	7	1	14	330
21	60	45	53	1	12	0	0.00	0.0	0	1.0	8	340	M	M	8	12	10	350
22	65	42	54	2	11	0	0.00	0.0	0	2.6	12	30	M	M	2	12	15	40
23	64	39	52	0	13	0	0.00	0.0	0	1.9	9	20	M	M	3		13	10
24	67	45	56	5	9	0	0.00	0.0	0	1.2	6	40	M	M	3		8	250
25	61	49	55	4	10	0	0.68	M	0	9.0	24	180	M	M	9	1	32	180
26	64	45	55	4	10	0	T	M	0	7.2	14	180	M	M	6	8	19	190
27	57	39	48	-2	17	0	0.00	0.0	0	1.2	7	230	M	M	5	12	8	20
28	62	50	56	6	9	0	0.34	0.0	0	2.4	10	230	M	M	10	1	16	220
29	64	51	58	8	7	0	0.09	0.0	0	6.0	14	200	M	M	8	18	21	200
30	61	54	58	8	7	0	0.56	0.0	0	15.4	24	180	M	M	10	1	36	190
31	63	50	57	8	8	0	1.94	0.0	0	10.0	25	180	M	M	8	1	34	180
SM	2107	1490		210	1	4.12		0.0	127.2				M		160			
AV	68.0	48.1								4.1	FASTST		M	M	5		MAX(MPH)	
								MISC	---->	# 25	180					# 36	190	

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: AURORA STATE OR
MONTH: OCTOBER
YEAR: 2015
LATITUDE: 45 15 N

LONGITUDE: 122 46 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 58.0
DPTR FM NORMAL: 4.3
HIGHEST: 85 ON 5
LOWEST: 39 ON 27,23

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 0
MIN 32 OR BELOW: 0
MIN 0 OR BELOW: 0

[HDD (BASE 65)]
TOTAL THIS MO. 210
DPTR FM NORMAL -142
TOTAL FM JUL 1 327
DPTR FM NORMAL -171

[CDD (BASE 65)]
TOTAL THIS MO. 1
DPTR FM NORMAL -1
TOTAL FM JAN 1 573
DPTR FM NORMAL 237

[REMARKS]
#FINAL-10-15#

[PRECIPITATION DATA]

TOTAL FOR MONTH: 4.12
DPTR FM NORMAL: 0.89
GRTST 24HR 2.00 ON 30-31

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 0.0 INCH
GRTST 24HR 0.0
GRTST DEPTH: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 11
0.10 INCH OR MORE: 6
0.50 INCH OR MORE: 3
1.00 INCH OR MORE: 1

CLEAR (SCALE 0-3) 11
PTCLDY (SCALE 4-7) 13
CLOUDY (SCALE 8-10) 7

[PRESSURE DATA]
HIGHEST SLP 30.28 ON 20
LOWEST SLP 29.68 ON 25

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[Explanation of the Preliminary Monthly Climate Data (F6) Product]

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

```
000
CXUS56 KPQR 241200
CF6UAO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                        STATION:   AURORA STATE OR
                                        MONTH:     NOVEMBER
                                        YEAR:      2015
                                        LATITUDE:   45 15 N
                                        LONGITUDE: 122 46 W

  TEMPERATURE IN F:        :PCPN:    SNOW:  WIND       :SUNSHINE: SKY     :PK WND
==========================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                    12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
==========================================================================

 1  61  49  55   6  10   0 1.00    M    0  9.3 21 210   M    M   8 1      32 230
 2  58  44  51   2  14   0 0.03    M    0  2.2  7 250   M    M   9 1      11 200
 3  58  36  47  -2  18   0    T    M    0  2.3 10  40   M    M   6 12     13  20
 4  51  32  42  -6  23   0    T    M    0  1.4  9 180   M    M   6 128    11 170
 5  52  45  49   1  16   0 0.03    M    0  4.8 14 210   M    M  10 1      19 220
 6  60  40  50   2  15   0 0.00  0.0    0  0.7  6 250   M    M   4 128     8 230
 7  54  40  47  -1  18   0 0.63    M    0  4.2 17 180   M    M   9 12     22 180
 8  54  44  49   1  16   0 0.06    M    0  3.7 18 190   M    M   9 1      24 180
 9  52  36  44  -3  21   0 0.01    M    0  1.0  7 260   M    M   7 12     11 250
10  50  35  43  -4  22   0 0.01    M    0  3.6 17 190   M    M   9 12     23 180
11  53  39  46  -1  19   0 0.10    M    0  5.3 22 190   M    M   8 12     30 190
12  50  34  42  -5  23   0 0.08    M    0  7.9 22 190   M    M  10 12     31 190
13  58  49  54   8  11   0 0.13    M    M 13.8 24 180   M    M   9 1      33 190
14  59  52  56  10   9   0    T    M    M 11.5 25 180   M    M  10        35 190
15  56  37  47   1  18   0 0.11    M    M  3.7 23 330   M    M   8 1      31 330
16  49  37  43  -3  22   0 0.37    M    0 11.4 28 190   M    M   9 1      36 180
17  56  45  51   6  14   0 0.89    M    0 14.0 28 190   M    M  10 1      44 180
18  51  37  44  -1  21   0 0.33    M    0  2.8 12 330   M    M   6 1      14 340
19  47  36  42  -3  23   0 0.63    M    0  7.1 14  10   M    M   9 1      18  10
20  51  36  44  -1  21   0 0.00  0.0    0  9.4 18  20   M    M   1        24  20
21  51  27  39  -5  26   0 0.00  0.0    0  6.1 16  20   M    M   0        19  20
22  44  25  35  -9  30   0 0.00  0.0    0  0.3  6 190   M    M   0 1       8 170
23  40  27  34 -10  31   0 0.37    M    0  1.4  8 350   M    M   9 12     10 350
==========================================================================
SM 1215  882       441   0  4.78     0.0 127.9          M      166
==========================================================================
AV 52.8 38.3                            5.6 FASTST   M    M   7    MAX(MPH)
                                MISC ---->  # 28 190                # 44  180
==========================================================================
NOTES:
# LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

                                        STATION:  AURORA STATE OR
                                        MONTH:    NOVEMBER
                                        YEAR:     2015
                                        LATITUDE:   45 15 N
                                        LONGITUDE: 122 46 W

[TEMPERATURE DATA]      [PRECIPITATION DATA]       SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 45.6   TOTAL FOR MONTH:   4.78    1 = FOG OR MIST
DPTR FM NORMAL:  -1.0   DPTR FM NORMAL:   -0.11    2 = FOG REDUCING VISIBILITY
HIGHEST:     61 ON  1   GRTST 24HR  1.98 ON 31- 1      TO 1/4 MILE OR LESS
LOWEST:      25 ON 22                               3 = THUNDER
```

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 0.0 INCH
GRTST 24HR 0.0
GRTST DEPTH: 0

4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW:	0
MAX 90 OR ABOVE:	0
MIN 32 OR BELOW:	4
MIN 0 OR BELOW:	0

[HDD (BASE 65)]

TOTAL THIS MO.	441
DPTR FM NORMAL	17
TOTAL FM JUL 1	768
DPTR FM NORMAL	-154

[CDD (BASE 65)]

TOTAL THIS MO.	0
DPTR FM NORMAL	0
TOTAL FM JAN 1	573
DPTR FM NORMAL	237

[WEATHER - DAYS WITH]

0.01 INCH OR MORE:	16
0.10 INCH OR MORE:	10
0.50 INCH OR MORE:	4
1.00 INCH OR MORE:	1
CLEAR (SCALE 0-3)	3
PTCLDY (SCALE 4-7)	8
CLOUDY (SCALE 8-10)	12

[PRESSURE DATA]
HIGHEST SLP M ON M
LOWEST SLP 29.45 ON 15

[REMARKS]

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

Climatological Report (Daily)

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000
CDUS46 KPQR 031149
CLIUAO


CLIMATE REPORT
NATIONAL WEATHER SERVICE PORTLAND OREGON
348 AM PST TUE NOV 3 2015


.................................

...THE AURORA STATE OR CLIMATE SUMMARY FOR NOVEMBER 2 2015...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 9999 TO 9999


WEATHER ITEM   OBSERVED TIME       LAST
                VALUE   (LST)      YEAR
.....................................
TEMPERATURE (F)
 YESTERDAY
  MAXIMUM         58    324 PM
  MINIMUM         44   1159 PM

PRECIPITATION (IN)
  YESTERDAY        0.03            0.06
  MONTH TO DATE    1.03            0.07
  SINCE OCT 1      5.15            6.79
  SINCE JAN 1     23.83           31.79

DEGREE DAYS
 HEATING
  YESTERDAY       14              15
  MONTH TO DATE   24              31
  SINCE SEP 1    345             261
  SINCE JUL 1    351             267

 COOLING
  YESTERDAY        0               0
  MONTH TO DATE    0               0
  SINCE SEP 1     35              94
  SINCE JAN 1    573             538
.....................................


WIND (MPH)
  HIGHEST WIND SPEED     7   HIGHEST WIND DIRECTION     W (250)
  HIGHEST GUST SPEED    11   HIGHEST GUST DIRECTION     S (200)
  AVERAGE WIND SPEED     2.2


SKY COVER
  AVERAGE SKY COVER 0.9


WEATHER CONDITIONS
 THE FOLLOWING WEATHER WAS RECORDED YESTERDAY.
  LIGHT RAIN
  FOG


RELATIVE HUMIDITY (PERCENT)
 HIGHEST   100           700 AM
 LOWEST     62           200 PM
 AVERAGE    81

.....................................................
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```
SUNRISE AND SUNSET
NOVEMBER  3 2015......SUNRISE   653 AM PST   SUNSET   456 PM PST
NOVEMBER  4 2015......SUNRISE   654 AM PST   SUNSET   455 PM PST


-  INDICATES NEGATIVE NUMBERS.
R  INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T  INDICATES TRACE AMOUNT.
```

The U.S. Naval Observatory (USNO) computes astronomical data. Therefore, the NWS does not record, certify, or authenticate astronomical data. Computed times of sunrise, sunset, moonrise, moonset; and twilight, moon phases and other astronomical data are available from USNO's Astronomical Applications Department (http://www.usno.navy.mil). See http://www.usno.navy.mil/USNO/astronomical-applications/astronomical-information-center/litigation for information on using these data for legal purposes.

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

Climatological Report (Daily)

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000
CDUS46 KPQR 241142
CLIUAO


CLIMATE REPORT
NATIONAL WEATHER SERVICE PORTLAND OREGON
341 AM PST TUE NOV 24 2015


.................................

...THE AURORA STATE OR CLIMATE SUMMARY FOR NOVEMBER 23 2015...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 9999 TO 9999


WEATHER ITEM   OBSERVED TIME       LAST
                VALUE   (LST)      YEAR
.....................................
TEMPERATURE (F)
 YESTERDAY
  MAXIMUM         40   1159 PM
  MINIMUM         27    743 AM

PRECIPITATION (IN)
  YESTERDAY        0.37            0.30
  MONTH TO DATE    4.78            2.22
  SINCE OCT 1      8.90            8.94
  SINCE JAN 1     27.58           33.94

DEGREE DAYS
 HEATING
  YESTERDAY       31              14
  MONTH TO DATE  441             453
  SINCE SEP 1    762             683
  SINCE JUL 1    768             689

 COOLING
  YESTERDAY        0               0
  MONTH TO DATE    0               0
  SINCE SEP 1     35              94
  SINCE JAN 1    573             538
.....................................


WIND (MPH)
  HIGHEST WIND SPEED     8   HIGHEST WIND DIRECTION     N (350)
  HIGHEST GUST SPEED    10   HIGHEST GUST DIRECTION     N (350)
  AVERAGE WIND SPEED     1.4


SKY COVER
  AVERAGE SKY COVER 0.9


WEATHER CONDITIONS
 THE FOLLOWING WEATHER WAS RECORDED YESTERDAY.
  RAIN
  LIGHT RAIN
  FOG
  FOG W/VISIBILITY <= 1/4 MILE


RELATIVE HUMIDITY (PERCENT)
 HIGHEST   100           200 AM
 LOWEST     92          1200 AM
 AVERAGE    96
```

. . . . . .

SUNRISE AND SUNSET
NOVEMBER 24 2015.....SUNRISE   721 AM PST   SUNSET   434 PM PST
NOVEMBER 25 2015.....SUNRISE   722 AM PST   SUNSET   433 PM PST

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

The U.S. Naval Observatory (USNO) computes astronomical data. Therefore, the NWS does not record, certify, or authenticate astronomical data. Computed times of sunrise, sunset, moonrise, moonset; and twilight, moon phases and other astronomical data are available from USNO's Astronomical Applications Department (http://www.usno.navy.mil). See http://www.usno.navy.mil/USNO/astronomical-applications/astronomical-information-center/litigation for information on using these data for legal purposes.

APPENDIX D

Wetland Determination Data Sheets

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WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Molalla Bear Creek City/County: Molalla / Clakamas Sampling Date: 11/23/2015

Applicant/Owner: PNG Environmental, Inc. / Avison Lumber Company State: OR Sampling Point: **DP01**

Investigator(s): E. Dulin Section, Township, Range: 17, 5S, 2E

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): <2

Subregion (LRR): A, Northwest Forests and Coast Lat: Long: Datum:

Soil Map Unit Name: 29 - Dayton silt loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ,Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X**	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes **X**	No		
Wetland Hydrology Present?	Yes **X**	No		

Precipitation prior to fieldwork: 2.66 inches prior 2 weeks in Aurora, WYTD 8.90 inches (0.78 inches above normal).

Remarks:

Data point associated with Wetland 2-A. Wetland directly abuts Reach 2 on the northern bank. Vegetated channel from culvert to creek.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Rubus armeniacus*	10%	Yes	FACU
2.			
3.			
4.			
5.			
	10% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	100%	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	110 (A)		240 (B)

Prevalence Index = B/A = 2.18

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

Pushing 50% vegetation cover based on soils and hydrology.

Entered by: ED QC by: cmw

SOIL

Sampling Point: **DP01**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100					L	
6-14	2.5Y 4/1	94	10YR 5/6	6	C	M	L	between fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock fill

Depth (inches): 14

Hydric Soil Present? **Yes** **X** **No** ___

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Rock fill material starts at 6" with impassable rock fill layer at 14"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	N/A	
Water Table Present?	Yes ___	No X	Depth (inches):	>14	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	5	**Yes** **X** **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: ED QC by: cmw
Fed by industrial runoff from impervious surfaces through culvert on northern extent of wetland.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Molalla Bear Creek | City/County: Molalla / Clakamas | Sampling Date: 11/23/2015

Applicant/Owner: PNG Environmental, Inc. / Avison Lumber Company | State: OR | Sampling Point: **DP02**

Investigator(s): E. Dulin | Section, Township, Range: 17, 5S, 2E

Landform (hillslope, terrace, etc.): pavement | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): A, Northwest Forests and Coast | Lat: | Long: | Datum:

Soil Map Unit Name: 29 - Dayton silt loam | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ,Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?**	**Yes** **No X**
Hydric Soil Present?	Yes	No X		
Wetland Hydrology Present?	Yes	No X		

Precipitation prior to fieldwork: 2.66 inches prior 2 weeks in Aurora, WYTD 8.90 inches (0.78 inches above normal).

Remarks:
Data point associated with Wetland 2-A. Point taken on paved area adjacent to Reach 2 channel.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Cytisus scoparius*	5%	Yes	NOL
2.			
3.			
4.			
5.			
	5% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	30%	Yes	FACW
2. *Agrostis capillaris*	20%	Yes	FAC
3. *Daucus carota*	10%	No	FACU
4. *Panicum capillare*	10%	No	FAC
5. *Bromus tectorum*	5%	No	NOL
6. *Hypochaeris radicata*	5%	No	FACU
7.			
8.			
9.			
10.			
11.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1 =	0
FACW species 30	x 2 =	60
FAC species 30	x 3 =	90
FACU species 15	x 4 =	60
UPL species 10	x 5 =	50
Column Totals: 85 (A)		260 (B)

Prevalence Index = B/A = 3.06

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks:
Vegetation growing on pavement. Bare ground areas are bare pavement.

Entered by: ED QC by: cmw

SOIL

Sampling Point: **DP02**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0	-	-	-	-	-	-	-	Pavement

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Pavement

Depth (inches): Surface

Hydric Soil Present? Yes ___ **No** X

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Soil pit could not be taken due to paved surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	N/A	
Water Table Present?	Yes ___	No X	Depth (inches):	N/A	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	N/A	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: ED QC by: cmw
Water table and Saturation could not be measured due to paved surface.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Molalla Bear Creek | City/County: Molalla / Clakamas | Sampling Date: 11/23/2015

Applicant/Owner: PNG Environmental, Inc. / Avison Lumber Company | State: OR | Sampling Point: **DP03**

Investigator(s): E. Dulin | Section, Township, Range: 17, 5S, 2E

Landform (hillslope, terrace, etc.): stream terrace | Local relief (concave, convex, none): concave | Slope (%): <2

Subregion (LRR): A, Northwest Forests and Coast | Lat: | Long: | Datum:

Soil Map Unit Name: 29 - Dayton silt loam | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ,Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?**	**Yes X** **No**
Hydric Soil Present?	Yes X	No		
Wetland Hydrology Present?	Yes X	No		

Precipitation prior to fieldwork: 2.66 inches prior 2 weeks in Aurora, WYTD 8.90 inches (0.78 inches above normal).

Remarks:

Data point associated with Wetland 5-B. Wetland directly abuts the western bank of Reach 5 and extends off-site, west, onto adjacent horse pasture.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiandra*	10%	Yes	FACW
2.			
3.			
4.			
	10% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Crataegus monogyna*	7%	Yes	FAC
2. *Rosa rubiginosa*	3%	Yes	FACW
3.			
4.			
5.			
	10% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	90%	Yes	FACW
2. *Juncus effusus*	7%	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	97% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	110	x 2 =	220
FAC species	7	x 3 =	21
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	117 (A)		241 (B)

Prevalence Index = B/A = 2.06

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: Entered by: ED QC by: cmw

3% Open water. Small forested community within this wetland has vegetation of: *Salix lasiandra* 50% (tree) and *Phalaris arundinacea* 40% (herb).

SOIL

Sampling Point: **DP03**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	100					L	
6-16	10YR 3/1	90	5YR 4/4	10	C	M	L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches):	2
Water Table Present?	Yes ___	No X	Depth (inches):	>16
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	Surface

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: ED QC by: cmw

Fed from runoff from uplands to the west (horse pasture/agriculture).

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Molalla Bear Creek | City/County: Molalla / Clakamas | Sampling Date: 11/23/2015

Applicant/Owner: PNG Environmental, Inc. / Avison Lumber Company | State: OR | Sampling Point: **DP04**

Investigator(s): E. Dulin | Section, Township, Range: 17, 5S, 2E

Landform (hillslope, terrace, etc.): stream terrace | Local relief (concave, convex, none): none | Slope (%): <2

Subregion (LRR): A, Northwest Forests and Coast | Lat: | Long: | Datum:

Soil Map Unit Name: 29 - Dayton silt loam | NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ,Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?**	**Yes** **No X**
Hydric Soil Present?	Yes	No X		
Wetland Hydrology Present?	Yes	No X		

Precipitation prior to fieldwork: 2.66 inches prior 2 weeks in Aurora, WYTD 8.90 inches (0.78 inches above normal).

Remarks:
Data point associated with Wetland 5-B.

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1. *Salix lasiandra*	35%	Yes	FACW
2. *Pseudotsuga menziesii*	10%	Yes	FACU
3.			
4.			
	45% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	70%	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1. *Rubus armeniacus*	15%	Yes	FACU
2. *Rubus ursinus*	5%	Yes	FACU
	20% = Total Cover		

% Bare Ground in Herb Stratum 30%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	105	x 2 =	210
FAC species	0	x 3 =	0
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	135 (A)		330 (B)

Prevalence Index = B/A = 2.44

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **No X**

Remarks:

Entered by: ED QC by: cmw

SOIL

Sampling Point: **DP04**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100					CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ **No** X

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Large stones (>3 cm) are present below 10".

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	N/A	
Water Table Present?	Yes ___	No X	Depth (inches):	>16	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>16	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: ED QC by: cmw

APPENDIX E

Ground-Level Site Photographs

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TL 5290
TL 200
TL 101
TL 290
TL 5280
TL 102
Beaver Pond
Beaver Dam
Wetland 5-B
WTL-5B-DP03
WTL-5B-DP04
Wetland 2-A
WTL-2A-DP02
WTL-2A-DP01
REACH-1
REACH-2
REACH-3
REACH-4
REACH-5
Bear Creek
Breached Culvert
S. MOLALLA FOREST RD
S. MOLALLA AVE
MW-01
IMW-01
IMW-02
MW-02
IMW-06
MW-06
IMW-05
MW-03/AB-03
IMW-07
IMW-04
MW-04
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T

APPROXIMATE SCALE IN FEET
0 50 100 200

LEGEND

- Property Boundary
- Tax Lots
- TL 101 — Tax Lot ID Numbers (Tax Map 5 2E 17A)
- Bear Creek Flow Direction
- Former Building Footprints
- Current Building Footprints
- Culvert
- MW-01 — Monitoring Well
- Study Area Boundary Line
- Ordinary High Water Mark (OHWM)
- Wetland Boundary
- REACH-3 concurred by DSL under WD#2015-0279
- WTL-2A-DP02 — Wetland Data Point

SURVEY NOTES:

THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM. THE HORIZONTAL ACCURACY FOR THE SITE IS 1 FOOT IN 50,000 FEET. THE HORIZONTAL ACCURACY AT ANY LOCATION IS ABOUT 0.10 OF ONE FOOT.

THE VERTICAL DATUM FOR THIS SURVEY IS BASED UPON OSHD BENCHMARK RAIT. THE ELEVATION IS 240.377' NGVD 29 DATUM. STUDY AREA AND DATA PLOT POINT ACCURACY IS +/- 0.5 FEET.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A LOOP FIELD TRAVERSE.

SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014, NOVEMBER 9-13 AND DECEMBER 3, 2015.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014 (REACH 3), NOVEMBER 2 AND 23, 2015 (REACH-1, -2, -4, AND -5).

A → SWCA photolocation and direction of view.

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE: 1-26-16
FILE NAME: 1177-01
DRAWN BY: JJT
APPROVED BY: PE

FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

BEAR CREEK WATER SURVEY

Project No. 1177-01

C:\Users\Josh\Desktop\Autocad Backup\PNG-Autocad\1177-01 Avison\2016\Jan 2016\1177-01_WTL-012616.dwg 2.17.2014

Photo A. View northeast of Reach 1, Bear Creek. Photo by E. Dulin on November 23, 2015.

Photo C. Overview of Unknown Reach (between 1 and 2), Bear Creek. Photo by E. Dulin on November 23, 2015.

Photo B. View west of Reach 2, Bear Creek. Photo by E. Dulin on November 23, 2015.

Photo D. Southwest view of Reach 4, Bear Creek. Photo by E. Dulin on November 23, 2015.

Photo E. East view of Reach 4, Bear Creek. Photo by E. Dulin on November 23, 2015.

Photo G. West view of Reach 5, Bear Creek. Photo by E. Dulin on November 23, 2015.

Photo F. View northeast of culvert between Reaches 4 and 5, Bear Creek. Photo by E. Dulin on November 23, 2015.

Photo H. View northwest of Reach 5, Bear Creek. Photo by E. Dulin on November 23, 2015

Photo I. Southeast view of a beaver dam on Reach 5, Bear Creek. Photo by E. Dulin on November 23, 2015.

Photo K. View south from Wetland 2-A (DP01). Photo by E. Dulin on November 23, 2015.

Photo J. View north from Wetland 2-A (DP01). Photo by E. Dulin on November 23, 2015.

Photo L. View east from adjacent upland to Wetland 2-A (DP02). Photo by E. Dulin on November 23, 2015.

Photo M. View north from adjacent upland to Wetland 2-A (DP02). Photo by E. Dulin on November 23, 2015.

Photo O. View west from Wetland 5-B (DP03). Photo by E. Dulin on November 23, 2015.

Photo N. View east from Wetland 5-B (DP03). Photo by E. Dulin on November 23, 2015.

Photo P. View south from Wetland 5-B (Forested). Photo by E. Dulin on November 23, 2015

Photo Q. View west from Wetland 5-B (Forested). Photo by E. Dulin on November 23, 2015.

Photo S. View north from adjacent upland to Wetland 5-B (DP04). Photo by E. Dulin on November 23, 2015.

Photo R. View west from adjacent upland to Wetland 5-B (DP04). Photo by E. Dulin on November 23, 2015.

Photo T. View of property west of Wetland 5-B. Photo by E. Dulin on November 23, 2016

APPENDIX F

Literature Cited and References Used

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APPENDIX G

LWI Data Sheets

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Wetland Characterization Sheet

Project Name: Molalla LWI

		Wetland Code:	BC-22B
Date(s) of field work:	5/1/01, 6/6/01	Size (acres):	10.64
Data Sheet Numbers:	64,65, 66	Cowardin Class(es):	PFO, POW
Investigator(s):	PF/SE	HGM Class(es):	RFT

Location -- Legal:	T. 5S, R. 2E, Sections 8, 17
Other:	North of Molalla Forest Road, west of Molalla Ave., south of Hwy 211
Tax Lots:	5S2E08C 03400, 03401; 52E17 00100, 00101; 52E17A 05100, 05190, 05200, 05280
Hydrologic basin:	Bear Creek
Soil -- Mapped series:	Dayton silt loam
Hydrologic Source:	Surface water, groundwater

Dominant Wetland Vegetation

TREES	SHRUBS	VINES	HERBS
Fraxinus latifolia	*Cornus stolonifera*	*Solanum dulcamara*	*Agrostis stolonifera*
Populus trichocarpa	*Salix spp.*		*Ranunculus repens*
	Spiraea douglasii		*Agrostis tenuis*
	Physocarpus capitatus		*Carex densa*
			Epilobium watsonii
			Phalaris arundinacea
			Lotus corniculatus
			Impatiens noli-tangere
			Juncus effusus
			Alopecuris geniculatus

Comments: **Locally Significant Wetland**

Palustrine forested wetland extending from Floragon Forest Products site west. Areas of ponded water, beaver dams, snags. High quality wildlife habitat. Bear Creek flows through this area. Hydrologically connected to BC-22A, 22C, 22D and 19 by surface water. Zoned residential and small area of heavy industrial. Adjacent land use is residential and heavy industrial.

Adjacent Upland Species: Rubus discolor, Daucus carota, Cirsium arvense, Chrysanthemum leucanthemum, Festuca arundinacea, Taraxacum officinale, Heracleum lanatum, Cytisus scoparius, Prunus avium, Populus trichocarpa

COWARDIN CODES:	E2FO = estuarine forested	E2SS = estuarine scrub shrub	E2EM = estuarine emergent
PFO = palustrine forested	PSS = palustrine scrub-shrub	PEM = palustrine emergent	POW = palustrine open water
HGM CODES:	EFB = Estuarine Fringe Embayment	EFR = Estuarine Fringe Riverine	RFT = Riverine Flow Through
RI = River Impounding	LFH = Lacustrine Fringe Headwater	LFV = Lacustrine Fringe Valley	DB = Depressional Bog
DA- Depressional Alkaline	DO = Depressional Outflow	DCP = Depressional Closed Permanent	DCNP = Depressional Nonpermanent
HS = Headwater Slope	VS = Valley Slope		

Wetland Characterization Sheet

Project Name: Molalla LWI

		Wetland Code:	BC-22C
Date(s) of field work:	OFF-SITE	Size (acres):	3.48
Data Sheet Numbers:	N/A	Cowardin Class(es):	PEM
Investigator(s):	PF/SE	HGM Class(es):	VS

Location -- Legal:	**T. 5S, R. 2E, Section 17**
Other:	**North of Molalla Forest Road, west of Molalla Ave., south of Hwy 211**
Tax Lots:	**52E17A 05190**
Hydrologic basin:	**Bear Creek**
Soil -- Mapped series:	**Dayton silt loam**
Hydrologic Source:	**Ground water, surface water**

Dominant Wetland Vegetation

TREES	SHRUBS	VINES	HERBS
			Agrostis stolonifera
			Ranunculus repens
			Agrostis tenuis
			Carex densa
			Juncus patens
			Phalaris arundinacea
			Holcus lanatus
			Equisetum arvense
			Juncus effusus

Comments:

OFF-SITE. Palustrine emergent wetland pasture upslope from Bear Creek. Hydrologically connected to BC-22B by groundwater and seasonal surface water. Zoned residential. Adjacent land use is rural residential/pasture.

Adjacent Upland Species: Rubus discolor, Daucus carota, Cirsium arvense, Chrysanthemum leucanthemum, Festuca arundinacea, Taraxacum officinale, Cytisus scoparius, Anthoxanthum odoratum

COWARDIN CODES:	E2FO = estuarine forested	E2SS = estuarine scrub shrub	E2EM = estuarine emergent
PFO = palustrine forested	PSS = palustrine scrub-shrub	PEM = palustrine emergent	POW = palustrine open water
HGM CODES:	EFB = Estuarine Fringe Embayment	EFR = Estuarine Fringe Riverine	RFT = Riverine Flow Through
RI = River Impounding	LFH = Lacustrine Fringe Headwater	LFV = Lacustrine Fringe Valley	DB = Depressional Bog
DA- Depressional Alkaline	DO = Depressional Outflow	DCP = Depressional Closed Permanent	DCNP = Depressional Nonpermanent
HS = Headwater Slope	VS = Valley Slope		

Wetland Characterization -- Field For PHS

Project Name: Molalla Local Wetland Inventory

Wetland Code: BC-22B

Watershed Setting: (Questions 1-14) See Attached Table

Wetland Structure and Relation to Surrounding Landscape		Wetland Habitat		Fisheries Habitat		Wetland Hydrology		Recreation	
Q	A	Q	A	Q	A	Q	A	Q	A
Q-15		Q-21		Q-29	A	Q-36	A	Q-47	C
1	B	1	C	Streams connected to the Wetland		Q-37	A	Q-48	C
2	A	2	/			Q-38	C	Q-49	B
3	A	3	/	Q	A	Q-39	C	Q-50	B
4	B	4	A	Q-30	A	Q-40	A	Asthetics	
5	A	Q-22	A	Q-31	A	Public Access to Wetland Site		Q	A
Q-16	/	Q-23	A	Q-32	A			Q-51	N/A
Q-17	A	Q-24	A	Lakes and Ponds		Q	A	Q-52	B
Q-18	A	Q-25	N/A			Q-41	C	Q-53	A
Q-19	B	Q-26	A	Q	A	Q-42	A	Q-54	A
Q-20		Q-27	A	Q-33	A	Q-43	A	Q-55	B
1	A	Q-28	B	Q-34	A	Q-44	B	Q-56	A
2	A			Q-35	A	Q-45	B	Q-57	C
3	A					Q-46	C	Q-58	A
4	C								
5	A								

43 Associated wetlands (PEM; BC-22C & BC-22D) surround wetland on southeast and southwest sides. Northwest side of wetland adjacent to open space.

Wetland Characterization -- Field For PHS

Project Name: Molalla Local Wetland Inventory

Wetland Code: BC-22C

Watershed Setting: (Questions 1-14) See Attached Table

Wetland Structure and Relation to Surrounding Landscape		Wetland Habitat		Fisheries Habitat		Wetland Hydrology		Recreation	
Q	A	Q	A	Q	A	Q	A	Q	A
Q-15		Q-21		Q-29	—	Q-36	C	Q-47	C
1	B	1	/	Streams connected to the Wetland		Q-37	B	Q-48	C
2	A	2	A	Q	A	Q-38	C	Q-49	B
3	A	3	/	Q-30	—	Q-39	—	Q-50	B
4	B	4	/	Q-31	—	Q-40	A	Asthetics	
5	A	Q-22	A	Q-32	—	Public Access to Wetland Site		Q	A
Q-16	1	Q-23	C	Lakes and Ponds		Q	A	Q-51	N/A
Q-17	B	Q-24	B	Q	A	Q-41	C	Q-52	B
Q-18	A	Q-25	N/A	Q-33	—	Q-42	A	Q-53	A
Q-19	B	Q-26	A	Q-34	—	Q-43	A	Q-54	A
Q-20		Q-27	A	Q-35	—	Q-44	B	Q-55	B
1	A	Q-28	C			Q-45	B	Q-56	B
2	A					Q-46	C	Q-57	A
3	A							Q-58	B
4	C								
5	A								

#13 Hydrologically connected to BC-22B and BC-22A. To the south is an open space (large lot with one house in the southern portion).

Wetland Determination Data Form
Routine Onsite Method

Pacific Habitat Services, Inc.

Project:	Molalla LWI	Number:	2250	Sample Site	BC-22B-64
Applicant:	City of Molalla	County:	Clackamas	Date:	5/1/01
Investigators:	SE/PF	Township:	5S Range: 2E	Section:	8

Do Normal Circumstances exist on this site? **Yes** Is the area a potential Problem Area? **No**

Is this an Atypical Situation? **No**

HYDROLOGY			Primary Indicators		Secondary Indicators
			Inundated		Ox. rhizospheres
			Sat. in Upper 12"		H20-stained leaves
Depth of Surf. H2O		Inches	Water Marks	Yes	Local Soil Survey
Depth to Free H20	>14	Inches	Drift Lines		FAC Neutral Test
Depth to Saturation	>14	Inches	Sediment Deposits		Other
			Drainage patterns	Yes	Criteria Met: Yes

SOILS **Mapped Series:** Wapato silty clay loam **Hydric Soil?:** Yes

Classification: Fluvaquentic Endoaquolls **Drainage Class:** poorly drained

Depth (Inches)	Matrix Color	Soil Texture*	Redox Concentrations Color	Redox Concentrations abundance/size/contrast	Other Hydric Soil Field Indicators	Comments
0-8	10YR 3/2	SCL				
8-14	10YR 3/2	SCL	7.5YR 4/6	common, medium, distinct		

*SD=Sand, SDL=Sandy Loam, L=Loam, SDCL=Sandy Clay Loam, S=Silt, SL=Silt Loam, SCL=Silty Clay Loam, CL=Clay Loam, C=Clay

Criteria Met: Yes

VEGETATION

Tree Stratum (0%)	Status	% Cover	Herbaceous Stratum (100%)	Status	% Cover
			*Phalaris arundinacea**	FACW	75
			*Impatiens noli-tangere**	FACW	20
			Galium aparine	FACU	5
Shrub Stratum (0%)	**Status**	**% Cover**			
			Woody Vine Stratum (0%)	**Status**	**% Cover**

***Percent of dominant species FAC, FACW, or OBL:** 100% Criteria Met: Yes

Comments:

Determination: Wetland

Wetland Determination Data Form
Routine Onsite Method

Pacific Habitat Services, Inc.

Project:	Molalla LWI		Number: 2250	Sample Site	BC-22B-65
Applicant:	City of Molalla	County:	Clackamas	Date:	5/1/01
Investigators:	SE/PF	Township:	5S Range: 2E	Section:	8

Do Normal Circumstances exist on this site? **Yes** Is the area a potential Problem Area? **No**

Is this an Atypical Situation? **No**

HYDROLOGY

			Primary Indicators	Secondary Indicators
			Inundated	Ox. rhizospheres
			Sat. in Upper 12"	H20-stained leaves
Depth of Surf. H2O		Inches	Water Marks	Local Soil Survey
Depth to Free H20	>14	Inches	Drift Lines	FAC Neutral Test
Depth to Saturation	>14	Inches	Sediment Deposits	Other
			Drainage patterns	

Criteria Met: No

SOILS

Mapped Series: Sawtell silt loam **Hydric Soil?:** No

Classification: Ultic Argixerolls **Drainage Class:** moderately well drained

Depth (Inches)	Matrix Color	Soil Texture*	Redox Concentrations Color	Redox Concentrations abundance/size/contrast	Other Hydric Soil Field Indicators	Comments
0-14	10YR 2/1	SL				

*SD=Sand, SDL=Sandy Loam, L=Loam, SDCL=Sandy Clay Loam, S=Silt, SL=Silt Loam, SCL=Silty Clay Loam, CL=Clay Loam, C=Clay

Criteria Met: Yes

VEGETATION

Tree Stratum (0%)	Status	% Cover

Shrub Stratum (0%)	Status	% Cover

Herbaceous Stratum (100%)	Status	% Cover
*Festuca arundinacea**	FAC-	80
Taraxacum officinale	FACU	10
Ranunculus repens	FACW	5
Rumex crispus	FAC+	2
Convolvulus arvensis	UPL	2

Woody Vine Stratum (0%)	Status	% Cover

***Percent of dominant species FAC, FACW, or OBL:** 0%

Criteria Met: No

Comments:

Determination: Upland

Wetland Determination Data Form
Routine Onsite Method

Pacific Habitat Services, Inc.

Project:	Molalla LWI	Number:	2250	Sample Site	BC-22B-66
Applicant:	City of Molalla	County:	Clackamas	Date:	5/1/01
Investigators:	SE/PF	Township:	5S Range: 2E	Section:	8

Do Normal Circumstances exist on this site? **Yes** Is the area a potential Problem Area? **No**

Is this an Atypical Situation? **No**

HYDROLOGY

			Primary Indicators		Secondary Indicators	
			Inundated		Ox. rhizospheres	Yes
			Sat. in Upper 12"	Yes	H20-stained leaves	
Depth of Surf. H2O		Inches	Water Marks		Local Soil Survey	
Depth to Free H20	10	Inches	Drift Lines		FAC Neutral Test	
Depth to Saturation		Inches	Sediment Deposits		Other	
			Drainage patterns	Yes	Criteria Met:	Yes

SOILS **Mapped Series:** Wapato silty clay loam **Hydric Soil?:** Yes

Classification: Fluvaquentic Endoaquolls **Drainage Class:** poorly drained

Depth (Inches)	Matrix Color	Soil Texture*	Redox Concentrations Color	Redox Concentrations abundance/size/contrast	Other Hydric Soil Field Indicators	Comments
0-14	5Y 3/1	SCL	5YR 4/6	many, coarse, prominent		

*SD=Sand, SDL=Sandy Loam, L=Loam, SDCL=Sandy Clay Loam, S=Silt, SL=Silt Loam, SCL=Silty Clay Loam, CL=Clay Loam, C=Clay

Criteria Met: Yes

VEGETATION

Tree Stratum (20%)	Status	% Cover
*Fraxinus latifolia**	FACW	100

Shrub Stratum (0%)	Status	% Cover

Herbaceous Stratum (80%)	Status	% Cover
*Ranunculus repens**	FACW	20
Rumex crispus	FAC+	10
*Alopecurus geniculatus**	OBL	20
Lotus corniculatus	FAC	5
Trifolium repens	FAC	5
*Alopecurus pratensis**	FACW	20
Trifolium pratense	FACU	5
Plantago major	FACU+	5

Woody Vine Stratum (0%)	Status	% Cover

***Percent of dominant species FAC, FACW, or OBL:** 100%

Criteria Met: Yes

Comments:

Determination: Wetland

Oregon Freshwater Wetland Assessment Methodology

(Revised Edition, April 1996)

Wetland Assessment Summary Sheet

Pacific Habitat Services, Inc.

Project Name:	Molalla LWI	**Wetland:**	**BC-22B**
Project Location:	Clackamas County	**Wetland Type(s):**	PFO, POW

Date(s) of field work:	5/1/01, 6/6/01	**Approx. Area (acres):**	10.64
Onsite Assessment?:	Partial	**Investigator(s):**	PF/SE
Wetland Location:	North of Molalla Forest Road, west of Molalla Ave., south of Hwy 211		

Function and Condition Assessment Answers:

Wildlife Habitat		Fish Habitat		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q	A	Q	A	Q	A	Q	A	Q	A
Q-1	A	Q-1	A	Q-1	A	Q-1	B	Q-1	A
Q-2	A	Q-2	A	Q-2	A	Q-2	A	Q-2	B
Q-3	A	Q-3	A	Q-3	A	Q-3	A	Q-3	C
Q-4	B	Q-4	A	Q-4	A	Q-4	C	Q-4	B
Q-5	A	Q-5	B	Q-5	B	Q-5	A	Q-5	A
Q-6	A	Q-6	A	Q-6	C	Q-6	A	Q-6	A
Q-7	A					Q-7	A		
Q-8	B								
Q-9A									
Q-9B	A								

Results:

Wildlife Habitat	Wetland provides diverse wildlife habitat
Fish Habitat	Wetland's fish habitat function is intact
Water Quality	Wetland's water-quality function is intact
Hydrologic Control	Wetland's hydrologic control function is intact
Sensitivity to Impact	Wetland is potentially sensitive to future impacts

Function and Condition Assessment Answers:

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q	A	Q	A	Q	A	Q	A
Q-1		Q-1	C	Q-1	C	Q-1	A
Q-2		Q-2	A	Q-2	C	Q-2	C
Q-3	C	Q-3	A	Q-3	C	Q-3	A
Q-4		Q-4	B	Q-4	A	Q-4	B
Q-5B		Q-5	C	Q-5	B	Q-5	B
Q-6		Q-6	B	Q-6	B	Q-6	A

Results:

Enhancement Potential	Due to diverse wildlife habitat, this wetland cannot be enhanced
Education	Wetland site is not appropriate for educational use
Recreation	Wetland is not appropriate or does not provide rec. opportunities
Aesthetic Quality	Wetland is considered to be pleasing

Oregon Freshwater Wetland Assessment Methodology
Functions and Conditions Summary Sheet

Project:	Molalla LWI	**Wetland:**	**BC-22B**
Location:	Clackamas County	**Approx. Area (acres):**	10.64
Date:	5/1/01, 6/6/01	**Wetland Types(s):**	PFO, POW

Result:	**Wetland provides diverse wildlife habitat**	
Rationale:	More than one Cowardin class	No adjacent Water Quality limited streams
	Dominated by woody vegetation	Adjacent land use is primarily agriculture
	Between 0.5 - 1 acre of open water	Wetland buffer is greater than 40%
Result:	**Wetland's fish habitat function is intact**	
Rationale:	50% or more of stream is shaded	No adjacent Water Quality Limited streams
	Stream is in a natural channel	Adjacent land use is primarily agriculture
	>25% of stream has instream structures	Salmon and/or trout present in stream
Result:	**Wetland's water-quality function is intact**	
Rationale:	Primary water source is surface flow	Wetland is more than 5 acres in size
	Wetland floods/ponds in growing season	Adjacent land use is primarily agriculture
	High wetland vegetation cover	No adjacent Water Quality Limited streams
Result:	**Wetland's hydrologic control function is intact**	
Rationale:	Wetland is not within 100 year floodplain	Dominated by woody vegetation
	Wetland floods/ponds in growing season	Development downslope of wetland
	Water has unrestricted flow out of wetland	Development upslope of wetland
Result:	**Wetland is potentially sensitive to future impacts**	
Rationale:	Stream modified or isolated wetland	Adjacent land use is primarily agriculture
	Water not taken out	Adjacent zoning is primarily development
	No adjacent Water Quality Limited streams	Dominated by woody vegetation
Result:	**Due to diverse wildlife habitat, this wetland cannot be enhanced**	
Rationale:		
Result:	**Wetland site is not appropriate for educational use**	
Rationale:	No access allowed to wetland	No access point to wetland exists
	No visible hazards to public	Wetland is not limited mobility accessible
	Other habitats can be observed not accessed	
Result:	**Wetland is not appropriate or does not provide rec. opportunities**	
Rationale:	No access point to wetland exists	Wetland provides diverse wildlife habitat
	No boat launching can be developed	No fishing is allowed
	No trails or viewing areas exist	No hunting is allowed
Result:	**Wetland is considered to be pleasing**	
Rationale:	More than two Cowardin classes are visible	Wetland surrounded by landscaped areas
	Less than 25% of wetland can be seen	Unpleasant odors are present sometimes
	No visual detractors are present	Some traffic and natural noises are present

Oregon Freshwater Wetland Assessment Methodology

(Revised Edition, April 1996)

Wetland Assessment Summary Sheet

Pacific Habitat Services, Inc.

Project Name:	Molalla LWI	**Wetland:**	**BC-22C**
Project Location:	Clackamas County	**Wetland Type(s):**	PEM

Date(s) of field work:	OFF-SITE	**Approx. Area (acres):**	3.48
Onsite Assessment?:	No	**Investigator(s):**	PF/SE
Wetland Location:	North of Molalla Forest Road, west of Molalla Ave., south of Hwy 211		

Function and Condition Assessment Answers:

Wildlife Habitat		Fish Habitat		Water Quality		Hydrologic Control		Sensitivity to Impact	
Q	A	Q	A	Q	A	Q	A	Q	A
Q-1	B	Q-1		Q-1	C	Q-1	B	Q-1	A
Q-2	C	Q-2		Q-2	B	Q-2	B	Q-2	B
Q-3	B	Q-3		Q-3	A	Q-3	B	Q-3	C
Q-4	C	Q-4		Q-4	B	Q-4	C	Q-4	B
Q-5	A	Q-5		Q-5	B	Q-5	C	Q-5	A
Q-6	A	Q-6		Q-6	C	Q-6	B	Q-6	C
Q-7	A					Q-7	B		
Q-8	B								
Q-9A									
Q-9B	A								

Results:

Wildlife Habitat	Wetland provides habitat for some wildlife species
Fish Habitat	Fish habitat was not assessed for this wetland
Water Quality	Wetland's water-quality function is impacted or degraded
Hydrologic Control	Wetland's hydrologic control is impacted or degraded
Sensitivity to Impact	Wetland is potentially sensitive to future impacts

Function and Condition Assessment Answers:

Enhancement Potential		Education		Recreation		Aesthetic Quality	
Q	A	Q	A	Q	A	Q	A
Q-1	A	Q-1	C	Q-1	C	Q-1	B
Q-2	B	Q-2	A	Q-2	C	Q-2	A
Q-3		Q-3	B	Q-3	C	Q-3	A
Q-4	B	Q-4	B	Q-4	B	Q-4	B
Q-5B	A	Q-5	C	Q-5	B	Q-5	B
Q-6	B	Q-6	B	Q-6	B	Q-6	B

Results:

Enhancement Potential	Wetland has high enhancement potential
Education	Wetland site is not appropriate for educational use
Recreation	Wetland is not appropriate or does not provide rec. opportunities
Aesthetic Quality	Wetland is considered to be pleasing

Oregon Freshwater Wetland Assessment Methodology
Functions and Conditions Summary Sheet

Project:	Molalla LWI	**Wetland:**	**BC-22C**
Location:	Clackamas County	**Approx. Area (acres):**	3.48
Date:	OFF-SITE	**Wetland Types(s):**	PEM

Result:	**Wetland provides habitat for some wildlife species**	
Rationale:	One Cowardin class with > 5 species	No adjacent Water Quality limited streams
	Herbaceous vegetation, no ponding	Adjacent land use is primarily agriculture
	Less than 0.5 acres of open water	Wetland buffer is greater than 40%
Result:	**Fish habitat was not assessed for this wetland**	
Rationale:		
Result:	**Wetland's water-quality function is impacted or degraded**	
Rationale:	Primary water source is groundwater	Surface water connection to other wetlands
	Can't determine if wetland floods or ponds	Adjacent land use is primarily agriculture
	High wetland vegetation cover	No adjacent Water Quality Limited streams
Result:	**Wetland's hydrologic control is impacted or degraded**	
Rationale:	Wetland is not within 100 year floodplain	Herbaceous vegetation, no ponding
	Can't determine if wetland floods or ponds	Agriculture downslope of wetland
	Water has unrestricted flow out of wetland	Agriculture upslope of wetland
Result:	**Wetland is potentially sensitive to future impacts**	
Rationale:	Stream modified or isolated wetland	Adjacent land use is primarily agriculture
	Water not taken out	Adjacent zoning is primarily development
	No adjacent Water Quality Limited streams	Herbaceous vegetation, no ponding
Result:	**Wetland has high enhancement potential**	
Rationale:	Wetland functions are impacted or degraded	Wetland is between 0.5 and 5 acres
	Primary water source is groundwater	Wetland buffer is greater than 40%
	Water flow is permanently restricted	Potentially sensitive to future impacts
Result:	**Wetland site is not appropriate for educational use**	
Rationale:	No access allowed to wetland	No access point to wetland exists
	No visible hazards to public	Wetland is not limited mobility accessible
	Other habitats can be observed not accessed	
Result:	**Wetland is not appropriate or does not provide rec. opportunities**	
Rationale:	No access point to wetland exists	Wetland provides habitat for some wildlife
	No boat launching can be developed	No fishing is allowed
	No trails or viewing areas exist	No hunting is allowed
Result:	**Wetland is considered to be pleasing**	
Rationale:	Two Cowardin classes visible	Wetland surrounded by landscaped areas
	>50% of wetland can be seen	Unpleasant odors are present sometimes
	No visual detractors are present	Continuous traffic and natural noises occur

Locally Significant Wetlands Criteria

ORS 197.279 (3)(b)

Project Name:	Molalla LWI	**Wetland:**	**BC-22B**
Project Location:	Clackamas County	**Approx. Area (acres):**	10.64
Date:	5/1/01, 6/6/01	**Wetland Types(s):**	PFO, POW

***Exclusions*: This wetland cannot be designated as significant if the answer to any of the criteria below is "Yes".**		
1 Is this wetland artificially created entirely from upland and:		
a. created for the purpose of controlling, storing, or maintaining stormwater		No
b. is used for active surface mining or as a log pond		No
c. is a ditch without a free and open connection to natural waters of the state		No
d. is less than 1 acre and created unintentionally from irrigation or construction		No
e. created for the purpose of wastewater treatment, cranberry production, farm watering, sediment settling, cooling industrial water, or a golf hazard		No
2 Is the wetland or portion of the wetland contaminated by hazardous substances, materials or wastes as per the conditions of ORS 141-86-350 1(b)		No
Exclusion criteria satisfied?		**No**

***Mandatory Locally Significant Wetland Criteria*: This wetland is locally significant if "Yes" is the answer to any of the criteria below.**		
1 Does the wetland provide *diverse wildlife habitat*?	Yes	
2 Is the wetland's *fish habitat function intact*?	Yes	
3 Is the wetland's *water quality function intact*?	Yes	
4 Is the wetland's *hydrologic control function intact*?	Yes	
5 Is the wetland less than 1/4 mile from a water body listed by DEQ as a water quality limited water body (303(d) list) and is the wetland's *water quality function intact, or impacted or degraded*?		No
6 Does the wetland contain a rare plant community?		No
7 Is the wetland inhabited by any species listed federally as threatened or endangered, or state listed as sensitive, threatened or endangered?		No
8 Does the wetland have a direct surface water connection to a stream segment mapped by ODFW as habitat for indigenous anadromous salmonids and is the wetland's *fish habitat function intact, or impacted or degraded*?		No
Mandatory Locally Significant Wetland criteria satisfied ?	**Yes**	

***Optional Locally Significant Wetland Criteria*: local governments may identify a wetland as significant if "Yes" is the answer to the criteria below**		
1 Does the wetland represent a locally unique native plant community and provides *diverse wildlife habitat or habitat for some species* or has a *intact, or impacted or degraded fish habitat function* or has a *intact, or impacted or degraded water quality function* or has a *intact, or impacted or degraded hydrologic control function*.		No
2 Is the wetland publicly owned and used by a school or organization and does the wetland provide *educational uses*?		No
Optional Locally Significant Wetland criteria satisfied ?		**No**

Locally Significant Wetland

Locally Significant Wetlands Criteria

ORS 197.279 (3)(b)

Project Name:	Molalla LWI	**Wetland:**	**BC-22C**
Project Location:	Clackamas County	**Approx. Area (acres):**	3.48
Date:	OFF-SITE	**Wetland Types(s):**	PEM

Exclusions **: This wetland cannot be designated as significant if the answer to any of the criteria below is "Yes".**		
1 Is this wetland artificially created entirely from upland and:		
a. created for the purpose of controlling, storing, or maintaining stormwater		No
b. is used for active surface mining or as a log pond		No
c. is a ditch without a free and open connection to natural waters of the state		No
d. is less than 1 acre and created unintentionally from irrigation or construction		No
e. created for the purpose of wastewater treatment, cranberry production, farm watering, sediment settling, cooling industrial water, or a golf hazard		No
2 Is the wetland or portion of the wetland contaminated by hazardous substances, materials or wastes as per the conditions of ORS 141-86-350 1(b)		No
Exclusion criteria satisfied?		**No**

Mandatory Locally Significant Wetland Criteria **: This wetland is locally significant if "Yes" is the answer to any of the criteria below.**		
1 Does the wetland provide *diverse wildlife habitat* ?		No
2 Is the wetland's *fish habitat function intact* ?		No
3 Is the wetland's *water quality function intact* ?		No
4 Is the wetland's *hydrologic control function intact* ?		No
5 Is the wetland less than 1/4 mile from a water body listed by DEQ as a water quality limited water body (303(d) list) and is the wetland's *water quality function intact, or impacted or degraded* ?		No
6 Does the wetland contain a rare plant community?		No
7 Is the wetland inhabited by any species listed federally as threatened or endangered, or state listed as sensitive, threatened or endangered?		No
8 Does the wetland have a direct surface water connection to a stream segment mapped by ODFW as habitat for indigenous anadromous salmonids and is the wetland's *fish habitat function intact, or impacted or degraded* ?		No
Mandatory Locally Significant Wetland criteria satisfied ?		**No**

Optional Locally Significant Wetland Criteria **: local governments may identify a wetland as significant if "Yes" is the answer to the criteria below**		
1 Does the wetland represent a locally unique native plant community and provides *diverse wildlife habitat or habitat for some species* or has a *intact, or impacted or degraded fish habitat function* or has a *intact, or impacted or degraded water quality function* or has a *intact, or impacted or degraded hydrologic control function* .		No
2 Is the wetland publicly owned and used by a school or organization and does the wetland provide *educational uses* ?		No
Optional Locally Significant Wetland criteria satisfied ?		**No**

Does not satisfy the criteria, Not a Locally Significant Wetland

APPENDIX 4

Maxxam
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Success Through Science®

Your Project #: A4K0572
Your C.O.C. #: na

Attention:Philip Nerenberg

Apex Laboratories
12232 SW Garden Place
Tigard, OR
USA 97223

Report Date: 2015/06/18
Report #: R3469595
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5A4215
Received: 2015/06/02, 15:15

Sample Matrix: Soil
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dioxins/Furans in Soil (1613B) (1)	5	2015/06/06	2015/06/10	BRL SOP-00410	EPA 1613B m
2378TCDF Confirmation in Soil	5	N/A	2015/06/16	BRL SOP-00406	EPA 8290A m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.

Confirmatory runs for 2,3,7,8-TCDF are performed only if the primary result is greater than the RDL.

Encryption Key M Di Grazia Melissa DiGrazia
18 Jun 2015 09:52:46 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Melissa DiGrazia, Project Manager - ATUT
Email: MDiGrazia@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		AJL515							
Sampling Date		2014/11/20 10:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	Units	AB-25-0COMP (0-1)	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	1.54	0.105	0.200	0.0400	1.00	1.54		4059381
1,2,3,7,8-Penta CDD *	pg/g	9.83	0.0889	1.00	0.0400	1.00	9.83		4059381
1,2,3,4,7,8-Hexa CDD *	pg/g	13.9	0.354	1.00	0.0400	0.100	1.39		4059381
1,2,3,6,7,8-Hexa CDD *	pg/g	177	0.371	1.00	0.0400	0.100	17.7		4059381
1,2,3,7,8,9-Hexa CDD *	pg/g	38.7	0.362	1.00	0.0400	0.100	3.87		4059381
1,2,3,4,6,7,8-Hepta CDD *	pg/g	1640	0.109	1.00	0.0400	0.0100	16.4		4059381
Octa CDD *	pg/g	6750 (1)	1.25	10.0	0.0800	0.000300	2.03		4059381
Total Tetra CDD *	pg/g	11.6	0.105	0.200	0.0400			11	4059381
Total Penta CDD *	pg/g	50.7	0.0889	1.00	0.0400			10	4059381
Total Hexa CDD *	pg/g	594	0.363	1.00	0.0400			6	4059381
Total Hepta CDD *	pg/g	2830	0.109	1.00	0.0400			2	4059381
2,3,7,8-Tetra CDF **	pg/g	11.9	0.0849	0.200	0.0400	0.100	1.19		4059381
1,2,3,7,8-Penta CDF **	pg/g	8.04	0.0904	1.00	0.0400	0.0300	0.241		4059381
2,3,4,7,8-Penta CDF **	pg/g	9.74	0.0892	1.00	0.0400	0.300	2.92		4059381
1,2,3,4,7,8-Hexa CDF **	pg/g	23.2	0.796	1.00	0.0400	0.100	2.32		4059381
1,2,3,6,7,8-Hexa CDF **	pg/g	27.0	0.813	1.00	0.0400	0.100	2.70		4059381
2,3,4,6,7,8-Hexa CDF **	pg/g	22.6	0.752	1.00	0.0400	0.100	2.26		4059381
1,2,3,7,8,9-Hexa CDF **	pg/g	1.06	0.782	1.00	0.0400	0.100	0.106		4059381
1,2,3,4,6,7,8-Hepta CDF **	pg/g	616	0.140	1.00	0.0400	0.0100	6.16		4059381
1,2,3,4,7,8,9-Hepta CDF **	pg/g	23.9	0.140	1.00	0.0400	0.0100	0.239		4059381
Octa CDF **	pg/g	384	0.312	2.00	0.0800	0.000300	0.115		4059381
Total Tetra CDF **	pg/g	72.0	0.0849	0.200	0.0400			14	4059381
Total Penta CDF **	pg/g	356	0.0898	1.00	0.0400			13	4059381
Total Hexa CDF **	pg/g	1260	0.785	1.00	0.0400			11	4059381
Total Hepta CDF **	pg/g	1770	0.140	1.00	0.0400			4	4059381
Confirmation 2,3,7,8-Tetra CDF **	pg/g	8.18	0.081	1.0	0.90	0.100	0.818		4068022
TOTAL TOXIC EQUIVALENCY	pg/g						70.6		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	97							4059381

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 5X Dilution **

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		AJL515							
Sampling Date		2014/11/20 10:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	Units	AB-25-0COMP (0-1)	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	102							4059381
C13-1234678 HeptaCDF **	%	95							4059381
C13-123478 HexaCDD *	%	93							4059381
C13-123478 HexaCDF **	%	98							4059381
C13-1234789 HeptaCDF **	%	84							4059381
C13-123678 HexaCDD *	%	112							4059381
C13-123678 HexaCDF **	%	96							4059381
C13-12378 PentaCDD *	%	110							4059381
C13-12378 PentaCDF **	%	102							4059381
C13-123789 HexaCDF **	%	107							4059381
C13-234678 HexaCDF **	%	96							4059381
C13-23478 PentaCDF **	%	117							4059381
C13-2378 TetraCDD *	%	92							4059381
C13-2378 TetraCDF **	%	99							4059381
C13-OCDD *	%	129 (1)							4059381
Confirmation C13-2378 TetraCDF **	%	94							4068022

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		AJL516							
Sampling Date		2014/11/19 12:40							
COC Number		na				TOXIC EQUIVALENCY		# of	
	Units	AB-25-1COMP (0-1)	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	1.45	0.106	0.200	0.0400	1.00	1.45		4059381
1,2,3,7,8-Penta CDD *	pg/g	14.1	0.142	1.00	0.0400	1.00	14.1		4059381
1,2,3,4,7,8-Hexa CDD *	pg/g	25.9	2.13	1.00	0.0400	0.100	2.59		4059381
1,2,3,6,7,8-Hexa CDD *	pg/g	425	2.23	1.00	0.0400	0.100	42.5		4059381
1,2,3,7,8,9-Hexa CDD *	pg/g	76.1	2.18	1.00	0.0400	0.100	7.61		4059381
1,2,3,4,6,7,8-Hepta CDD *	pg/g	4550 (1)	0.753	5.00	0.0400	0.0100	45.5		4059381
Octa CDD *	pg/g	19700 (1)	2.80	10.0	0.0800	0.000300	5.91		4059381
Total Tetra CDD *	pg/g	69.8	0.106	0.200	0.0400			13	4059381
Total Penta CDD *	pg/g	239	0.142	1.00	0.0400			12	4059381
Total Hexa CDD *	pg/g	1520	2.18	1.00	0.0400			7	4059381
Total Hepta CDD *	pg/g	7390 (1)	0.753	5.00	0.0400			2	4059381
2,3,7,8-Tetra CDF **	pg/g	28.4	0.133	0.200	0.0400	0.100	2.84		4059381
1,2,3,7,8-Penta CDF **	pg/g	12.9	0.142	1.00	0.0400	0.0300	0.387		4059381
2,3,4,7,8-Penta CDF **	pg/g	14.4	0.140	1.00	0.0400	0.300	4.32		4059381
1,2,3,4,7,8-Hexa CDF **	pg/g	62.3	1.29	1.00	0.0400	0.100	6.23		4059381
1,2,3,6,7,8-Hexa CDF **	pg/g	63.8	1.32	1.00	0.0400	0.100	6.38		4059381
2,3,4,6,7,8-Hexa CDF **	pg/g	46.8	1.22	1.00	0.0400	0.100	4.68		4059381
1,2,3,7,8,9-Hexa CDF **	pg/g	2.20	1.27	1.00	0.0400	0.100	0.220		4059381
1,2,3,4,6,7,8-Hepta CDF **	pg/g	1220	0.101	1.00	0.0400	0.0100	12.2		4059381
1,2,3,4,7,8,9-Hepta CDF **	pg/g	44.9	0.101	1.00	0.0400	0.0100	0.449		4059381
Octa CDF **	pg/g	773	0.107	2.00	0.0800	0.000300	0.232		4059381
Total Tetra CDF **	pg/g	301	0.133	0.200	0.0400			16	4059381
Total Penta CDF **	pg/g	809	0.141	1.00	0.0400			14	4059381
Total Hexa CDF **	pg/g	2930	1.28	1.00	0.0400			13	4059381
Total Hepta CDF **	pg/g	3440	0.101	1.00	0.0400			4	4059381
Confirmation 2,3,7,8-Tetra CDF **	pg/g	21.7	0.16	1.0	0.90	0.100	2.17		4068022
TOTAL TOXIC EQUIVALENCY	pg/g						157		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	93							4059381

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 5X Dilution **

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		AJL516							
Sampling Date		2014/11/19 12:40							
COC Number		na				TOXIC EQUIVALENCY		# of	
	Units	AB-25-1COMP (0-1)	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	126 (1)							4059381
C13-1234678 HeptaCDF **	%	91							4059381
C13-123478 HexaCDD *	%	83							4059381
C13-123478 HexaCDF **	%	88							4059381
C13-1234789 HeptaCDF **	%	80							4059381
C13-123678 HexaCDD *	%	97							4059381
C13-123678 HexaCDF **	%	86							4059381
C13-12378 PentaCDD *	%	108							4059381
C13-12378 PentaCDF **	%	100							4059381
C13-123789 HexaCDF **	%	87							4059381
C13-234678 HexaCDF **	%	82							4059381
C13-23478 PentaCDF **	%	115							4059381
C13-2378 TetraCDD *	%	87							4059381
C13-2378 TetraCDF **	%	93							4059381
C13-OCDD *	%	141 (1)							4059381
Confirmation C13-2378 TetraCDF **	%	91							4068022

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 5X Dilution **

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		AJL517							
Sampling Date		2014/11/19 12:30							
COC Number		na				TOXIC EQUIVALENCY		# of	
	Units	AB-25-2COMP (0-1)	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	1.16	0.0785	0.200	0.0400	1.00	1.16		4059381
1,2,3,7,8-Penta CDD *	pg/g	10.2	0.107	1.00	0.0400	1.00	10.2		4059381
1,2,3,4,7,8-Hexa CDD *	pg/g	19.7	0.121	1.00	0.0400	0.100	1.97		4059381
1,2,3,6,7,8-Hexa CDD *	pg/g	288	0.127	1.00	0.0400	0.100	28.8		4059381
1,2,3,7,8,9-Hexa CDD *	pg/g	50.6	0.124	1.00	0.0400	0.100	5.06		4059381
1,2,3,4,6,7,8-Hepta CDD *	pg/g	3470 (1)	0.866	5.00	0.0400	0.0100	34.7		4059381
Octa CDD *	pg/g	14100 (1)	2.66	10.0	0.0800	0.000300	4.23		4059381
Total Tetra CDD *	pg/g	32.3	0.0785	0.200	0.0400			15	4059381
Total Penta CDD *	pg/g	135	0.107	1.00	0.0400			12	4059381
Total Hexa CDD *	pg/g	1070	0.124	1.00	0.0400			7	4059381
Total Hepta CDD *	pg/g	5650 (1)	0.866	5.00	0.0400			2	4059381
2,3,7,8-Tetra CDF **	pg/g	19.1	0.0784	0.200	0.0400	0.100	1.91		4059381
1,2,3,7,8-Penta CDF **	pg/g	9.79	0.129	1.00	0.0400	0.0300	0.294		4059381
2,3,4,7,8-Penta CDF **	pg/g	11.4	0.128	1.00	0.0400	0.300	3.42		4059381
1,2,3,4,7,8-Hexa CDF **	pg/g	48.8	0.795	1.00	0.0400	0.100	4.88		4059381
1,2,3,6,7,8-Hexa CDF **	pg/g	46.9	0.813	1.00	0.0400	0.100	4.69		4059381
2,3,4,6,7,8-Hexa CDF **	pg/g	32.1	0.752	1.00	0.0400	0.100	3.21		4059381
1,2,3,7,8,9-Hexa CDF **	pg/g	1.75	0.782	1.00	0.0400	0.100	0.175		4059381
1,2,3,4,6,7,8-Hepta CDF **	pg/g	1020	0.0843	1.00	0.0400	0.0100	10.2		4059381
1,2,3,4,7,8,9-Hepta CDF **	pg/g	33.7	0.0847	1.00	0.0400	0.0100	0.337		4059381
Octa CDF **	pg/g	676	0.253	2.00	0.0800	0.000300	0.203		4059381
Total Tetra CDF **	pg/g	194	0.0784	0.200	0.0400			16	4059381
Total Penta CDF **	pg/g	519	0.129	1.00	0.0400			14	4059381
Total Hexa CDF **	pg/g	2120	0.785	1.00	0.0400			12	4059381
Total Hepta CDF **	pg/g	2830	0.0845	1.00	0.0400			4	4059381
Confirmation 2,3,7,8-Tetra CDF **	pg/g	14.6	0.096	1.0	0.90	0.100	1.46		4068022
TOTAL TOXIC EQUIVALENCY	pg/g						115		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	98							4059381

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 5X Dilution **

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		AJL517							
Sampling Date		2014/11/19 12:30							
COC Number		na				TOXIC EQUIVALENCY		# of	
	Units	AB-25-2COMP (0-1)	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	128 (1)							4059381
C13-1234678 HeptaCDF **	%	83							4059381
C13-123478 HexaCDD *	%	73							4059381
C13-123478 HexaCDF **	%	79							4059381
C13-1234789 HeptaCDF **	%	74							4059381
C13-123678 HexaCDD *	%	90							4059381
C13-123678 HexaCDF **	%	77							4059381
C13-12378 PentaCDD *	%	110							4059381
C13-12378 PentaCDF **	%	101							4059381
C13-123789 HexaCDF **	%	84							4059381
C13-234678 HexaCDF **	%	76							4059381
C13-23478 PentaCDF **	%	115							4059381
C13-2378 TetraCDD *	%	87							4059381
C13-2378 TetraCDF **	%	90							4059381
C13-OCDD *	%	137 (1)							4059381
Confirmation C13-2378 TetraCDF **	%	85							4068022

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 5X Dilution **

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		AJL518							
Sampling Date		2014/11/19 12:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	Units	AB-25-3COMP (0-1)	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	5.04	0.147	0.200	0.0400	1.00	5.04		4059381
1,2,3,7,8-Penta CDD *	pg/g	39.4	0.113	1.00	0.0400	1.00	39.4		4059381
1,2,3,4,7,8-Hexa CDD *	pg/g	63.5	0.291	1.00	0.0400	0.100	6.35		4059381
1,2,3,6,7,8-Hexa CDD *	pg/g	1260	0.305	1.00	0.0400	0.100	126		4059381
1,2,3,7,8,9-Hexa CDD *	pg/g	189	0.298	1.00	0.0400	0.100	18.9		4059381
1,2,3,4,6,7,8-Hepta CDD *	pg/g	12200 (1)	2.46	10.0	0.0400	0.0100	122		4059381
Octa CDD *	pg/g	39500 (1)	8.43	20.0	0.0800	0.000300	11.9		4059381
Total Tetra CDD *	pg/g	93.3	0.147	0.200	0.0400			15	4059381
Total Penta CDD *	pg/g	520	0.113	1.00	0.0400			12	4059381
Total Hexa CDD *	pg/g	4100	0.298	1.00	0.0400			6	4059381
Total Hepta CDD *	pg/g	19200 (1)	2.46	10.0	0.0400			2	4059381
2,3,7,8-Tetra CDF **	pg/g	76.7	0.133	0.200	0.0400	0.100	7.67		4059381
1,2,3,7,8-Penta CDF **	pg/g	45.0	0.351	1.00	0.0400	0.0300	1.35		4059381
2,3,4,7,8-Penta CDF **	pg/g	52.0	0.346	1.00	0.0400	0.300	15.6		4059381
1,2,3,4,7,8-Hexa CDF **	pg/g	267	4.67	1.00	0.0400	0.100	26.7		4059381
1,2,3,6,7,8-Hexa CDF **	pg/g	173	4.78	1.00	0.0400	0.100	17.3		4059381
2,3,4,6,7,8-Hexa CDF **	pg/g	166	4.42	1.00	0.0400	0.100	16.6		4059381
1,2,3,7,8,9-Hexa CDF **	pg/g	8.15	4.59	1.00	0.0400	0.100	0.815		4059381
1,2,3,4,6,7,8-Hepta CDF **	pg/g	6560 (1)	1.02	10.0	0.0400	0.0100	65.6		4059381
1,2,3,4,7,8,9-Hepta CDF **	pg/g	198 (1)	1.02	10.0	0.0400	0.0100	1.98		4059381
Octa CDF **	pg/g	4790 (1)	1.45	20.0	0.0800	0.000300	1.44		4059381
Total Tetra CDF **	pg/g	545	0.133	0.200	0.0400			16	4059381
Total Penta CDF **	pg/g	2070	0.349	1.00	0.0400			14	4059381
Total Hexa CDF **	pg/g	9600	4.61	1.00	0.0400			12	4059381
Total Hepta CDF **	pg/g	18700 (1)	1.02	10.0	0.0400			4	4059381
Confirmation 2,3,7,8-Tetra CDF **	pg/g	60.6	0.090	1.0	0.90	0.100	6.06		4068022
TOTAL TOXIC EQUIVALENCY	pg/g						483		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	99							4059381

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 10X Dilution **

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		AJL518							
Sampling Date		2014/11/19 12:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	Units	AB-25-3COMP (0-1)	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	116 (1)							4059381
C13-1234678 HeptaCDF **	%	115 (1)							4059381
C13-123478 HexaCDD *	%	98							4059381
C13-123478 HexaCDF **	%	101							4059381
C13-1234789 HeptaCDF **	%	106 (1)							4059381
C13-123678 HexaCDD *	%	117							4059381
C13-123678 HexaCDF **	%	100							4059381
C13-12378 PentaCDD *	%	112							4059381
C13-12378 PentaCDF **	%	105							4059381
C13-123789 HexaCDF **	%	116							4059381
C13-234678 HexaCDF **	%	101							4059381
C13-23478 PentaCDF **	%	119							4059381
C13-2378 TetraCDD *	%	93							4059381
C13-2378 TetraCDF **	%	95							4059381
C13-OCDD *	%	138 (1)							4059381
Confirmation C13-2378 TetraCDF **	%	94							4068022

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		AJL519							
Sampling Date		2014/11/19 11:20							
COC Number		na				TOXIC EQUIVALENCY		# of	
	Units	AB-25-4COMP (0-1)	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	1.27	0.0948	0.200	0.0400	1.00	1.27		4059381
1,2,3,7,8-Penta CDD *	pg/g	9.51	0.136	1.00	0.0400	1.00	9.51		4059381
1,2,3,4,7,8-Hexa CDD *	pg/g	17.0	0.512	1.00	0.0400	0.100	1.70		4059381
1,2,3,6,7,8-Hexa CDD *	pg/g	254	0.536	1.00	0.0400	0.100	25.4		4059381
1,2,3,7,8,9-Hexa CDD *	pg/g	53.9	0.523	1.00	0.0400	0.100	5.39		4059381
1,2,3,4,6,7,8-Hepta CDD *	pg/g	2610 (1)	3.42	5.00	0.0400	0.0100	26.1		4059381
Octa CDD *	pg/g	13000 (1)	5.01	10.0	0.0800	0.000300	3.90		4059381
Total Tetra CDD *	pg/g	25.2	0.0948	0.200	0.0400			14	4059381
Total Penta CDD *	pg/g	120	0.136	1.00	0.0400			12	4059381
Total Hexa CDD *	pg/g	920	0.525	1.00	0.0400			7	4059381
Total Hepta CDD *	pg/g	4370 (1)	3.42	5.00	0.0400			2	4059381
2,3,7,8-Tetra CDF **	pg/g	15.8	0.0982	0.200	0.0400	0.100	1.58		4059381
1,2,3,7,8-Penta CDF **	pg/g	7.76	0.0845	1.00	0.0400	0.0300	0.233		4059381
2,3,4,7,8-Penta CDF **	pg/g	8.70	0.0834	1.00	0.0400	0.300	2.61		4059381
1,2,3,4,7,8-Hexa CDF **	pg/g	39.0	0.528	1.00	0.0400	0.100	3.90		4059381
1,2,3,6,7,8-Hexa CDF **	pg/g	35.7	0.540	1.00	0.0400	0.100	3.57		4059381
2,3,4,6,7,8-Hexa CDF **	pg/g	26.6	0.499	1.00	0.0400	0.100	2.66		4059381
1,2,3,7,8,9-Hexa CDF **	pg/g	1.50	0.519	1.00	0.0400	0.100	0.150		4059381
1,2,3,4,6,7,8-Hepta CDF **	pg/g	805	0.195	1.00	0.0400	0.0100	8.05		4059381
1,2,3,4,7,8,9-Hepta CDF **	pg/g	27.1	0.196	1.00	0.0400	0.0100	0.271		4059381
Octa CDF **	pg/g	658	0.143	2.00	0.0800	0.000300	0.197		4059381
Total Tetra CDF **	pg/g	144	0.0982	0.200	0.0400			16	4059381
Total Penta CDF **	pg/g	377	0.0839	1.00	0.0400			14	4059381
Total Hexa CDF **	pg/g	1640	0.521	1.00	0.0400			13	4059381
Total Hepta CDF **	pg/g	2180	0.195	1.00	0.0400			4	4059381
Confirmation 2,3,7,8-Tetra CDF **	pg/g	12.6	0.16	1.0	0.90	0.100	1.26		4068022
TOTAL TOXIC EQUIVALENCY	pg/g						96.2		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	98							4059381

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		AJL519							
Sampling Date		2014/11/19 11:20							
COC Number		na				TOXIC EQUIVALENCY		# of	
	Units	AB-25-4COMP (0-1)	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	120 (1)							4059381
C13-1234678 HeptaCDF **	%	105							4059381
C13-123478 HexaCDD *	%	87							4059381
C13-123478 HexaCDF **	%	93							4059381
C13-1234789 HeptaCDF **	%	97							4059381
C13-123678 HexaCDD *	%	107							4059381
C13-123678 HexaCDF **	%	92							4059381
C13-12378 PentaCDD *	%	114							4059381
C13-12378 PentaCDF **	%	104							4059381
C13-123789 HexaCDF **	%	98							4059381
C13-234678 HexaCDF **	%	91							4059381
C13-23478 PentaCDF **	%	119							4059381
C13-2378 TetraCDD *	%	92							4059381
C13-2378 TetraCDF **	%	96							4059381
C13-OCDD *	%	135 (1)							4059381
Confirmation C13-2378 TetraCDF **	%	92							4068022

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 5X Dilution **

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

TEST SUMMARY

Maxxam ID: AJL515
Sample ID: AB-25-0COMP (0-1)
Matrix: Soil

Collected: 2014/11/20
Shipped:
Received: 2015/06/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4059381	2015/06/06	2015/06/10	Owen Cosby
2378TCDF Confirmation in Soil	HRMS/MS	4068022	N/A	2015/06/16	Vica Cioranic

Maxxam ID: AJL516
Sample ID: AB-25-1COMP (0-1)
Matrix: Soil

Collected: 2014/11/19
Shipped:
Received: 2015/06/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4059381	2015/06/06	2015/06/10	Owen Cosby
2378TCDF Confirmation in Soil	HRMS/MS	4068022	N/A	2015/06/16	Vica Cioranic

Maxxam ID: AJL517
Sample ID: AB-25-2COMP (0-1)
Matrix: Soil

Collected: 2014/11/19
Shipped:
Received: 2015/06/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4059381	2015/06/06	2015/06/10	Owen Cosby
2378TCDF Confirmation in Soil	HRMS/MS	4068022	N/A	2015/06/16	Vica Cioranic

Maxxam ID: AJL518
Sample ID: AB-25-3COMP (0-1)
Matrix: Soil

Collected: 2014/11/19
Shipped:
Received: 2015/06/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4059381	2015/06/06	2015/06/10	Owen Cosby
2378TCDF Confirmation in Soil	HRMS/MS	4068022	N/A	2015/06/16	Vica Cioranic

Maxxam ID: AJL519
Sample ID: AB-25-4COMP (0-1)
Matrix: Soil

Collected: 2014/11/19
Shipped:
Received: 2015/06/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4059381	2015/06/06	2015/06/10	Owen Cosby
2378TCDF Confirmation in Soil	HRMS/MS	4068022	N/A	2015/06/16	Vica Cioranic

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.9°C

Results relate only to the items tested.

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	Units	QC Limits
4059381	OBC	Spiked Blank	37CL4 2378 Tetra CDD	2015/06/10		105	%	35 - 197
			C13-1234678 HeptaCDD	2015/06/10		96	%	23 - 140
			C13-1234678 HeptaCDF	2015/06/10		106	%	28 - 143
			C13-123478 HexaCDD	2015/06/10		89	%	32 - 141
			C13-123478 HexaCDF	2015/06/10		93	%	26 - 152
			C13-1234789 HeptaCDF	2015/06/10		97	%	26 - 138
			C13-123678 HexaCDD	2015/06/10		106	%	28 - 130
			C13-123678 HexaCDF	2015/06/10		96	%	26 - 123
			C13-12378 PentaCDD	2015/06/10		104	%	25 - 181
			C13-12378 PentaCDF	2015/06/10		99	%	24 - 185
			C13-123789 HexaCDF	2015/06/10		99	%	29 - 147
			C13-234678 HexaCDF	2015/06/10		94	%	28 - 136
			C13-23478 PentaCDF	2015/06/10		112	%	21 - 178
			C13-2378 TetraCDD	2015/06/10		91	%	25 - 164
			C13-2378 TetraCDF	2015/06/10		92	%	24 - 169
			C13-OCDD	2015/06/10		97	%	17 - 157
			2,3,7,8-Tetra CDD	2015/06/10		118	%	67 - 158
			1,2,3,7,8-Penta CDD	2015/06/10		118	%	25 - 181
			1,2,3,4,7,8-Hexa CDD	2015/06/10		115	%	70 - 164
			1,2,3,6,7,8-Hexa CDD	2015/06/10		127	%	76 - 134
			1,2,3,7,8,9-Hexa CDD	2015/06/10		106	%	64 - 162
			1,2,3,4,6,7,8-Hepta CDD	2015/06/10		107	%	70 - 140
			Octa CDD	2015/06/10		115	%	78 - 144
			2,3,7,8-Tetra CDF	2015/06/10		122	%	75 - 158
			1,2,3,7,8-Penta CDF	2015/06/10		119	%	80 - 134
			2,3,4,7,8-Penta CDF	2015/06/10		116	%	68 - 160
			1,2,3,4,7,8-Hexa CDF	2015/06/10		117	%	72 - 134
			1,2,3,6,7,8-Hexa CDF	2015/06/10		118	%	84 - 130
			2,3,4,6,7,8-Hexa CDF	2015/06/10		110	%	70 - 156
			1,2,3,7,8,9-Hexa CDF	2015/06/10		101	%	78 - 130
			1,2,3,4,6,7,8-Hepta CDF	2015/06/10		101	%	82 - 122
			1,2,3,4,7,8,9-Hepta CDF	2015/06/10		122	%	78 - 138
			Octa CDF	2015/06/10		109	%	63 - 170
4059381	OBC	Method Blank	37CL4 2378 Tetra CDD	2015/06/10		103	%	35 - 197
			C13-1234678 HeptaCDD	2015/06/10		95	%	23 - 140
			C13-1234678 HeptaCDF	2015/06/10		94	%	28 - 143
			C13-123478 HexaCDD	2015/06/10		88	%	32 - 141
			C13-123478 HexaCDF	2015/06/10		95	%	26 - 152
			C13-1234789 HeptaCDF	2015/06/10		84	%	26 - 138
			C13-123678 HexaCDD	2015/06/10		103	%	28 - 130
			C13-123678 HexaCDF	2015/06/10		93	%	26 - 123
			C13-12378 PentaCDD	2015/06/10		102	%	25 - 181
			C13-12378 PentaCDF	2015/06/10		98	%	24 - 185
			C13-123789 HexaCDF	2015/06/10		95	%	29 - 147
			C13-234678 HexaCDF	2015/06/10		91	%	28 - 136
			C13-23478 PentaCDF	2015/06/10		109	%	21 - 178
			C13-2378 TetraCDD	2015/06/10		89	%	25 - 164
			C13-2378 TetraCDF	2015/06/10		93	%	24 - 169
			C13-OCDD	2015/06/10		96	%	17 - 157
			2,3,7,8-Tetra CDD	2015/06/10	<0.0623, EDL=0.0623		pg/g	
			1,2,3,7,8-Penta CDD	2015/06/10	<0.117, EDL=0.117		pg/g	

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	Units	QC Limits
			1,2,3,4,7,8-Hexa CDD	2015/06/10	<0.0861, EDL=0.0861		pg/g	
			1,2,3,6,7,8-Hexa CDD	2015/06/10	<0.0901, EDL=0.0901		pg/g	
			1,2,3,7,8,9-Hexa CDD	2015/06/10	<0.0880, EDL=0.0880		pg/g	
			1,2,3,4,6,7,8-Hepta CDD	2015/06/10	0.0961, EDL=0.0854		pg/g	
			Octa CDD	2015/06/10	<0.233, EDL=0.233 (1)		pg/g	
			Total Tetra CDD	2015/06/10	<0.0623, EDL=0.0623		pg/g	
			Total Penta CDD	2015/06/10	<0.117, EDL=0.117		pg/g	
			Total Hexa CDD	2015/06/10	<0.125, EDL=0.125 (1)		pg/g	
			Total Hepta CDD	2015/06/10	0.0961, EDL=0.0854		pg/g	
			2,3,7,8-Tetra CDF	2015/06/10	<0.0738, EDL=0.0738		pg/g	
			1,2,3,7,8-Penta CDF	2015/06/10	<0.0754, EDL=0.0754		pg/g	
			2,3,4,7,8-Penta CDF	2015/06/10	<0.0745, EDL=0.0745		pg/g	
			1,2,3,4,7,8-Hexa CDF	2015/06/10	<0.0734, EDL=0.0734		pg/g	
			1,2,3,6,7,8-Hexa CDF	2015/06/10	<0.0751, EDL=0.0751		pg/g	
			2,3,4,6,7,8-Hexa CDF	2015/06/10	<0.0694, EDL=0.0694		pg/g	
			1,2,3,7,8,9-Hexa CDF	2015/06/10	<0.0722, EDL=0.0722		pg/g	
			1,2,3,4,6,7,8-Hepta CDF	2015/06/10	<0.0622, EDL=0.0622		pg/g	
			1,2,3,4,7,8,9-Hepta CDF	2015/06/10	<0.0624, EDL=0.0624		pg/g	
			Octa CDF	2015/06/10	<0.122, EDL=0.122		pg/g	
			Total Tetra CDF	2015/06/10	<0.0738, EDL=0.0738		pg/g	
			Total Penta CDF	2015/06/10	<0.0749, EDL=0.0749		pg/g	
			Total Hexa CDF	2015/06/10	<0.0724, EDL=0.0724		pg/g	
			Total Hepta CDF	2015/06/10	<0.0623, EDL=0.0623		pg/g	
4059381	OBC	RPD - Sample/Sample Dup	2,3,7,8-Tetra CDD	2015/06/11	NC		%	25
			1,2,3,7,8-Penta CDD	2015/06/11	NC		%	25
			1,2,3,4,7,8-Hexa CDD	2015/06/11	NC		%	25
			1,2,3,6,7,8-Hexa CDD	2015/06/11	1.7		%	25
			1,2,3,7,8,9-Hexa CDD	2015/06/11	4.4		%	25

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Maxxam Job #: B5A4215
Report Date: 2015/06/18

Apex Laboratories
Client Project #: A4K0572

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	Units	QC Limits
			1,2,3,4,6,7,8-Hepta CDD	2015/06/11	1.2		%	25
			Octa CDD	2015/06/11	1.4		%	25
			Total Tetra CDD	2015/06/11	34 (2)		%	25
			Total Penta CDD	2015/06/11	20		%	25
			Total Hexa CDD	2015/06/11	3.4		%	25
			Total Hepta CDD	2015/06/11	1.9		%	25
			2,3,7,8-Tetra CDF	2015/06/11	2.2		%	25
			1,2,3,7,8-Penta CDF	2015/06/11	NC		%	25
			2,3,4,7,8-Penta CDF	2015/06/11	NC		%	25
			1,2,3,4,7,8-Hexa CDF	2015/06/11	2.8		%	25
			1,2,3,6,7,8-Hexa CDF	2015/06/11	NC		%	25
			2,3,4,6,7,8-Hexa CDF	2015/06/11	NC		%	25
			1,2,3,7,8,9-Hexa CDF	2015/06/11	NC		%	25
			1,2,3,4,6,7,8-Hepta CDF	2015/06/11	7.4		%	25
			1,2,3,4,7,8,9-Hepta CDF	2015/06/11	NC		%	25
			Octa CDF	2015/06/11	3.9		%	25
			Total Tetra CDF	2015/06/11	24		%	25
			Total Penta CDF	2015/06/11	29 (2)		%	25
			Total Hexa CDF	2015/06/11	18		%	25
			Total Hepta CDF	2015/06/11	7.6		%	25
4068022	VCI	Method Blank	Confirmation 2,3,7,8-Tetra CDF	2015/06/16	<0.097, EDL=0.097		pg/g	
			Confirmation C13-2378 TetraCDF	2015/06/16		91	%	40 - 135
4068022	VCI	RPD - Sample/Sample Dup	Confirmation 2,3,7,8-Tetra CDF	2015/06/16	NC		%	100

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

(2) Duplicate results exceeded RPD acceptance criteria. This may be due to sample heterogeneity.

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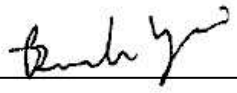
Maxxam Job #: B5A4215
Report Date: 2015/06/18

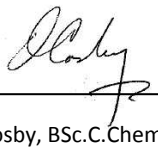
Apex Laboratories
Client Project #: A4K0572

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Branko Vrzic, A.SC.T., Senior Analyst, HRMS Services



Owen Cosby, BSc.C.Chem, Supervisor, HRMS Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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503-718-0333 Fax

Tuesday, December 15, 2015

Paul Ecker
EES Environmental Inc
240 N Broadway Ste 203
Portland, OR 97227

RE: Floragon / 1177-01

Enclosed are the results of analyses for work order A5J0568, which was received by the laboratory on 10/16/2015 at 1:20:00PM.

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: pnerenberg@apex-labs.com, or by phone at 503-718-2323.

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SED-200 (0-1)	A5J0568-06	Sediment	10/15/15 12:10	10/16/15 13:20
SED-201 (0-1)	A5J0568-13	Sediment	10/15/15 14:10	10/16/15 13:20
SED-201 (1-2)	A5J0568-14	Sediment	10/15/15 14:20	10/16/15 13:20
SED-202 (0-1)	A5J0568-18	Sediment	10/15/15 15:41	10/16/15 13:20
SED-203 (0-1)	A5J0568-24	Sediment	10/16/15 08:51	10/16/15 13:20
SED-203 (1-2)	A5J0568-25	Sediment	10/16/15 08:52	10/16/15 13:20
SED-204 (0-1)	A5J0568-31	Sediment	10/16/15 09:51	10/16/15 13:20
SED-204 (1-2)	A5J0568-32	Sediment	10/16/15 09:52	10/16/15 13:20
SED-205 (0-1)	A5J0568-36	Sediment	10/16/15 11:21	10/16/15 13:20
SED-200ABC (0-1) COMP	A5J0568-37	Sediment	10/15/15 11:30	10/16/15 13:20
SED-200AC (1-2) COMP	A5J0568-38	Sediment	10/15/15 11:40	10/16/15 13:20
SED-201ABC (0-1) COMP	A5J0568-39	Sediment	10/15/15 13:10	10/16/15 13:20
SED-201ABC (1-2) COMP	A5J0568-40	Sediment	10/15/15 13:20	10/16/15 13:20
SED-202ABC (0-1) COMP	A5J0568-41	Sediment	10/15/15 15:15	10/16/15 13:20
SED-203ABC (0-1) COMP	A5J0568-42	Sediment	10/16/15 08:00	10/16/15 13:20
SED-203AC (1-2) COMP	A5J0568-43	Sediment	10/16/15 08:10	10/16/15 13:20
SED-204ABC (0-1) COMP	A5J0568-44	Sediment	10/16/15 09:00	10/16/15 13:20
SED-204AC (1-2) COMP	A5J0568-45	Sediment	10/16/15 09:10	10/16/15 13:20
SED-205ABC (0-1) COMP	A5J0568-46	Sediment	10/16/15 10:30	10/16/15 13:20

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-200ABC (0-1) COMP (A5J0568-37)			**Matrix: Sediment**					
Batch: 5110013								
Arsenic	ND	---	1.32	mg/kg dry	5	11/03/15 20:43	EPA 6020A	
Barium	**208**	---	0.658	"	"	"	"	
Cadmium	ND	---	1.32	"	"	"	"	
Chromium	**25.0**	---	1.32	"	"	"	"	
Lead	**3.69**	---	0.658	"	"	"	"	
Selenium	ND	---	2.63	"	"	"	"	
Silver	ND	---	0.658	"	"	"	"	
SED-200ABC (0-1) COMP (A5J0568-37RE1)			**Matrix: Sediment**					
Batch: 5110013								
Mercury	ND	---	0.0527	mg/kg dry	5	11/04/15 14:16	EPA 6020A	
SED-201ABC (0-1) COMP (A5J0568-39)			**Matrix: Sediment**					
Batch: 5110013								
Arsenic	**1.84**	---	1.69	mg/kg dry	5	11/03/15 20:46	EPA 6020A	
Barium	**122**	---	0.846	"	"	"	"	
Cadmium	ND	---	1.69	"	"	"	"	
Chromium	**23.1**	---	1.69	"	"	"	"	
Lead	**7.85**	---	0.846	"	"	"	"	
Selenium	ND	---	3.38	"	"	"	"	
Silver	ND	---	0.846	"	"	"	"	
SED-201ABC (0-1) COMP (A5J0568-39RE1)			**Matrix: Sediment**					
Batch: 5110013								
Mercury	**0.0710**	---	0.0677	mg/kg dry	5	11/04/15 14:19	EPA 6020A	
SED-203ABC (0-1) COMP (A5J0568-42)			**Matrix: Sediment**					
Batch: 5110013								
Arsenic	ND	---	1.63	mg/kg dry	5	11/03/15 20:49	EPA 6020A	
Barium	**150**	---	0.814	"	"	"	"	
Cadmium	ND	---	1.63	"	"	"	"	
Chromium	**20.5**	---	1.63	"	"	"	"	
Lead	**5.96**	---	0.814	"	"	"	"	
Selenium	ND	---	3.26	"	"	"	"	
Silver	ND	---	0.814	"	"	"	"	
SED-203ABC (0-1) COMP (A5J0568-42RE1)			**Matrix: Sediment**					
Batch: 5110013								
Mercury	**0.102**	---	0.0651	mg/kg dry	5	11/04/15 14:22	EPA 6020A	

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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.

Philip Nerenberg

Philip Nerenberg, Lab Director

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-205ABC (0-1) COMP (A5J0568-46)			**Matrix: Sediment**					
Batch: 5110013								
Arsenic	**2.24**	---	1.62	mg/kg dry	5	11/03/15 20:52	EPA 6020A	
Barium	**187**	---	0.812	"	"	"	"	
Cadmium	ND	---	1.62	"	"	"	"	
Chromium	**30.6**	---	1.62	"	"	"	"	
Lead	**8.29**	---	0.812	"	"	"	"	
Selenium	ND	---	3.25	"	"	"	"	
Silver	ND	---	0.812	"	"	"	"	
SED-205ABC (0-1) COMP (A5J0568-46RE1)			**Matrix: Sediment**					
Batch: 5110013								
Mercury	**0.0970**	---	0.0650	mg/kg dry	5	11/04/15 14:25	EPA 6020A	

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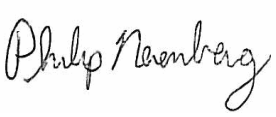

Philip Nerenberg, Lab Director

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

TCLP Extraction by EPA 1311

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-200ABC (0-1) COMP (A5J0568-37)			**Matrix: Sediment**		**Batch: 5110016**			
TCLP Extraction	PREP	---		N/A	1	11/02/15 16:09	EPA 1311	
SED-201ABC (0-1) COMP (A5J0568-39)			**Matrix: Sediment**		**Batch: 5110016**			
TCLP Extraction	PREP	---		N/A	1	11/02/15 16:09	EPA 1311	
SED-203ABC (0-1) COMP (A5J0568-42)			**Matrix: Sediment**		**Batch: 5110016**			
TCLP Extraction	PREP	---		N/A	1	11/02/15 16:09	EPA 1311	
SED-205ABC (0-1) COMP (A5J0568-46)			**Matrix: Sediment**		**Batch: 5110016**			
TCLP Extraction	PREP	---		N/A	1	11/02/15 16:09	EPA 1311	

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Philip Nerenberg

Philip Nerenberg, Lab Director

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

TCLP Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-200ABC (0-1) COMP (A5J0568-37)			**Matrix: Sediment**					
Batch: 5110062								
Arsenic	ND	---	0.100	mg/L	5	11/03/15 15:57	1311/6020A	TCLPa
Barium	**1.73**	---	0.500	"	"	"	"	TCLPa
Cadmium	ND	---	0.0500	"	"	"	"	TCLPa
Chromium	ND	---	0.100	"	"	"	"	TCLPa
Lead	ND	---	0.0500	"	"	"	"	TCLPa
Mercury	ND	---	0.00400	"	"	"	"	TCLPa
Selenium	ND	---	0.100	"	"	"	"	TCLPa
Silver	ND	---	0.0500	"	"	"	"	TCLPa
SED-201ABC (0-1) COMP (A5J0568-39)			**Matrix: Sediment**					
Batch: 5110062								
Arsenic	ND	---	0.100	mg/L	5	11/03/15 16:00	1311/6020A	TCLPa
Barium	**1.02**	---	0.500	"	"	"	"	TCLPa
Cadmium	ND	---	0.0500	"	"	"	"	TCLPa
Chromium	ND	---	0.100	"	"	"	"	TCLPa
Lead	ND	---	0.0500	"	"	"	"	TCLPa
Mercury	ND	---	0.00400	"	"	"	"	TCLPa
Selenium	ND	---	0.100	"	"	"	"	TCLPa
Silver	ND	---	0.0500	"	"	"	"	TCLPa
SED-203ABC (0-1) COMP (A5J0568-42)			**Matrix: Sediment**					
Batch: 5110062								
Arsenic	ND	---	0.100	mg/L	5	11/03/15 16:12	1311/6020A	TCLPa
Barium	**1.50**	---	0.500	"	"	"	"	TCLPa
Cadmium	ND	---	0.0500	"	"	"	"	TCLPa
Chromium	ND	---	0.100	"	"	"	"	TCLPa
Lead	ND	---	0.0500	"	"	"	"	TCLPa
Mercury	ND	---	0.00400	"	"	"	"	TCLPa
Selenium	ND	---	0.100	"	"	"	"	TCLPa
Silver	ND	---	0.0500	"	"	"	"	TCLPa
SED-205ABC (0-1) COMP (A5J0568-46)			**Matrix: Sediment**					
Batch: 5110062								
Arsenic	ND	---	0.100	mg/L	5	11/03/15 16:15	1311/6020A	TCLPa
Barium	**1.65**	---	0.500	"	"	"	"	TCLPa
Cadmium	ND	---	0.0500	"	"	"	"	TCLPa
Chromium	ND	---	0.100	"	"	"	"	TCLPa
Lead	ND	---	0.0500	"	"	"	"	TCLPa

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

TCLP Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-205ABC (0-1) COMP (A5J0568-46)			**Matrix: Sediment**					
Mercury	ND	---	0.00400	mg/L	5	"	1311/6020A	TCLPa
Selenium	ND	---	0.100	"	"	"	"	TCLPa
Silver	ND	---	0.0500	"	"	"	"	TCLPa

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Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-200ABC (0-1) COMP (A5J0568-37)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**2600**	---	200	mg/kg	1	10/29/15 14:15	PSEP/SM 5310B MOD	
SED-200AC (1-2) COMP (A5J0568-38)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**2100**	---	200	mg/kg	1	10/29/15 14:15	PSEP/SM 5310B MOD	
SED-201ABC (0-1) COMP (A5J0568-39)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**15000**	---	200	mg/kg	1	10/29/15 14:15	PSEP/SM 5310B MOD	
SED-201ABC (1-2) COMP (A5J0568-40)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**5400**	---	200	mg/kg	1	10/29/15 14:15	PSEP/SM 5310B MOD	
SED-202ABC (0-1) COMP (A5J0568-41)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**6000**	---	200	mg/kg	1	10/29/15 14:15	PSEP/SM 5310B MOD	
SED-203ABC (0-1) COMP (A5J0568-42)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**6500**	---	200	mg/kg	1	10/29/15 14:15	PSEP/SM 5310B MOD	
SED-203AC (1-2) COMP (A5J0568-43)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**2000**	---	200	mg/kg	1	10/29/15 14:15	PSEP/SM 5310B MOD	
SED-204ABC (0-1) COMP (A5J0568-44)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**8800**	---	200	mg/kg	1	10/30/15 15:10	PSEP/SM 5310B MOD	
SED-204AC (1-2) COMP (A5J0568-45)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**9400**	---	200	mg/kg	1	10/30/15 15:10	PSEP/SM 5310B MOD	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-205ABC (0-1) COMP (A5J0568-46)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**7600**	---	200	mg/kg	1	10/30/15 15:10	PSEP/SM 5310B MOD	

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Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-200 (0-1) (A5J0568-06)			**Matrix: Sediment**	**Batch: 5110267**				GS-01, X
Gravel (>2.00mm)	**86.9**	---		% of Total	1	11/10/15 18:29	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**82.0**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**4.85**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**7.33**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**2.55**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**2.15**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**1.13**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**0.71**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**0.36**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**0.32**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.11**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**5.40**	---		"	"	"	"	
Clay (< 0.005 mm)	**0.40**	---		"	"	"	"	
SED-201 (0-1) (A5J0568-13)			**Matrix: Sediment**	**Batch: 5110267**				GS-01
Gravel (>2.00mm)	**65.6**	---		% of Total	1	11/10/15 18:29	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**46.2**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**19.4**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**20.7**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**7.44**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**5.39**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**3.41**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**2.52**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**1.03**	---		"	"	"	"	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-201 (0-1) (A5J0568-13)			**Matrix: Sediment**	**Batch: 5110267**				GS-01
Percent Retained 0.075 mm sieve (#200)	**0.72**	---		% of Total	1	"	ASTM D 422m	
Percent Retained 0.063 mm sieve (#230)	**0.20**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**11.0**	---		"	"	"	"	
Clay (< 0.005 mm)	**2.80**	---		"	"	"	"	
SED-201 (1-2) (A5J0568-14)			**Matrix: Sediment**	**Batch: 5110267**				GS-01
Gravel (>2.00mm)	**44.8**	---		% of Total	1	11/10/15 18:29	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**33.5**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**11.3**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**30.4**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**8.39**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**7.98**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**5.85**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**4.41**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**1.91**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**1.41**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.45**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**18.5**	---		"	"	"	"	
Clay (< 0.005 mm)	**6.40**	---		"	"	"	"	
SED-202 (0-1) (A5J0568-18)			**Matrix: Sediment**	**Batch: 5110267**				GS-01
Gravel (>2.00mm)	**24.2**	---		% of Total	1	11/10/15 18:29	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**19.0**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**5.14**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**24.1**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**4.53**	---		"	"	"	"	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-202 (0-1) (A5J0568-18)			**Matrix: Sediment**	**Batch: 5110267**				GS-01
Percent Retained 0.425 mm sieve (#40)	**4.10**	---		% of Total	1	"	ASTM D 422m	
Percent Retained 0.250 mm sieve (#60)	**4.25**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**4.69**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**2.86**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**2.70**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**1.00**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**28.9**	---		"	"	"	"	
Clay (< 0.005 mm)	**22.8**	---		"	"	"	"	
SED-203 (0-1) (A5J0568-24)			**Matrix: Sediment**	**Batch: 5110267**				GS-01
Gravel (>2.00mm)	**63.0**	---		% of Total	1	11/10/15 18:29	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**51.8**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**11.2**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**18.4**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**5.36**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**4.31**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**3.32**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**2.70**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**1.30**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**1.02**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.35**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**14.3**	---		"	"	"	"	
Clay (< 0.005 mm)	**4.30**	---		"	"	"	"	
SED-203 (1-2) (A5J0568-25)			**Matrix: Sediment**	**Batch: 5110267**				GS-01
Gravel (>2.00mm)	**46.7**	---		% of Total	1	11/10/15 18:29	ASTM D 422m	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-203 (1-2) (A5J0568-25)			**Matrix: Sediment**	**Batch: 5110267**				GS-01
Percent Retained 4.75 mm sieve (#4)	**34.0**	---		% of Total	1	"	ASTM D 422m	
Percent Retained 2.00 mm sieve (#10)	**12.6**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**20.7**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**4.83**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**4.41**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**4.16**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**3.68**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**1.76**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**1.43**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.45**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**22.4**	---		"	"	"	"	
Clay (< 0.005 mm)	**10.2**	---		"	"	"	"	
SED-204 (0-1) (A5J0568-31)			**Matrix: Sediment**	**Batch: 5110267**				GS-01
Gravel (>2.00mm)	**63.8**	---		% of Total	1	11/10/15 18:29	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**55.7**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**8.09**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**11.3**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**2.07**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**2.08**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**2.06**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**2.33**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**1.27**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**1.08**	---		"	"	"	"	

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240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-204 (0-1) (A5J0568-31)			**Matrix: Sediment**		**Batch: 5110267**			GS-01
Percent Retained 0.063 mm sieve (#230)	**0.36**	---		% of Total	1	"	ASTM D 422m	
Silt (0.005mm < 0.063mm)	**19.7**	---		"	"	"	"	
Clay (< 0.005 mm)	**5.20**	---		"	"	"	"	
SED-204 (1-2) (A5J0568-32)			**Matrix: Sediment**		**Batch: 5110267**			GS-01
Gravel (>2.00mm)	**64.6**	---		% of Total	1	11/10/15 18:29	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**56.7**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**7.85**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**15.7**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**3.94**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**3.33**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**2.98**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**2.48**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**1.35**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**1.20**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.40**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**15.7**	---		"	"	"	"	
Clay (< 0.005 mm)	**4.00**	---		"	"	"	"	
SED-205 (0-1) (A5J0568-36)			**Matrix: Sediment**		**Batch: 5110267**			GS-01
Gravel (>2.00mm)	**62.2**	---		% of Total	1	11/10/15 18:29	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**47.2**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**15.0**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**15.1**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**3.59**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**3.31**	---		"	"	"	"	

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240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-205 (0-1) (A5J0568-36)			**Matrix: Sediment**	**Batch: 5110267**				GS-01
Percent Retained 0.250 mm sieve (#60)	**3.02**	---		% of Total	1	"	ASTM D 422m	
Percent Retained 0.150 mm sieve (#100)	**2.67**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**1.22**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**0.93**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.31**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**17.8**	---		"	"	"	"	
Clay (< 0.005 mm)	**5.00**	---		"	"	"	"	

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240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-200ABC (0-1) COMP (A5J0568-37)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**74.0**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-200AC (1-2) COMP (A5J0568-38)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**71.0**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-201ABC (0-1) COMP (A5J0568-39)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**57.3**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-201ABC (1-2) COMP (A5J0568-40)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**67.1**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-202ABC (0-1) COMP (A5J0568-41)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**67.6**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-203ABC (0-1) COMP (A5J0568-42)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**60.9**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-203AC (1-2) COMP (A5J0568-43)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**66.6**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-204ABC (0-1) COMP (A5J0568-44)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**58.5**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-204AC (1-2) COMP (A5J0568-45)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**65.8**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-205ABC (0-1) COMP (A5J0568-46)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**59.4**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

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 5110013 - EPA 3051A							**Sediment**					
Blank (5110013-BLK1)					Prepared: 11/02/15 09:24		Analyzed: 11/03/15 20:37					
EPA 6020A												
Arsenic	ND	---	1.00	mg/kg wet	5	---	---	---	---	---	---	
Barium	ND	---	0.500	"	"	---	---	---	---	---	---	
Cadmium	ND	---	1.00	"	"	---	---	---	---	---	---	
Chromium	ND	---	1.00	"	"	---	---	---	---	---	---	
Lead	ND	---	0.500	"	"	---	---	---	---	---	---	
Selenium	ND	---	2.00	"	"	---	---	---	---	---	---	
Silver	ND	---	0.500	"	"	---	---	---	---	---	---	
Blank (5110013-BLK2)					Prepared: 11/02/15 09:24		Analyzed: 11/04/15 14:13					
EPA 6020A												
Mercury	ND	---	0.0400	mg/kg wet	5	---	---	---	---	---	---	Q-16
LCS (5110013-BS1)					Prepared: 11/02/15 09:24		Analyzed: 11/03/15 20:40					
EPA 6020A												
Arsenic	24.8	---	1.00	mg/kg wet	5	25.0	---	99	80-120%	---	---	
Barium	25.3	---	0.500	"	"	"	---	101	"	---	---	
Cadmium	25.0	---	1.00	"	"	"	---	100	"	---	---	
Chromium	24.3	---	1.00	"	"	"	---	97	"	---	---	
Lead	25.6	---	0.500	"	"	"	---	102	"	---	---	
Mercury	0.588	---	0.0400	"	"	0.500	---	118	"	---	---	Q-41
Selenium	12.8	---	2.00	"	"	12.5	---	103	"	---	---	
Silver	12.5	---	0.500	"	"	"	---	100	"	---	---	
Duplicate (5110013-DUP1)					Prepared: 11/02/15 09:24		Analyzed: 11/03/15 20:55					
QC Source Sample: SED-205ABC (0-1) COMP (A5J0568-46)												
EPA 6020A												
Arsenic	**2.64**	---	1.68	mg/kg dry	5	---	2.24	---	---	16	40%	
Barium	**199**	---	0.840	"	"	---	187	---	---	7	40%	
Cadmium	ND	---	1.68	"	"	---	ND	---	---	---	40%	
Chromium	**29.5**	---	1.68	"	"	---	30.6	---	---	4	40%	
Lead	**8.06**	---	0.840	"	"	---	8.29	---	---	3	40%	
Selenium	ND	---	3.36	"	"	---	ND	---	---	---	40%	
Silver	ND	---	0.840	"	"	---	ND	---	---	---	40%	
Duplicate (5110013-DUP2)					Prepared: 11/02/15 09:24		Analyzed: 11/04/15 16:05					

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

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 5110013 - EPA 3051A									**Sediment**			
Duplicate (5110013-DUP2)					Prepared: 11/02/15 09:24		Analyzed: 11/04/15 16:05					
QC Source Sample: SED-205ABC (0-1) COMP (A5J0568-46RE1)												
EPA 6020A												
Mercury	**0.0948**	---	0.0672	mg/kg dry	5	---	0.0970	---	---	2	40%	Q-16
Matrix Spike (5110013-MS1)					Prepared: 11/02/15 09:24		Analyzed: 11/03/15 20:58					
QC Source Sample: SED-205ABC (0-1) COMP (A5J0568-46)												
EPA 6020A												
Arsenic	42.8	---	1.65	mg/kg dry	5	41.4	2.24	98	75-125%	---	---	
Barium	222	---	0.827	"	"	"	187	85	"	---	---	
Cadmium	42.1	---	1.65	"	"	"	ND	102	"	---	---	
Chromium	79.1	---	1.65	"	"	"	30.6	117	"	---	---	
Lead	48.8	---	0.827	"	"	"	8.29	98	"	---	---	
Selenium	21.2	---	3.31	"	"	20.6	ND	103	"	---	---	
Silver	20.9	---	0.827	"	"	"	ND	101	"	---	---	
Matrix Spike (5110013-MS2)					Prepared: 11/02/15 09:24		Analyzed: 11/04/15 16:08					
QC Source Sample: SED-205ABC (0-1) COMP (A5J0568-46RE1)												
EPA 6020A												
Mercury	0.931	---	0.0661	mg/kg dry	5	0.827	0.0970	101	75-125%	---	---	Q-16

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240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

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 5110062 - EPA 1311/3015									**Solid**			
Blank (5110062-BLK1)					Prepared: 11/03/15 09:59		Analyzed: 11/03/15 15:30					
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 (5110062-BS1)					Prepared: 11/03/15 09:59		Analyzed: 11/03/15 15:33					
1311/6020A												
Arsenic	2.54	---	0.100	mg/L	5	2.50	---	102	80-120%	---	---	TCLP
Barium	2.42	---	0.500	"	"	"	---	97	"	---	---	TCLP
Cadmium	2.40	---	0.0500	"	"	"	---	96	"	---	---	TCLP
Chromium	2.51	---	0.100	"	"	"	---	100	"	---	---	TCLP
Lead	2.43	---	0.0500	"	"	"	---	97	"	---	---	TCLP
Mercury	0.0473	---	0.00400	"	"	0.0500	---	95	"	---	---	TCLP
Selenium	2.61	---	0.100	"	"	2.50	---	104	"	---	---	TCLP
Silver	1.22	---	0.0500	"	"	1.25	---	98	"	---	---	TCLP
Matrix Spike (5110062-MS1)					Prepared: 11/03/15 09:59		Analyzed: 11/03/15 15:54					
QC Source Sample: Other (A5J0449-BP)												
1311/6020A												
Arsenic	2.49	---	0.100	mg/L	5	2.50	ND	100	50-150%	---	---	
Barium	2.82	---	0.500	"	"	"	0.316	100	"	---	---	
Cadmium	2.49	---	0.0500	"	"	"	ND	100	"	---	---	
Chromium	2.49	---	0.100	"	"	"	ND	100	"	---	---	
Lead	2.52	---	0.0500	"	"	"	ND	101	"	---	---	
Mercury	0.0510	---	0.00400	"	"	0.0500	ND	102	"	---	---	
Selenium	2.48	---	0.100	"	"	2.50	ND	99	"	---	---	
Silver	1.24	---	0.0500	"	"	1.25	ND	99	"	---	---	
Matrix Spike (5110062-MS2)					Prepared: 11/03/15 09:59		Analyzed: 11/03/15 16:21					
QC Source Sample: Other (A5J0576-53)												
1311/6020A												

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

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 5110062 - EPA 1311/3015							**Solid**					
Matrix Spike (5110062-MS2)					Prepared: 11/03/15 09:59 Analyzed: 11/03/15 16:21							
QC Source Sample: Other (A5J0576-53)												
Arsenic	2.55	---	0.100	mg/L	5	2.50	ND	102	50-150%	---	---	
Barium	3.61	---	0.500	"	"	"	1.08	101	"	---	---	
Cadmium	2.47	---	0.0500	"	"	"	ND	99	"	---	---	
Chromium	2.54	---	0.100	"	"	"	ND	102	"	---	---	
Lead	2.53	---	0.0500	"	"	"	ND	101	"	---	---	
Mercury	0.0504	---	0.00400	"	"	0.0500	ND	101	"	---	---	
Selenium	2.55	---	0.100	"	"	2.50	ND	102	"	---	---	
Silver	1.27	---	0.0500	"	"	1.25	ND	102	"	---	---	

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240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

QUALITY CONTROL (QC) SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5100842 - PSEP TOC									**Sediment**			
Blank (5100842-BLK1)					Prepared: 10/28/15 12:32		Analyzed: 10/29/15 14:15					
PSEP/SM 5310B MOD												
Total Organic Carbon	ND	---	200	mg/kg	1	---	---	---	---	---	---	
LCS (5100842-BS1)					Prepared: 10/28/15 12:32		Analyzed: 10/29/15 14:15					
PSEP/SM 5310B MOD												
Total Organic Carbon	9200	---		mg/kg	1	10000	---	92	85-115%	---	---	
Duplicate (5100842-DUP1)					Prepared: 10/28/15 12:32		Analyzed: 10/29/15 14:15					
QC Source Sample: SED-200ABC (0-1) COMP (A5J0568-37)												
PSEP/SM 5310B MOD												
Total Organic Carbon	**2100**	---	200	mg/kg	1	---	2600	---	---	21	20%	Q-01
Duplicate (5100842-DUP2)					Prepared: 10/28/15 12:32		Analyzed: 11/02/15 13:40					
QC Source Sample: Other (A5J0576-54)												
PSEP/SM 5310B MOD												
Total Organic Carbon	**3400**	---	200	mg/kg	1	---	2800	---	---	20	20%	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

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 5100890 - Total Solids (Dry Weight)								Soil				
Duplicate (5100890-DUP1)					Prepared: 10/29/15 10:36		Analyzed: 10/30/15 08:25					
QC Source Sample: SED-201ABC (1-2) COMP (A5J0568-40)												
EPA 8000C												
% Solids	**65.5**	---	1.00	% by Weight	1	---	67.1	---	---	2	10%	
Duplicate (5100890-DUP2)					Prepared: 10/29/15 10:36		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0576-51)												
EPA 8000C												
% Solids	**71.3**	---	1.00	% by Weight	1	---	73.2	---	---	3	10%	
Duplicate (5100890-DUP3)					Prepared: 10/29/15 10:36		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0781-17)												
EPA 8000C												
% Solids	**88.9**	---	1.00	% by Weight	1	---	88.8	---	---	0.06	10%	
Duplicate (5100890-DUP4)					Prepared: 10/29/15 10:36		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0798-01)												
EPA 8000C												
% Solids	**71.6**	---	1.00	% by Weight	1	---	66.8	---	---	7	10%	
Duplicate (5100890-DUP5)					Prepared: 10/29/15 10:37		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0869-04)												
EPA 8000C												
% Solids	**77.0**	---	1.00	% by Weight	1	---	76.8	---	---	0.2	10%	
Duplicate (5100890-DUP6)					Prepared: 10/29/15 10:37		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0869-10)												
EPA 8000C												
% Solids	**77.8**	---	1.00	% by Weight	1	---	77.7	---	---	0.07	10%	
Duplicate (5100890-DUP7)					Prepared: 10/29/15 16:19		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0895-05)												
EPA 8000C												
% Solids	**80.6**	---	1.00	% by Weight	1	---	80.8	---	---	0.1	10%	
Duplicate (5100890-DUP8)					Prepared: 10/29/15 17:58		Analyzed: 10/30/15 08:25					

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

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 5100890 - Total Solids (Dry Weight)											**Soil**	
Duplicate (5100890-DUP8)					Prepared: 10/29/15 17:58		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0908-01)												
EPA 8000C												
% Solids	**84.1**	---	1.00	% by Weight	1	---	84.0	---	---	0.08	10%	
Duplicate (5100890-DUP9)					Prepared: 10/29/15 17:58		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0827-02)												
EPA 8000C												
% Solids	**96.9**	---	1.00	% by Weight	1	---	96.8	---	---	0.1	10%	
Duplicate (5100890-DUPA)					Prepared: 10/29/15 20:24		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0916-01)												
EPA 8000C												
% Solids	**73.4**	---	1.00	% by Weight	1	---	73.6	---	---	0.3	10%	

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240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

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: 5110013							
A5J0568-37	Sediment	EPA 6020A	10/15/15 11:30	11/02/15 09:24	0.513g/50mL	0.5g/50mL	0.98
A5J0568-37RE1	Sediment	EPA 6020A	10/15/15 11:30	11/02/15 09:24	0.513g/50mL	0.5g/50mL	0.98
A5J0568-39	Sediment	EPA 6020A	10/15/15 13:10	11/02/15 09:24	0.516g/50mL	0.5g/50mL	0.97
A5J0568-39RE1	Sediment	EPA 6020A	10/15/15 13:10	11/02/15 09:24	0.516g/50mL	0.5g/50mL	0.97
A5J0568-42	Sediment	EPA 6020A	10/16/15 08:00	11/02/15 09:24	0.504g/50mL	0.5g/50mL	0.99
A5J0568-42RE1	Sediment	EPA 6020A	10/16/15 08:00	11/02/15 09:24	0.504g/50mL	0.5g/50mL	0.99
A5J0568-46	Sediment	EPA 6020A	10/16/15 10:30	11/02/15 09:24	0.518g/50mL	0.5g/50mL	0.97
A5J0568-46RE1	Sediment	EPA 6020A	10/16/15 10:30	11/02/15 09:24	0.518g/50mL	0.5g/50mL	0.97

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: 5110016							
A5J0568-37	Sediment	EPA 1311	10/15/15 11:30	11/02/15 16:09	67.9g/1358mL	100g/2000mL	NA
A5J0568-39	Sediment	EPA 1311	10/15/15 13:10	11/02/15 16:09	94.84g/1897mL	100g/2000mL	NA
A5J0568-42	Sediment	EPA 1311	10/16/15 08:00	11/02/15 16:09	96.2g/1924mL	100g/2000mL	NA
A5J0568-46	Sediment	EPA 1311	10/16/15 10:30	11/02/15 16:09	83.04g/1661mL	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: 5110062							
A5J0568-37	Sediment	1311/6020A	10/15/15 11:30	11/03/15 09:59	5mL/50mL	5mL/50mL	1.00
A5J0568-39	Sediment	1311/6020A	10/15/15 13:10	11/03/15 09:59	5mL/50mL	5mL/50mL	1.00
A5J0568-42	Sediment	1311/6020A	10/16/15 08:00	11/03/15 09:59	5mL/50mL	5mL/50mL	1.00
A5J0568-46	Sediment	1311/6020A	10/16/15 10:30	11/03/15 09:59	5mL/50mL	5mL/50mL	1.00

Conventional Chemistry Parameters

Prep: PSEP TOC

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 5100842							
A5J0568-37	Sediment	PSEP/SM 5310B MOD	10/15/15 11:30	10/28/15 12:32	5g/5g	5g/5g	NA

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240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

SAMPLE PREPARATION INFORMATION

Conventional Chemistry Parameters

Prep: PSEP TOC

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A5J0568-38	Sediment	PSEP/SM 5310B MOD	10/15/15 11:40	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0568-39	Sediment	PSEP/SM 5310B MOD	10/15/15 13:10	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0568-40	Sediment	PSEP/SM 5310B MOD	10/15/15 13:20	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0568-41	Sediment	PSEP/SM 5310B MOD	10/15/15 15:15	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0568-42	Sediment	PSEP/SM 5310B MOD	10/16/15 08:00	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0568-43	Sediment	PSEP/SM 5310B MOD	10/16/15 08:10	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0568-44	Sediment	PSEP/SM 5310B MOD	10/16/15 09:00	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0568-45	Sediment	PSEP/SM 5310B MOD	10/16/15 09:10	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0568-46	Sediment	PSEP/SM 5310B MOD	10/16/15 10:30	10/28/15 12:32	5g/5g	5g/5g	NA

Grain Size by ASTM D 422m/PSET Parameters

Prep: ASTM D 421

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 5110267							
A5J0568-06	Sediment	ASTM D 422m	10/15/15 12:10	11/05/15 10:43	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-13	Sediment	ASTM D 422m	10/15/15 14:10	11/05/15 11:07	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-14	Sediment	ASTM D 422m	10/15/15 14:20	11/05/15 11:13	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-18	Sediment	ASTM D 422m	10/15/15 15:41	11/05/15 11:26	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-24	Sediment	ASTM D 422m	10/16/15 08:51	11/05/15 11:35	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-25	Sediment	ASTM D 422m	10/16/15 08:52	11/05/15 11:48	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-31	Sediment	ASTM D 422m	10/16/15 09:51	11/05/15 11:59	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-32	Sediment	ASTM D 422m	10/16/15 09:52	11/05/15 12:08	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-36	Sediment	ASTM D 422m	10/16/15 11:21	11/05/15 12:24	1N/A/1N/A	1N/A/1N/A	NA

Percent Dry Weight

Prep: Total Solids (Dry Weight)

	Sample	Default	RL Prep

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Philip Nerenberg

Philip Nerenberg, Lab Director

Apex Labs

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

SAMPLE PREPARATION INFORMATION

Percent Dry Weight

Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 5100890							
A5J0568-37	Sediment	EPA 8000C	10/15/15 11:30	10/29/15 10:36	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-38	Sediment	EPA 8000C	10/15/15 11:40	10/29/15 10:36	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-39	Sediment	EPA 8000C	10/15/15 13:10	10/29/15 10:36	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-40	Sediment	EPA 8000C	10/15/15 13:20	10/29/15 10:36	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-41	Sediment	EPA 8000C	10/15/15 15:15	10/29/15 10:36	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-42	Sediment	EPA 8000C	10/16/15 08:00	10/29/15 10:36	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-43	Sediment	EPA 8000C	10/16/15 08:10	10/29/15 10:36	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-44	Sediment	EPA 8000C	10/16/15 09:00	10/29/15 10:36	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-45	Sediment	EPA 8000C	10/16/15 09:10	10/29/15 10:36	1N/A/1N/A	1N/A/1N/A	NA
A5J0568-46	Sediment	EPA 8000C	10/16/15 10:30	10/29/15 10:36	1N/A/1N/A	1N/A/1N/A	NA

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

Notes and Definitions

Qualifiers:

GS-01	See detailed Particle Size Analysis results, accumulation curves, and Case Narratives at the end of this report.
Q-01	Spike recovery and/or RPD is outside acceptance limits.
Q-16	Reanalysis of an original Batch QC sample.
Q-41	Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.
TCLP	This batch QC sample was prepared with TCLP or SPLP fluid from preparation batch 5110016.
TCLPa	Limited sample volume. Leachate was prepared using less than the recommended amount of sample per EPA 1311 or 1312. To maintain consistency in leaching, the standard ratio of sample to leachate fluid was maintained.
X	See Case Narrative.

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	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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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02

APEX LABS **CHAIN OF CUSTODY** Lab # A5J0568 COC 1 of 4

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: EES Project Mgr: PAUL ECKER Project Name: FLORAGON Project # 1177-01

Address: 240 N BROADWAY #203, PDX, OR Phone: 503-847-2740 Fax: — Email: PAUL@EES-ENV.COM

Sampled by: CR + JG

Site Location: (OR) WA Other: ______

ANALYSIS REQUEST

	SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 VOC	8260 RBDM VOCs	8260 BTEX	8270 SVOC	8270 SIM PAHs	8082 PCBs	600 TTO	RCRA Metals (8)	TCLP Metals (8)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS TCLP	1200- COLS	1200-Z
1	SED-200A (0-1)		10/15	1130	S	2															
2	SED-200A (1-2)			1140																	
3	SED-200B (0-1)			1150																	
4	~~SED-200B (1-2)~~ CR																				
5	SED-200C (0-1)			1200																	
6	SED-200C (1-2)			1209																	
7	SED-200 (0-1)			1210																	
8	SED-201A (0-1)			1310																	
9	SED-201A (1-2)			1320																	
10	SED-201B (0-1)			1330																	

Normal Turn Around Time (TAT) = 7-10 Business Days YES NO

TAT Requested (circle) 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: ______

SAMPLES ARE HELD FOR 30 DAYS

SPECIAL INSTRUCTIONS: HOLD ALL SAMPLES. ANALYTICAL REQUEST PENDING.

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [signature] Date: 10/16/15	Signature: [signature] Date: 10/16/15	Signature: Date:	Signature: Date:
Printed Name: CHRIS RHEA Time: 1230	Printed Name: K Wolzei Time: 13:20	Printed Name: Time:	Printed Name: Time:
Company: EES	Company: Apex Labs	Company:	Company:

Apex Labs

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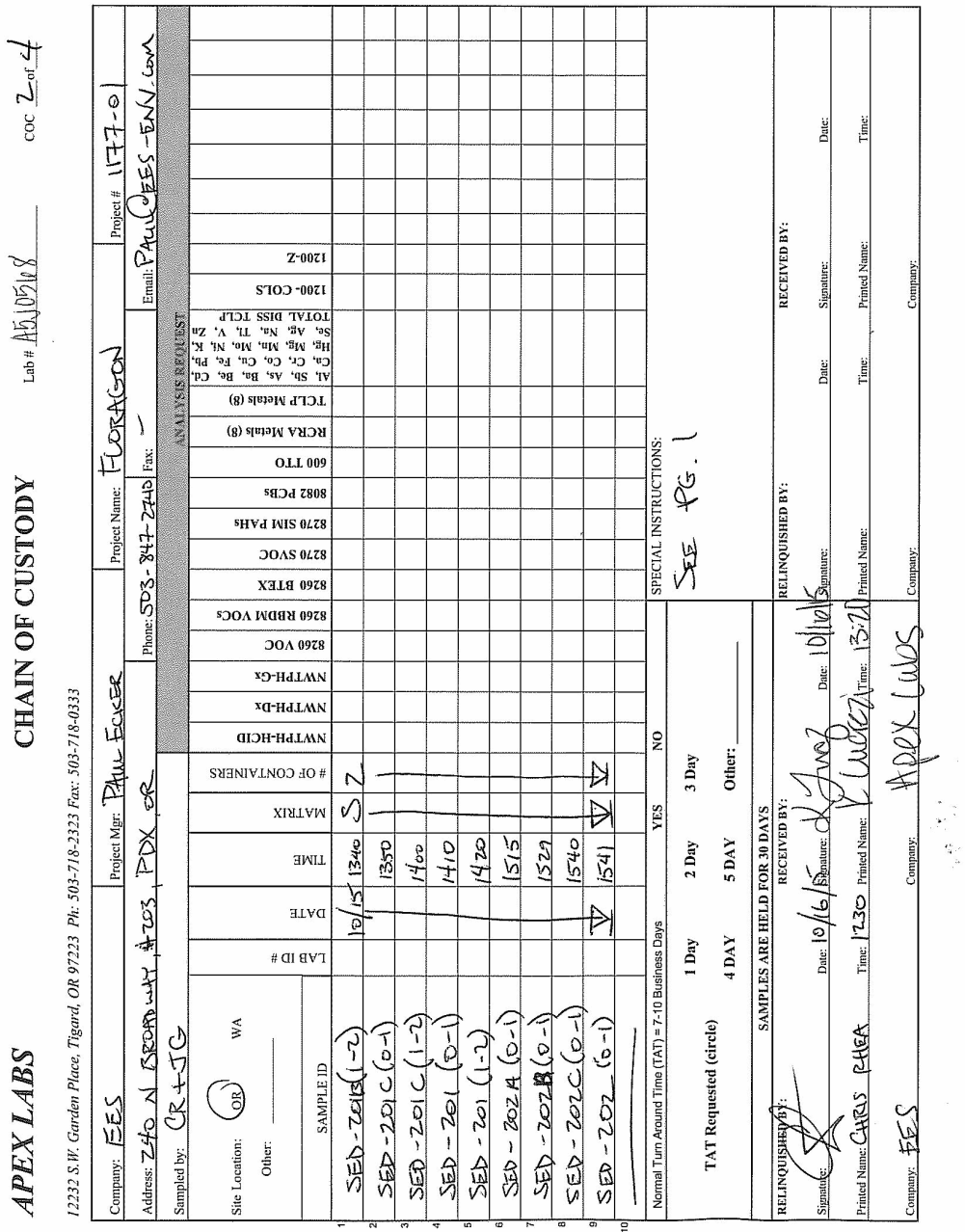
503-718-0333 Fax

EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02



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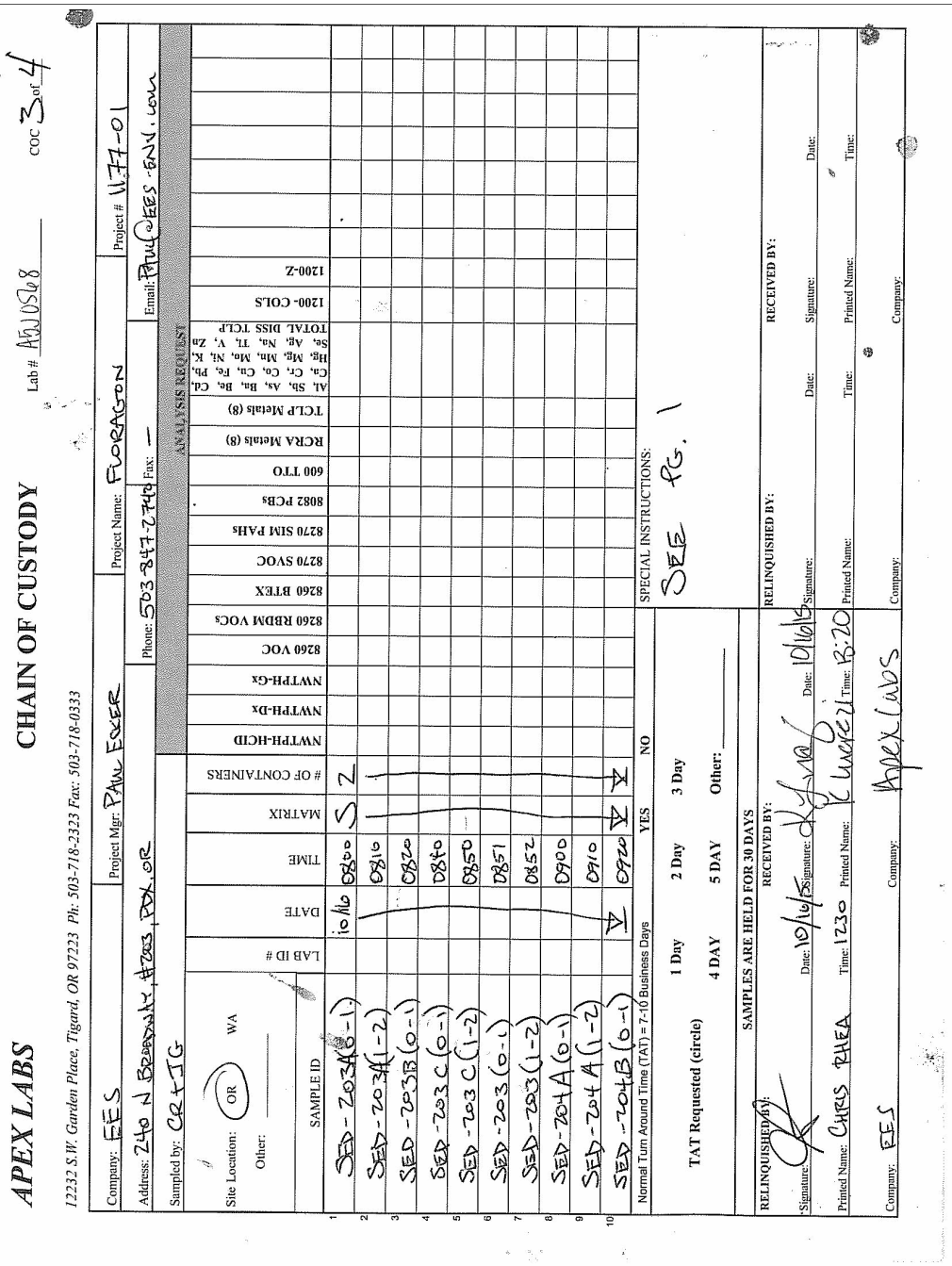
EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02



APEX LABS
12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

CHAIN OF CUSTODY

Lab # A5J0568 COC 3 of 4

Company: EES | Project Mgr: Paul Ecker | Project Name: Floragon | Project # 1177-01
Address: 240 N Broadway, #203, PDX, OR | Phone: 503-827-7749 Fax: — | Email: PaulE@EES-ENV.com
Sampled by: CR+TG

ANALYSIS REQUEST

	SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 VOC	8260 RBDM VOCs	8260 BTEX	8270 SVOC	8270 SIM PAHs	8082 PCBs	600 TTO	RCRA Metals (8)	TCLP Metals (8)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS TCLP	1200- COLS	1200-Z
1	SED-203A(0-1)		10/16	0800	S	2															
2	SED-203A(1-2)			0810																	
3	SED-203B(0-1)			0820																	
4	SED-203C(0-1)			0840																	
5	SED-203C(1-2)			0850																	
6	SED-203(0-1)			0851																	
7	SED-203(1-2)			0852																	
8	SED-204A(0-1)			0900																	
9	SED-204A(1-2)			0910																	
10	SED-204B(0-1)			0920		4															

Normal Turn Around Time (TAT) = 7-10 Business Days — YES / NO

TAT Requested (circle): 1 Day | 2 Day | 3 Day | 4 DAY | 5 DAY | Other: _____

SPECIAL INSTRUCTIONS: SEE PG. 1

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: Signature: | Printed Name: CHRIS RHEA | Company: EES | Date: 10/16/15 | Time: 1230

RECEIVED BY: Signature: | Printed Name: K LUCHERINI | Company: APEX LABS | Date: 10/16/15 | Time: 13:20

RELINQUISHED BY: Signature: | Printed Name: | Company: | Date: | Time:

RECEIVED BY: Signature: | Printed Name: | Company: | Date: | Time:

Apex Laboratories

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Philip Nerenberg

Philip Nerenberg, Lab Director

A5J0568_with Grain Size12/15

Apex Labs

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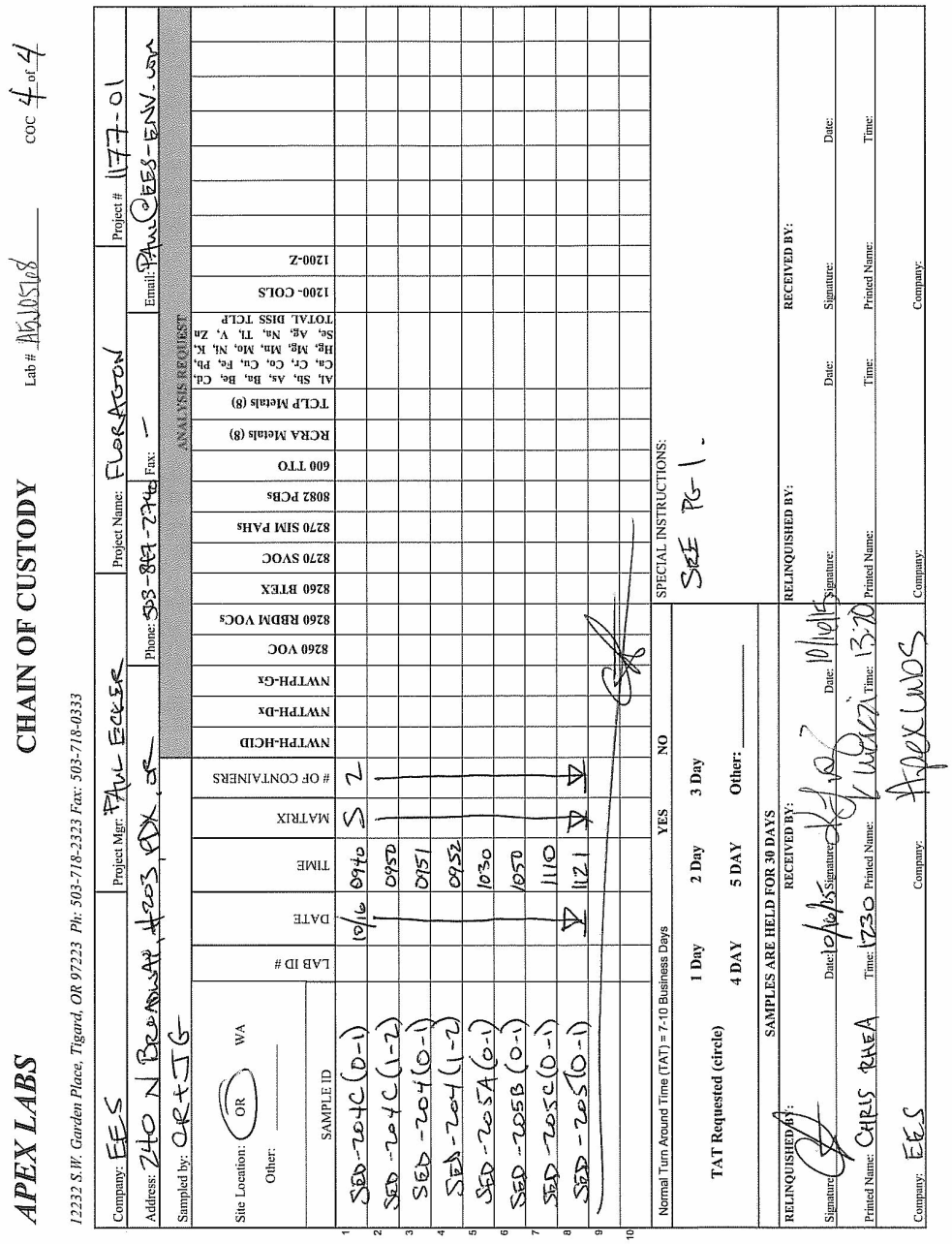
503-718-0333 Fax

EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:02



Apex Laboratories

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Philip Nerenberg

Philip Nerenberg, Lab Director

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0568-06		Client Sample ID:	SED-200 (0-1)		Batch Number:	5110267
Data Entered by:	VA	Date:	11/10/15	Data Reviewed by:	JPW	Date:	11/11/15
Sample Description:	GRAVEL with some Silt and trace Sand			Max Particle Size:	Gravel		
Particle Shape:	Sub-angular to Rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	6.681	331.996	325.32	5.74	307.6

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.113	258.442	252.33	252.33	82.0	18.0
10	2.00	1.212	16.139	14.93	267.26	4.9	13.1
Pan		5.654	57.939	52.29	319.54	16.0	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9457		J56806	1.212	6.053	5.790	5.74

Hydrometer Analysis

Start Date/Time	11/5/2015	10:43	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	47.471		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	13.1		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	44.89		Corrected Dry Weight of Soil Tested (g) (W)	341.97

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	24	19.2	17.51	5.1	12.2	0.01382	0.048	0.67
2	23	19.2	16.51	4.8	12.4	0.01382	0.034	0.63
4	22.5	19.2	16.01	4.7	12.4	0.01382	0.024	0.61
8	20.5	19.2	14.01	4.1	12.7	0.01382	0.017	0.54
15	19	19.2	12.51	3.7	13	0.01382	0.013	0.48
30	18	19.2	11.51	3.4	13.2	0.01382	0.009	0.44
60	17	19.5	10.61	3.1	13.3	0.01365	0.006	0.41
90	16.5	19.9	10.25	3.0	13.3	0.01365	0.005	0.39
120	16	19.9	9.75	2.9	13.5	0.01365	0.005	0.37
240	15	20.3	8.88	2.6	13.7	0.01365	0.003	0.34
360	15	20.5	8.95	2.6	13.7	0.01348	0.003	0.34
1440	14	19.4	7.58	2.2	13.8	0.01382	0.001	0.29

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.288	10.004	8.72	276.86	2.5	10.6
40	0.425	1.272	8.621	7.35	284.95	2.1	8.4
60	0.250	1.277	5.129	3.85	289.19	1.1	7.3
100	0.150	1.300	3.740	2.44	291.88	0.7	6.6
140	0.105	1.291	2.506	1.22	293.22	0.4	6.2
200	0.075	1.279	2.386	1.11	294.44	0.3	5.9
230	0.063	1.298	1.687	0.39	294.87	0.1	5.8
			Sum	25.07	230 Minus	19.82	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-200 (0-1) (A5J0568-06)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*86.87*
Retained on No. 4 sieve		4.75	17.98	82.02
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	13.13	4.85
Sand				*7.33*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	10.58	2.55
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	8.43	2.15
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	7.3	1.13
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	6.59	0.71
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	6.23	0.36
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	5.91	0.32
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	5.8	0.11
Silt and Clay (Measurements in the Clay fraction are noted)				*5.8*
Hydrometer Test		0.0483	0.67	5.12
Hydrometer Test		0.0344	0.63	0.04
Hydrometer Test		0.0243	0.61	0.02
Hydrometer Test		0.0174	0.54	0.08
Hydrometer Test		0.0129	0.48	0.06
Hydrometer Test		0.0092	0.44	0.04
Hydrometer Test		0.0064	0.41	0.03
Hydrometer Test		0.0052	0.39	0.01
Hydrometer Test	Clay	0.0046	0.37	0.02
Hydrometer Test	Clay	0.0033	0.34	0.03
Hydrometer Test	Clay	0.0026	0.34	0
Hydrometer Test	Clay	0.0014	0.29	0.05

Grain Size Summary	Percent of Total Sample
Gravel	86.9
Sand	7.3
Coarse sand	2.5
Medium sand	4.0
Fine sand	0.8
Silt	5.4
Clay	0.4

Case Narrative for Sample ID: SED-200 (0-1) (A5J0568-06)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

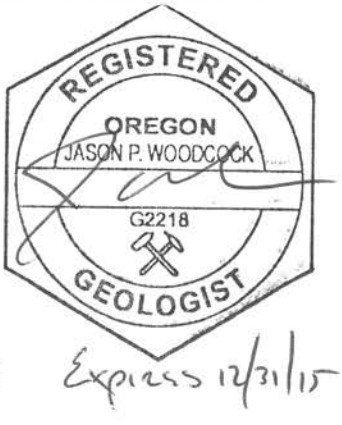
Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

Hydrometer readings for 1, 2, and 4 minutes are estimated due to the presence of foam.

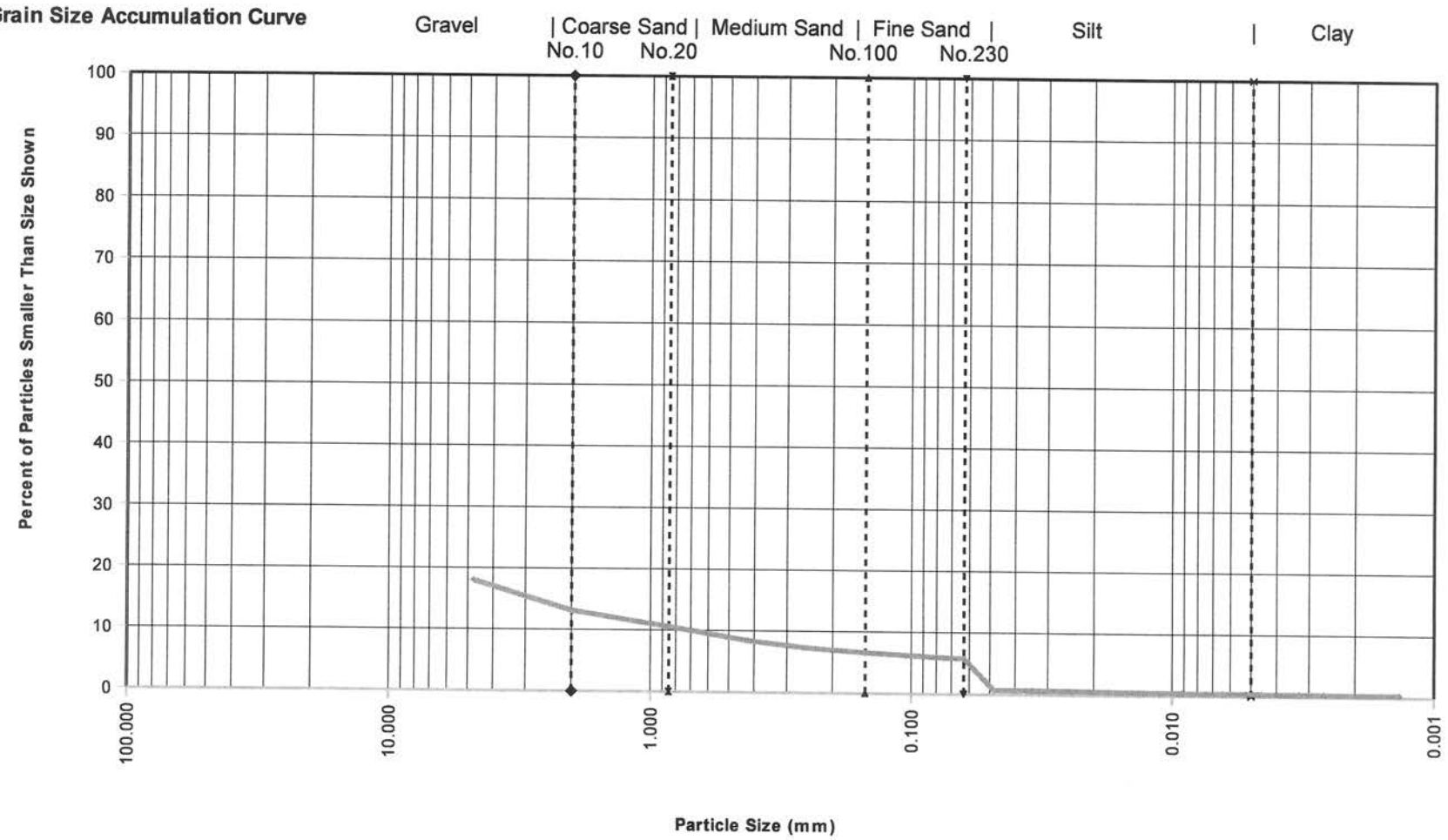
Organic material present in +10 and +20 fractions.

Only 52.29 grams of sample was retained on the -10 sieve, which is less than the required 65 grams; the silt and clay results may be slightly biased due to this deviation.



Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-200 (0-1) (A5J0568-06)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Sub-angular to Rounded	Hard and Durable	GRAVEL with some Silt and trace Sand

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0568-13		Client Sample ID:	SED-201 (0-1)		Batch Number:	5110267
Data Entered by:	VA	Date:	11/10/15	Data Reviewed by:	JPW	Date:	11/11/15
Sample Description:	GRAVEL with some Sand and Silt and trace Clay			Max Particle Size:	Gravel		
Particle Shape:	Angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.417	221.154	215.74	5.17	205.1

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.137	100.880	94.74	94.74	46.2	53.8
10	2.00	6.142	45.860	39.72	134.46	19.4	34.5
Pan		5.357	81.993	76.64	211.10	35.4	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9508		J56813	1.217	19.499	18.600	5.17

Hydrometer Analysis

Start Date/Time	11/5/2015	11:07	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	50.293		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	34.5		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	47.82		Corrected Dry Weight of Soil Tested (g) (W)	138.81

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	24	19.5	19.08	13.7	12.2	0.01365	0.048	4.74
2	22.5	19.5	17.58	12.7	12.4	0.01365	0.034	4.36
4	22	19.6	17.11	12.3	12.5	0.01365	0.024	4.25
8	19	19.5	14.08	10.1	13	0.01365	0.017	3.49
15	19	19.5	14.08	10.1	13	0.01365	0.013	3.49
30	18	19.6	13.11	9.4	13.2	0.01365	0.009	3.25
60	17	19.9	12.18	8.8	13.3	0.01365	0.006	3.02
90	16	19.9	11.18	8.1	13.5	0.01365	0.005	2.78
120	15.5	20.1	10.73	7.7	13.5	0.01365	0.005	2.66
240	15	20.4	10.31	7.4	13.7	0.01365	0.003	2.56
360	14	20.4	9.31	6.7	13.8	0.01365	0.003	2.31
1440	13	19.4	8.05	5.8	14	0.01382	0.001	2.00

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.296	11.619	10.32	150.19	7.4	27.0
40	0.425	1.292	8.779	7.49	161.60	5.4	21.6
60	0.250	1.287	6.023	4.74	168.82	3.4	18.2
100	0.150	1.292	4.789	3.50	174.15	2.5	15.7
140	0.105	1.286	2.716	1.43	176.32	1.0	14.7
200	0.075	1.289	2.295	1.01	177.86	0.7	13.9
230	0.063	1.291	1.573	0.28	178.29	0.2	13.7
			Sum	28.76	230 Minus	19.06	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-201 (0-1) (A5J0568-13)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*65.55*
Retained on No. 4 sieve		4.75	53.81	46.19
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	34.45	19.36
Sand				*20.72*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	27.01	7.44
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	21.62	5.39
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	18.21	3.41
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	15.69	2.52
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	14.66	1.03
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	13.93	0.72
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	13.73	0.2
Silt and Clay (Measurements in the Clay fraction are noted)				*13.73*
Hydrometer Test		0.0477	4.74	8.99
Hydrometer Test		0.0340	4.36	0.37
Hydrometer Test		0.0241	4.25	0.12
Hydrometer Test		0.0174	3.49	0.75
Hydrometer Test		0.0127	3.49	0
Hydrometer Test		0.0091	3.25	0.24
Hydrometer Test		0.0064	3.02	0.23
Hydrometer Test		0.0053	2.78	0.25
Hydrometer Test	Clay	0.0046	2.66	0.11
Hydrometer Test	Clay	0.0033	2.56	0.11
Hydrometer Test	Clay	0.0027	2.31	0.25
Hydrometer Test	Clay	0.0014	2	0.31

Grain Size Summary	Percent of Total Sample
Gravel	65.5
Sand	20.7
Coarse sand	7.4
Medium sand	11.3
Fine sand	2.0
Silt	11.0
Clay	2.8

Case Narrative for Sample ID: SED-201 (0-1) (A5J0568-13)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

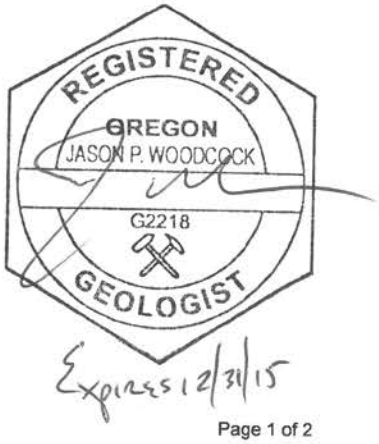
Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

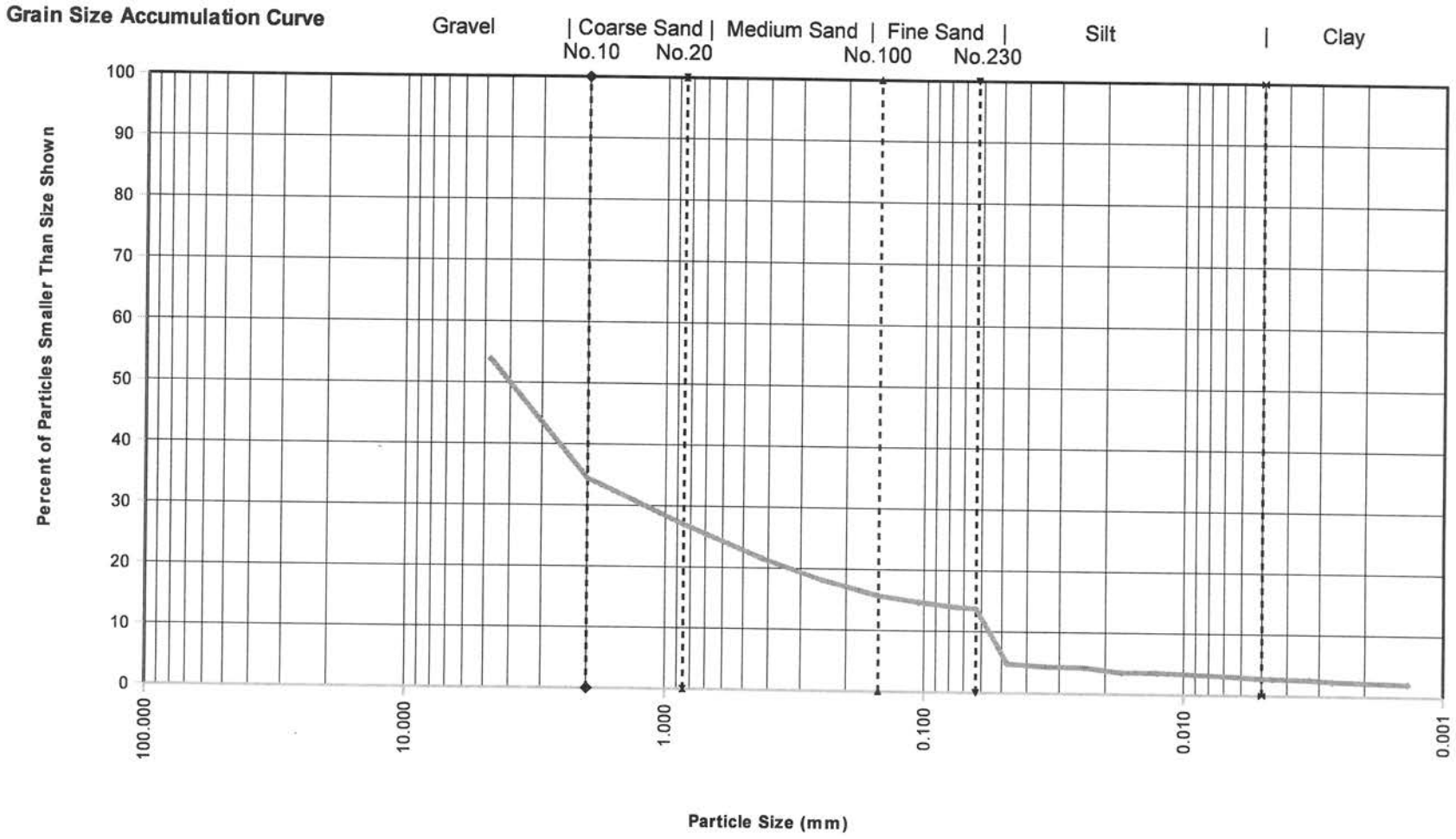
Hydrometer readings for 1, 2, and 4 minutes are estimated due to the presence of foam.

Organic material present in +4, +20 and +40 fractions.

+10 fraction consists mostly of organic material.



Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified



Sample ID:	SED-201 (0-1) (A5J0568-13)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to Sub-rounded	Hard and Durable	GRAVEL with some Sand and Silt and trace Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0568-14		Client Sample ID:	SED-201 (1-2)		Batch Number:	5110267
Data Entered by:	VA	Date:	11/10/15	Data Reviewed by:	JPW	Date:	11/11/15
Sample Description:	Silty Sandy GRAVEL with some Clay			Max Particle Size:	Gravel		
Particle Shape:	Sub-angular to sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.373	261.585	256.21	5.18	243.6

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.091	87.601	81.51	81.51	33.5	66.5
10	2.00	1.287	28.804	27.52	109.03	11.3	55.2
Pan		5.295	147.955	142.66	251.69	55.5	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9507		J56814	1.260	21.060	20.084	5.18

Hydrometer Analysis

Start Date/Time	11/5/2015	11:13	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	51.712		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	55.2		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	49.16		Corrected Dry Weight of Soil Tested (g) (W)	89.00

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	26	19.3	19.55	22.0	11.9	0.01382	0.048	12.13
2	25	19.3	18.55	20.8	12	0.01382	0.034	11.51
4	24.5	19.4	18.08	20.3	12	0.01382	0.024	11.22
8	22	19.4	15.58	17.5	12.5	0.01382	0.017	9.67
15	21	19.4	14.58	16.4	12.7	0.01382	0.013	9.05
30	20	19.5	13.61	15.3	12.9	0.01365	0.009	8.45
60	19.5	19.9	13.25	14.9	12.9	0.01365	0.006	8.22
90	16.5	19.9	10.25	11.5	13.3	0.01365	0.005	6.36
120	17	20.1	10.81	12.2	13.3	0.01365	0.005	6.71
240	16	20.4	9.91	11.1	13.5	0.01365	0.003	6.15
360	15	20.4	8.91	10.0	13.7	0.01365	0.003	5.53
1440	14	19.4	7.58	8.5	13.8	0.01382	0.001	4.70

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.274	8.741	7.47	129.63	8.4	46.9
40	0.425	1.290	8.392	7.10	149.22	8.0	38.9
60	0.250	1.268	6.474	5.21	163.58	5.8	33.0
100	0.150	1.295	5.217	3.92	174.40	4.4	28.6
140	0.105	1.227	2.926	1.70	179.09	1.9	26.7
200	0.075	1.300	2.559	1.26	182.56	1.4	25.3
230	0.063	1.232	1.629	0.40	183.66	0.4	24.8
			Sum	27.05	230 Minus	22.11	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-201 (1-2) (A5J0568-14)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*44.76*
Retained on No. 4 sieve		4.75	66.54	33.46
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	55.24	11.3
Sand				*30.4*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	46.85	8.39
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	38.87	7.98
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	33.02	5.85
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	28.61	4.41
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	26.7	1.91
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	25.29	1.41
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	24.84	0.45
Silt and Clay (Measurements in the Clay fraction are noted)				*24.84*
Hydrometer Test		0.0477	12.13	12.71
Hydrometer Test		0.0339	11.51	0.62
Hydrometer Test		0.0239	11.22	0.29
Hydrometer Test		0.0173	9.67	1.55
Hydrometer Test		0.0127	9.05	0.62
Hydrometer Test		0.0090	8.45	0.6
Hydrometer Test		0.0063	8.22	0.23
Hydrometer Test		0.0052	6.36	1.86
Hydrometer Test	Clay	0.0045	6.71	0
Hydrometer Test	Clay	0.0032	6.15	0.21
Hydrometer Test	Clay	0.0027	5.53	0.62
Hydrometer Test	Clay	0.0014	4.7	0.83

Grain Size Summary	Percent of Total Sample
Gravel	44.8
Sand	30.4
Coarse sand	8.4
Medium sand	18.2
Fine sand	3.8
Silt	18.5
Clay	6.4

Case Narrative for Sample ID: SED-201 (1-2) (A5J0568-14)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

Hydrometer readings for 1, 2, and 4 minutes are estimated due to the presence of foam.

Organic material present in +4, +10, +20 and +40 fractions.

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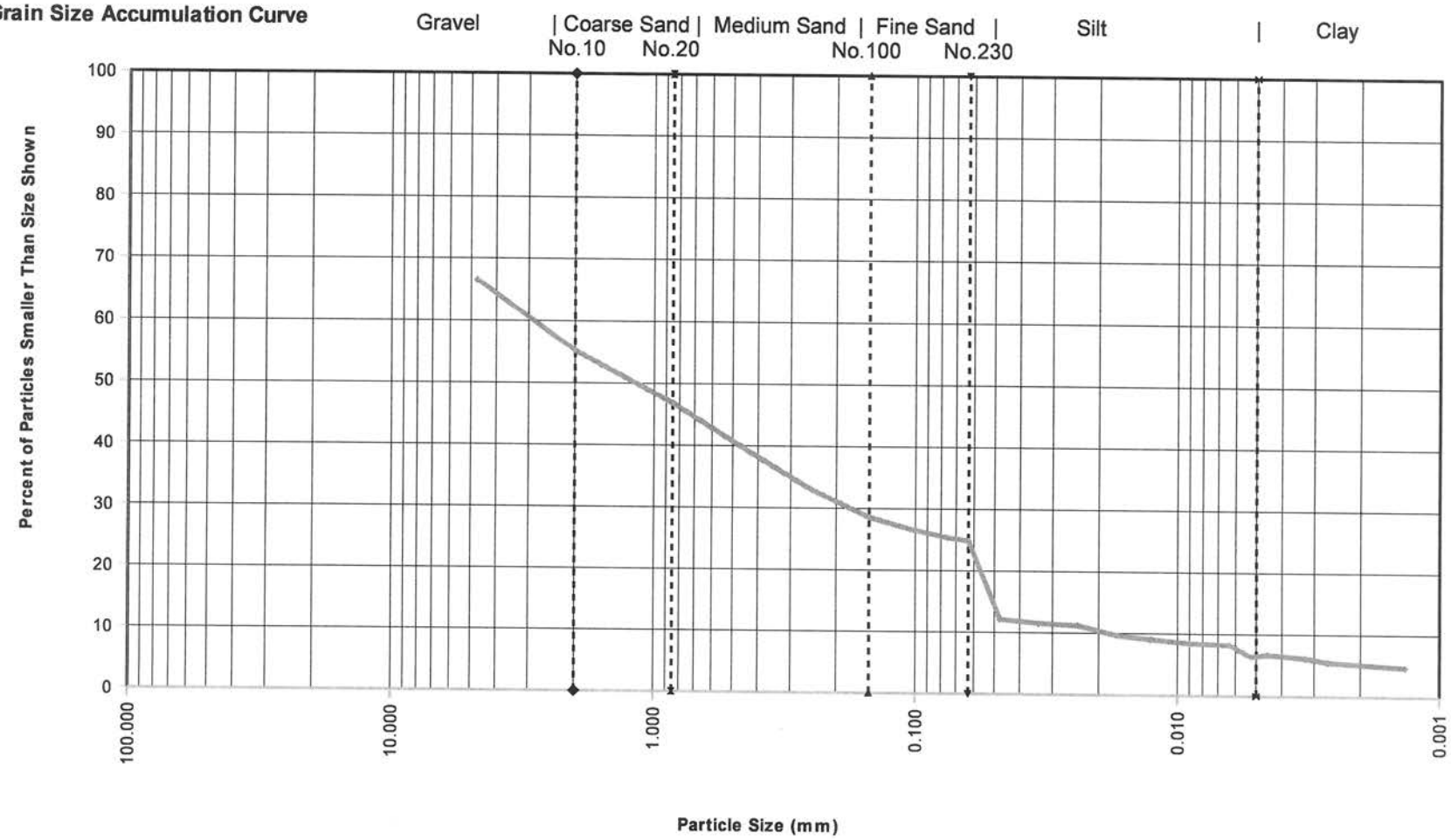
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-201 (1-2) (A5J0568-14)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Sub-angular to sub-rounded	Hard and Durable	Silty Sandy GRAVEL with some Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0568-18		Client Sample ID:	SED-202 (0-1)		Batch Number:	5110267
Data Entered by:	VA	Date:	11/10/15	Data Reviewed by:	JPW	Date:	11/11/15
Sample Description:	Clayey SILT with some Sand and Gravel			Max Particle Size:	Gravel		
Particle Shape:	Sub-angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.402	286.525	281.12	8.23	259.8

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	1.225	50.703	49.48	49.48	19.0	81.0
10	2.00	1.257	14.599	13.34	62.82	5.1	75.8
Pan		5.355	221.233	215.88	278.70	76.3	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9240		J56818	1.227	16.490	15.330	8.23

Hydrometer Analysis

Start Date/Time	11/5/2015	11:26	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	50.900		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	75.8		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	47.03		Corrected Dry Weight of Soil Tested (g) (W)	62.03

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	34.5	19.4	29.55	47.6	10.4	0.01382	0.045	36.12
2	33	19.4	28.05	45.2	10.7	0.01382	0.032	34.29
4	32	19.4	27.05	43.6	10.9	0.01382	0.023	33.07
8	29	19.3	24.03	38.7	11.4	0.01382	0.016	29.37
15	28	19.3	23.03	37.1	11.5	0.01382	0.012	28.15
30	26	19.5	21.08	34.0	11.9	0.01365	0.009	25.76
60	24.5	19.9	19.68	31.7	12	0.01365	0.006	24.05
90	23.5	19.9	18.68	30.1	12.2	0.01365	0.005	22.83
120	23	20.1	18.23	29.4	12.4	0.01365	0.004	22.28
240	22	20.3	17.28	27.9	12.5	0.01365	0.003	21.12
360	21	20.5	16.33	26.3	12.7	0.01348	0.003	19.96
1440	20	19.5	15.08	24.3	12.9	0.01365	0.001	18.43

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.278	4.089	2.81	74.74	4.5	71.3
40	0.425	1.296	3.839	2.54	85.53	4.1	67.2
60	0.250	1.254	3.893	2.64	96.72	4.3	62.9
100	0.150	1.295	4.202	2.91	109.05	4.7	58.2
140	0.105	1.228	3.000	1.77	116.56	2.9	55.4
200	0.075	1.288	2.966	1.68	123.68	2.7	52.7
230	0.063	1.284	1.904	0.62	126.31	1.0	51.7
			Sum	14.97	230 Minus	32.06	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-202 (0-1) (A5J0568-18)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*24.18*
Retained on No. 4 sieve		4.75	80.95	19.05
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	75.82	5.14
Sand				*24.13*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	71.28	4.53
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	67.19	4.1
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	62.93	4.25
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	58.24	4.69
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	55.39	2.86
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	52.68	2.7
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	51.68	1
Silt and Clay (Measurements in the Clay fraction are noted)				*51.68*
Hydrometer Test		0.0446	36.12	15.56
Hydrometer Test		0.0320	34.29	1.83
Hydrometer Test		0.0228	33.07	1.22
Hydrometer Test		0.0165	29.37	3.7
Hydrometer Test		0.0121	28.15	1.22
Hydrometer Test		0.0086	25.76	2.38
Hydrometer Test		0.0061	24.05	1.71
Hydrometer Test		0.0050	22.83	1.22
Hydrometer Test	Clay	0.0044	22.28	0.55
Hydrometer Test	Clay	0.0031	21.12	1.16
Hydrometer Test	Clay	0.0025	19.96	1.16
Hydrometer Test	Clay	0.0013	18.43	1.53

Grain Size Summary	Percent of Total Sample
Gravel	24.2
Sand	24.1
Coarse sand	4.5
Medium sand	13.0
Fine sand	6.6
Silt	28.9
Clay	22.8

Case Narrative for Sample ID: SED-202 (0-1) (A5J0568-18)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.

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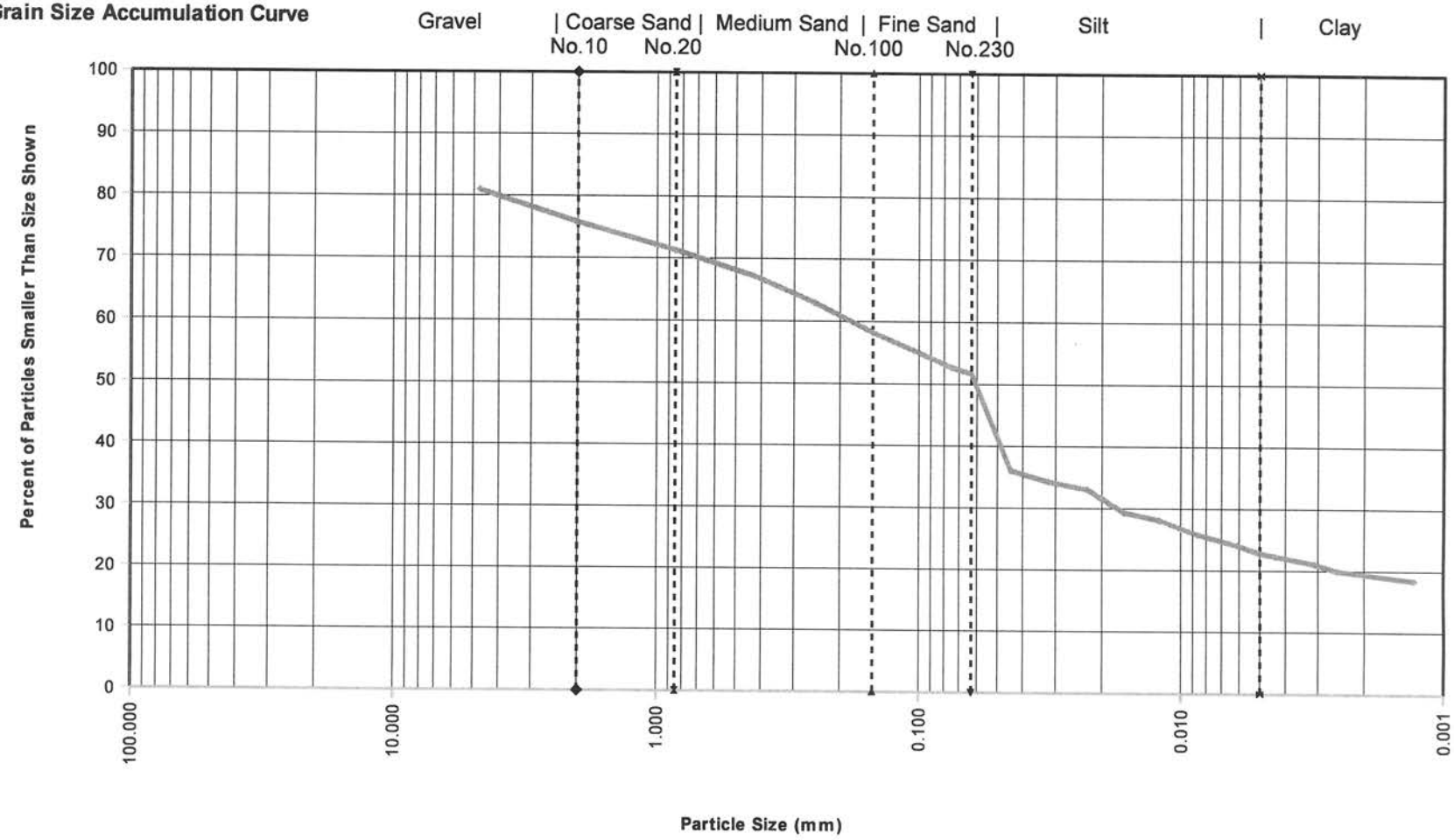
Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-202 (0-1) (A5J0568-18)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Sub-angular to Sub-rounded	Hard and Durable	Clayey SILT with some Sand and Gravel

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0568-24		Client Sample ID:	SED-203 (0-1)		Batch Number:	5110267
Data Entered by:	VA	Date:	11/10/15	Data Reviewed by:	JPW	Date:	11/11/15
Sample Description:	Silty GRAVEL with some Sand and trace Clay			Max Particle Size:	Gravel		
Particle Shape:	Angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	6.560	334.071	327.51	7.45	304.8

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.061	163.882	157.82	157.82	51.8	48.2
10	2.00	1.221	35.288	34.07	191.89	11.2	37.0
Pan		5.335	133.737	128.40	320.29	39.0	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9306		J56824	1.214	16.335	15.286	7.45

Hydrometer Analysis

Start Date/Time	11/5/2015	11:35	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	100.887		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	37.0		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	93.89		Corrected Dry Weight of Soil Tested (g) (W)	253.46

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	50	19.4	43.58	17.2	7.9	0.01382	0.039	6.37
2	47.5	19.4	41.08	16.2	8.3	0.01382	0.028	6.00
4	45	19.4	38.58	15.2	8.8	0.01382	0.020	5.64
8	43	19.4	36.58	14.4	9.1	0.01382	0.015	5.35
15	40	19.4	33.58	13.2	9.6	0.01382	0.011	4.91
30	38	19.8	31.71	12.5	9.9	0.01365	0.008	4.63
60	36	19.9	29.75	11.7	10.2	0.01365	0.006	4.35
90	35	19.9	28.75	11.3	10.4	0.01365	0.005	4.20
120	34	20.1	27.81	11.0	10.5	0.01365	0.004	4.06
240	32	20.3	25.88	10.2	10.9	0.01365	0.003	3.78
360	31	20.4	24.91	9.8	11.1	0.01365	0.002	3.64
1440	28	19.6	21.65	8.5	11.5	0.01365	0.001	3.16

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.271	14.849	13.58	209.17	5.4	31.7
40	0.425	1.270	12.187	10.92	223.06	4.3	27.4
60	0.250	1.268	9.678	8.41	233.77	3.3	24.1
100	0.150	1.266	8.113	6.85	242.48	2.7	21.4
140	0.105	1.278	4.563	3.29	246.66	1.3	20.1
200	0.075	1.271	3.855	2.58	249.95	1.0	19.0
230	0.063	1.270	2.154	0.88	251.08	0.3	18.7
			Sum	46.51	230 Minus	47.38	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-203 (0-1) (A5J0568-24)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*62.96*
Retained on No. 4 sieve		4.75	48.22	51.78
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	37.04	11.18
Sand				*18.35*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	31.69	5.36
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	27.38	4.31
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	24.06	3.32
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	21.36	2.7
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	20.06	1.3
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	19.04	1.02
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	18.69	0.35
Silt and Clay (Measurements in the Clay fraction are noted)				*18.69*
Hydrometer Test		0.0388	6.37	12.33
Hydrometer Test		0.0282	6	0.37
Hydrometer Test		0.0205	5.64	0.37
Hydrometer Test		0.0147	5.35	0.29
Hydrometer Test		0.0111	4.91	0.44
Hydrometer Test		0.0078	4.63	0.27
Hydrometer Test		0.0056	4.35	0.29
Hydrometer Test	Clay	0.0046	4.2	0.15
Hydrometer Test	Clay	0.0040	4.06	0.14
Hydrometer Test	Clay	0.0029	3.78	0.28
Hydrometer Test	Clay	0.0024	3.64	0.14
Hydrometer Test	Clay	0.0012	3.16	0.48

Grain Size Summary	Percent of Total Sample
Gravel	63.0
Sand	18.3
Coarse sand	5.4
Medium sand	10.3
Fine sand	2.7
Silt	14.3
Clay	4.3

Case Narrative for Sample ID: SED-203 (0-1) (A5J0568-24)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

Organic material present in +10, +20 and +40 fractions.

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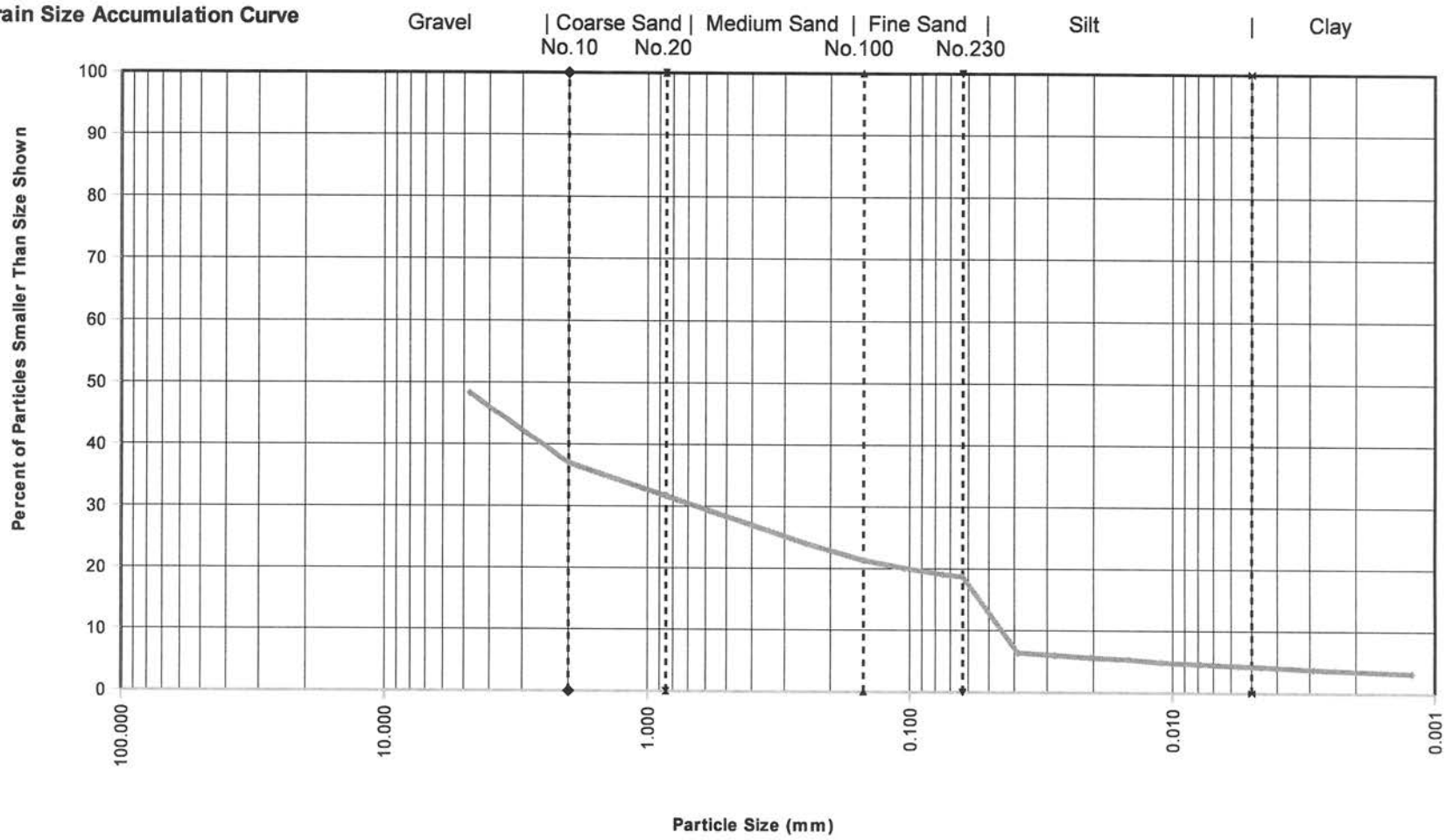
Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-203 (0-1) (A5J0568-24)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to Sub-rounded	Hard and Durable	Silty GRAVEL with some Sand and trace Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0568-25		Client Sample ID:	SED-203 (1-2)		Batch Number:	5110267
Data Entered by:	VA	Date:	11/10/15	Data Reviewed by:	JPW	Date:	11/11/15
Sample Description:	Silty GRAVEL with some Sand and Clay			Max Particle Size:	Gravel		
Particle Shape:	Angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	6.674	325.863	319.19	7.55	296.8

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.127	107.166	101.04	101.04	34.0	66.0
10	2.00	1.225	38.704	37.48	138.52	12.6	53.3
Pan		5.502	179.588	174.09	312.60	54.2	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9298		J56825	1.234	19.630	18.339	7.55

Hydrometer Analysis

Start Date/Time	11/5/2015	11:48	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	51.639		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	53.3		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	48.02		Corrected Dry Weight of Soil Tested (g) (W)	90.04

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	30.5	19.6	25.61	28.4	11.1	0.01365	0.045	15.17
2	29	19.6	24.11	26.8	11.4	0.01365	0.033	14.28
4	28.5	19.7	23.63	26.2	11.4	0.01365	0.023	14.00
8	27	19.7	22.13	24.6	11.7	0.01365	0.017	13.11
15	25	20	20.21	22.4	12	0.01365	0.012	11.97
30	24	20.1	19.23	21.4	12.2	0.01365	0.009	11.39
60	22.5	19.9	17.68	19.6	12.4	0.01365	0.006	10.47
90	22	20.1	17.23	19.1	12.5	0.01365	0.005	10.21
120	21	20.2	16.26	18.1	12.7	0.01365	0.004	9.63
240	20	20.4	15.31	17.0	12.9	0.01365	0.003	9.07
360	19.5	20.4	14.81	16.4	12.9	0.01365	0.003	8.77
1440	18	19.6	13.11	14.6	13.2	0.01365	0.001	7.76

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.267	5.612	4.35	153.17	4.8	48.5
40	0.425	1.219	5.192	3.97	166.56	4.4	44.1
60	0.250	1.292	5.039	3.75	179.19	4.2	39.9
100	0.150	1.270	4.585	3.32	190.37	3.7	36.2
140	0.105	1.277	2.860	1.58	195.70	1.8	34.5
200	0.075	1.289	2.576	1.29	200.04	1.4	33.1
230	0.063	1.225	1.630	0.41	201.41	0.4	32.6
			Sum	18.66	230 Minus	29.36	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-203 (1-2) (A5J0568-25)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*46.67*
Retained on No. 4 sieve		4.75	65.96	34.04
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	53.33	12.63
Sand				*20.72*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	48.5	4.83
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	44.09	4.41
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	39.93	4.16
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	36.25	3.68
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	34.49	1.76
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	33.06	1.43
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	32.61	0.45
Silt and Clay (Measurements in the Clay fraction are noted)				*32.61*
Hydrometer Test		0.0455	15.17	17.44
Hydrometer Test		0.0326	14.28	0.89
Hydrometer Test		0.0230	14	0.28
Hydrometer Test		0.0165	13.11	0.89
Hydrometer Test		0.0122	11.97	1.14
Hydrometer Test		0.0087	11.39	0.58
Hydrometer Test		0.0062	10.47	0.92
Hydrometer Test		0.0051	10.21	0.27
Hydrometer Test	Clay	0.0044	9.63	0.58
Hydrometer Test	Clay	0.0032	9.07	0.56
Hydrometer Test	Clay	0.0026	8.77	0.3
Hydrometer Test	Clay	0.0013	7.76	1.01

Grain Size Summary	Percent of Total Sample
Gravel	46.7
Sand	20.7
Coarse sand	4.8
Medium sand	12.3
Fine sand	3.6
Silt	22.4
Clay	10.2

Case Narrative for Sample ID: SED-203 (1-2) (A5J0568-25)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.

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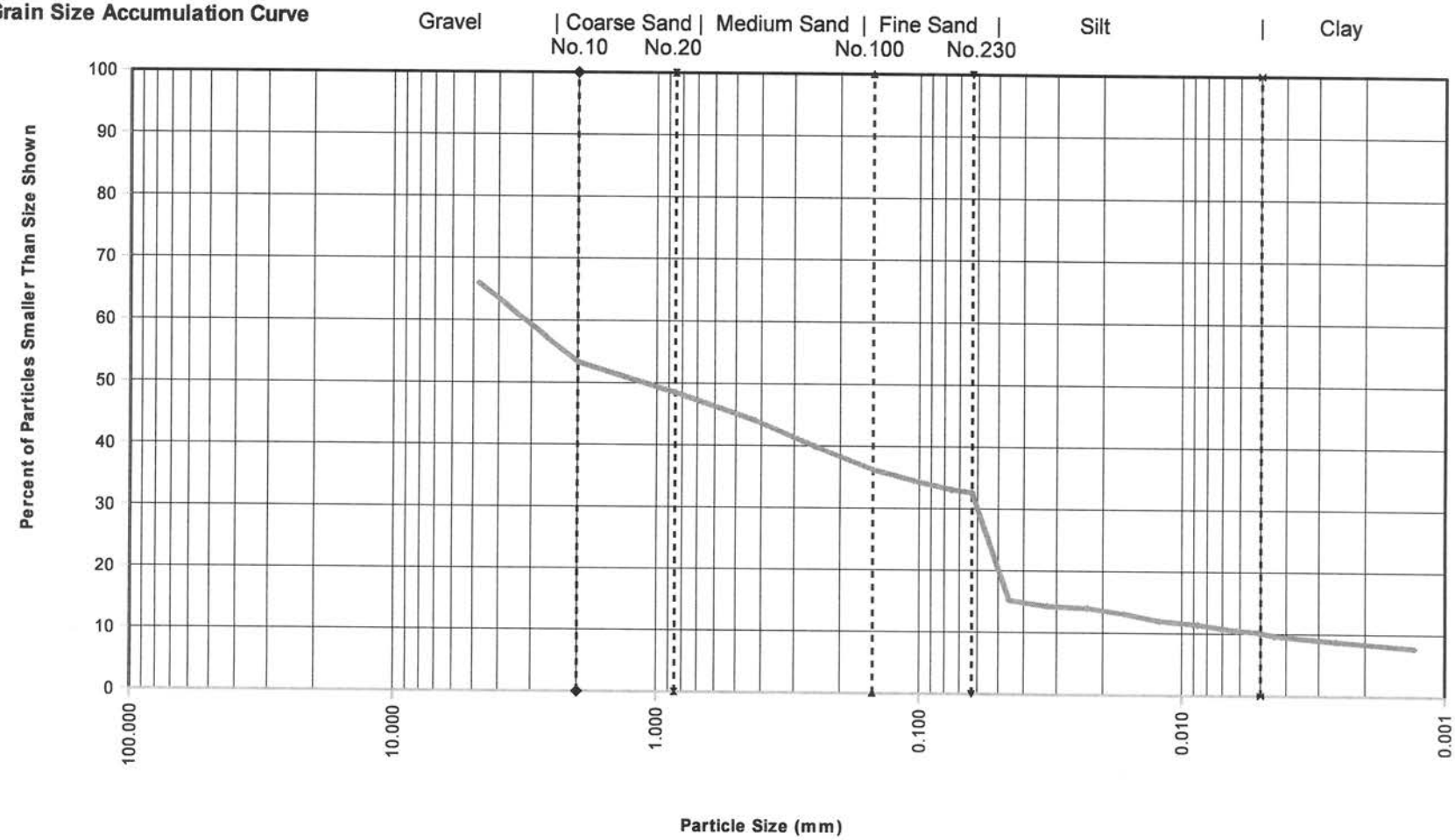
Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-203 (1-2) (A5J0568-25)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to Sub-rounded	Hard and Durable	Silty GRAVEL with some Sand and Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0568-31		Client Sample ID:	SED-204 (0-1)		Batch Number:	5110267
Data Entered by:	VA	Date:	11/10/15	Data Reviewed by:	JPW	Date:	11/11/15
Sample Description:	Silty GRAVEL with trace Sand and Clay			Max Particle Size:	Gravel		
Particle Shape:	Angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.427	265.227	259.80	7.14	242.5

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.113	141.203	135.09	135.09	55.7	44.3
10	2.00	1.223	20.843	19.62	154.71	8.1	36.2
Pan		5.360	104.513	99.15	253.86	38.0	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9333		J56831	1.274	20.131	18.874	7.14

Hydrometer Analysis

Start Date/Time	11/5/2015	11:59	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	50.356		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	36.2		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	47.00		Corrected Dry Weight of Soil Tested (g) (W)	129.84

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	35	19.6	28.65	22.1	10.4	0.01365	0.044	7.99
2	33.5	19.6	27.15	20.9	10.5	0.01365	0.031	7.57
4	33	19.7	26.68	20.5	10.7	0.01365	0.022	7.44
8	30.5	19.7	24.18	18.6	11.1	0.01365	0.016	6.74
15	29	19.7	22.68	17.5	11.4	0.01365	0.012	6.32
30	27	19.8	20.71	16.0	11.7	0.01365	0.009	5.77
60	25	19.8	18.71	14.4	12	0.01365	0.006	5.22
90	24.5	19.9	18.25	14.1	12	0.01365	0.005	5.09
120	23.5	20.1	17.31	13.3	12.2	0.01365	0.004	4.83
240	22	20.4	15.91	12.3	12.5	0.01365	0.003	4.44
360	21	20.4	14.91	11.5	12.7	0.01365	0.003	4.16
1440	18.5	19.7	12.18	9.4	13	0.01365	0.001	3.40

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.292	3.979	2.69	160.00	2.1	34.1
40	0.425	1.211	3.915	2.70	165.33	2.1	32.0
60	0.250	1.287	3.965	2.68	170.60	2.1	30.0
100	0.150	1.238	4.257	3.02	176.54	2.3	27.7
140	0.105	1.235	2.889	1.65	179.80	1.3	26.4
200	0.075	1.275	2.682	1.41	182.57	1.1	25.3
230	0.063	1.238	1.708	0.47	183.50	0.4	24.9
			Sum	14.62	230 Minus	32.38	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-204 (0-1) (A5J0568-31)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*63.8*
Retained on No. 4 sieve		4.75	44.29	55.71
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	36.2	8.09
Sand				*11.26*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	34.13	2.07
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	32.05	2.08
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	29.98	2.06
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	27.66	2.33
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	26.38	1.27
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	25.3	1.08
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	24.94	0.36
Silt and Clay (Measurements in the Clay fraction are noted)				*24.94*
Hydrometer Test		0.0440	7.99	16.95
Hydrometer Test		0.0313	7.57	0.42
Hydrometer Test		0.0223	7.44	0.13
Hydrometer Test		0.0161	6.74	0.7
Hydrometer Test		0.0119	6.32	0.42
Hydrometer Test		0.0085	5.77	0.55
Hydrometer Test		0.0061	5.22	0.56
Hydrometer Test	Clay	0.0050	5.09	0.13
Hydrometer Test	Clay	0.0044	4.83	0.26
Hydrometer Test	Clay	0.0031	4.44	0.39
Hydrometer Test	Clay	0.0026	4.16	0.28
Hydrometer Test	Clay	0.0013	3.4	0.76

Grain Size Summary	**Percent of Total Sample**
Gravel	63.8
Sand	11.3
Coarse sand	2.1
Medium sand	6.5
Fine sand	2.7
Silt	19.7
Clay	5.2

Case Narrative for Sample ID: SED-204 (0-1) (A5J0568-31)

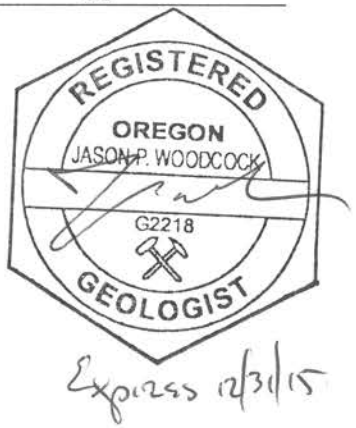
This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

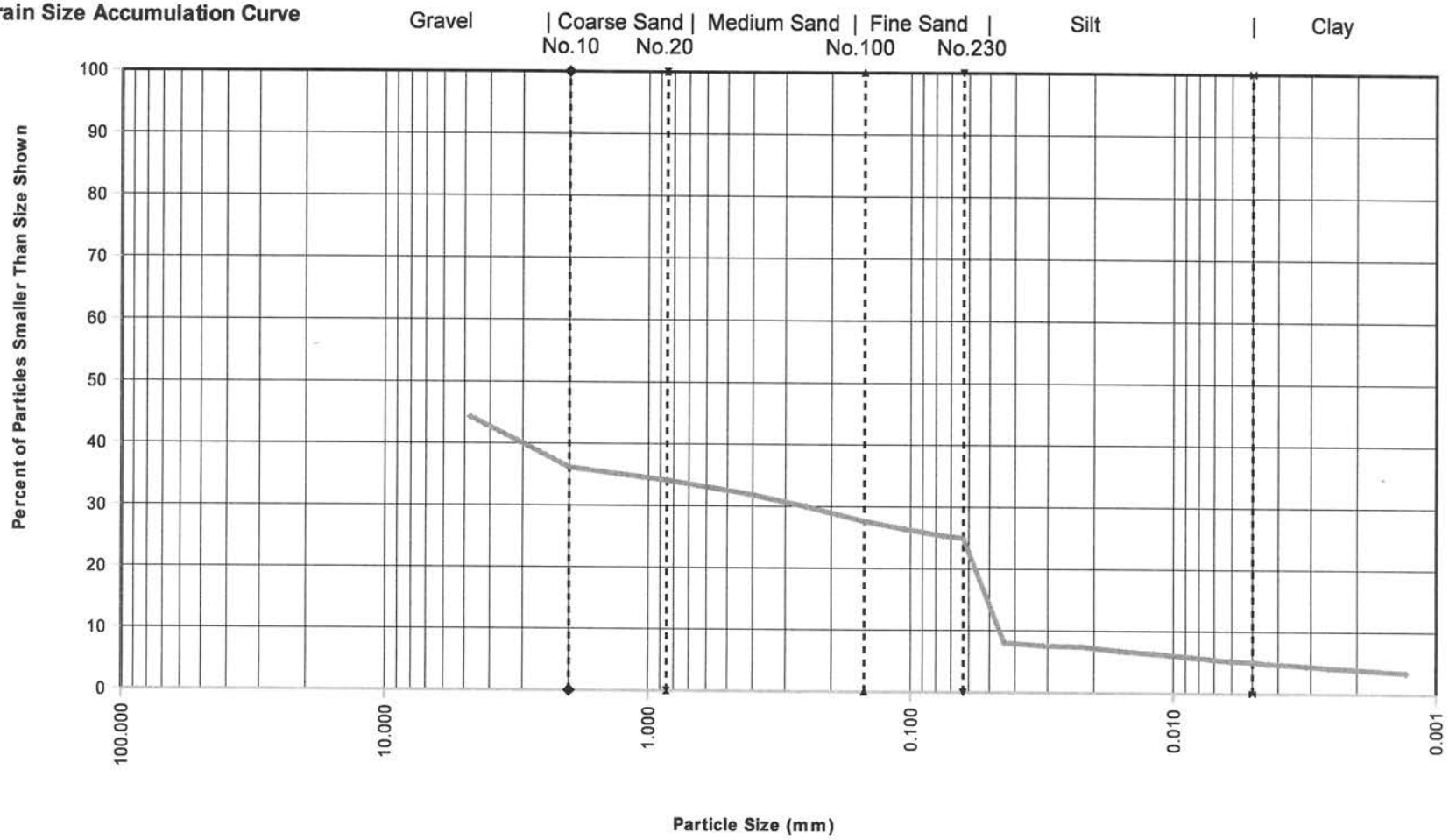
Organic material present in +4, +10, +20 and +40 fractions.



Expires 12/31/15

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-204 (0-1) (A5J0568-31)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to Sub-rounded	Hard and Durable	Silty GRAVEL with trace Sand and Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0568-32		Client Sample ID:	SED-204 (1-2)		Batch Number:	5110267
Data Entered by:	VA	Date:	11/10/15	Data Reviewed by:	JPW	Date:	11/11/15
Sample Description:	Silty GRAVEL with some Sand and trace Clay			Max Particle Size:	Gravel		
Particle Shape:	Sub-angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	6.580	329.420	322.84	6.90	302.0

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.144	177.518	171.37	171.37	56.7	43.3
10	2.00	1.217	24.934	23.72	195.09	7.9	35.4
Pan		5.348	126.809	121.46	316.55	37.4	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9355		J56832	1.274	21.514	20.208	6.90

Hydrometer Analysis

Start Date/Time	11/5/2015	12:08	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	50.710		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	35.4		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	47.44		Corrected Dry Weight of Soil Tested (g) (W)	134.00

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	28	20	23.21	17.3	11.5	0.01365	0.046	6.13
2	27	20	22.21	16.6	11.7	0.01365	0.033	5.87
4	26	20.1	21.23	15.8	11.9	0.01365	0.024	5.61
8	24.5	20	19.71	14.7	12	0.01365	0.017	5.21
15	23	20	18.21	13.6	12.4	0.01365	0.012	4.81
30	22	19.9	17.18	12.8	12.5	0.01365	0.009	4.54
60	21	19.9	16.18	12.1	12.7	0.01365	0.006	4.28
90	20	20.1	15.23	11.4	12.9	0.01365	0.005	4.02
120	19	20.1	14.23	10.6	13	0.01365	0.004	3.76
240	18.5	20.3	13.78	10.3	13	0.01365	0.003	3.64
360	18	20.2	13.26	9.9	13.2	0.01365	0.003	3.50
1440	17	19.7	12.13	9.1	13.3	0.01365	0.001	3.20

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.239	6.520	5.28	207.74	3.9	31.5
40	0.425	1.295	5.755	4.46	218.42	3.3	28.1
60	0.250	1.288	5.285	4.00	228.00	3.0	25.1
100	0.150	1.225	4.542	3.32	235.94	2.5	22.7
140	0.105	1.220	3.033	1.81	240.28	1.4	21.3
200	0.075	1.215	2.817	1.60	244.12	1.2	20.1
230	0.063	1.296	1.833	0.54	245.41	0.4	19.7
			Sum	21.01	230 Minus	26.43	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-204 (1-2) (A5J0568-32)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*64.6*
Retained on No. 4 sieve		4.75	43.26	56.74
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	35.4	7.85
Sand				*15.68*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	31.46	3.94
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	28.13	3.33
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	25.15	2.98
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	22.67	2.48
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	21.32	1.35
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	20.13	1.2
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	19.72	0.4
Silt and Clay (Measurements in the Clay fraction are noted)				*19.72*
Hydrometer Test		0.0463	6.13	13.59
Hydrometer Test		0.0330	5.87	0.26
Hydrometer Test		0.0235	5.61	0.26
Hydrometer Test		0.0167	5.21	0.4
Hydrometer Test		0.0124	4.81	0.4
Hydrometer Test		0.0088	4.54	0.27
Hydrometer Test		0.0063	4.28	0.26
Hydrometer Test		0.0052	4.02	0.25
Hydrometer Test	Clay	0.0045	3.76	0.26
Hydrometer Test	Clay	0.0032	3.64	0.12
Hydrometer Test	Clay	0.0026	3.5	0.14
Hydrometer Test	Clay	0.0013	3.2	0.3

Grain Size Summary	Percent of Total Sample
Gravel	64.6
Sand	15.7
Coarse sand	3.9
Medium sand	8.8
Fine sand	2.9
Silt	15.7
Clay	4.0

Case Narrative for Sample ID: SED-204 (1-2) (A5J0568-32)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

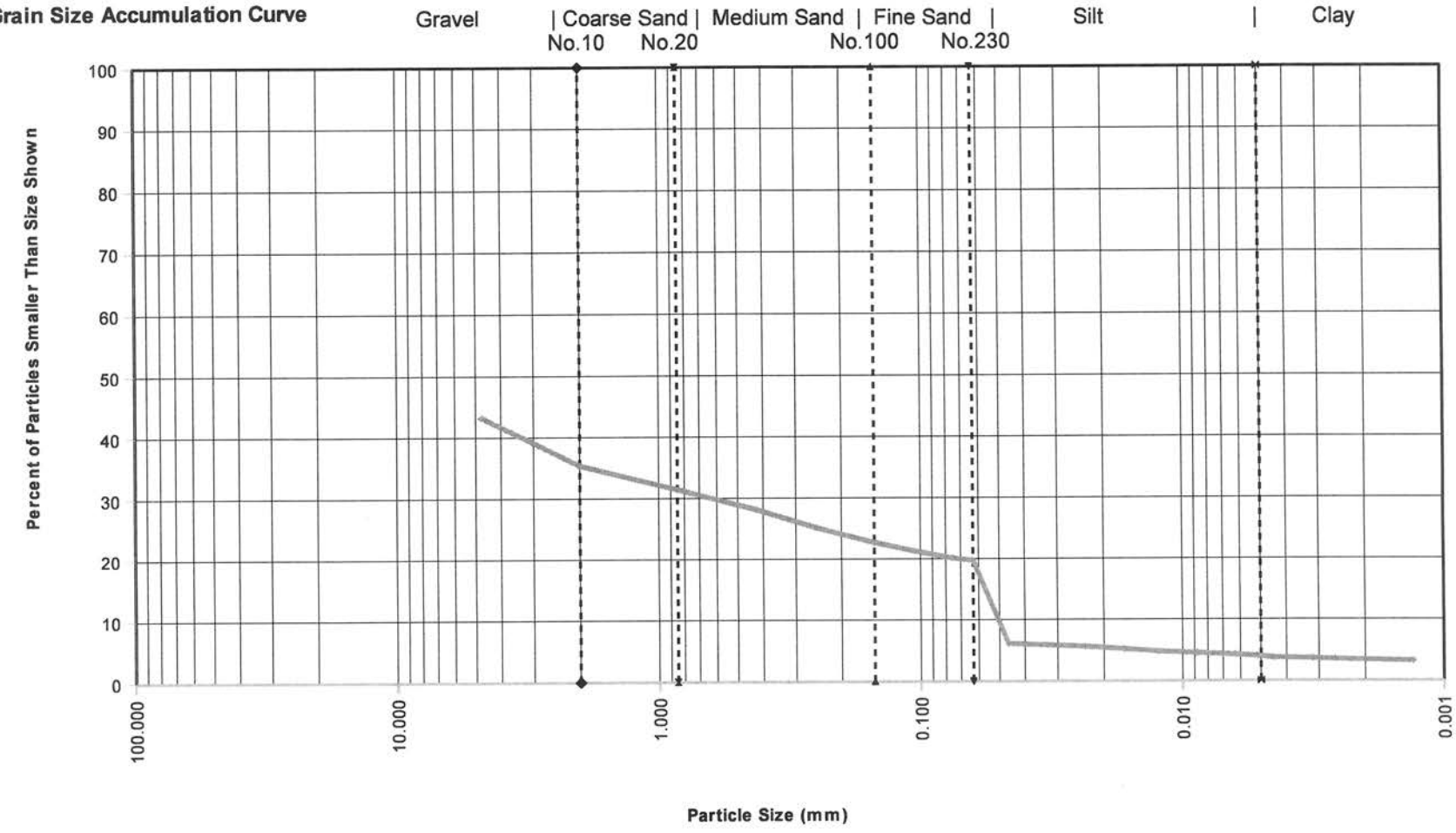
The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.

Expires 12/31/15

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-204 (1-2) (A5J0568-32)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Sub-angular to Sub-rounded	Hard and Durable	Silty GRAVEL with some Sand and trace Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0568-36		Client Sample ID:	SED-205 (0-1)		Batch Number:	5110267
Data Entered by:	VA	Date:	11/10/15	Data Reviewed by:	JPW	Date:	11/11/15
Sample Description:	Silty GRAVEL with some Sand and Clay			Max Particle Size:	Gravel		
Particle Shape:	Sub-angular to Rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.297	272.262	266.97	6.21	251.3

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.142	124.781	118.64	118.64	47.2	52.8
10	2.00	1.224	38.995	37.77	156.41	15.0	37.8
Pan		5.316	108.249	102.93	259.34	38.4	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9415		J56836	1.261	17.260	16.324	6.21

Hydrometer Analysis

Start Date/Time	11/5/2015	12:24	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	51.459		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	37.8		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	48.45		Corrected Dry Weight of Soil Tested (g) (W)	128.27

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	33	20.1	26.81	20.9	10.7	0.01365	0.045	7.90
2	31	20.1	24.81	19.3	11.1	0.01365	0.032	7.31
4	30	20.1	23.81	18.6	11.2	0.01365	0.023	7.01
8	28	20.1	21.81	17.0	11.5	0.01365	0.016	6.42
15	27	19.9	20.75	16.2	11.7	0.01365	0.012	6.11
30	26	19.9	19.75	15.4	11.9	0.01365	0.009	5.81
60	24.5	20	18.28	14.3	12	0.01365	0.006	5.38
90	23	20.1	16.81	13.1	12.4	0.01365	0.005	4.95
120	23	20.2	16.85	13.1	12.4	0.01365	0.004	4.96
240	21.5	20.3	15.38	12.0	12.5	0.01365	0.003	4.53
360	20.5	20.3	14.38	11.2	12.7	0.01365	0.003	4.23
1440	19.5	19.8	13.21	10.3	12.9	0.01365	0.001	3.89

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.269	5.879	4.61	165.63	3.6	34.2
40	0.425	1.291	5.536	4.25	174.12	3.3	30.9
60	0.250	1.287	5.164	3.88	181.88	3.0	27.8
100	0.150	1.282	4.711	3.43	188.74	2.7	25.2
140	0.105	1.286	2.854	1.57	191.87	1.2	23.9
200	0.075	1.282	2.474	1.19	194.26	0.9	23.0
230	0.063	1.290	1.685	0.40	195.05	0.3	22.7
			Sum	19.32	230 Minus	29.13	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-205 (0-1) (A5J0568-36)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*62.23*
Retained on No. 4 sieve		4.75	52.8	47.2
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	37.77	15.03
Sand				*15.06*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	34.18	3.59
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	30.87	3.31
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	27.85	3.02
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	25.17	2.67
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	23.95	1.22
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	23.02	0.93
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	22.71	0.31
Silt and Clay (Measurements in the Clay fraction are noted)				*22.71*
Hydrometer Test		0.0447	7.9	14.82
Hydrometer Test		0.0322	7.31	0.59
Hydrometer Test		0.0228	7.01	0.29
Hydrometer Test		0.0164	6.42	0.59
Hydrometer Test		0.0121	6.11	0.31
Hydrometer Test		0.0086	5.81	0.29
Hydrometer Test		0.0061	5.38	0.43
Hydrometer Test		0.0051	4.95	0.43
Hydrometer Test	Clay	0.0044	4.96	0
Hydrometer Test	Clay	0.0031	4.53	0.42
Hydrometer Test	Clay	0.0026	4.23	0.29
Hydrometer Test	Clay	0.0013	3.89	0.34

Grain Size Summary	Percent of Total Sample
Gravel	62.2
Sand	15.1
Coarse sand	3.6
Medium sand	9.0
Fine sand	2.5
Silt	17.8
Clay	5.0

Case Narrative for Sample ID: SED-205 (0-1) (A5J0568-36)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.

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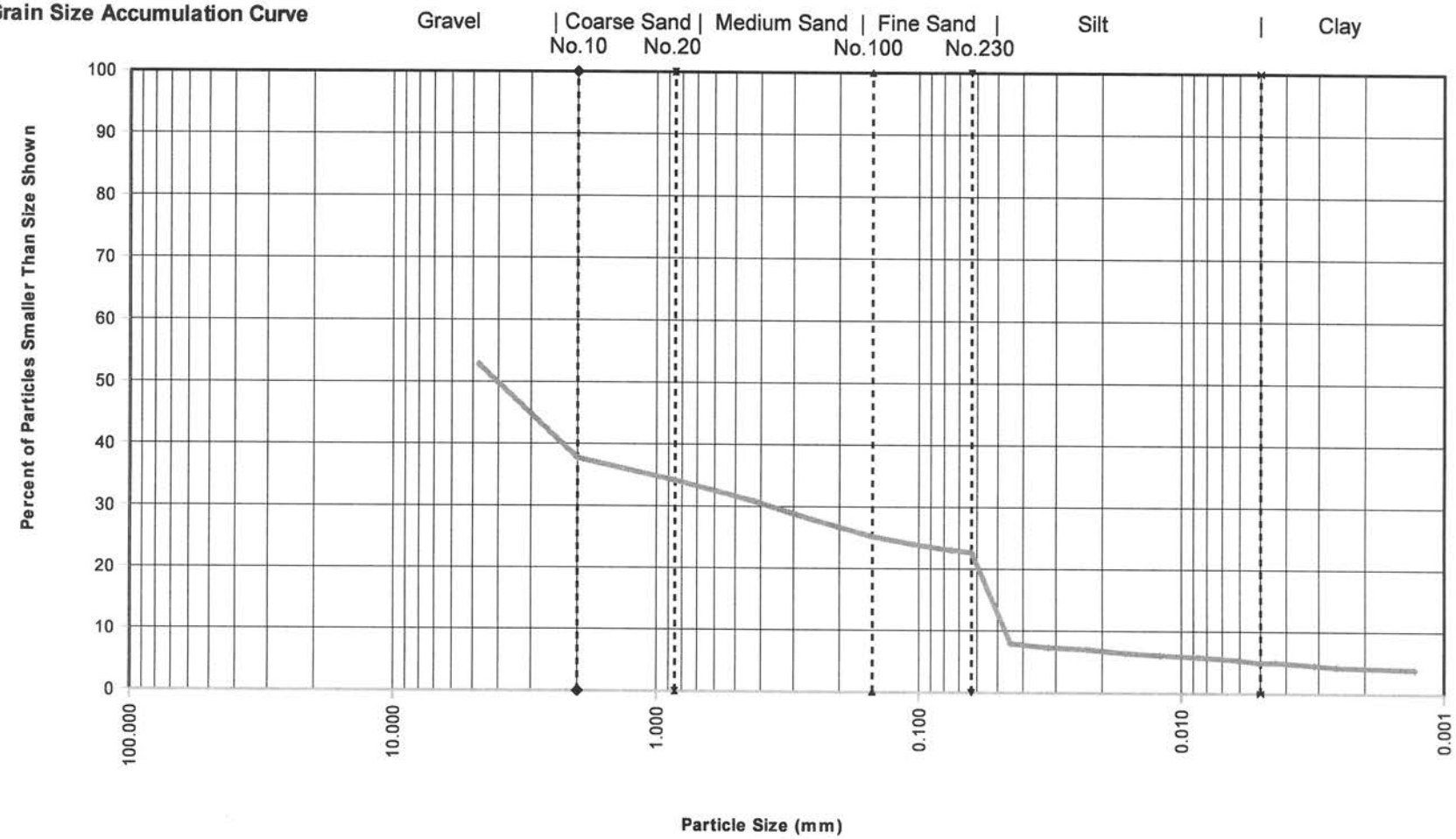
Page 1 of 2

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-205 (0-1) (A5J0568-36)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Sub-angular to Rounded	Hard and Durable	Silty GRAVEL with some Sand and Clay

Apex Labs

12232 S.W. Garden Place
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Tuesday, December 15, 2015

Paul Ecker
EES Environmental Inc
240 N Broadway Ste 203
Portland, OR 97227

RE: Floragon / 1177-01

Enclosed are the results of analyses for work order A5J0576, which was received by the laboratory between 10/19/2015 at 3:43:00PM and 10/20/2015 at 3:43:00PM.

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: pnerenberg@apex-labs.com, or by phone at 503-718-2323.

Apex Labs

12232 S.W. Garden Place
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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SED-206(0-1)	A5J0576-04	Sediment	10/16/15 12:51	10/19/15 15:43
SED-207(0-1)	A5J0576-10	Sediment	10/16/15 13:51	10/19/15 15:43
SED-207(1-2)	A5J0576-11	Sediment	10/16/15 13:52	10/19/15 15:43
SED-208(0-1)	A5J0576-18	Sediment	10/19/15 09:21	10/19/15 15:43
SED-208(1-2)	A5J0576-19	Sediment	10/19/15 09:22	10/19/15 15:43
SED-209(0-1)	A5J0576-26	Sediment	10/19/15 10:21	10/19/15 15:43
SED-209(1-2)	A5J0576-27	Sediment	10/19/15 10:22	10/19/15 15:43
SED-210(0-1)	A5J0576-32	Sediment	10/19/15 11:51	10/19/15 15:43
SED-211(0-1)	A5J0576-40	Sediment	10/19/15 12:51	10/19/15 15:43
SED-211(1-2)	A5J0576-41	Sediment	10/19/15 12:52	10/19/15 15:43
SED-206ABC(0-1) COMP	A5J0576-45	Sediment	10/16/15 12:00	10/19/15 15:43
SED-207ABC(0-1) COMP	A5J0576-46	Sediment	10/16/15 13:00	10/19/15 15:43
SED-207AC(1-2) COMP	A5J0576-47	Sediment	10/16/15 13:10	10/19/15 15:43
SED-208ABC(0-1) COMP	A5J0576-48	Sediment	10/19/15 08:30	10/19/15 15:43
SED-208ABC(1-2) COMP	A5J0576-49	Sediment	10/19/15 08:40	10/19/15 15:43
SED-209ABC(0-1) COMP	A5J0576-50	Sediment	10/19/15 09:30	10/19/15 15:43
SED-209AB(1-2) COMP	A5J0576-51	Sediment	10/19/15 09:40	10/19/15 15:43
SED-210ABC(0-1) COMP	A5J0576-52	Sediment	10/19/15 11:00	10/19/15 15:43
SED-211ABC(0-1) COMP	A5J0576-53	Sediment	10/19/15 12:00	10/19/15 15:43
SED-211ABC(1-2) COMP	A5J0576-54	Sediment	10/19/15 12:10	10/19/15 15:43
SED-250ABC(0-1) COMP	A5J0576-55	Sediment	10/19/15 13:00	10/19/15 15:43

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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.

Philip Nerenberg, Lab Director

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-211ABC(0-1) COMP (A5J0576-53)			**Matrix: Sediment**					
Batch: 5110013								
Arsenic	**3.94**	---	1.42	mg/kg dry	5	11/03/15 21:01	EPA 6020A	
Barium	**129**	---	0.709	"	"	"	"	
Cadmium	ND	---	1.42	"	"	"	"	
Chromium	**39.5**	---	1.42	"	"	"	"	
Lead	**10.2**	---	0.709	"	"	"	"	
Selenium	ND	---	2.84	"	"	"	"	
Silver	ND	---	0.709	"	"	"	"	
SED-211ABC(0-1) COMP (A5J0576-53RE1)			**Matrix: Sediment**					
Batch: 5110013								
Mercury	**0.255**	---	0.0567	mg/kg dry	5	11/04/15 16:11	EPA 6020A	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

TCLP Extraction by EPA 1311

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-211ABC(0-1) COMP (A5J0576-53)			**Matrix: Sediment**		**Batch: 5110016**			
TCLP Extraction	PREP	---		N/A	1	11/02/15 16:09	EPA 1311	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

TCLP Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-211ABC(0-1) COMP (A5J0576-53)			**Matrix: Sediment**					
Batch: 5110062								
Arsenic	ND	---	0.100	mg/L	5	11/03/15 16:18	1311/6020A	TCLPa
Barium	**1.08**	---	0.500	"	"	"	"	TCLPa
Cadmium	ND	---	0.0500	"	"	"	"	TCLPa
Chromium	ND	---	0.100	"	"	"	"	TCLPa
Lead	ND	---	0.0500	"	"	"	"	TCLPa
Mercury	ND	---	0.00400	"	"	"	"	TCLPa
Selenium	ND	---	0.100	"	"	"	"	TCLPa
Silver	ND	---	0.0500	"	"	"	"	TCLPa

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-206ABC(0-1) COMP (A5J0576-45)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**19000**	---	200	mg/kg	1	10/30/15 15:10	PSEP/SM 5310B MOD	
SED-207ABC(0-1) COMP (A5J0576-46)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**8200**	---	200	mg/kg	1	10/30/15 15:10	PSEP/SM 5310B MOD	
SED-207AC(1-2) COMP (A5J0576-47)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**7500**	---	200	mg/kg	1	10/30/15 15:10	PSEP/SM 5310B MOD	
SED-208ABC(0-1) COMP (A5J0576-48)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**16000**	---	200	mg/kg	1	10/30/15 15:10	PSEP/SM 5310B MOD	
SED-208ABC(1-2) COMP (A5J0576-49)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**7400**	---	200	mg/kg	1	10/30/15 15:10	PSEP/SM 5310B MOD	
SED-209ABC(0-1) COMP (A5J0576-50)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**21000**	---	200	mg/kg	1	10/30/15 15:10	PSEP/SM 5310B MOD	
SED-209AB(1-2) COMP (A5J0576-51)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**7100**	---	200	mg/kg	1	10/30/15 15:10	PSEP/SM 5310B MOD	
SED-210ABC(0-1) COMP (A5J0576-52)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**5200**	---	200	mg/kg	1	11/02/15 13:40	PSEP/SM 5310B MOD	
SED-211ABC(0-1) COMP (A5J0576-53)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**9200**	---	200	mg/kg	1	11/02/15 13:40	PSEP/SM 5310B MOD	

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Philip Nerenberg

Philip Nerenberg, Lab Director

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-211ABC(1-2) COMP (A5J0576-54)			**Matrix: Sediment**					
Batch: 5100842								
Total Organic Carbon	**2800**	---	200	mg/kg	1	11/02/15 13:40	PSEP/SM 5310B MOD	
SED-250ABC(0-1) COMP (A5J0576-55)			**Matrix: Sediment**					
Batch: 5100849								
Total Organic Carbon	**16000**	---	200	mg/kg	1	11/02/15 13:40	PSEP/SM 5310B MOD	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-206(0-1) (A5J0576-04)			**Matrix: Sediment**	**Batch: 5110514**				GS-01
Gravel (>2.00mm)	**88.3**	---		% of Total	1	11/17/15 20:01	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**81.7**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**6.54**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**8.48**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**3.06**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**1.88**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**1.45**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**1.17**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**0.48**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**0.34**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.09**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**3.10**	---		"	"	"	"	
Clay (< 0.005 mm)	**0.20**	---		"	"	"	"	
SED-207(0-1) (A5J0576-10)			**Matrix: Sediment**	**Batch: 5110514**				GS-01
Gravel (>2.00mm)	**28.0**	---		% of Total	1	11/17/15 20:01	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**21.3**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**6.64**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**22.6**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**4.74**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**5.08**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**4.18**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**4.11**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**2.16**	---		"	"	"	"	

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Philip Nerenberg, Lab Director

Apex Labs

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-207(0-1) (A5J0576-10)			**Matrix: Sediment**		**Batch: 5110514**			GS-01
Percent Retained 0.075 mm sieve (#200)	**1.80**	---		% of Total	1	"	ASTM D 422m	
Percent Retained 0.063 mm sieve (#230)	**0.54**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**30.1**	---		"	"	"	"	
Clay (< 0.005 mm)	**19.3**	---		"	"	"	"	
SED-207(1-2) (A5J0576-11)			**Matrix: Sediment**		**Batch: 5110514**			GS-01
Gravel (>2.00mm)	**64.5**	---		% of Total	1	11/17/15 20:01	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**59.3**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**5.22**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**11.6**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**3.40**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**2.31**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**1.93**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**1.93**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**0.97**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**0.79**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.25**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**18.0**	---		"	"	"	"	
Clay (< 0.005 mm)	**5.90**	---		"	"	"	"	
SED-208(0-1) (A5J0576-18)			**Matrix: Sediment**		**Batch: 5110514**			GS-01
Gravel (>2.00mm)	**41.6**	---		% of Total	1	11/17/15 20:01	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**32.0**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**9.57**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**29.2**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**8.68**	---		"	"	"	"	

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Philip Nerenberg, Lab Director

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-208(0-1) (A5J0576-18)			**Matrix: Sediment**	**Batch: 5110514**				GS-01
Percent Retained 0.425 mm sieve (#40)	**4.66**	---		% of Total	1	"	ASTM D 422m	
Percent Retained 0.250 mm sieve (#60)	**4.81**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**5.95**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**2.72**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**1.82**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.54**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**21.2**	---		"	"	"	"	
Clay (< 0.005 mm)	**8.10**	---		"	"	"	"	
SED-208(1-2) (A5J0576-19)			**Matrix: Sediment**	**Batch: 5110514**				GS-01
Gravel (>2.00mm)	**43.3**	---		% of Total	1	11/17/15 20:01	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**31.6**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**11.7**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**27.8**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**7.07**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**5.15**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**5.07**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**5.46**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**2.57**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**1.92**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.59**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**20.3**	---		"	"	"	"	
Clay (< 0.005 mm)	**8.60**	---		"	"	"	"	
SED-209(0-1) (A5J0576-26)			**Matrix: Sediment**	**Batch: 5110514**				GS-01
Gravel (>2.00mm)	**48.4**	---		% of Total	1	11/17/15 20:01	ASTM D 422m	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-209(0-1) (A5J0576-26)			**Matrix: Sediment**	**Batch: 5110514**				GS-01
Percent Retained 4.75 mm sieve (#4)	**37.4**	---		% of Total	1	"	ASTM D 422m	
Percent Retained 2.00 mm sieve (#10)	**11.0**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**28.5**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**9.29**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**7.16**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**4.79**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**3.83**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**1.75**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**1.30**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.39**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**18.3**	---		"	"	"	"	
Clay (< 0.005 mm)	**4.80**	---		"	"	"	"	
SED-209(1-2) (A5J0576-27)			**Matrix: Sediment**	**Batch: 5110514**				GS-01
Gravel (>2.00mm)	**61.6**	---		% of Total	1	11/17/15 20:01	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**51.2**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**10.4**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**20.1**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**7.04**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**4.41**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**3.29**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**2.75**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**1.30**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**1.03**	---		"	"	"	"	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-209(1-2) (A5J0576-27)			**Matrix: Sediment**		**Batch: 5110514**			GS-01
Percent Retained 0.063 mm sieve (#230)	**0.33**	---		% of Total	1	"	ASTM D 422m	
Silt (0.005mm < 0.063mm)	**14.3**	---		"	"	"	"	
Clay (< 0.005 mm)	**4.00**	---		"	"	"	"	
SED-210(0-1) (A5J0576-32)			**Matrix: Sediment**		**Batch: 5110514**			GS-01
Gravel (>2.00mm)	**38.6**	---		% of Total	1	11/17/15 20:01	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**32.1**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**6.46**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**26.1**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**7.01**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**5.85**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**4.35**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**3.88**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**2.24**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**2.08**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.67**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**24.0**	---		"	"	"	"	
Clay (< 0.005 mm)	**11.4**	---		"	"	"	"	
SED-211(0-1) (A5J0576-40)			**Matrix: Sediment**		**Batch: 5110514**			GS-01
Gravel (>2.00mm)	**59.8**	---		% of Total	1	11/17/15 20:01	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**41.6**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**18.2**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**21.5**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**8.95**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**4.33**	---		"	"	"	"	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422m/PSET Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-211(0-1) (A5J0576-40)			**Matrix: Sediment**	**Batch: 5110514**				GS-01
Percent Retained 0.250 mm sieve (#60)	**3.02**	---		% of Total	1	"	ASTM D 422m	
Percent Retained 0.150 mm sieve (#100)	**2.55**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**1.26**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**1.02**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.34**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**14.6**	---		"	"	"	"	
Clay (< 0.005 mm)	**4.10**	---		"	"	"	"	
SED-211(1-2) (A5J0576-41)			**Matrix: Sediment**	**Batch: 5110514**				GS-01
Gravel (>2.00mm)	**60.1**	---		% of Total	1	11/17/15 20:01	ASTM D 422m	
Percent Retained 4.75 mm sieve (#4)	**49.5**	---		"	"	"	"	
Percent Retained 2.00 mm sieve (#10)	**10.6**	---		"	"	"	"	
Sand (0.063mm - 2.00mm)	**24.3**	---		"	"	"	"	
Percent Retained 0.85 mm sieve (#20)	**9.78**	---		"	"	"	"	
Percent Retained 0.425 mm sieve (#40)	**5.75**	---		"	"	"	"	
Percent Retained 0.250 mm sieve (#60)	**3.45**	---		"	"	"	"	
Percent Retained 0.150 mm sieve (#100)	**2.52**	---		"	"	"	"	
Percent Retained 0.106 mm sieve (#140)	**1.30**	---		"	"	"	"	
Percent Retained 0.075 mm sieve (#200)	**1.10**	---		"	"	"	"	
Percent Retained 0.063 mm sieve (#230)	**0.37**	---		"	"	"	"	
Silt (0.005mm < 0.063mm)	**12.9**	---		"	"	"	"	
Clay (< 0.005 mm)	**2.60**	---		"	"	"	"	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
SED-206ABC(0-1) COMP (A5J0576-45)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**59.8**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-207ABC(0-1) COMP (A5J0576-46)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**59.7**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-207AC(1-2) COMP (A5J0576-47)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**60.5**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-208ABC(0-1) COMP (A5J0576-48)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**62.6**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-208ABC(1-2) COMP (A5J0576-49)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**71.3**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-209ABC(0-1) COMP (A5J0576-50)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**28.6**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-209AB(1-2) COMP (A5J0576-51)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**73.2**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-210ABC(0-1) COMP (A5J0576-52)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**64.9**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-211ABC(0-1) COMP (A5J0576-53)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**70.2**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-211ABC(1-2) COMP (A5J0576-54)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**71.8**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	
SED-250ABC(0-1) COMP (A5J0576-55)			**Matrix: Sediment**		**Batch: 5100890**			
% Solids	**63.2**	---	1.00	% by Weight	1	10/30/15 08:25	EPA 8000C	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

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 5110013 - EPA 3051A							**Sediment**					
Blank (5110013-BLK1)					Prepared: 11/02/15 09:24		Analyzed: 11/03/15 20:37					
EPA 6020A												
Arsenic	ND	---	1.00	mg/kg wet	5	---	---	---	---	---	---	
Barium	ND	---	0.500	"	"	---	---	---	---	---	---	
Cadmium	ND	---	1.00	"	"	---	---	---	---	---	---	
Chromium	ND	---	1.00	"	"	---	---	---	---	---	---	
Lead	ND	---	0.500	"	"	---	---	---	---	---	---	
Selenium	ND	---	2.00	"	"	---	---	---	---	---	---	
Silver	ND	---	0.500	"	"	---	---	---	---	---	---	
Blank (5110013-BLK2)					Prepared: 11/02/15 09:24		Analyzed: 11/04/15 14:13					
EPA 6020A												
Mercury	ND	---	0.0400	mg/kg wet	5	---	---	---	---	---	---	Q-16
LCS (5110013-BS1)					Prepared: 11/02/15 09:24		Analyzed: 11/03/15 20:40					
EPA 6020A												
Arsenic	24.8	---	1.00	mg/kg wet	5	25.0	---	99	80-120%	---	---	
Barium	25.3	---	0.500	"	"	"	---	101	"	---	---	
Cadmium	25.0	---	1.00	"	"	"	---	100	"	---	---	
Chromium	24.3	---	1.00	"	"	"	---	97	"	---	---	
Lead	25.6	---	0.500	"	"	"	---	102	"	---	---	
Mercury	0.588	---	0.0400	"	"	0.500	---	118	"	---	---	Q-41
Selenium	12.8	---	2.00	"	"	12.5	---	103	"	---	---	
Silver	12.5	---	0.500	"	"	"	---	100	"	---	---	
Duplicate (5110013-DUP1)					Prepared: 11/02/15 09:24		Analyzed: 11/03/15 20:55					
QC Source Sample: Other (A5J0568-46)												
EPA 6020A												
Arsenic	**2.64**	---	1.68	mg/kg dry	5	---	2.24	---	---	16	40%	
Barium	**199**	---	0.840	"	"	---	187	---	---	7	40%	
Cadmium	ND	---	1.68	"	"	---	ND	---	---	---	40%	
Chromium	**29.5**	---	1.68	"	"	---	30.6	---	---	4	40%	
Lead	**8.06**	---	0.840	"	"	---	8.29	---	---	3	40%	
Selenium	ND	---	3.36	"	"	---	ND	---	---	---	40%	
Silver	ND	---	0.840	"	"	---	ND	---	---	---	40%	
Duplicate (5110013-DUP2)					Prepared: 11/02/15 09:24		Analyzed: 11/04/15 16:05					

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

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 5110013 - EPA 3051A											**Sediment**	
Duplicate (5110013-DUP2)					Prepared: 11/02/15 09:24		Analyzed: 11/04/15 16:05					
QC Source Sample: Other (A5J0568-46RE1)												
EPA 6020A												
Mercury	**0.0948**	---	0.0672	mg/kg dry	5	---	0.0970	---	---	2	40%	Q-16
Matrix Spike (5110013-MS1)					Prepared: 11/02/15 09:24		Analyzed: 11/03/15 20:58					
QC Source Sample: Other (A5J0568-46)												
EPA 6020A												
Arsenic	42.8	---	1.65	mg/kg dry	5	41.4	2.24	98	75-125%	---	---	
Barium	222	---	0.827	"	"	"	187	85	"	---	---	
Cadmium	42.1	---	1.65	"	"	"	ND	102	"	---	---	
Chromium	79.1	---	1.65	"	"	"	30.6	117	"	---	---	
Lead	48.8	---	0.827	"	"	"	8.29	98	"	---	---	
Selenium	21.2	---	3.31	"	"	20.6	ND	103	"	---	---	
Silver	20.9	---	0.827	"	"	"	ND	101	"	---	---	
Matrix Spike (5110013-MS2)					Prepared: 11/02/15 09:24		Analyzed: 11/04/15 16:08					
QC Source Sample: Other (A5J0568-46RE1)												
EPA 6020A												
Mercury	0.931	---	0.0661	mg/kg dry	5	0.827	0.0970	101	75-125%	---	---	Q-16

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

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 5110062 - EPA 1311/3015									**Solid**			
Blank (5110062-BLK1)					Prepared: 11/03/15 09:59		Analyzed: 11/03/15 15:30					
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 (5110062-BS1)					Prepared: 11/03/15 09:59		Analyzed: 11/03/15 15:33					
1311/6020A												
Arsenic	2.54	---	0.100	mg/L	5	2.50	---	102	80-120%	---	---	TCLP
Barium	2.42	---	0.500	"	"	"	---	97	"	---	---	TCLP
Cadmium	2.40	---	0.0500	"	"	"	---	96	"	---	---	TCLP
Chromium	2.51	---	0.100	"	"	"	---	100	"	---	---	TCLP
Lead	2.43	---	0.0500	"	"	"	---	97	"	---	---	TCLP
Mercury	0.0473	---	0.00400	"	"	0.0500	---	95	"	---	---	TCLP
Selenium	2.61	---	0.100	"	"	2.50	---	104	"	---	---	TCLP
Silver	1.22	---	0.0500	"	"	1.25	---	98	"	---	---	TCLP
Matrix Spike (5110062-MS1)					Prepared: 11/03/15 09:59		Analyzed: 11/03/15 15:54					
QC Source Sample: Other (A5J0449-BP)												
1311/6020A												
Arsenic	2.49	---	0.100	mg/L	5	2.50	ND	100	50-150%	---	---	
Barium	2.82	---	0.500	"	"	"	0.316	100	"	---	---	
Cadmium	2.49	---	0.0500	"	"	"	ND	100	"	---	---	
Chromium	2.49	---	0.100	"	"	"	ND	100	"	---	---	
Lead	2.52	---	0.0500	"	"	"	ND	101	"	---	---	
Mercury	0.0510	---	0.00400	"	"	0.0500	ND	102	"	---	---	
Selenium	2.48	---	0.100	"	"	2.50	ND	99	"	---	---	
Silver	1.24	---	0.0500	"	"	1.25	ND	99	"	---	---	
Matrix Spike (5110062-MS2)					Prepared: 11/03/15 09:59		Analyzed: 11/03/15 16:21					
QC Source Sample: SED-211ABC(0-1) COMP (A5J0576-53)												
1311/6020A												

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Philip Nerenberg, Lab Director

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

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 5110062 - EPA 1311/3015									**Solid**			
Matrix Spike (5110062-MS2)					Prepared: 11/03/15 09:59 Analyzed: 11/03/15 16:21							
QC Source Sample: SED-211ABC(0-1) COMP (A5J0576-53)												
Arsenic	2.55	---	0.100	mg/L	5	2.50	ND	102	50-150%	---	---	
Barium	3.61	---	0.500	"	"	"	1.08	101	"	---	---	
Cadmium	2.47	---	0.0500	"	"	"	ND	99	"	---	---	
Chromium	2.54	---	0.100	"	"	"	ND	102	"	---	---	
Lead	2.53	---	0.0500	"	"	"	ND	101	"	---	---	
Mercury	0.0504	---	0.00400	"	"	0.0500	ND	101	"	---	---	
Selenium	2.55	---	0.100	"	"	2.50	ND	102	"	---	---	
Silver	1.27	---	0.0500	"	"	1.25	ND	102	"	---	---	

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240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

QUALITY CONTROL (QC) SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5100842 - PSEP TOC									**Sediment**			
Blank (5100842-BLK1)					Prepared: 10/28/15 12:32		Analyzed: 10/29/15 14:15					
PSEP/SM 5310B MOD												
Total Organic Carbon	ND	---	200	mg/kg	1	---	---	---	---	---	---	
LCS (5100842-BS1)					Prepared: 10/28/15 12:32		Analyzed: 10/29/15 14:15					
PSEP/SM 5310B MOD												
Total Organic Carbon	9200	---		mg/kg	1	10000	---	92	85-115%	---	---	
Duplicate (5100842-DUP1)					Prepared: 10/28/15 12:32		Analyzed: 10/29/15 14:15					
QC Source Sample: Other (A5J0568-37)												
PSEP/SM 5310B MOD												
Total Organic Carbon	**2100**	---	200	mg/kg	1	---	2600	---	---	21	20%	Q-01
Duplicate (5100842-DUP2)					Prepared: 10/28/15 12:32		Analyzed: 11/02/15 13:40					
QC Source Sample: SED-211ABC(1-2) COMP (A5J0576-54)												
PSEP/SM 5310B MOD												
Total Organic Carbon	**3400**	---	200	mg/kg	1	---	2800	---	---	20	20%	

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

QUALITY CONTROL (QC) SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5100849 - PSEP TOC												**Sediment**
Blank (5100849-BLK1)					Prepared: 10/28/15 12:33		Analyzed: 11/02/15 13:40					
PSEP/SM 5310B MOD												
Total Organic Carbon	ND	---	200	mg/kg	1	---	---	---	---	---	---	
LCS (5100849-BS1)					Prepared: 10/28/15 12:33		Analyzed: 11/02/15 13:40					
PSEP/SM 5310B MOD												
Total Organic Carbon	9400	---		mg/kg	1	10000	---	94	85-115%	---	---	
Duplicate (5100849-DUP1)					Prepared: 10/28/15 12:33		Analyzed: 11/02/15 13:40					
QC Source Sample: SED-250ABC(0-1) COMP (A5J0576-55)												
PSEP/SM 5310B MOD												
Total Organic Carbon	**18000**	---	200	mg/kg	1	---	16000	---	---	14	20%	

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240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

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 5100890 - Total Solids (Dry Weight)								Soil				
Duplicate (5100890-DUP1)					Prepared: 10/29/15 10:36		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0568-40)												
EPA 8000C												
% Solids	**65.5**	---	1.00	% by Weight	1	---	67.1	---	---	2	10%	
Duplicate (5100890-DUP2)					Prepared: 10/29/15 10:36		Analyzed: 10/30/15 08:25					
QC Source Sample: SED-209AB(1-2) COMP (A5J0576-51)												
EPA 8000C												
% Solids	**71.3**	---	1.00	% by Weight	1	---	73.2	---	---	3	10%	
Duplicate (5100890-DUP3)					Prepared: 10/29/15 10:36		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0781-17)												
EPA 8000C												
% Solids	**88.9**	---	1.00	% by Weight	1	---	88.8	---	---	0.06	10%	
Duplicate (5100890-DUP4)					Prepared: 10/29/15 10:36		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0798-01)												
EPA 8000C												
% Solids	**71.6**	---	1.00	% by Weight	1	---	66.8	---	---	7	10%	
Duplicate (5100890-DUP5)					Prepared: 10/29/15 10:37		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0869-04)												
EPA 8000C												
% Solids	**77.0**	---	1.00	% by Weight	1	---	76.8	---	---	0.2	10%	
Duplicate (5100890-DUP6)					Prepared: 10/29/15 10:37		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0869-10)												
EPA 8000C												
% Solids	**77.8**	---	1.00	% by Weight	1	---	77.7	---	---	0.07	10%	
Duplicate (5100890-DUP7)					Prepared: 10/29/15 16:19		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0895-05)												
EPA 8000C												
% Solids	**80.6**	---	1.00	% by Weight	1	---	80.8	---	---	0.1	10%	
Duplicate (5100890-DUP8)					Prepared: 10/29/15 17:58		Analyzed: 10/30/15 08:25					

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

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 5100890 - Total Solids (Dry Weight)											**Soil**	
Duplicate (5100890-DUP8)					Prepared: 10/29/15 17:58		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0908-01)												
EPA 8000C												
% Solids	**84.1**	---	1.00	% by Weight	1	---	84.0	---	---	0.08	10%	
Duplicate (5100890-DUP9)					Prepared: 10/29/15 17:58		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0827-02)												
EPA 8000C												
% Solids	**96.9**	---	1.00	% by Weight	1	---	96.8	---	---	0.1	10%	
Duplicate (5100890-DUPA)					Prepared: 10/29/15 20:24		Analyzed: 10/30/15 08:25					
QC Source Sample: Other (A5J0916-01)												
EPA 8000C												
% Solids	**73.4**	---	1.00	% by Weight	1	---	73.6	---	---	0.3	10%	

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EES Environmental Inc	Project: **Floragon**	
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Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

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: 5110013							
A5J0576-53	Sediment	EPA 6020A	10/19/15 12:00	11/02/15 09:24	0.502g/50mL	0.5g/50mL	1.00
A5J0576-53RE1	Sediment	EPA 6020A	10/19/15 12:00	11/02/15 09:24	0.502g/50mL	0.5g/50mL	1.00

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: 5110016							
A5J0576-53	Sediment	EPA 1311	10/19/15 12:00	11/02/15 16:09	65.54g/1311mL	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: 5110062							
A5J0576-53	Sediment	1311/6020A	10/19/15 12:00	11/03/15 09:59	5mL/50mL	5mL/50mL	1.00

Conventional Chemistry Parameters

Prep: PSEP TOC

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 5100842							
A5J0576-45	Sediment	PSEP/SM 5310B MOD	10/16/15 12:00	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0576-46	Sediment	PSEP/SM 5310B MOD	10/16/15 13:00	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0576-47	Sediment	PSEP/SM 5310B MOD	10/16/15 13:10	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0576-48	Sediment	PSEP/SM 5310B MOD	10/19/15 08:30	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0576-49	Sediment	PSEP/SM 5310B MOD	10/19/15 08:40	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0576-50	Sediment	PSEP/SM 5310B MOD	10/19/15 09:30	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0576-51	Sediment	PSEP/SM 5310B MOD	10/19/15 09:40	10/28/15 12:32	5g/5g	5g/5g	NA

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

SAMPLE PREPARATION INFORMATION

Conventional Chemistry Parameters

Prep: PSEP TOC

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A5J0576-52	Sediment	PSEP/SM 5310B MOD	10/19/15 11:00	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0576-53	Sediment	PSEP/SM 5310B MOD	10/19/15 12:00	10/28/15 12:32	5g/5g	5g/5g	NA
A5J0576-54	Sediment	PSEP/SM 5310B MOD	10/19/15 12:10	10/28/15 12:32	5g/5g	5g/5g	NA
Batch: 5100849							
A5J0576-55	Sediment	PSEP/SM 5310B MOD	10/19/15 13:00	10/28/15 12:33	5g/5g	5g/5g	NA

Grain Size by ASTM D 422m/PSET Parameters

Prep: ASTM D 421

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 5110514							
A5J0576-04	Sediment	ASTM D 422m	10/16/15 12:51	11/12/15 11:15	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-10	Sediment	ASTM D 422m	10/16/15 13:51	11/12/15 11:29	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-11	Sediment	ASTM D 422m	10/16/15 13:52	11/12/15 11:39	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-18	Sediment	ASTM D 422m	10/19/15 09:21	11/12/15 12:02	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-19	Sediment	ASTM D 422m	10/19/15 09:22	11/12/15 12:18	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-26	Sediment	ASTM D 422m	10/19/15 10:21	11/12/15 12:36	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-27	Sediment	ASTM D 422m	10/19/15 10:22	11/12/15 12:53	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-32	Sediment	ASTM D 422m	10/19/15 11:51	11/12/15 13:14	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-40	Sediment	ASTM D 422m	10/19/15 12:51	11/12/15 13:24	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-41	Sediment	ASTM D 422m	10/19/15 12:52	11/12/15 13:37	1N/A/1N/A	1N/A/1N/A	NA

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 5100890							
A5J0576-45	Sediment	EPA 8000C	10/16/15 12:00	10/29/15 10:37	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-46	Sediment	EPA 8000C	10/16/15 13:00	10/29/15 10:37	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-47	Sediment	EPA 8000C	10/16/15 13:10	10/29/15 10:37	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-48	Sediment	EPA 8000C	10/19/15 08:30	10/29/15 10:37	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-49	Sediment	EPA 8000C	10/19/15 08:40	10/29/15 10:37	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-50	Sediment	EPA 8000C	10/19/15 09:30	10/29/15 10:37	1N/A/1N/A	1N/A/1N/A	NA

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EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

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
A5J0576-51	Sediment	EPA 8000C	10/19/15 09:40	10/29/15 10:37	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-52	Sediment	EPA 8000C	10/19/15 11:00	10/29/15 10:37	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-53	Sediment	EPA 8000C	10/19/15 12:00	10/29/15 10:37	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-54	Sediment	EPA 8000C	10/19/15 12:10	10/29/15 10:37	1N/A/1N/A	1N/A/1N/A	NA
A5J0576-55	Sediment	EPA 8000C	10/19/15 13:00	10/29/15 10:37	1N/A/1N/A	1N/A/1N/A	NA

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240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00

Notes and Definitions

Qualifiers:

GS-01	See detailed Particle Size Analysis results, accumulation curves, and Case Narratives at the end of this report.
Q-01	Spike recovery and/or RPD is outside acceptance limits.
Q-16	Reanalysis of an original Batch QC sample.
Q-41	Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.
TCLP	This batch QC sample was prepared with TCLP or SPLP fluid from preparation batch 5110016.
TCLPa	Limited sample volume. Leachate was prepared using less than the recommended amount of sample per EPA 1311 or 1312. To maintain consistency in leaching, the standard ratio of sample to leachate fluid was maintained.

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	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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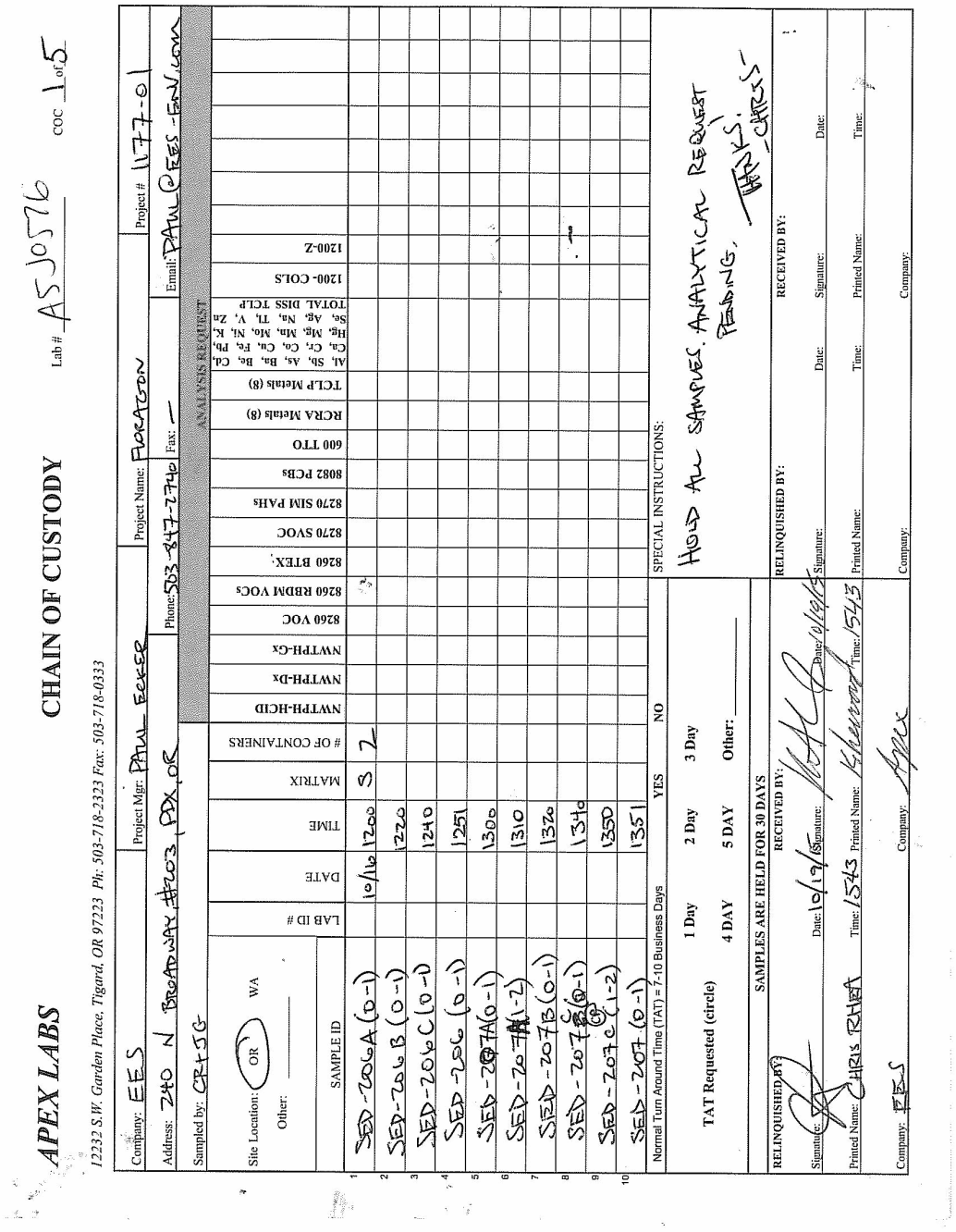
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00



APEX LABS

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CHAIN OF CUSTODY

Lab # A5J0576 COC 1 of 5

Company: EES | Project Mgr: Paul Beeler | Project Name: Floragon | Project #: 1177-01

Address: 240 N Broadway #103, PDX, OR | Phone: 503-847-2740 | Fax: — | Email: Paul@EES-Env.com

Sampled by: CR+SG

ANALYSIS REQUEST

Site Location: (OR) WA Other: _____

#	SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 VOC	8260 RBDM VOCs	8260 BTEX	8270 SVOC	8270 SIM PAHs	8082 PCBs	600 TTO	RCRA Metals (8)	TCLP Metals (8)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS TCLP	1200- COLS	1200-Z
1	SED-206A (0-1)		10/12	1200	S	2															
2	SED-206B (0-1)			1220																	
3	SED-206C (0-1)			1240																	
4	SED-206 (0-1)			1251																	
5	SED-207A (0-1)			1300																	
6	SED-207A (1-2)			1310																	
7	SED-207B (0-1)			1320																	
8	SED-207C (0-1)			1340																	
9	SED-207C (1-2)			1350																	
10	SED-207 (0-1)			1351																	

Normal Turn Around Time (TAT) = 7-10 Business Days — YES / NO

TAT Requested (circle): 1 Day, 2 Day, 3 Day, 4 DAY, 5 DAY, Other: _____

SPECIAL INSTRUCTIONS: Hold all samples. Analytical Request Pending, Thanks, Chris

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: Signature: _____ Date: 10/13/15 Time: 1543 Printed Name: Chris Richter Company: EES

RECEIVED BY: Signature: _____ Date: 10/13/15 Time: 1543 Printed Name: _____ Company: _____

RELINQUISHED BY: Signature: _____ Date: _____ Time: _____ Printed Name: _____ Company: _____

RECEIVED BY: Signature: _____ Date: _____ Time: _____ Printed Name: _____ Company: _____

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.

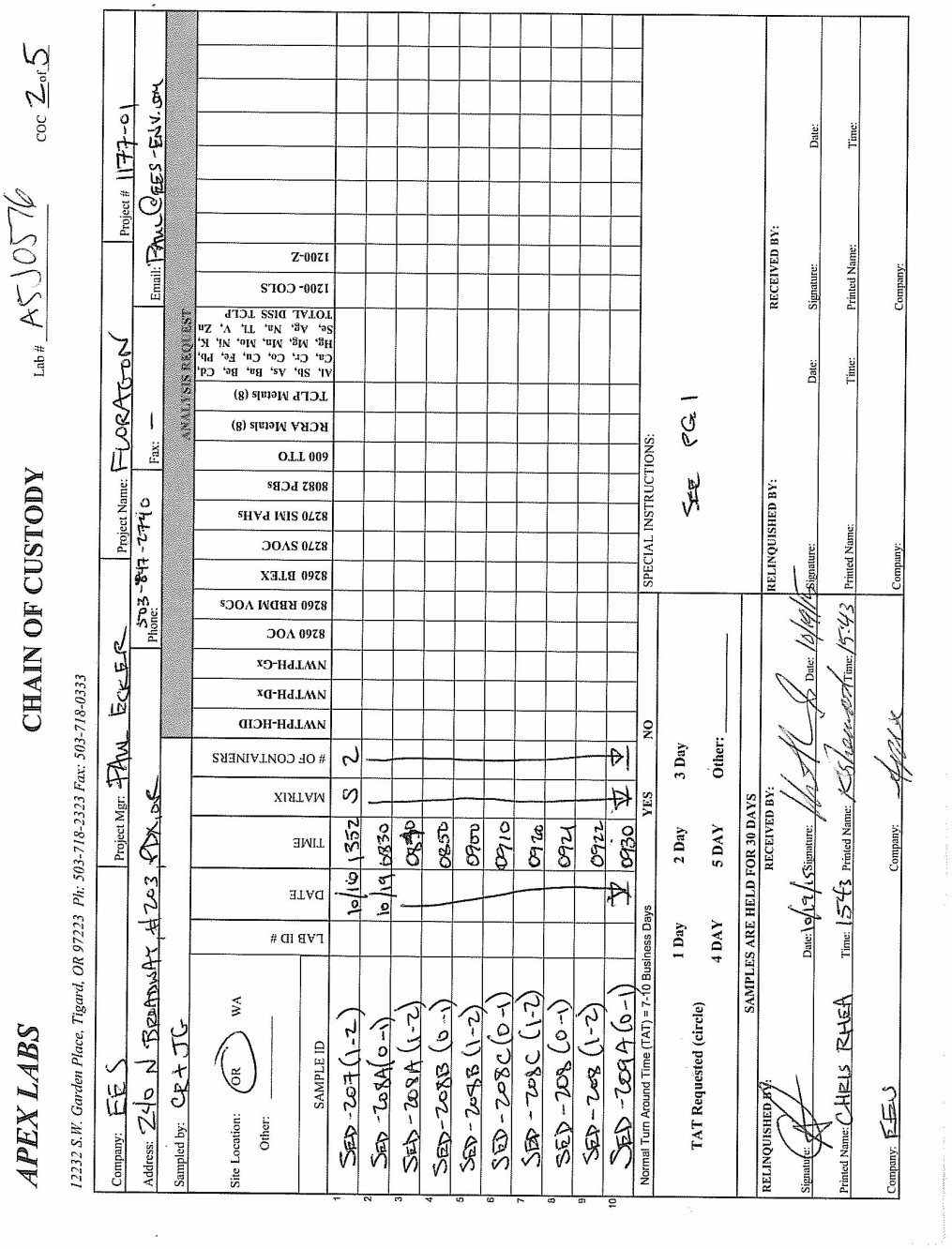
Philip Nerenberg

Philip Nerenberg, Lab Director

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00



APEX LABS

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

CHAIN OF CUSTODY

Lab # A5J0576 COC 2 of 5

Company: EES | Project Mgr: PAUL ECKER | Project Name: FLORAGON | Project #: 1177-01

Address: 240 N BROADWAY, #203, PDX, OR | Phone: 503-887-7960 | Fax: — | Email: PAUL@EES-ENV.COM

Sampled by: CR + JG

ANALYSIS REQUEST

Site Location: (OR) WA Other: ____

#	SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 VOC	8260 RBDM VOCs	8260 BTEX	8270 SVOC	8270 SIM PAHs	8082 PCBs	600 TTO	RCRA Metals (8)	TCLP Metals (8)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Se, Ag, Mn, Mo, Ni, K, Hg, Mg, Mn, Mo, Ni, K, Sn, Ag, Na, Tl, V, Zn TOTAL DISS TCLP	1200- COLS	1200-Z
1	SED-207(1-2)		10/16	1352	S	2														
2	SED-208A(0-1)		10/19	0830																
3	SED-208A(1-2)			0840																
4	SED-208B (0-1)			0850																
5	SED-208B(1-2)			0900																
6	SED-208C(0-1)			0910																
7	SED-208C(1-2)			0920																
8	SED-208(0-1)			0921																
9	SED-208(1-2)			0922																
10	SED-209A(0-1)			0930																

Normal Turn Around Time (TAT) = 7-10 Business Days — YES — NO

TAT Requested (circle): 1 Day | 2 Day | 3 Day | 4 DAY | 5 DAY | Other: ____

SPECIAL INSTRUCTIONS: SEE PG 1

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: Signature: ____ Printed Name: CHRIS RHEA Company: EES

RECEIVED BY: Signature: ____ Printed Name: ____ Company: ____ Date: 10/19/15 Time: 1543

RELINQUISHED BY: Signature: ____ Printed Name: ____ Company: ____ Date: ____ Time: ____

RECEIVED BY: Signature: ____ Printed Name: ____ Company: ____ Date: ____ Time: ____

Apex Laboratories

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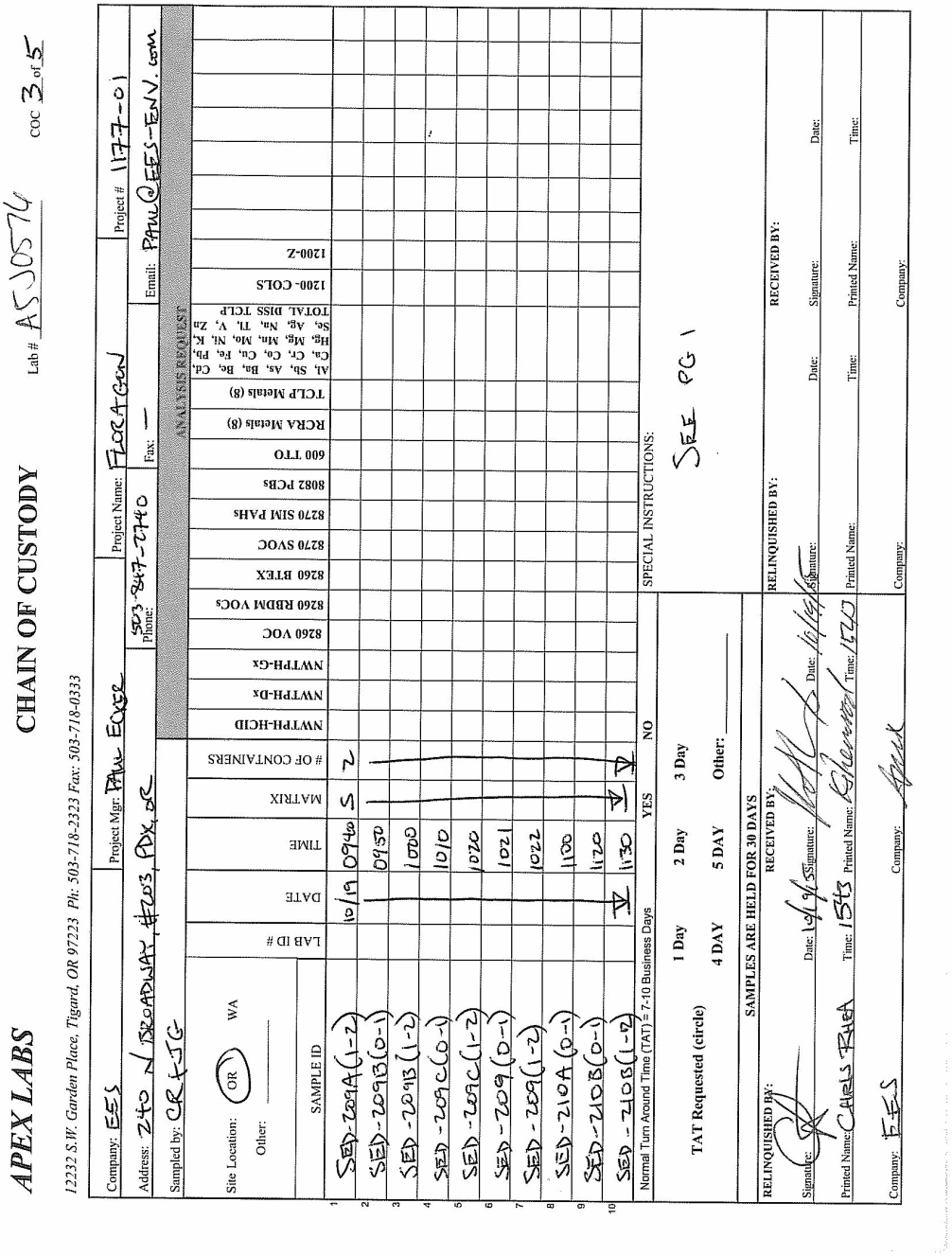
Philip Nerenberg

Philip Nerenberg, Lab Director

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

EES Environmental Inc	Project: **Floragon**	
240 N Broadway Ste 203	Project Number: 1177-01	**Reported:**
Portland, OR 97227	Project Manager: Paul Ecker	12/15/15 09:00



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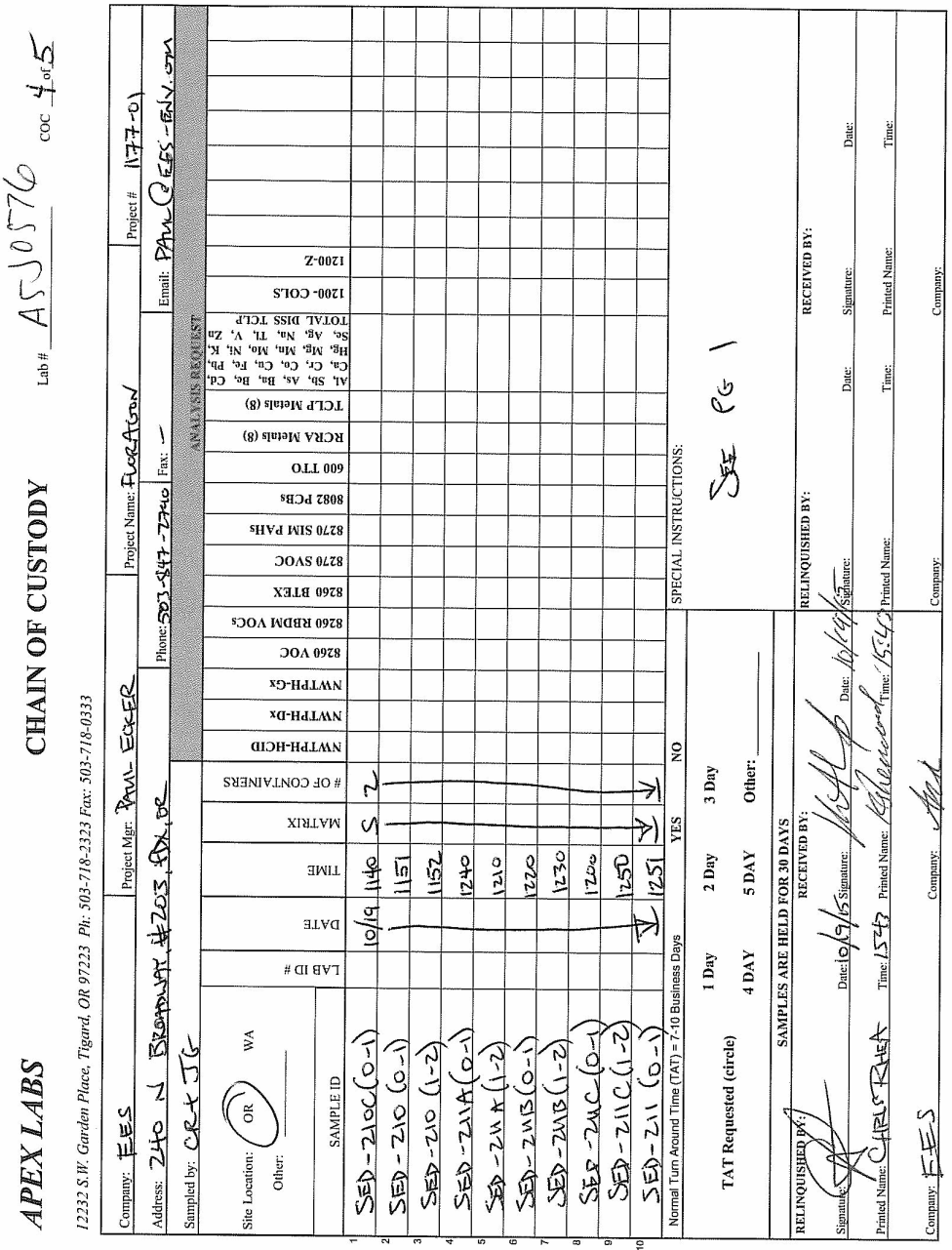

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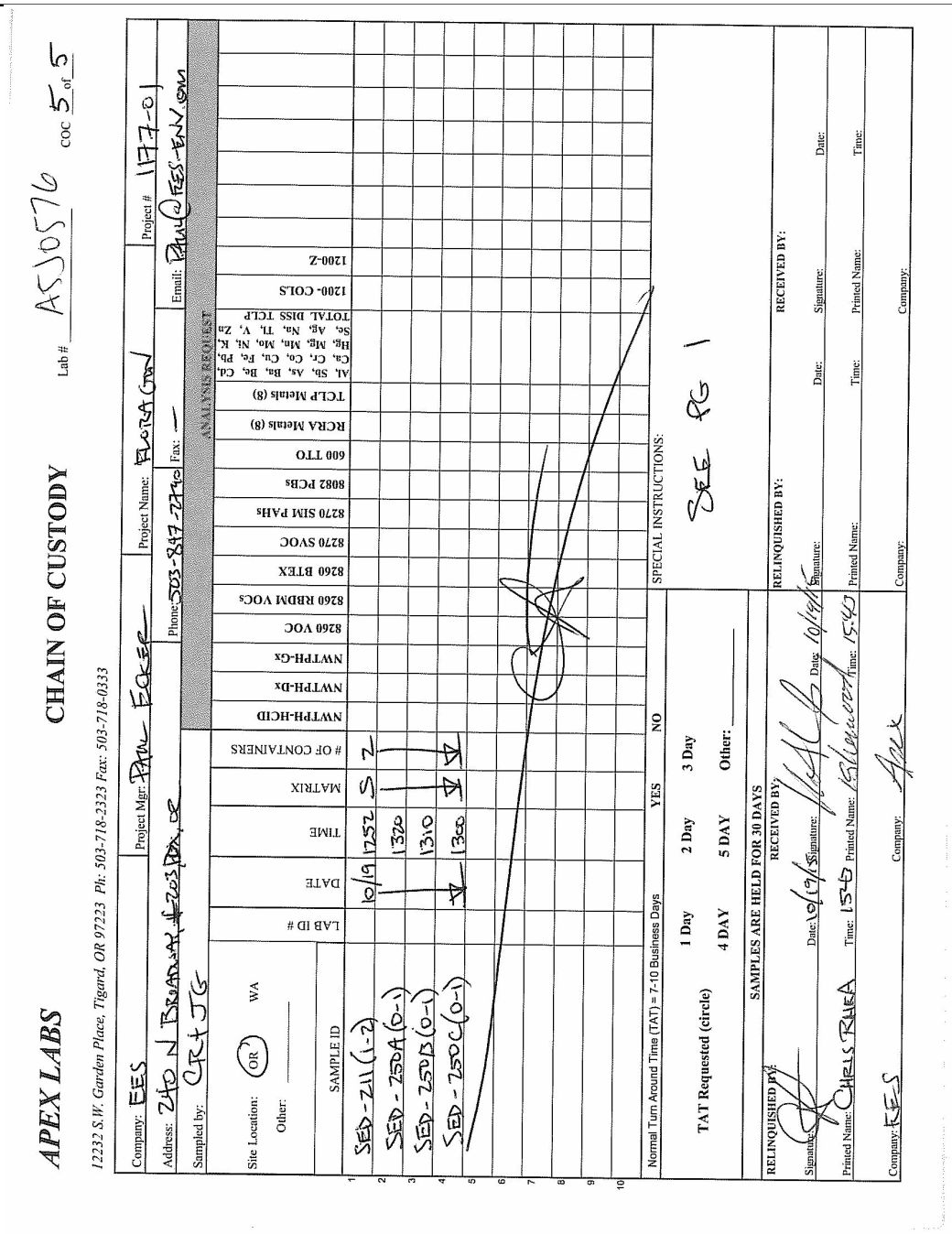

Apex Laboratories

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Philip Nerenberg

Philip Nerenberg, Lab Director

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0576-04		Client Sample ID:	SED-206(0-1)		Batch Number:	5110514
Data Entered by:	VA	Date:	11/17/15	Data Reviewed by:	JPW	Date:	11/18/15
Sample Description:	Gravel with trace Sand and Silt			Max Particle Size:	Gravel		
Particle Shape:	Angular			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	6.773	319.303	312.53	3.73	301.3

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.077	252.292	246.22	246.22	81.7	18.3
10	2.00	1.293	21.000	19.71	265.92	6.5	11.7
Pan		5.430	47.321	41.89	307.81	13.4	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9640		J57604	1.286	6.265	6.086	3.73

Hydrometer Analysis

Start Date/Time	11/12/2015	11:15	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	36.807		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	11.7		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	35.48		Corrected Dry Weight of Soil Tested (g) (W)	302.24

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	16	18.4	10.8	3.6	13.5	0.01399	0.051	0.42
2	14.5	18.4	9.3	3.1	13.7	0.01399	0.037	0.36
4	14	18.4	8.8	2.9	13.8	0.01399	0.026	0.34
8	13.5	18.4	8.3	2.7	13.8	0.01399	0.018	0.32
15	12.5	18.4	7.3	2.4	14	0.01399	0.014	0.28
30	10.5	18.5	5.33	1.8	14.3	0.01382	0.010	0.21
60	10	18.7	4.88	1.6	14.5	0.01382	0.007	0.19
90	9	18.8	3.9	1.3	14.7	0.01382	0.006	0.15
120	9	19	3.95	1.3	14.7	0.01382	0.005	0.15
240	7	19.5	2.08	0.7	15	0.01365	0.003	0.08
360	7	19.6	2.11	0.7	15	0.01365	0.003	0.08
1440	6	18.9	0.93	0.3	15.2	0.01382	0.001	0.04

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.276	10.531	9.26	276.46	3.1	8.7
40	0.425	1.210	6.900	5.69	282.93	1.9	6.8
60	0.250	1.269	5.659	4.39	287.93	1.5	5.3
100	0.150	1.265	4.796	3.53	291.95	1.2	4.2
140	0.105	1.268	2.730	1.46	293.61	0.5	3.7
200	0.075	1.271	2.288	1.02	294.77	0.3	3.4
230	0.063	1.254	1.532	0.28	295.08	0.1	3.3
			Sum	25.62	230 Minus	9.86	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-206(0-1) (A5J0576-04)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*88.26*
Retained on No. 4 sieve		4.75	18.28	81.72
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	11.74	6.54
Sand				*8.48*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	8.68	3.06
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	6.8	1.88
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	5.34	1.45
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	4.17	1.17
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	3.69	0.48
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	3.35	0.34
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	3.26	0.09
Silt and Clay (Measurements in the Clay fraction are noted)				*3.26*
Hydrometer Test		0.0514	0.42	2.84
Hydrometer Test		0.0366	0.36	0.06
Hydrometer Test		0.0260	0.34	0.02
Hydrometer Test		0.0184	0.32	0.02
Hydrometer Test		0.0135	0.28	0.04
Hydrometer Test		0.0095	0.21	0.08
Hydrometer Test		0.0068	0.19	0.02
Hydrometer Test		0.0056	0.15	0.04
Hydrometer Test	Clay	0.0048	0.15	0
Hydrometer Test	Clay	0.0034	0.08	0.07
Hydrometer Test	Clay	0.0028	0.08	0
Hydrometer Test	Clay	0.0014	0.04	0.04

Grain Size Summary	Percent of Total Sample
Gravel	88.3
Sand	8.5
Coarse sand	3.1
Medium sand	4.5
Fine sand	0.9
Silt	3.1
Clay	0.2

Case Narrative for Sample ID: SED-206(0-1) (A5J0576-04)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10 and +20 fractions.

+40 fraction consists mostly of organic material.

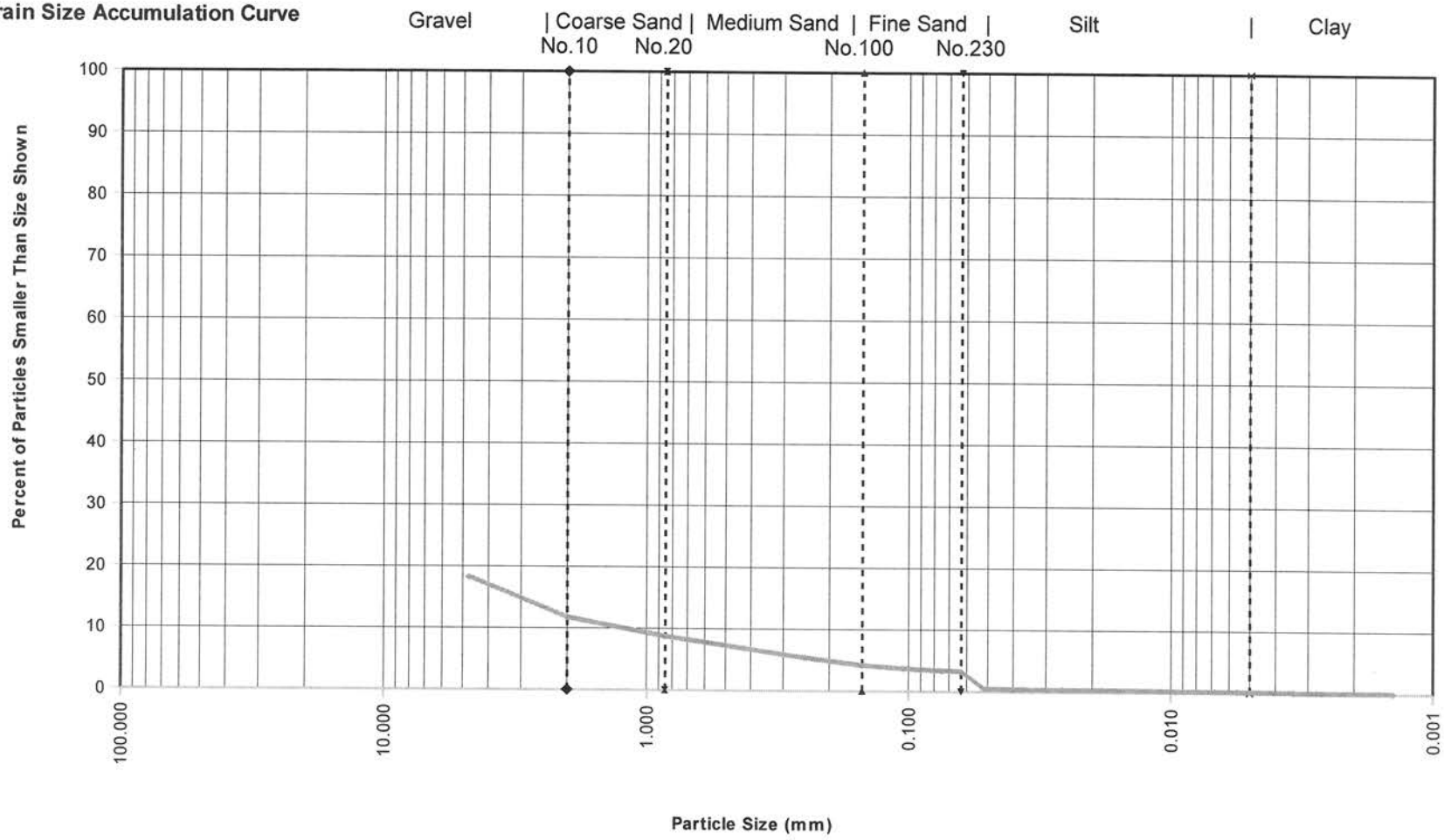
Hydrometer readings for 1, 2, 4, 8 and 15 minutes are estimated due to the presence of foam.

Only 41.89 grams of sample was retained on the -10 sieve, which is less than the required 65 grams; the silt and clay results may be slightly biased due to this deviation.

Express 12/31/15

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-206(0-1) (A5J0576-04)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular	Hard and Durable	Gravel with trace Sand and Silt

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0576-10		Client Sample ID:	SED-207(0-1)		Batch Number:	5110514
Data Entered by:	VA	Date:	11/17/15	Data Reviewed by:	JPW	Date:	11/18/15
Sample Description:	Clayey SILT with some Gravel and Sand			Max Particle Size:	Gravel		
Particle Shape:	Sub-angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.458	259.260	253.80	7.87	235.3

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	1.295	51.483	50.19	50.19	21.3	78.7
10	2.00	1.294	16.927	15.63	65.82	6.6	72.0
Pan		5.429	190.642	185.21	251.03	72.5	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9271		J57610	1.239	17.391	16.213	7.87

Hydrometer Analysis

Start Date/Time	11/12/2015	11:29	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	50.420		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	72.0		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	46.74		Corrected Dry Weight of Soil Tested (g) (W)	64.90

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	34	18.6	27.31	42.1	10.5	0.01382	0.045	30.31
2	33	18.6	26.31	40.5	10.7	0.01382	0.032	29.20
4	31.5	18.6	24.81	38.2	10.9	0.01382	0.023	27.54
8	30	18.5	23.28	35.9	11.2	0.01382	0.016	25.84
15	27.5	18.5	20.78	32.0	11.5	0.01382	0.012	23.06
30	26.5	18.6	19.81	30.5	11.7	0.01382	0.009	21.99
60	25	18.8	18.38	28.3	12	0.01382	0.006	20.40
90	24	18.9	17.41	26.8	12.2	0.01382	0.005	19.33
120	23.5	19.2	17.01	26.2	12.2	0.01382	0.004	18.88
240	23	19.5	16.61	25.6	12.4	0.01365	0.003	18.44
360	22.5	19.6	16.15	24.9	12.4	0.01365	0.003	17.92
1440	22	18.9	15.41	23.7	12.5	0.01382	0.001	17.11

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.220	4.294	3.07	77.11	4.7	67.3
40	0.425	1.226	4.525	3.30	89.23	5.1	62.2
60	0.250	1.274	3.985	2.71	99.19	4.2	58.0
100	0.150	1.278	3.946	2.67	108.99	4.1	53.9
140	0.105	1.239	2.644	1.41	114.15	2.2	51.8
200	0.075	1.221	2.390	1.17	118.45	1.8	50.0
230	0.063	1.250	1.600	0.35	119.73	0.5	49.4
			Sum	14.68	230 Minus	32.07	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-207(0-1) (A5J0576-10)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*27.97*
Retained on No. 4 sieve		4.75	78.67	21.33
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	72.03	6.64
Sand				*22.61*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	67.29	4.74
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	62.21	5.08
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	58.03	4.18
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	53.92	4.11
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	51.75	2.16
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	49.95	1.8
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	49.41	0.54
Silt and Clay (Measurements in the Clay fraction are noted)				*49.41*
Hydrometer Test		0.0448	30.31	19.1
Hydrometer Test		0.0320	29.2	1.11
Hydrometer Test		0.0228	27.54	1.66
Hydrometer Test		0.0164	25.84	1.7
Hydrometer Test		0.0121	23.06	2.77
Hydrometer Test		0.0086	21.99	1.07
Hydrometer Test		0.0062	20.4	1.59
Hydrometer Test		0.0051	19.33	1.07
Hydrometer Test	Clay	0.0044	18.88	0.44
Hydrometer Test	Clay	0.0031	18.44	0.44
Hydrometer Test	Clay	0.0025	17.92	0.52
Hydrometer Test	Clay	0.0013	17.11	0.81

Grain Size Summary	Percent of Total Sample
Gravel	28.0
Sand	22.6
Coarse sand	4.7
Medium sand	13.4
Fine sand	4.5
Silt	30.1
Clay	19.3

Case Narrative for Sample ID: SED-207(0-1) (A5J0576-10)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

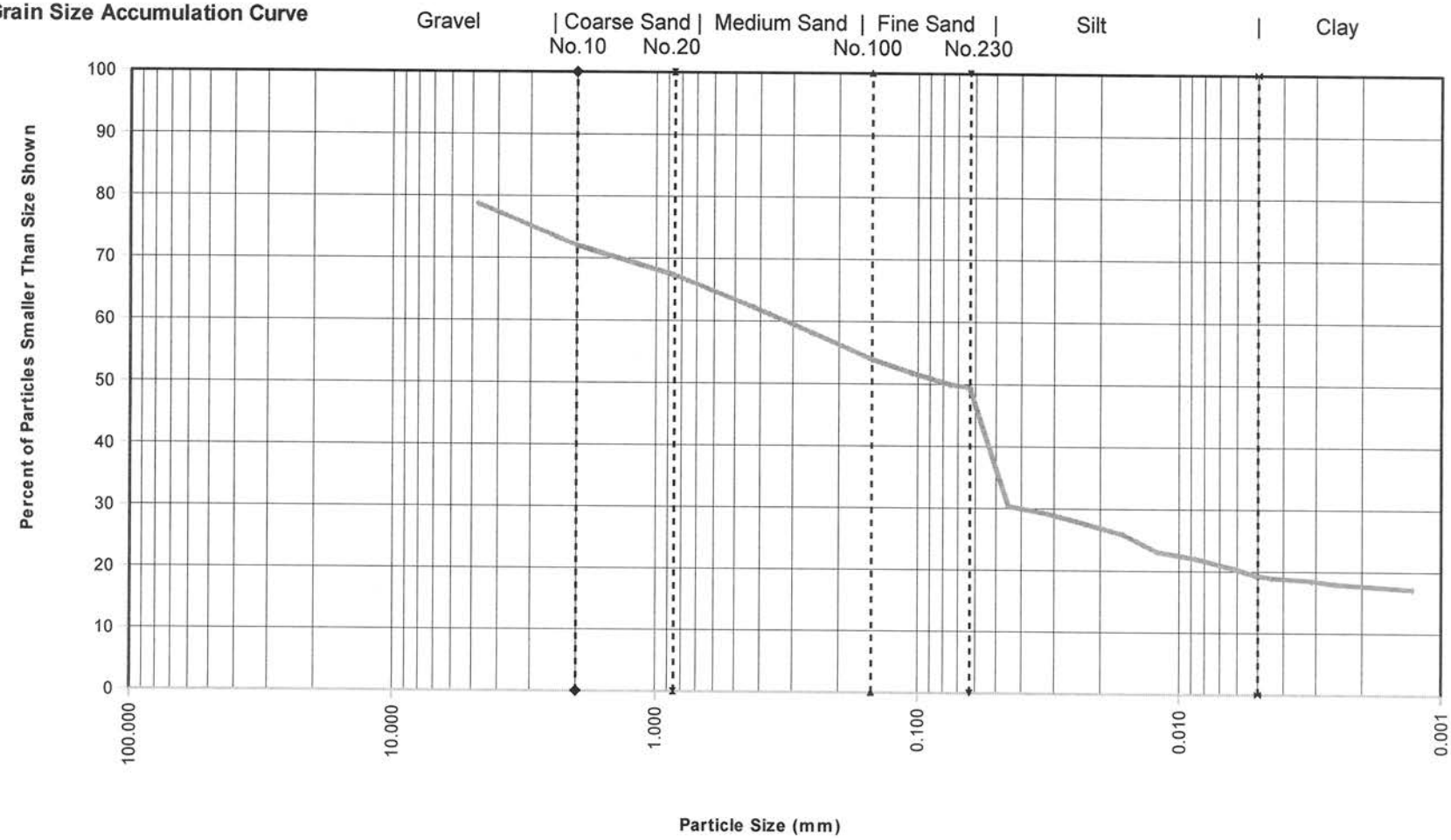
The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.

Expires 12/31/15

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-207(0-1) (A5J0576-10)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Sub-angular to Sub-rounded	Hard and Durable	Clayey SILT with some Gravel and Sand

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0576-11		Client Sample ID:	SED-207(1-2)		Batch Number:	5110514
Data Entered by:	VA	Date:	11/17/15	Data Reviewed by:	JPW	Date:	11/18/15
Sample Description:	Silty GRAVEL with some Clay and trace Sand			Max Particle Size:	Gravel		
Particle Shape:	Sub-angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.408	298.427	293.02	6.47	275.2

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.158	169.366	163.21	163.21	59.3	40.7
10	2.00	1.275	15.635	14.36	177.57	5.2	35.5
Pan		5.413	116.740	111.33	288.90	37.8	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9392		J57611	1.277	19.928	18.794	6.47

Hydrometer Analysis

Start Date/Time	11/12/2015	11:39	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	52.416		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	35.5		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	49.23		Corrected Dry Weight of Soil Tested (g) (W)	138.76

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	36	18.9	30.93	22.3	10.2	0.01382	0.044	7.91
2	35	18.9	29.93	21.6	10.4	0.01382	0.032	7.65
4	34	18.9	28.93	20.8	10.5	0.01382	0.022	7.40
8	32.5	18.9	27.43	19.8	10.7	0.01382	0.016	7.01
15	31	18.9	25.93	18.7	11.1	0.01382	0.012	6.63
30	29.5	18.9	24.43	17.6	11.2	0.01382	0.008	6.25
60	28	19	22.95	16.5	11.5	0.01382	0.006	5.87
90	27	19.2	22	15.9	11.7	0.01382	0.005	5.63
120	26	19.3	21.03	15.2	11.9	0.01382	0.004	5.38
240	24.5	19.4	19.55	14.1	12	0.01382	0.003	5.00
360	24	19.7	19.13	13.8	12.2	0.01365	0.003	4.89
1440	23	19	17.95	12.9	12.4	0.01382	0.001	4.59

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.268	5.981	4.71	187.58	3.4	32.1
40	0.425	1.223	4.434	3.21	194.40	2.3	29.8
60	0.250	1.292	3.977	2.69	200.10	1.9	27.8
100	0.150	1.253	3.925	2.67	205.78	1.9	25.9
140	0.105	1.267	2.608	1.34	208.62	1.0	24.9
200	0.075	1.282	2.373	1.09	210.94	0.8	24.2
230	0.063	1.253	1.606	0.35	211.69	0.3	23.9
			Sum	16.07	230 Minus	33.16	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-207(1-2) (A5J0576-11)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*64.52*
Retained on No. 4 sieve		4.75	40.7	59.3
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	35.48	5.22
Sand				*11.58*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	32.08	3.4
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	29.77	2.31
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	27.83	1.93
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	25.91	1.93
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	24.94	0.97
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	24.15	0.79
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	23.9	0.25
Silt and Clay (Measurements in the Clay fraction are noted)				*23.9*
Hydrometer Test		0.0441	7.91	15.99
Hydrometer Test		0.0315	7.65	0.26
Hydrometer Test		0.0224	7.4	0.26
Hydrometer Test		0.0160	7.01	0.38
Hydrometer Test		0.0119	6.63	0.38
Hydrometer Test		0.0084	6.25	0.38
Hydrometer Test		0.0061	5.87	0.38
Hydrometer Test	Clay	0.0050	5.63	0.24
Hydrometer Test	Clay	0.0044	5.38	0.25
Hydrometer Test	Clay	0.0031	5	0.38
Hydrometer Test	Clay	0.0025	4.89	0.11
Hydrometer Test	Clay	0.0013	4.59	0.3

Grain Size Summary	Percent of Total Sample
Gravel	64.5
Sand	11.6
Coarse sand	3.4
Medium sand	6.2
Fine sand	2.0
Silt	18.0
Clay	5.9

Case Narrative for Sample ID: SED-207(1-2) (A5J0576-11)

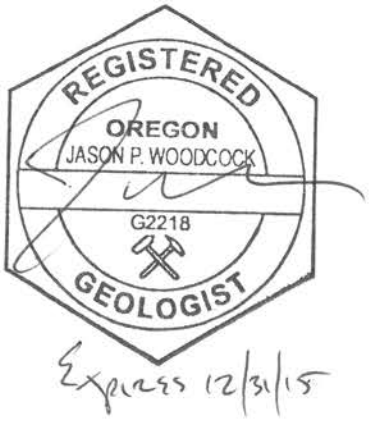
This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

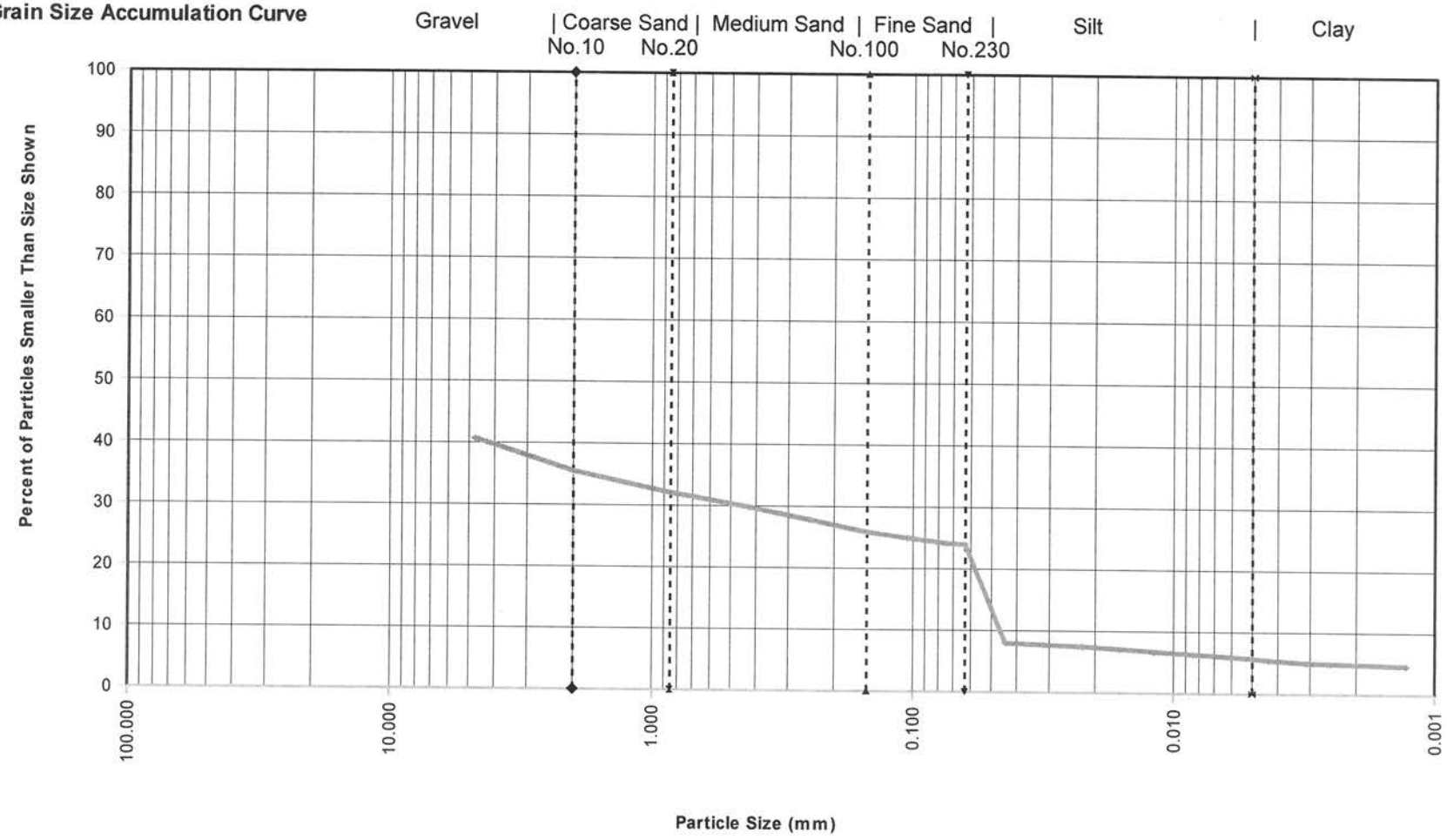
The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.



Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-207(1-2) (A5J0576-11)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Sub-angular to Sub-rounded	Hard and Durable	Silty GRAVEL with some Clay and trace Sand

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0576-18		Client Sample ID:	SED-208(0-1)		Batch Number:	5110514
Data Entered by:	VA	Date:	11/17/15	Data Reviewed by:	JPW	Date:	11/18/15
Sample Description:	Silty GRAVEL with some Sand and Clay			Max Particle Size:	Gravel		
Particle Shape:	Angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.530	307.170	301.64	3.97	290.1

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.149	98.943	92.79	92.79	32.0	68.0
10	2.00	1.276	29.055	27.78	120.57	9.6	58.4
Pan		5.448	183.497	178.05	298.62	58.9	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9618		J57618	1.272	20.455	19.723	3.97

Hydrometer Analysis

Start Date/Time	11/12/2015	12:02	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	59.425		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	58.4		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	57.16		Corrected Dry Weight of Soil Tested (g) (W)	97.80

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	31	19	24.45	25.0	11.1	0.01382	0.046	14.61
2	29	19	22.45	23.0	11.4	0.01382	0.033	13.41
4	28.5	19	21.95	22.4	11.4	0.01382	0.023	13.11
8	26	19.1	19.48	19.9	11.9	0.01382	0.017	11.64
15	24.5	19	17.95	18.3	12	0.01382	0.012	10.72
30	23	19.1	16.48	16.8	12.4	0.01382	0.009	9.85
60	21	19.2	14.51	14.8	12.7	0.01382	0.006	8.67
90	20	19.4	13.58	13.9	12.9	0.01382	0.005	8.11
120	19.5	19.4	13.08	13.4	12.9	0.01382	0.005	7.82
240	18	19.5	11.61	11.9	13.2	0.01365	0.003	6.94
360	17	19.7	10.68	10.9	13.3	0.01365	0.003	6.38
1440	15	19.1	8.48	8.7	13.7	0.01382	0.001	5.07

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.230	9.716	8.49	146.00	8.7	49.8
40	0.425	1.266	5.824	4.56	159.66	4.7	45.1
60	0.250	1.206	5.911	4.71	173.75	4.8	40.3
100	0.150	1.278	7.096	5.82	191.18	5.9	34.3
140	0.105	1.243	3.899	2.66	199.14	2.7	31.6
200	0.075	1.240	3.021	1.78	204.48	1.8	29.8
230	0.063	1.241	1.766	0.53	206.05	0.5	29.3
			Sum	28.53	230 Minus	28.63	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-208(0-1) (A5J0576-18)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*41.56*
Retained on No. 4 sieve		4.75	68.02	31.98
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	58.44	9.57
Sand				*29.17*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	49.77	8.68
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	45.1	4.66
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	40.29	4.81
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	34.35	5.95
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	31.63	2.72
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	29.81	1.82
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	29.27	0.54
Silt and Clay (Measurements in the Clay fraction are noted)				*29.27*
Hydrometer Test		0.0460	14.61	14.66
Hydrometer Test		0.0330	13.41	1.2
Hydrometer Test		0.0233	13.11	0.3
Hydrometer Test		0.0169	11.64	1.47
Hydrometer Test		0.0124	10.72	0.92
Hydrometer Test		0.0089	9.85	0.88
Hydrometer Test		0.0064	8.67	1.18
Hydrometer Test		0.0052	8.11	0.56
Hydrometer Test	Clay	0.0045	7.82	0.3
Hydrometer Test	Clay	0.0032	6.94	0.88
Hydrometer Test	Clay	0.0026	6.38	0.56
Hydrometer Test	Clay	0.0013	5.07	1.31

Grain Size Summary	Percent of Total Sample
Gravel	41.6
Sand	29.2
Coarse sand	8.7
Medium sand	15.4
Fine sand	5.1
Silt	21.2
Clay	8.1

Case Narrative for Sample ID: SED-208(0-1) (A5J0576-18)

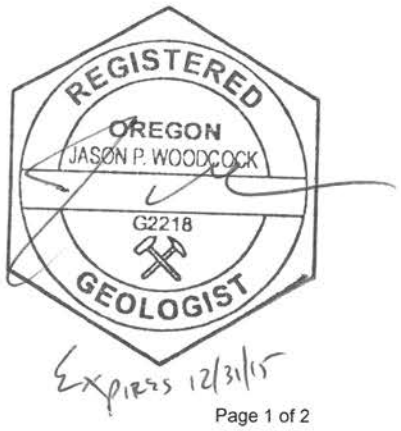
This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

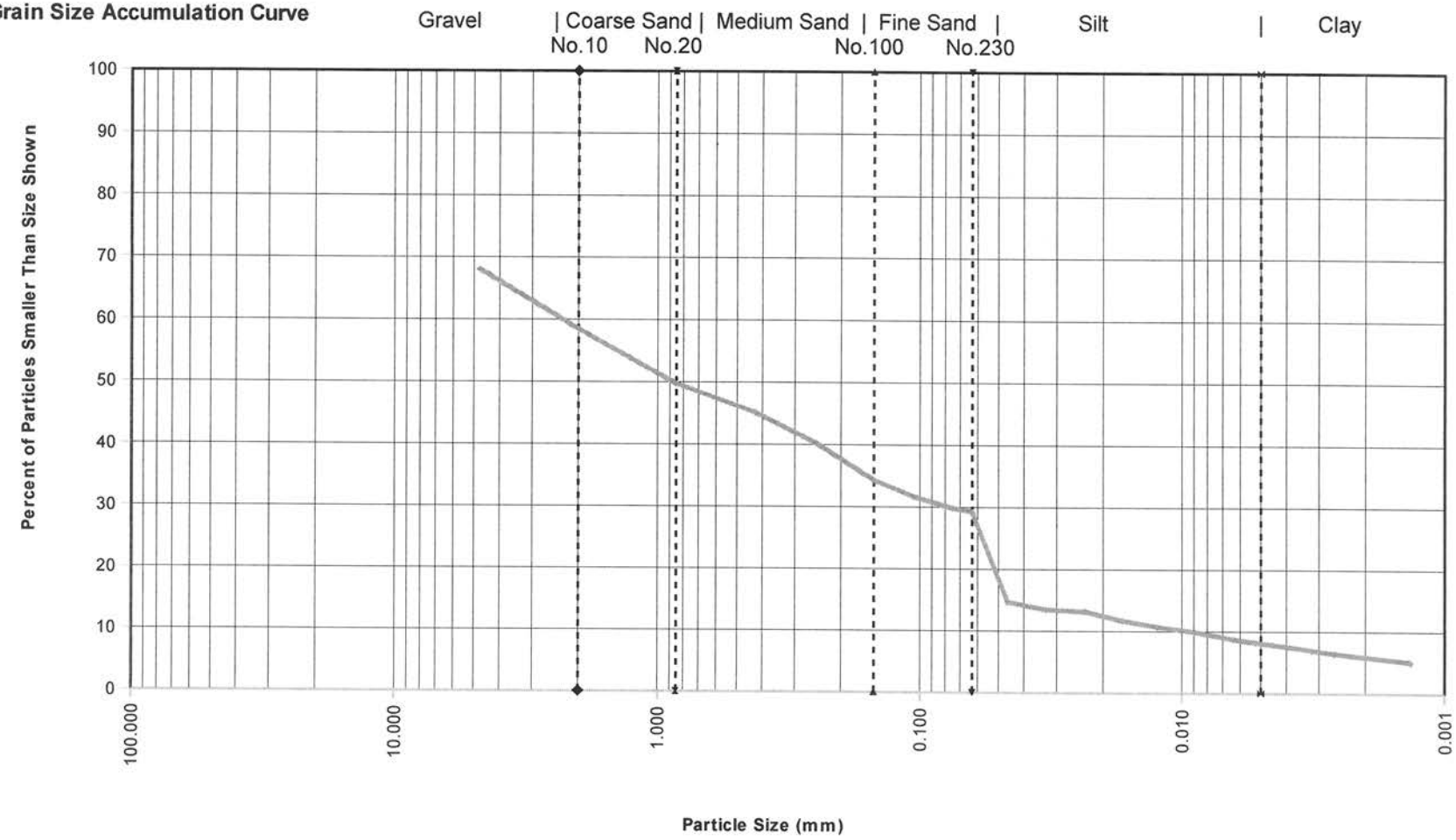
The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.



Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-208(0-1) (A5J0576-18)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to Sub-rounded	Hard and Durable	Silty GRAVEL with some Sand and Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0576-19		Client Sample ID:	SED-208(1-2)		Batch Number:	5110514
Data Entered by:	VA	Date:	11/17/15	Data Reviewed by:	JPW	Date:	11/18/15
Sample Description:	Silty GRAVEL with some Sand and Clay			Max Particle Size:	Gravel		
Particle Shape:	Angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	11.193	323.732	312.54	4.39	299.4

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.684	101.206	94.52	94.52	31.6	68.4
10	2.00	1.292	36.403	35.11	129.63	11.7	56.7
Pan		5.513	185.330	179.82	309.45	57.4	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9579		J57619	1.277	18.475	17.751	4.39

Hydrometer Analysis

Start Date/Time	11/12/2015 12:18	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	51.063	G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	56.7	Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	48.91	Corrected Dry Weight of Soil Tested (g) (W)	86.27

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	27.5	19	22.45	26.0	11.5	0.01382	0.047	14.76
2	26.5	19.1	21.48	24.9	11.7	0.01382	0.033	14.12
4	25.5	19.1	20.48	23.7	11.9	0.01382	0.024	13.46
8	24	19.1	18.98	22.0	12.2	0.01382	0.017	12.47
15	22.5	19.1	17.48	20.3	12.4	0.01382	0.013	11.49
30	21	19.1	15.98	18.5	12.7	0.01382	0.009	10.50
60	20	19.2	15	17.4	12.9	0.01382	0.006	9.86
90	18	19.3	13.03	15.1	13.2	0.01382	0.005	8.56
120	17	19.4	12.05	14.0	13.3	0.01382	0.005	7.92
240	16	19.5	11.08	12.8	13.5	0.01365	0.003	7.28
360	15	19.7	10.13	11.7	13.7	0.01365	0.003	6.66
1440	14	19.1	8.98	10.4	13.8	0.01382	0.001	5.90

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.224	7.323	6.10	151.11	7.1	49.6
40	0.425	1.236	5.678	4.44	166.75	5.1	44.5
60	0.250	1.222	5.594	4.37	182.15	5.1	39.4
100	0.150	1.223	5.930	4.71	198.72	5.5	34.0
140	0.105	1.221	3.442	2.22	206.55	2.6	31.4
200	0.075	1.279	2.932	1.65	212.37	1.9	29.5
230	0.063	1.230	1.735	0.51	214.14	0.6	28.9
			Sum	24.00	230 Minus	24.91	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-208(1-2) (A5J0576-19)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*43.3*
Retained on No. 4 sieve		4.75	68.43	31.57
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	56.7	11.73
Sand				*27.82*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	49.63	7.07
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	44.48	5.15
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	39.41	5.07
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	33.96	5.46
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	31.38	2.57
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	29.47	1.92
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	28.88	0.59
Silt and Clay (Measurements in the Clay fraction are noted)				*28.88*
Hydrometer Test		0.0469	14.76	14.12
Hydrometer Test		0.0334	14.12	0.64
Hydrometer Test		0.0238	13.46	0.66
Hydrometer Test		0.0171	12.47	0.99
Hydrometer Test		0.0126	11.49	0.99
Hydrometer Test		0.0090	10.5	0.99
Hydrometer Test		0.0064	9.86	0.64
Hydrometer Test		0.0053	8.56	1.3
Hydrometer Test	Clay	0.0046	7.92	0.64
Hydrometer Test	Clay	0.0032	7.28	0.64
Hydrometer Test	Clay	0.0027	6.66	0.62
Hydrometer Test	Clay	0.0014	5.9	0.76

Grain Size Summary	Percent of Total Sample
Gravel	43.3
Sand	27.8
Coarse sand	7.1
Medium sand	15.7
Fine sand	5.1
Silt	20.3
Clay	8.6

Case Narrative for Sample ID: SED-208(1-2) (A5J0576-19)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

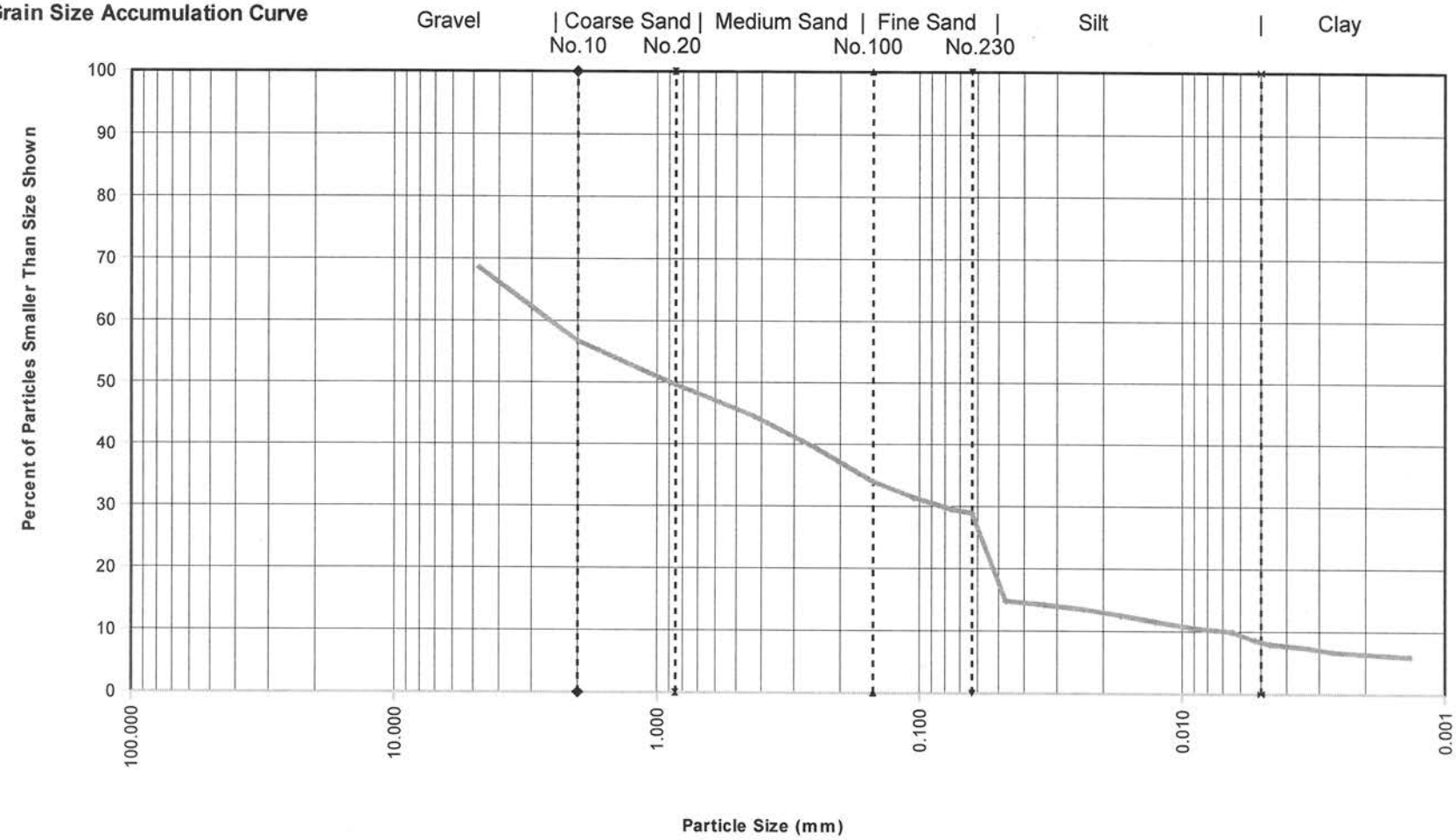
The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.

Expires 12/31/15

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-208(1-2) (A5J0576-19)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to Sub-rounded	Hard and Durable	Silty GRAVEL with some Sand and Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0576-26		Client Sample ID:	SED-209(0-1)		Batch Number:	5110514
Data Entered by:	VA	Date:	11/17/15	Data Reviewed by:	JPW	Date:	11/18/15
Sample Description:	Silty GRAVEL with some Sand and trace Clay			Max Particle Size:	Gravel		
Particle Shape:	Angular to Sub-angular			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.250	198.754	193.50	5.47	183.5

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.678	75.278	68.60	68.60	37.4	62.6
10	2.00	1.282	21.475	20.19	88.79	11.0	51.6
Pan		5.118	107.497	102.38	191.17	52.7	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9481		J57626	1.288	17.938	17.074	5.47

Hydrometer Analysis

Start Date/Time	11/12/2015	12:36	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	50.507		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	51.6		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	47.89		Corrected Dry Weight of Soil Tested (g) (W)	92.80

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	24.5	19.1	17.98	19.4	12	0.01382	0.048	10.00
2	23	19.1	16.48	17.8	12.4	0.01382	0.034	9.16
4	21.5	19.1	14.98	16.1	12.5	0.01382	0.024	8.33
8	20	19	13.45	14.5	12.9	0.01382	0.018	7.48
15	18	19.1	11.48	12.4	13.2	0.01382	0.013	6.38
30	17	19.1	10.48	11.3	13.3	0.01382	0.009	5.83
60	16.5	19.2	10.01	10.8	13.3	0.01382	0.007	5.57
90	15	19.4	8.58	9.2	13.7	0.01382	0.005	4.77
120	15	19.5	8.61	9.3	13.7	0.01365	0.005	4.79
240	13.5	19.5	7.11	7.7	13.8	0.01365	0.003	3.96
360	13	19.7	6.68	7.2	14	0.01365	0.003	3.71
1440	12	19.1	5.48	5.9	14.2	0.01382	0.001	3.05

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.272	9.890	8.62	106.26	9.3	42.3
40	0.425	1.270	7.911	6.64	119.72	7.2	35.2
60	0.250	1.282	5.723	4.44	128.73	4.8	30.4
100	0.150	1.275	4.832	3.56	135.94	3.8	26.5
140	0.105	1.233	2.857	1.62	139.23	1.8	24.8
200	0.075	1.238	2.445	1.21	141.67	1.3	23.5
230	0.063	1.273	1.636	0.36	142.41	0.4	23.1
			Sum	26.45	230 Minus	21.44	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-209(0-1) (A5J0576-26)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*48.4*
Retained on No. 4 sieve		4.75	62.61	37.39
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	51.6	11.01
Sand				*28.5*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	42.31	9.29
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	35.16	7.16
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	30.37	4.79
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	26.54	3.83
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	24.79	1.75
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	23.49	1.3
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	23.1	0.39
Silt and Clay (Measurements in the Clay fraction are noted)				*23.1*
Hydrometer Test		0.0479	10	13.1
Hydrometer Test		0.0344	9.16	0.83
Hydrometer Test		0.0244	8.33	0.83
Hydrometer Test		0.0175	7.48	0.85
Hydrometer Test		0.0130	6.38	1.09
Hydrometer Test		0.0092	5.83	0.56
Hydrometer Test		0.0065	5.57	0.26
Hydrometer Test		0.0054	4.77	0.8
Hydrometer Test	Clay	0.0046	4.79	0
Hydrometer Test	Clay	0.0033	3.96	0.82
Hydrometer Test	Clay	0.0027	3.71	0.24
Hydrometer Test	Clay	0.0014	3.05	0.67

Grain Size Summary	Percent of Total Sample
Gravel	48.4
Sand	28.5
Coarse sand	9.3
Medium sand	15.8
Fine sand	3.4
Silt	18.3
Clay	4.8

Case Narrative for Sample ID: SED-209(0-1) (A5J0576-26)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

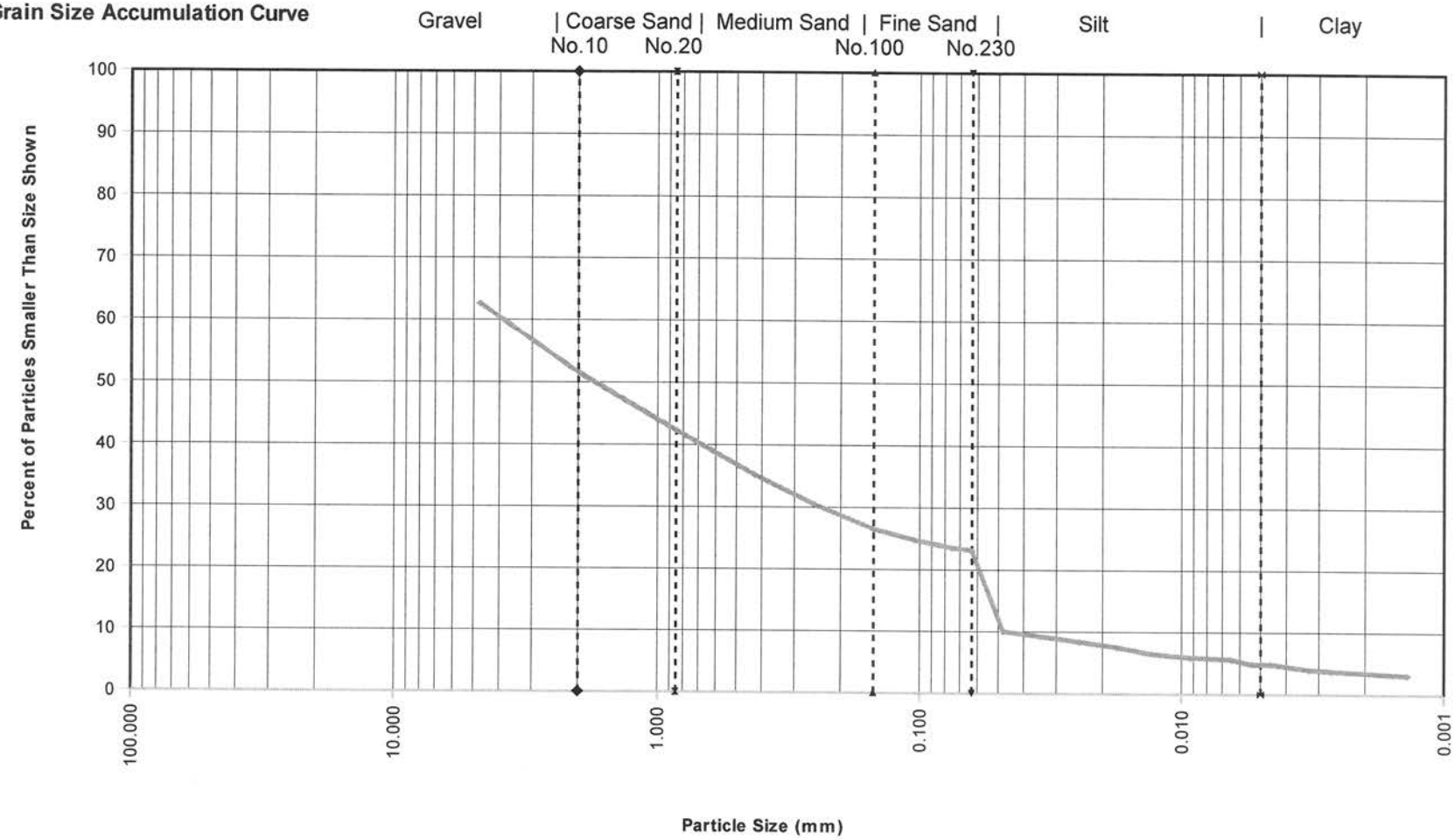
Organic material present in +4, +10, +20 and +40 fractions.

Hydrometer reading at 1 minute is estimated due to the presence of foam.

Expires 12/31/15

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-209(0-1) (A5J0576-26)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to Sub-angular	Hard and Durable	Silty GRAVEL with some Sand and trace Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0576-27		Client Sample ID:	SED-209(1-2)		Batch Number:	5110514
Data Entered by:	VA	Date:	11/17/15	Data Reviewed by:	JPW	Date:	11/18/15
Sample Description:	Silty GRAVEL with some Sand and trace Clay			Max Particle Size:	Gravel		
Particle Shape:	Sub-angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.740	261.572	255.83	5.61	242.2

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.754	130.709	123.96	123.96	51.2	48.8
10	2.00	1.272	26.457	25.19	149.14	10.4	38.4
Pan		5.665	108.034	102.37	251.51	39.9	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9469		J57627	1.266	19.681	18.703	5.61

Hydrometer Analysis

Start Date/Time	11/12/2015	12:53	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	53.057		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	38.4		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	50.24		Corrected Dry Weight of Soil Tested (g) (W)	130.71

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	27	19.1	21.98	16.8	11.7	0.01382	0.047	6.46
2	26	19.1	20.98	16.0	11.9	0.01382	0.034	6.17
4	25	19.1	19.98	15.3	12	0.01382	0.024	5.87
8	23.5	19.1	18.48	14.1	12.2	0.01382	0.017	5.43
15	22	19.1	16.98	13.0	12.5	0.01382	0.013	4.99
30	21	19.1	15.98	12.2	12.7	0.01382	0.009	4.70
60	19	19.2	14	10.7	13	0.01382	0.006	4.12
90	18.5	19.4	13.55	10.4	13	0.01382	0.005	3.99
120	18	19.5	13.08	10.0	13.2	0.01365	0.005	3.85
240	17	19.5	12.08	9.2	13.3	0.01365	0.003	3.55
360	16	19.7	11.13	8.5	13.5	0.01365	0.003	3.27
1440	15.5	19.5	10.58	8.1	13.5	0.01365	0.001	3.11

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.252	10.454	9.20	166.89	7.0	31.4
40	0.425	1.254	7.013	5.76	178.01	4.4	27.0
60	0.250	1.254	5.555	4.30	186.30	3.3	23.7
100	0.150	1.231	4.820	3.59	193.23	2.7	21.0
140	0.105	1.247	2.943	1.70	196.50	1.3	19.7
200	0.075	1.253	2.597	1.34	199.09	1.0	18.6
230	0.063	1.253	1.685	0.43	199.93	0.3	18.3
			Sum	26.32	230 Minus	23.92	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-209(1-2) (A5J0576-27)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*61.57*
Retained on No. 4 sieve		4.75	48.83	51.17
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	38.43	10.4
Sand				*20.14*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	31.39	7.04
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	26.99	4.41
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	23.7	3.29
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	20.95	2.75
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	19.66	1.3
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	18.63	1.03
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	18.3	0.33
Silt and Clay (Measurements in the Clay fraction are noted)				*18.3*
Hydrometer Test		0.0473	6.46	11.83
Hydrometer Test		0.0337	6.17	0.29
Hydrometer Test		0.0239	5.87	0.29
Hydrometer Test		0.0171	5.43	0.44
Hydrometer Test		0.0126	4.99	0.44
Hydrometer Test		0.0090	4.7	0.29
Hydrometer Test		0.0064	4.12	0.58
Hydrometer Test		0.0053	3.99	0.13
Hydrometer Test	Clay	0.0045	3.85	0.14
Hydrometer Test	Clay	0.0032	3.55	0.29
Hydrometer Test	Clay	0.0026	3.27	0.28
Hydrometer Test	Clay	0.0013	3.11	0.16

Grain Size Summary	Percent of Total Sample
Gravel	61.6
Sand	20.1
Coarse sand	7.0
Medium sand	10.4
Fine sand	2.7
Silt	14.3
Clay	4.0

Case Narrative for Sample ID: SED-209(1-2) (A5J0576-27)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

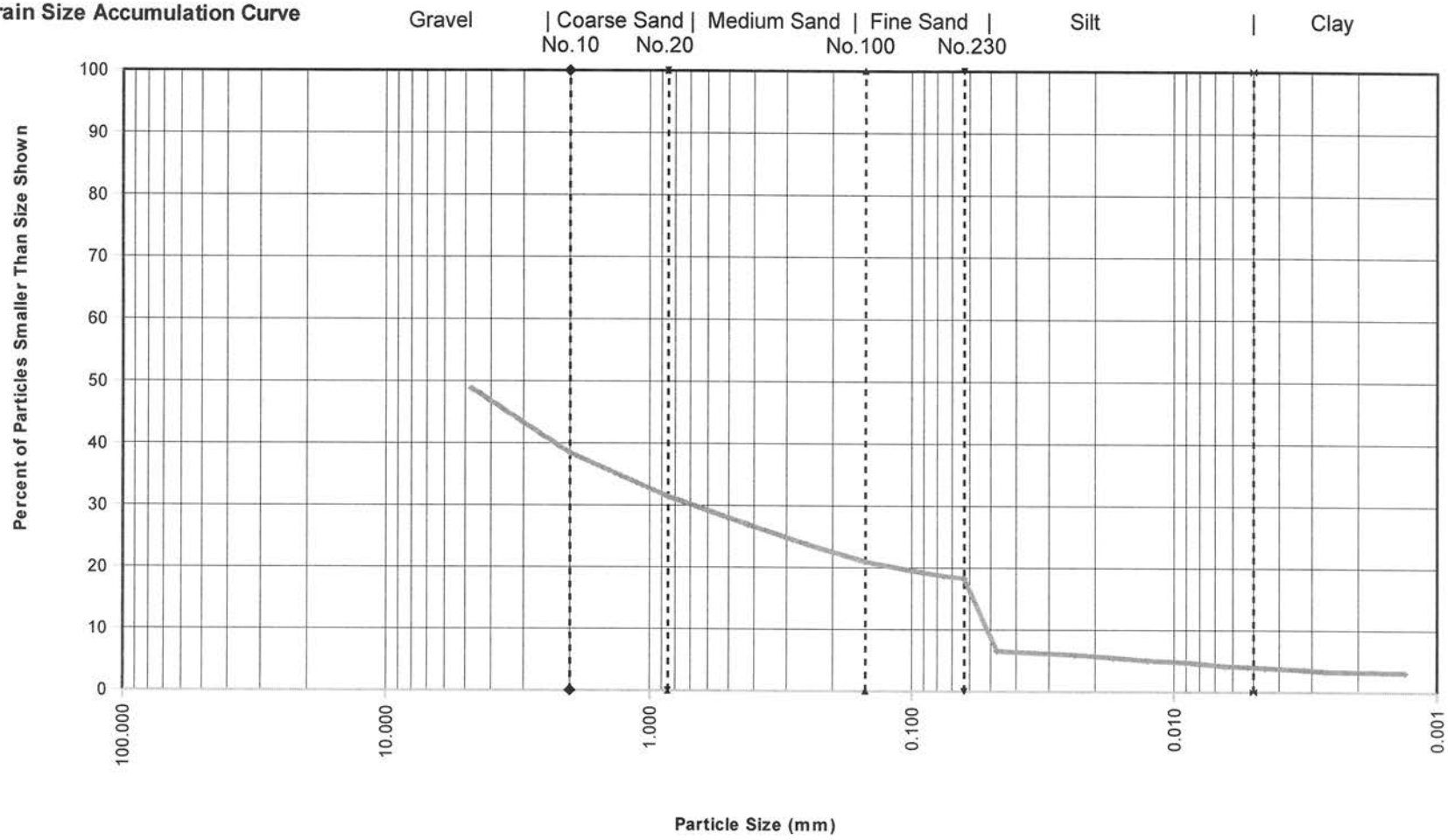
Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-209(1-2) (A5J0576-27)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Sub-angular to Sub-rounded	Hard and Durable	Silty GRAVEL with some Sand and trace Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0576-32 B		Client Sample ID:	SED-210(0-1)		Batch Number:	5110514
Data Entered by:	VA	Date:	11/17/15	Data Reviewed by:	JPW	Date:	11/25/15
Sample Description:	Silty GRAVEL with some Sand and Clay			Max Particle Size:	Gravel		
Particle Shape:	Angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	6.533	315.108	308.58	6.14	290.7

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.758	100.212	93.45	93.45	32.1	67.9
10	2.00	1.292	20.065	18.77	112.23	6.5	61.4
Pan		10.481	201.680	191.20	303.43	61.7	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9422		J57632	1.285	16.364	15.492	6.14

Hydrometer Analysis

Start Date/Time	11/19/2015	9:14	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	51.132		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	61.4		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	48.18		Corrected Dry Weight of Soil Tested (g) (W)	78.46

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	33	19.1	26.48	33.7	10.7	0.01382	0.045	20.72
2	30	19.1	23.48	29.9	11.2	0.01382	0.033	18.37
4	29	19.1	22.48	28.6	11.4	0.01382	0.023	17.59
8	27	19.1	20.48	26.1	11.7	0.01382	0.017	16.03
15	25.5	19.1	18.98	24.2	11.9	0.01382	0.012	14.85
30	23.5	19.1	16.98	21.6	12.2	0.01382	0.009	13.29
60	22	19.1	15.48	19.7	12.5	0.01382	0.006	12.11
90	21	19.2	14.51	18.5	12.7	0.01382	0.005	11.36
120	20	19.3	13.55	17.3	12.9	0.01382	0.005	10.60
240	19	19.7	12.68	16.2	13	0.01365	0.003	9.92
360	19	19.9	12.75	16.2	13	0.01365	0.003	9.97
1440	18	18.9	11.41	14.5	13.2	0.01382	0.001	8.93

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.251	6.754	5.50	132.80	7.0	54.4
40	0.425	1.253	5.847	4.59	149.98	5.9	48.5
60	0.250	1.263	4.679	3.42	162.76	4.4	44.2
100	0.150	1.257	4.300	3.04	174.14	3.9	40.3
140	0.105	1.261	3.019	1.76	180.71	2.2	38.1
200	0.075	1.256	2.891	1.64	186.82	2.1	36.0
230	0.063	1.246	1.768	0.52	188.77	0.7	35.3
			Sum	20.47	230 Minus	27.70	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-210(0-1) (A5J0576-32 B)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*38.6*
Retained on No. 4 sieve		4.75	67.86	32.14
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	61.4	6.46
Sand				*26.09*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	54.38	7.01
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	48.53	5.85
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	44.18	4.35
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	40.3	3.88
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	38.06	2.24
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	35.97	2.08
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	35.31	0.67
Silt and Clay (Measurements in the Clay fraction are noted)				*35.31*
Hydrometer Test		0.0452	20.72	14.59
Hydrometer Test		0.0327	18.37	2.35
Hydrometer Test		0.0233	17.59	0.78
Hydrometer Test		0.0167	16.03	1.57
Hydrometer Test		0.0123	14.85	1.17
Hydrometer Test		0.0088	13.29	1.57
Hydrometer Test		0.0063	12.11	1.17
Hydrometer Test		0.0052	11.36	0.76
Hydrometer Test	Clay	0.0045	10.6	0.76
Hydrometer Test	Clay	0.0032	9.92	0.68
Hydrometer Test	Clay	0.0026	9.97	0
Hydrometer Test	Clay	0.0013	8.93	0.99

Grain Size Summary	Percent of Total Sample
Gravel	38.6
Sand	26.1
Coarse sand	7.0
Medium sand	14.1
Fine sand	5.0
Silt	24.0
Clay	11.4

Case Narrative for Sample ID: SED-210(0-1) (A5J0576-32 B)

This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

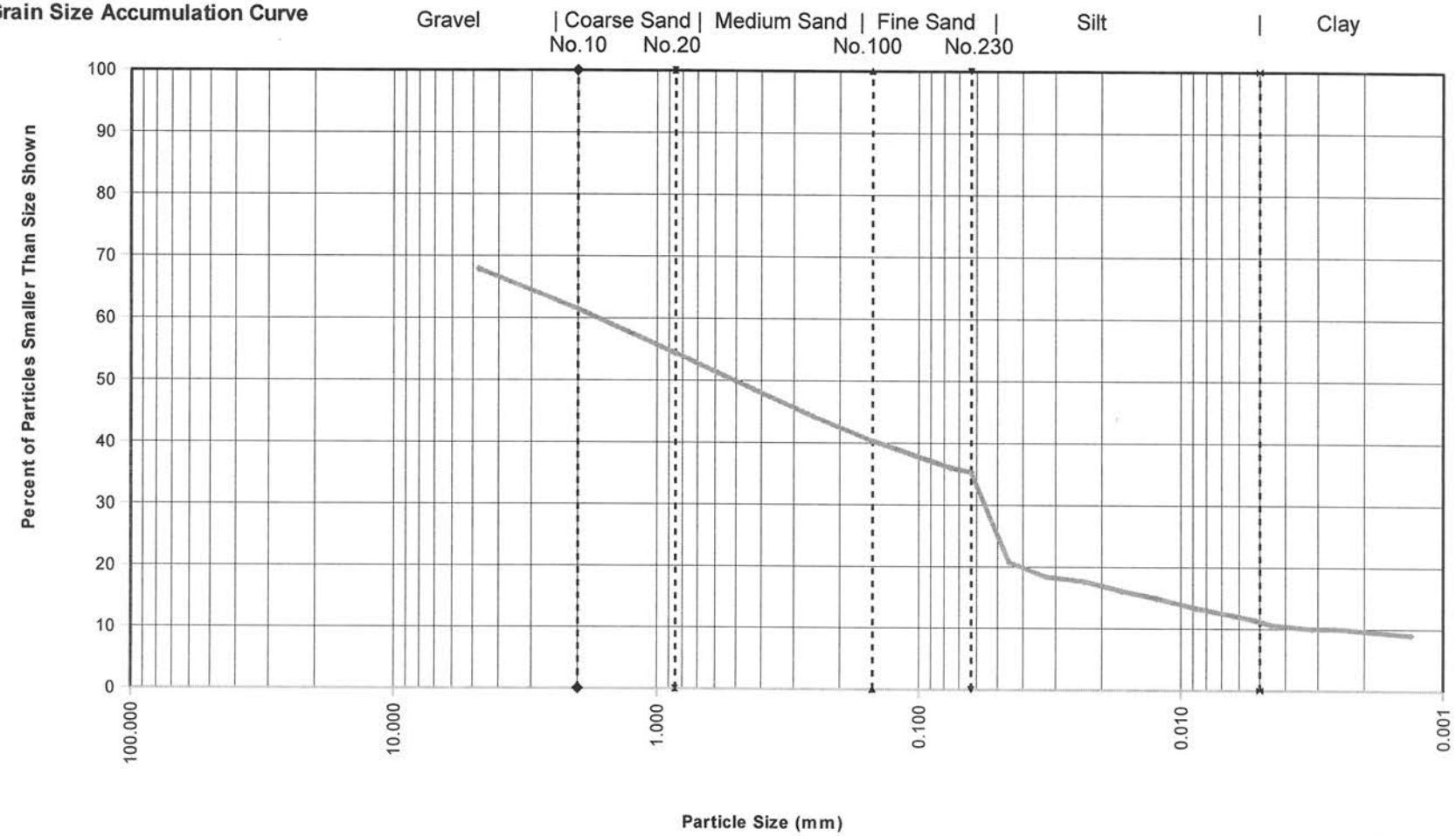
The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.

Hydrometer readings for 1, 2, and 4 minutes are estimated due to the presence of foam.

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-210(0-1) (A5J0576-32 B)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to Sub-rounded	Hard and Durable	Silty GRAVEL with some Sand and Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0576-40		Client Sample ID:	SED-211(0-1)		Batch Number:	5110514
Data Entered by:	VA	Date:	11/17/15	Data Reviewed by:	JPW	Date:	11/18/15
Sample Description:	Silty GRAVEL with some Sand and trace Clay			Max Particle Size:	Gravel		
Particle Shape:	Angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.541	292.180	286.64	6.46	269.2

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.842	118.921	112.08	112.08	41.6	58.4
10	2.00	1.278	50.293	49.02	161.09	18.2	40.2
Pan		5.479	126.950	121.47	282.57	42.2	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9393		J57640	1.227	17.900	16.888	6.46

Hydrometer Analysis

Start Date/Time	11/12/2015	13:24	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	54.375		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	40.2		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	51.07		Corrected Dry Weight of Soil Tested (g) (W)	127.15

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	28	19.3	23.03	18.1	11.5	0.01382	0.047	7.27
2	26	19.3	21.03	16.5	11.9	0.01382	0.034	6.64
4	25	19.3	20.03	15.8	12	0.01382	0.024	6.33
8	24	19.3	19.03	15.0	12.2	0.01382	0.017	6.01
15	22	19.3	17.03	13.4	12.5	0.01382	0.013	5.38
30	20.5	19.3	15.53	12.2	12.7	0.01382	0.009	4.91
60	19	19.4	14.05	11.1	13	0.01382	0.006	4.44
90	18	19.5	13.08	10.3	13.2	0.01365	0.005	4.13
120	17	19.5	12.08	9.5	13.3	0.01365	0.005	3.82
240	16	19.5	11.08	8.7	13.5	0.01365	0.003	3.50
360	15	19.7	10.13	8.0	13.7	0.01365	0.003	3.20
1440	14	19.5	9.08	7.1	13.8	0.01365	0.001	2.87

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.251	12.627	11.38	186.51	8.9	31.2
40	0.425	1.259	6.771	5.51	198.82	4.3	26.9
60	0.250	1.246	5.083	3.84	207.39	3.0	23.9
100	0.150	1.245	4.485	3.24	214.63	2.5	21.3
140	0.105	1.247	2.845	1.60	218.20	1.3	20.1
200	0.075	1.246	2.539	1.29	221.09	1.0	19.0
230	0.063	1.250	1.688	0.44	222.07	0.3	18.7
			Sum	27.29	230 Minus	23.78	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-211(0-1) (A5J0576-40)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*59.83*
Retained on No. 4 sieve		4.75	58.37	41.63
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	40.17	18.2
Sand				*21.47*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	31.22	8.95
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	26.89	4.33
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	23.87	3.02
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	21.32	2.55
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	20.06	1.26
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	19.05	1.02
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	18.7	0.34
Silt and Clay (Measurements in the Clay fraction are noted)				*18.7*
Hydrometer Test		0.0469	7.27	11.43
Hydrometer Test		0.0337	6.64	0.63
Hydrometer Test		0.0239	6.33	0.32
Hydrometer Test		0.0171	6.01	0.32
Hydrometer Test		0.0126	5.38	0.63
Hydrometer Test		0.0090	4.91	0.47
Hydrometer Test		0.0064	4.44	0.47
Hydrometer Test		0.0052	4.13	0.31
Hydrometer Test	Clay	0.0045	3.82	0.32
Hydrometer Test	Clay	0.0032	3.5	0.32
Hydrometer Test	Clay	0.0027	3.2	0.3
Hydrometer Test	Clay	0.0013	2.87	0.33

Grain Size Summary	Percent of Total Sample
Gravel	59.8
Sand	21.5
Coarse sand	8.9
Medium sand	9.9
Fine sand	2.6
Silt	14.6
Clay	4.1

Case Narrative for Sample ID: SED-211(0-1) (A5J0576-40)

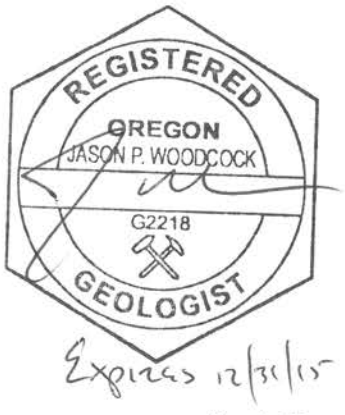
This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

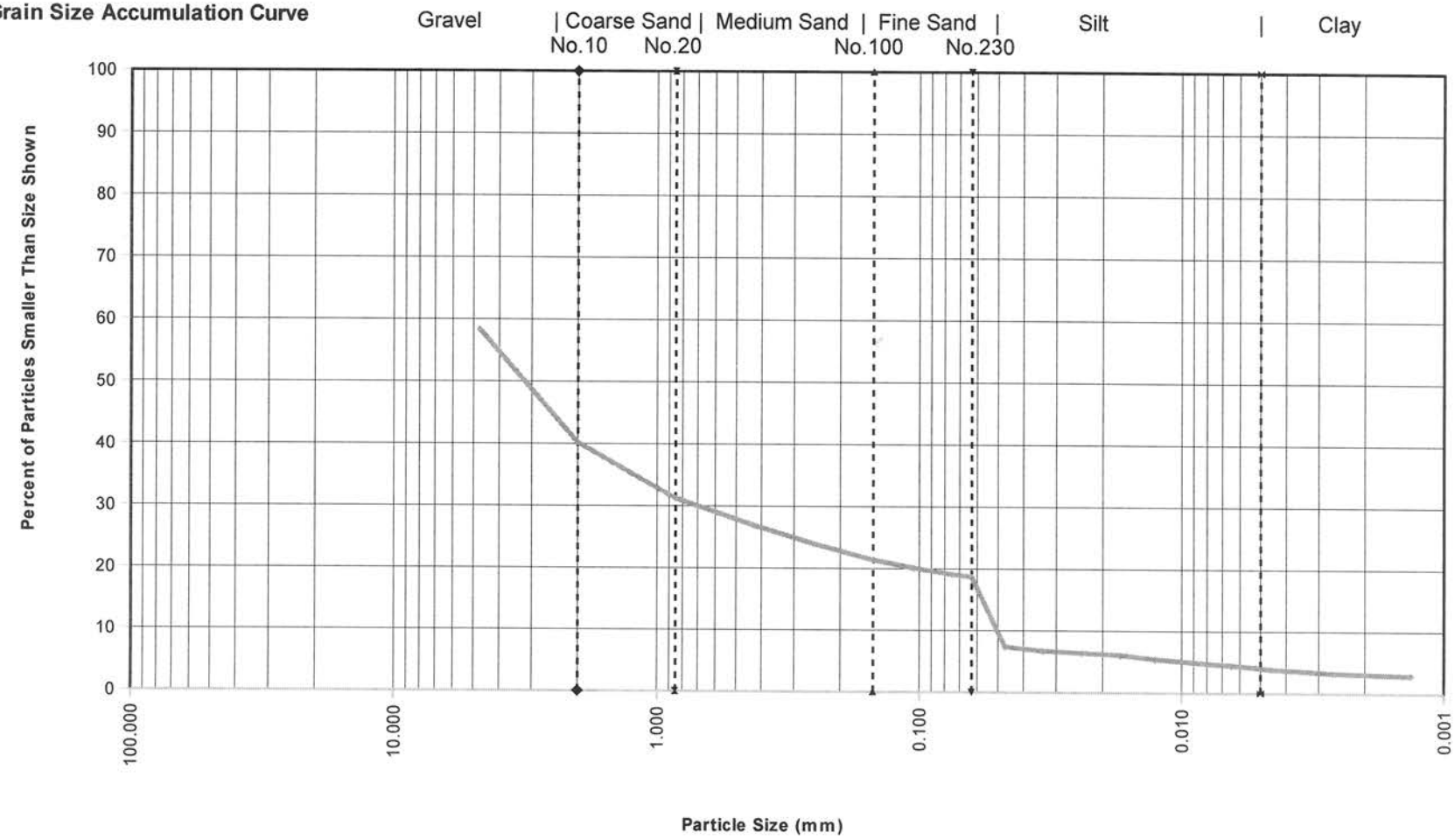
The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.



Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-211(0-1) (A5J0576-40)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to Sub-rounded	Hard and Durable	Silty GRAVEL with some Sand and trace Clay

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A5J0576-41		Client Sample ID:	SED-211(1-2)		Batch Number:	5110514
Data Entered by:	VA	Date:	11/17/15	Data Reviewed by:	JPW	Date:	11/18/15
Sample Description:	Silty GRAVEL with some Sand and trace Clay			Max Particle Size:	Gravel		
Particle Shape:	Angular to Sub-rounded			Hardness	Hard and Durable		

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.340	299.841	294.50	5.74	278.5

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.815	144.751	137.94	137.94	49.5	50.5
10	2.00	1.270	30.816	29.55	167.48	10.6	39.9
Pan		5.163	128.181	123.02	290.50	41.6	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9457		J57641	1.279	18.164	17.247	5.74

Hydrometer Analysis

Start Date/Time	11/12/2015	13:37	Dispersing Agent	$NaPO_3$
Air Dry Sample Wt. for Hydrometer Test (g)	54.888		G_s Correction Factor (α)	1.000
Percent Passing No.10 Sieve	39.9		Specific Gravity (G_s)	2.65
Dry Weight of Soil Tested (g)	51.91		Corrected Dry Weight of Soil Tested (g) (W)	130.21

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	23	19.3	16.55	12.7	12.4	0.01382	0.049	5.07
2	21.5	19.3	15.05	11.6	12.5	0.01382	0.035	4.61
4	21	19.4	14.58	11.2	12.7	0.01382	0.025	4.46
8	19.5	19.5	13.11	10.1	12.9	0.01365	0.017	4.01
15	18	19.4	11.58	8.9	13.2	0.01382	0.013	3.55
30	17	19.5	10.61	8.2	13.3	0.01365	0.009	3.25
60	16	19.6	9.65	7.4	13.5	0.01365	0.006	2.95
90	15	19.6	8.65	6.6	13.7	0.01365	0.005	2.65
120	14.5	19.5	8.11	6.2	13.7	0.01365	0.005	2.48
240	13.5	19.5	7.11	5.5	13.8	0.01365	0.003	2.18
360	13	19.7	6.68	5.1	14	0.01365	0.003	2.05
1440	12	19.5	5.61	4.3	14.2	0.01365	0.001	1.72

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.249	13.988	12.74	196.03	9.8	30.1
40	0.425	1.247	8.738	7.49	212.82	5.8	24.3
60	0.250	1.253	5.748	4.50	222.90	3.5	20.9
100	0.150	1.244	4.531	3.29	230.26	2.5	18.4
140	0.105	1.248	2.937	1.69	234.05	1.3	17.1
200	0.075	1.245	2.675	1.43	237.25	1.1	16.0
230	0.063	1.257	1.733	0.48	238.32	0.4	15.6
			Sum	31.61	230 Minus	20.30	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: SED-211(1-2) (A5J0576-41)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				*60.14*
Retained on No. 4 sieve		4.75	50.47	49.53
Gravel, passing No. 4 sieve and retained on No. 10 sieve		2.00	39.86	10.61
Sand				*24.27*
Coarse sand, passing No.10 sieve and retained on No. 20 sieve		0.8500	30.08	9.78
Medium sand, passing No.20 sieve and retained on No. 40 sieve		0.4250	24.33	5.75
Medium sand, passing No.40 sieve and retained on No. 60 sieve		0.2500	20.88	3.45
Medium sand, passing No. 60 sieve and retained on No.100 sieve		0.1500	18.35	2.52
Fine sand, passing No. 100 sieve and retained on No.140 sieve		0.1060	17.05	1.3
Fine sand passing No. 140 sieve and retained on No. 200 sieve		0.0750	15.96	1.1
Fine sand, passing No. 200 sieve and retained on No. 230 sieve		0.0630	15.59	0.37
Silt and Clay (Measurements in the Clay fraction are noted)				*15.59*
Hydrometer Test		0.0487	5.07	10.52
Hydrometer Test		0.0346	4.61	0.46
Hydrometer Test		0.0246	4.46	0.14
Hydrometer Test		0.0173	4.01	0.45
Hydrometer Test		0.0130	3.55	0.47
Hydrometer Test		0.0091	3.25	0.3
Hydrometer Test		0.0065	2.95	0.3
Hydrometer Test		0.0053	2.65	0.31
Hydrometer Test	Clay	0.0046	2.48	0.16
Hydrometer Test	Clay	0.0033	2.18	0.31
Hydrometer Test	Clay	0.0027	2.05	0.13
Hydrometer Test	Clay	0.0014	1.72	0.33

Grain Size Summary	Percent of Total Sample
Gravel	60.1
Sand	24.3
Coarse sand	9.8
Medium sand	11.7
Fine sand	2.8
Silt	12.9
Clay	2.6

Case Narrative for Sample ID: SED-211(1-2) (A5J0576-41)

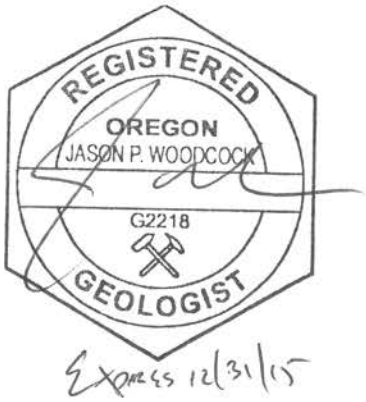
This data is not to be used for engineering purposes.

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

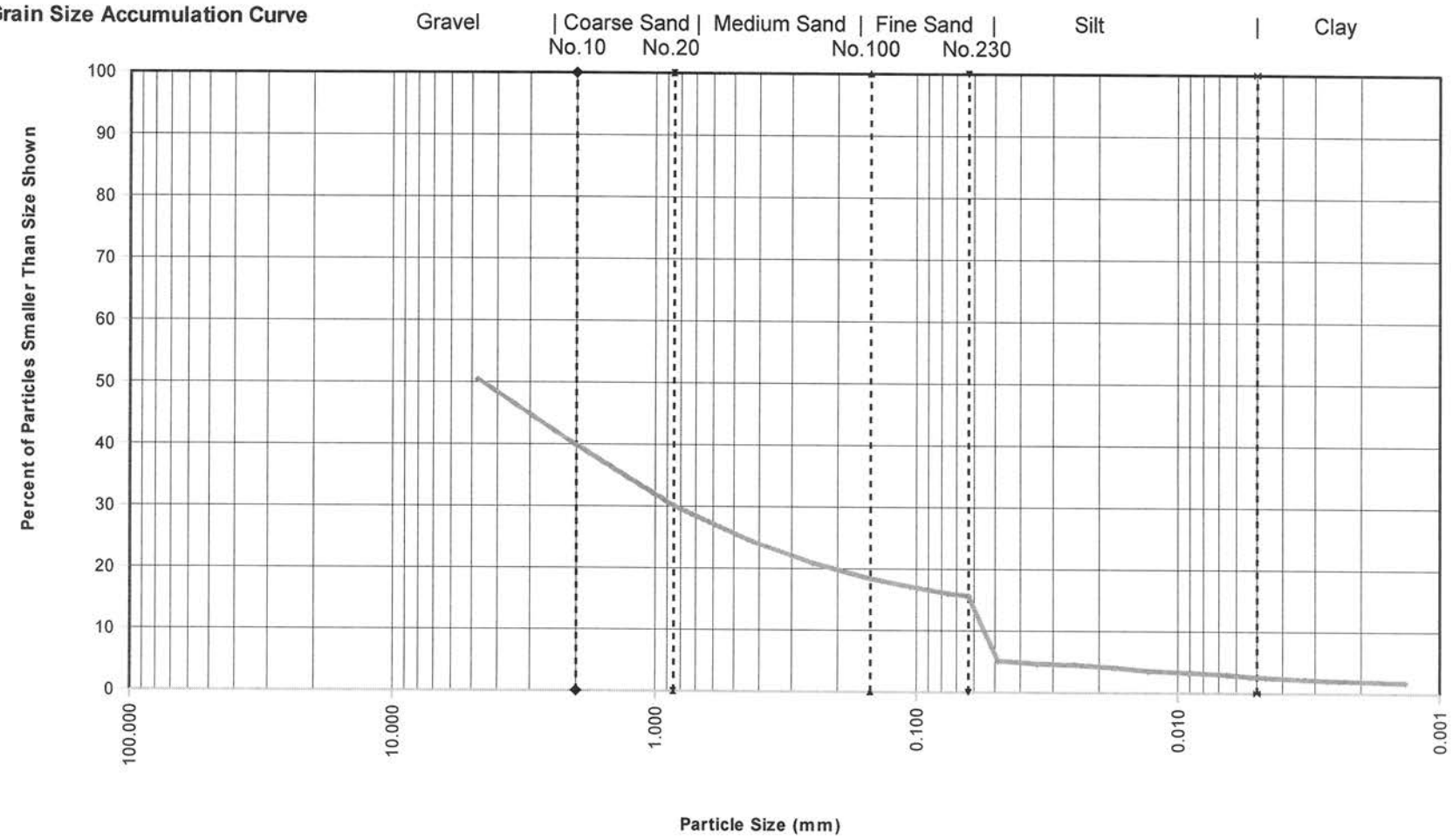
The assumed specific gravity used in the calculations was 2.65.

Organic material present in +4, +10, +20 and +40 fractions.



Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Grain Size Accumulation Curve



Sample ID:	SED-211(1-2) (A5J0576-41)			
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to Sub-rounded	Hard and Durable	Silty GRAVEL with some Sand and trace Clay

Maxxam
A Bureau Veritas Group Company

Your Project #: A5J0576
Your C.O.C. #: na

Attention:Philip Nerenberg

Apex Laboratories
12232 SW Garden Place
Tigard, OR
USA 97223

Report Date: 2015/12/03
Report #: R3792708
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5M2677
Received: 2015/10/30, 15:45

Sample Matrix: SEDIMENT
Samples Received: 11

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dioxins/Furans in Soil (1613B) (1)	9	2015/11/17	2015/11/29	BRL SOP-00410	EPA 1613B m
Dioxins/Furans in Soil (1613B) (1)	2	2015/11/17	2015/12/01	BRL SOP-00410	EPA 1613B m
2378TCDF Confirmation (M8290A/M1613)	7	N/A	2015/11/30	BRL SOP-00406	EPA M8290A / M1613
2378TCDF Confirmation (M8290A/M1613)	1	N/A	2015/12/01	BRL SOP-00406	EPA M8290A / M1613
Moisture	11	N/A	2015/11/03	CAM SOP-00445	Carter 2nd ed 51.2 m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.

Confirmatory runs for 2,3,7,8-TCDF are performed only if the primary result is greater than the RDL.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Melissa DiGrazia, Project Manager - ATUT
Email: MDiGrazia@maxxam.ca
Phone# (905) 817-5700
==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

RESULTS OF ANALYSES OF SEDIMENT

Maxxam ID		BGL954	BGL955	BGL956			
Sampling Date		2015/10/16 12:00	2015/10/16 13:00	2015/10/16 13:10			
COC Number		na	na	na			
	UNITS	SED-206ABC(0-1) COMP	SED-207ABC(0-1) COMP	SED-207AC(1-2) COMP	RDL	MDL	QC Batch
Moisture	%	52	38	43	1.0	0.50	4256569

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		BGL957	BGL958	BGL959			
Sampling Date		2015/10/19 08:30	2015/10/19 08:40	2015/10/19 09:30			
COC Number		na	na	na			
	UNITS	SED-208ABC(0-1) COMP	SED-208ABC(1-2) COMP	SED-209ABC(0-1) COMP	RDL	MDL	QC Batch
Moisture	%	42	31	54	1.0	0.50	4256569

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		BGL960	BGL961	BGL962			
Sampling Date		2015/10/19 09:40	2015/10/19 11:00	2015/10/19 12:00			
COC Number		na	na	na			
	UNITS	SED-209AB(1-2) COMP	SED-210ABC(0-1) COMP	SED-211ABC(0-1) COMP	RDL	MDL	QC Batch
Moisture	%	32	35	31	1.0	0.50	4256569

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		BGL963	BGL964			
Sampling Date		2015/10/19 12:10	2015/10/19 13:00			
COC Number		na	na			
	UNITS	SED-211ABC(1-2) COMP	SED-250ABC(0-1) COMP	RDL	MDL	QC Batch
Moisture	%	30	35	1.0	0.50	4256569

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL954							
Sampling Date		2015/10/16 12:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-206ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	1.30	0.313	2.00	0.0800	1.00	1.30		4286499
1,2,3,7,8-Penta CDD *	pg/g	10.8	0.315	10.0	0.0800	1.00	10.8		4286499
1,2,3,4,7,8-Hexa CDD *	pg/g	15.4	0.429	10.0	0.0800	0.100	1.54		4286499
1,2,3,6,7,8-Hexa CDD *	pg/g	297	0.458	10.0	0.0800	0.100	29.7		4286499
1,2,3,7,8,9-Hexa CDD *	pg/g	54.0	0.456	10.0	0.0800	0.100	5.40		4286499
1,2,3,4,6,7,8-Hepta CDD *	pg/g	2420	0.149	10.0	0.0800	0.0100	24.2		4286499
Octa CDD *	pg/g	13600 (1)	6.75	100	0.160	0.000300	4.08		4286499
Total Tetra CDD *	pg/g	31.0	0.313	2.00	0.0800			11	4286499
Total Penta CDD *	pg/g	114	0.315	10.0	0.0800			11	4286499
Total Hexa CDD *	pg/g	1050	0.458	10.0	0.0800			6	4286499
Total Hepta CDD *	pg/g	3100	0.149	10.0	0.0800			2	4286499
2,3,7,8-Tetra CDF **	pg/g	16.4	0.379	2.00	0.0800	0.100	1.64		4286499
1,2,3,7,8-Penta CDF **	pg/g	9.21	0.271	10.0	0.0800	0.0300	0.276		4286499
2,3,4,7,8-Penta CDF **	pg/g	9.97	0.266	10.0	0.0800	0.300	2.99		4286499
1,2,3,4,7,8-Hexa CDF **	pg/g	34.6	0.425	10.0	0.0800	0.100	3.46		4286499
1,2,3,6,7,8-Hexa CDF **	pg/g	38.7	0.446	10.0	0.0800	0.100	3.87		4286499
2,3,4,6,7,8-Hexa CDF **	pg/g	34.0	0.408	10.0	0.0800	0.100	3.40		4286499
1,2,3,7,8,9-Hexa CDF **	pg/g	1.61	0.436	10.0	0.0800	0.100	0.161		4286499
1,2,3,4,6,7,8-Hepta CDF **	pg/g	843	0.350	10.0	0.0800	0.0100	8.43		4286499
1,2,3,4,7,8,9-Hepta CDF **	pg/g	29.5	0.353	10.0	0.0800	0.0100	0.295		4286499
Octa CDF **	pg/g	671	0.352	20.0	0.160	0.000300	0.201		4286499
Total Tetra CDF **	pg/g	195	0.379	2.00	0.0800			15	4286499
Total Penta CDF **	pg/g	752	0.268	10.0	0.0800			13	4286499
Total Hexa CDF **	pg/g	1940	0.428	10.0	0.0800			11	4286499
Total Hepta CDF **	pg/g	2130	0.351	10.0	0.0800			4	4286499
Confirmation 2,3,7,8-Tetra CDF **	pg/g	11.6	0.11	2.0	1.8	0.100	1.16		4292733
TOTAL TOXIC EQUIVALENCY	pg/g						101		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	97							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1)

** From 5X Dilution **

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL954							
Sampling Date		2015/10/16 12:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-206ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	136							4286499
C13-1234678 HeptaCDF **	%	94							4286499
C13-123478 HexaCDD *	%	92							4286499
C13-123478 HexaCDF **	%	95							4286499
C13-1234789 HeptaCDF **	%	109							4286499
C13-123678 HexaCDD *	%	96							4286499
C13-123678 HexaCDF **	%	94							4286499
C13-12378 PentaCDD *	%	112							4286499
C13-12378 PentaCDF **	%	100							4286499
C13-123789 HexaCDF **	%	110							4286499
C13-234678 HexaCDF **	%	93							4286499
C13-23478 PentaCDF **	%	121							4286499
C13-2378 TetraCDD *	%	97							4286499
C13-2378 TetraCDF **	%	103							4286499
C13-OCDD *	%	118 (1)							4286499
Confirmation C13-2378 TetraCDF **	%	96							4292733

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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1)

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Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL955							
Sampling Date		2015/10/16 13:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-207ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	0.666	0.229	2.00	0.0800	1.00	0.666		4286499
1,2,3,7,8-Penta CDD *	pg/g	4.14	0.426	9.99	0.0800	1.00	4.14		4286499
1,2,3,4,7,8-Hexa CDD *	pg/g	6.99	0.410	9.99	0.0800	0.100	0.699		4286499
1,2,3,6,7,8-Hexa CDD *	pg/g	172	0.438	9.99	0.0800	0.100	17.2		4286499
1,2,3,7,8,9-Hexa CDD *	pg/g	22.5	0.437	9.99	0.0800	0.100	2.25		4286499
1,2,3,4,6,7,8-Hepta CDD *	pg/g	1230	0.375	9.99	0.0800	0.0100	12.3		4286499
Octa CDD *	pg/g	4390	0.925	20.0	0.160	0.000300	1.32		4286499
Total Tetra CDD *	pg/g	66.0	0.229	2.00	0.0800			7	4286499
Total Penta CDD *	pg/g	147	0.426	9.99	0.0800			10	4286499
Total Hexa CDD *	pg/g	723	0.438	9.99	0.0800			6	4286499
Total Hepta CDD *	pg/g	1940	0.375	9.99	0.0800			2	4286499
2,3,7,8-Tetra CDF **	pg/g	13.8	0.354	2.00	0.0800	0.100	1.38		4286499
1,2,3,7,8-Penta CDF **	pg/g	4.23	0.410	9.99	0.0800	0.0300	0.127		4286499
2,3,4,7,8-Penta CDF **	pg/g	4.69	0.403	9.99	0.0800	0.300	1.41		4286499
1,2,3,4,7,8-Hexa CDF **	pg/g	23.2	0.392	9.99	0.0800	0.100	2.32		4286499
1,2,3,6,7,8-Hexa CDF **	pg/g	24.3	0.412	9.99	0.0800	0.100	2.43		4286499
2,3,4,6,7,8-Hexa CDF **	pg/g	22.9	0.377	9.99	0.0800	0.100	2.29		4286499
1,2,3,7,8,9-Hexa CDF **	pg/g	1.45	0.402	9.99	0.0800	0.100	0.145		4286499
1,2,3,4,6,7,8-Hepta CDF **	pg/g	713	0.177	9.99	0.0800	0.0100	7.13		4286499
1,2,3,4,7,8,9-Hepta CDF **	pg/g	27.7	0.178	9.99	0.0800	0.0100	0.277		4286499
Octa CDF **	pg/g	699	0.341	20.0	0.160	0.000300	0.210		4286499
Total Tetra CDF **	pg/g	199	0.354	2.00	0.0800			15	4286499
Total Penta CDF **	pg/g	656	0.406	9.99	0.0800			13	4286499
Total Hexa CDF **	pg/g	1810	0.395	9.99	0.0800			12	4286499
Total Hepta CDF **	pg/g	2450	0.178	9.99	0.0800			4	4286499
Confirmation 2,3,7,8-Tetra CDF **	pg/g	10.5	0.10	2.0	1.8	0.100	1.05		4292733
TOTAL TOXIC EQUIVALENCY	pg/g						56.0		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	88							4286499
C13-1234678 HeptaCDD *	%	93							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

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QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL955							
Sampling Date		2015/10/16 13:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-207ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDF **	%	78							4286499
C13-123478 HexaCDD *	%	74							4286499
C13-123478 HexaCDF **	%	82							4286499
C13-1234789 HeptaCDF **	%	83							4286499
C13-123678 HexaCDD *	%	75							4286499
C13-123678 HexaCDF **	%	77							4286499
C13-12378 PentaCDD *	%	104							4286499
C13-12378 PentaCDF **	%	95							4286499
C13-123789 HexaCDF **	%	85							4286499
C13-234678 HexaCDF **	%	69							4286499
C13-23478 PentaCDF **	%	118							4286499
C13-2378 TetraCDD *	%	80							4286499
C13-2378 TetraCDF **	%	86							4286499
C13-OCDD *	%	66							4286499
Confirmation C13-2378 TetraCDF **	%	81							4292733

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

* CDD = Chloro Dibenzo-p-Dioxin

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Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL956							
Sampling Date		2015/10/16 13:10							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-207AC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	6.30	0.222	2.00	0.0800	1.00	6.30		4286499
1,2,3,7,8-Penta CDD *	pg/g	11.9	0.283	10.0	0.0800	1.00	11.9		4286499
1,2,3,4,7,8-Hexa CDD *	pg/g	37.0	1.50	10.0	0.0800	0.100	3.70		4286499
1,2,3,6,7,8-Hexa CDD *	pg/g	1160	1.60	10.0	0.0800	0.100	116		4286499
1,2,3,7,8,9-Hexa CDD *	pg/g	157	1.59	10.0	0.0800	0.100	15.7		4286499
1,2,3,4,6,7,8-Hepta CDD *	pg/g	10800 (1)	7.75	100	0.0800	0.0100	108		4286499
Octa CDD *	pg/g	23400 (1)	7.09	200	0.160	0.000300	7.02		4286499
Total Tetra CDD *	pg/g	1050	0.222	2.00	0.0800			12	4286499
Total Penta CDD *	pg/g	1850	0.283	10.0	0.0800			10	4286499
Total Hexa CDD *	pg/g	5370	1.60	10.0	0.0800			6	4286499
Total Hepta CDD *	pg/g	14800 (1)	7.75	100	0.0800			2	4286499
2,3,7,8-Tetra CDF **	pg/g	95.6	0.404	2.00	0.0800	0.100	9.56		4286499
1,2,3,7,8-Penta CDF **	pg/g	16.2	0.507	10.0	0.0800	0.0300	0.486		4286499
2,3,4,7,8-Penta CDF **	pg/g	12.5	0.498	10.0	0.0800	0.300	3.75		4286499
1,2,3,4,7,8-Hexa CDF **	pg/g	224	1.34	10.0	0.0800	0.100	22.4		4286499
1,2,3,6,7,8-Hexa CDF **	pg/g	<151 (2)	151	10.0	0.0800	0.100	15.1		4286499
2,3,4,6,7,8-Hexa CDF **	pg/g	139	1.29	10.0	0.0800	0.100	13.9		4286499
1,2,3,7,8,9-Hexa CDF **	pg/g	8.96	1.37	10.0	0.0800	0.100	0.896		4286499
1,2,3,4,6,7,8-Hepta CDF **	pg/g	6220 (1)	2.28	100	0.0800	0.0100	62.2		4286499
1,2,3,4,7,8,9-Hepta CDF **	pg/g	317 (1)	2.29	100	0.0800	0.0100	3.17		4286499
Octa CDF **	pg/g	7280	0.571	20.0	0.160	0.000300	2.18		4286499
Total Tetra CDF **	pg/g	1840	0.404	2.00	0.0800			16	4286499
Total Penta CDF **	pg/g	5790	0.502	10.0	0.0800			12	4286499
Total Hexa CDF **	pg/g	13300	1.35	10.0	0.0800			11	4286499
Total Hepta CDF **	pg/g	21600 (1)	2.29	100	0.0800			4	4286499
Confirmation 2,3,7,8-Tetra CDF **	pg/g	74.5	0.092	2.0	1.8	0.100	7.45		4292733
TOTAL TOXIC EQUIVALENCY	pg/g						400		

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 10X Dilution **

(2) EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL956							
Sampling Date		2015/10/16 13:10							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-207AC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	92							4286499
C13-1234678 HeptaCDD *	%	127 (1)							4286499
C13-1234678 HeptaCDF **	%	94 (1)							4286499
C13-123478 HexaCDD *	%	84							4286499
C13-123478 HexaCDF **	%	86							4286499
C13-1234789 HeptaCDF **	%	104 (1)							4286499
C13-123678 HexaCDD *	%	87							4286499
C13-123678 HexaCDF **	%	84							4286499
C13-12378 PentaCDD *	%	107							4286499
C13-12378 PentaCDF **	%	95							4286499
C13-123789 HexaCDF **	%	98							4286499
C13-234678 HexaCDF **	%	85							4286499
C13-23478 PentaCDF **	%	125							4286499
C13-2378 TetraCDD *	%	82							4286499
C13-2378 TetraCDF **	%	92							4286499
C13-OCDD *	%	110 (1)							4286499
Confirmation C13-2378 TetraCDF **	%	89							4292733

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

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(1) ** From 10X Dilution **

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Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL957							
Sampling Date		2015/10/19 08:30							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-208ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	0.712	0.209	2.00	0.0800	1.00	0.712		4286499
1,2,3,7,8-Penta CDD *	pg/g	3.63	0.202	10.0	0.0800	1.00	3.63		4286499
1,2,3,4,7,8-Hexa CDD *	pg/g	5.34	0.206	10.0	0.0800	0.100	0.534		4286499
1,2,3,6,7,8-Hexa CDD *	pg/g	122	0.220	10.0	0.0800	0.100	12.2		4286499
1,2,3,7,8,9-Hexa CDD *	pg/g	19.1	0.219	10.0	0.0800	0.100	1.91		4286499
1,2,3,4,6,7,8-Hepta CDD *	pg/g	1000	0.204	10.0	0.0800	0.0100	10.0		4286499
Octa CDD *	pg/g	6350	0.209	20.0	0.160	0.000300	1.91		4286499
Total Tetra CDD *	pg/g	12.4	0.209	2.00	0.0800			10	4286499
Total Penta CDD *	pg/g	39.9	0.202	10.0	0.0800			10	4286499
Total Hexa CDD *	pg/g	418	0.220	10.0	0.0800			6	4286499
Total Hepta CDD *	pg/g	1640	0.204	10.0	0.0800			2	4286499
2,3,7,8-Tetra CDF **	pg/g	7.82	0.212	2.00	0.0800	0.100	0.782		4286499
1,2,3,7,8-Penta CDF **	pg/g	4.05	0.211	10.0	0.0800	0.0300	0.122		4286499
2,3,4,7,8-Penta CDF **	pg/g	4.91	0.207	10.0	0.0800	0.300	1.47		4286499
1,2,3,4,7,8-Hexa CDF **	pg/g	13.3	0.210	10.0	0.0800	0.100	1.33		4286499
1,2,3,6,7,8-Hexa CDF **	pg/g	13.1	0.220	10.0	0.0800	0.100	1.31		4286499
2,3,4,6,7,8-Hexa CDF **	pg/g	13.3	0.201	10.0	0.0800	0.100	1.33		4286499
1,2,3,7,8,9-Hexa CDF **	pg/g	0.746	0.215	10.0	0.0800	0.100	0.0746		4286499
1,2,3,4,6,7,8-Hepta CDF **	pg/g	349	0.204	10.0	0.0800	0.0100	3.49		4286499
1,2,3,4,7,8,9-Hepta CDF **	pg/g	11.2	0.206	10.0	0.0800	0.0100	0.112		4286499
Octa CDF **	pg/g	288	0.208	20.0	0.160	0.000300	0.0864		4286499
Total Tetra CDF **	pg/g	91.1	0.212	2.00	0.0800			17	4286499
Total Penta CDF **	pg/g	295	0.209	10.0	0.0800			13	4286499
Total Hexa CDF **	pg/g	732	0.211	10.0	0.0800			11	4286499
Total Hepta CDF **	pg/g	977	0.205	10.0	0.0800			4	4286499
Confirmation 2,3,7,8-Tetra CDF **	pg/g	4.79	0.11	2.0	1.8	0.100	0.479		4292733
TOTAL TOXIC EQUIVALENCY	pg/g						40.7		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	97							4286499
C13-1234678 HeptaCDD *	%	125							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL957							
Sampling Date		2015/10/19 08:30							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-208ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDF **	%	96							4286499
C13-123478 HexaCDD *	%	87							4286499
C13-123478 HexaCDF **	%	91							4286499
C13-1234789 HeptaCDF **	%	102							4286499
C13-123678 HexaCDD *	%	90							4286499
C13-123678 HexaCDF **	%	89							4286499
C13-12378 PentaCDD *	%	124							4286499
C13-12378 PentaCDF **	%	111							4286499
C13-123789 HexaCDF **	%	107							4286499
C13-234678 HexaCDF **	%	92							4286499
C13-23478 PentaCDF **	%	145							4286499
C13-2378 TetraCDD *	%	94							4286499
C13-2378 TetraCDF **	%	105							4286499
C13-OCDD *	%	108							4286499
Confirmation C13-2378 TetraCDF **	%	97							4292733

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

* CDD = Chloro Dibenzo-p-Dioxin

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Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL958							
Sampling Date		2015/10/19 08:40							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-208ABC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	0.269	0.211	2.00	0.0800	1.00	0.269		4286499
1,2,3,7,8-Penta CDD *	pg/g	0.861	0.212	10.0	0.0800	1.00	0.861		4286499
1,2,3,4,7,8-Hexa CDD *	pg/g	1.37	0.205	10.0	0.0800	0.100	0.137		4286499
1,2,3,6,7,8-Hexa CDD *	pg/g	24.9	0.219	10.0	0.0800	0.100	2.49		4286499
1,2,3,7,8,9-Hexa CDD *	pg/g	3.88	0.218	10.0	0.0800	0.100	0.388		4286499
1,2,3,4,6,7,8-Hepta CDD *	pg/g	212	0.219	10.0	0.0800	0.0100	2.12		4286499
Octa CDD *	pg/g	1100	0.205	20.0	0.160	0.000300	0.330		4286499
Total Tetra CDD *	pg/g	3.95	0.211	2.00	0.0800			5	4286499
Total Penta CDD *	pg/g	11.6	0.212	10.0	0.0800			7	4286499
Total Hexa CDD *	pg/g	94.5	0.219	10.0	0.0800			6	4286499
Total Hepta CDD *	pg/g	334	0.219	10.0	0.0800			2	4286499
2,3,7,8-Tetra CDF **	pg/g	1.25	0.204	2.00	0.0800	0.100	0.125		4286499
1,2,3,7,8-Penta CDF **	pg/g	0.720	0.213	10.0	0.0800	0.0300	0.0216		4286499
2,3,4,7,8-Penta CDF **	pg/g	0.829	0.209	10.0	0.0800	0.300	0.249		4286499
1,2,3,4,7,8-Hexa CDF **	pg/g	3.45	0.214	10.0	0.0800	0.100	0.345		4286499
1,2,3,6,7,8-Hexa CDF **	pg/g	3.82	0.224	10.0	0.0800	0.100	0.382		4286499
2,3,4,6,7,8-Hexa CDF **	pg/g	3.42	0.205	10.0	0.0800	0.100	0.342		4286499
1,2,3,7,8,9-Hexa CDF **	pg/g	0.474	0.219	10.0	0.0800	0.100	0.0474		4286499
1,2,3,4,6,7,8-Hepta CDF **	pg/g	144	0.211	10.0	0.0800	0.0100	1.44		4286499
1,2,3,4,7,8,9-Hepta CDF **	pg/g	4.40	0.212	10.0	0.0800	0.0100	0.0440		4286499
Octa CDF **	pg/g	127	0.209	20.0	0.160	0.000300	0.0381		4286499
Total Tetra CDF **	pg/g	17.0	0.204	2.00	0.0800			10	4286499
Total Penta CDF **	pg/g	63.4	0.211	10.0	0.0800			11	4286499
Total Hexa CDF **	pg/g	229	0.215	10.0	0.0800			10	4286499
Total Hepta CDF **	pg/g	399	0.212	10.0	0.0800			4	4286499
TOTAL TOXIC EQUIVALENCY	pg/g						9.63		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	99							4286499
C13-1234678 HeptaCDD *	%	127							4286499
C13-1234678 HeptaCDF **	%	104							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL958							
Sampling Date		2015/10/19 08:40							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-208ABC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-123478 HexaCDD *	%	97							4286499
C13-123478 HexaCDF **	%	99							4286499
C13-1234789 HeptaCDF **	%	110							4286499
C13-123678 HexaCDD *	%	99							4286499
C13-123678 HexaCDF **	%	96							4286499
C13-12378 PentaCDD *	%	127							4286499
C13-12378 PentaCDF **	%	119							4286499
C13-123789 HexaCDF **	%	116							4286499
C13-234678 HexaCDF **	%	98							4286499
C13-23478 PentaCDF **	%	152							4286499
C13-2378 TetraCDD *	%	98							4286499
C13-2378 TetraCDF **	%	107							4286499
C13-OCDD *	%	103							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL959							
Sampling Date		2015/10/19 09:30							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-209ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	1.47	0.273	2.00	0.0800	1.00	1.47		4286499
1,2,3,7,8-Penta CDD *	pg/g	16.2	0.224	10.0	0.0800	1.00	16.2		4286499
1,2,3,4,7,8-Hexa CDD *	pg/g	23.4	0.225	10.0	0.0800	0.100	2.34		4286499
1,2,3,6,7,8-Hexa CDD *	pg/g	422	0.241	10.0	0.0800	0.100	42.2		4286499
1,2,3,7,8,9-Hexa CDD *	pg/g	73.8	0.239	10.0	0.0800	0.100	7.38		4286499
1,2,3,4,6,7,8-Hepta CDD *	pg/g	3220	0.212	10.0	0.0800	0.0100	32.2		4286499
Octa CDD *	pg/g	14200	0.194	20.0	0.160	0.000300	4.26		4286499
Total Tetra CDD *	pg/g	27.6	0.273	2.00	0.0800			10	4286499
Total Penta CDD *	pg/g	109	0.224	10.0	0.0800			12	4286499
Total Hexa CDD *	pg/g	1420	0.240	10.0	0.0800			6	4286499
Total Hepta CDD *	pg/g	5010	0.212	10.0	0.0800			2	4286499
2,3,7,8-Tetra CDF **	pg/g	20.8	0.239	2.00	0.0800	0.100	2.08		4286499
1,2,3,7,8-Penta CDF **	pg/g	14.2	0.203	10.0	0.0800	0.0300	0.426		4286499
2,3,4,7,8-Penta CDF **	pg/g	15.4	0.199	10.0	0.0800	0.300	4.62		4286499
1,2,3,4,7,8-Hexa CDF **	pg/g	56.5	0.275	10.0	0.0800	0.100	5.65		4286499
1,2,3,6,7,8-Hexa CDF **	pg/g	62.5	0.288	10.0	0.0800	0.100	6.25		4286499
2,3,4,6,7,8-Hexa CDF **	pg/g	55.8	0.264	10.0	0.0800	0.100	5.58		4286499
1,2,3,7,8,9-Hexa CDF **	pg/g	2.28	0.281	10.0	0.0800	0.100	0.228		4286499
1,2,3,4,6,7,8-Hepta CDF **	pg/g	1920	0.248	10.0	0.0800	0.0100	19.2		4286499
1,2,3,4,7,8,9-Hepta CDF **	pg/g	61.0	0.250	10.0	0.0800	0.0100	0.610		4286499
Octa CDF **	pg/g	1710	0.258	20.0	0.160	0.000300	0.513		4286499
Total Tetra CDF **	pg/g	212	0.239	2.00	0.0800			16	4286499
Total Penta CDF **	pg/g	999	0.201	10.0	0.0800			12	4286499
Total Hexa CDF **	pg/g	3370	0.277	10.0	0.0800			12	4286499
Total Hepta CDF **	pg/g	5330	0.249	10.0	0.0800			4	4286499
Confirmation 2,3,7,8-Tetra CDF **	pg/g	13.5	0.098	2.0	1.8	0.100	1.35		4292733
TOTAL TOXIC EQUIVALENCY	pg/g						150		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	94							4286499
C13-1234678 HeptaCDD *	%	132							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL959							
Sampling Date		2015/10/19 09:30							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-209ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDF **	%	101							4286499
C13-123478 HexaCDD *	%	93							4286499
C13-123478 HexaCDF **	%	94							4286499
C13-1234789 HeptaCDF **	%	107							4286499
C13-123678 HexaCDD *	%	93							4286499
C13-123678 HexaCDF **	%	90							4286499
C13-12378 PentaCDD *	%	122							4286499
C13-12378 PentaCDF **	%	104							4286499
C13-123789 HexaCDF **	%	109							4286499
C13-234678 HexaCDF **	%	92							4286499
C13-23478 PentaCDF **	%	136							4286499
C13-2378 TetraCDD *	%	91							4286499
C13-2378 TetraCDF **	%	105							4286499
C13-OCDD *	%	112							4286499
Confirmation C13-2378 TetraCDF **	%	95							4292733

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

* CDD = Chloro Dibenzo-p-Dioxin

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL960							
Sampling Date		2015/10/19 09:40							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-209AB(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	<0.208	0.208	2.00	0.0800	1.00	0.208		4286499
1,2,3,7,8-Penta CDD *	pg/g	1.40	0.205	10.0	0.0800	1.00	1.40		4286499
1,2,3,4,7,8-Hexa CDD *	pg/g	3.17	0.189	10.0	0.0800	0.100	0.317		4286499
1,2,3,6,7,8-Hexa CDD *	pg/g	50.8	0.202	10.0	0.0800	0.100	5.08		4286499
1,2,3,7,8,9-Hexa CDD *	pg/g	8.21	0.201	10.0	0.0800	0.100	0.821		4286499
1,2,3,4,6,7,8-Hepta CDD *	pg/g	426	0.206	10.0	0.0800	0.0100	4.26		4286499
Octa CDD *	pg/g	1600	0.216	20.0	0.160	0.000300	0.480		4286499
Total Tetra CDD *	pg/g	5.11	0.208	2.00	0.0800			4	4286499
Total Penta CDD *	pg/g	23.8	0.205	10.0	0.0800			8	4286499
Total Hexa CDD *	pg/g	208	0.201	10.0	0.0800			7	4286499
Total Hepta CDD *	pg/g	628	0.206	10.0	0.0800			2	4286499
2,3,7,8-Tetra CDF **	pg/g	1.22	0.202	2.00	0.0800	0.100	0.122		4286499
1,2,3,7,8-Penta CDF **	pg/g	1.36	0.234	10.0	0.0800	0.0300	0.0408		4286499
2,3,4,7,8-Penta CDF **	pg/g	1.27	0.230	10.0	0.0800	0.300	0.381		4286499
1,2,3,4,7,8-Hexa CDF **	pg/g	12.4	0.199	10.0	0.0800	0.100	1.24		4286499
1,2,3,6,7,8-Hexa CDF **	pg/g	15.3	0.209	10.0	0.0800	0.100	1.53		4286499
2,3,4,6,7,8-Hexa CDF **	pg/g	10.8	0.191	10.0	0.0800	0.100	1.08		4286499
1,2,3,7,8,9-Hexa CDF **	pg/g	<0.693 (1)	0.693	10.0	0.0800	0.100	0.0693		4286499
1,2,3,4,6,7,8-Hepta CDF **	pg/g	744	0.217	10.0	0.0800	0.0100	7.44		4286499
1,2,3,4,7,8,9-Hepta CDF **	pg/g	20.3	0.219	10.0	0.0800	0.0100	0.203		4286499
Octa CDF **	pg/g	673	0.205	20.0	0.160	0.000300	0.202		4286499
Total Tetra CDF **	pg/g	15.1	0.202	2.00	0.0800			10	4286499
Total Penta CDF **	pg/g	126	0.232	10.0	0.0800			12	4286499
Total Hexa CDF **	pg/g	892	0.200	10.0	0.0800			10	4286499
Total Hepta CDF **	pg/g	2180	0.218	10.0	0.0800			4	4286499
TOTAL TOXIC EQUIVALENCY	pg/g						24.9		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	78							4286499
C13-1234678 HeptaCDD *	%	126							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL960							
Sampling Date		2015/10/19 09:40							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-209AB(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDF **	%	93							4286499
C13-123478 HexaCDD *	%	79							4286499
C13-123478 HexaCDF **	%	80							4286499
C13-1234789 HeptaCDF **	%	101							4286499
C13-123678 HexaCDD *	%	81							4286499
C13-123678 HexaCDF **	%	83							4286499
C13-12378 PentaCDD *	%	95							4286499
C13-12378 PentaCDF **	%	83							4286499
C13-123789 HexaCDF **	%	98							4286499
C13-234678 HexaCDF **	%	82							4286499
C13-23478 PentaCDF **	%	107							4286499
C13-2378 TetraCDD *	%	63							4286499
C13-2378 TetraCDF **	%	68							4286499
C13-OCDD *	%	102							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

* CDD = Chloro Dibenzo-p-Dioxin

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Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL961							
Sampling Date		2015/10/19 11:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-210ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	0.369	0.265	2.00	0.0800	1.00	0.369		4286499
1,2,3,7,8-Penta CDD *	pg/g	3.81	0.213	9.99	0.0800	1.00	3.81		4286499
1,2,3,4,7,8-Hexa CDD *	pg/g	6.08	0.229	9.99	0.0800	0.100	0.608		4286499
1,2,3,6,7,8-Hexa CDD *	pg/g	114	0.245	9.99	0.0800	0.100	11.4		4286499
1,2,3,7,8,9-Hexa CDD *	pg/g	19.5	0.244	9.99	0.0800	0.100	1.95		4286499
1,2,3,4,6,7,8-Hepta CDD *	pg/g	822	0.234	9.99	0.0800	0.0100	8.22		4286499
Octa CDD *	pg/g	2560	0.225	20.0	0.160	0.000300	0.768		4286499
Total Tetra CDD *	pg/g	6.09	0.265	2.00	0.0800			5	4286499
Total Penta CDD *	pg/g	27.4	0.213	9.99	0.0800			9	4286499
Total Hexa CDD *	pg/g	382	0.245	9.99	0.0800			7	4286499
Total Hepta CDD *	pg/g	1200	0.234	9.99	0.0800			2	4286499
2,3,7,8-Tetra CDF **	pg/g	4.33	0.266	2.00	0.0800	0.100	0.433		4286499
1,2,3,7,8-Penta CDF **	pg/g	3.25	0.215	9.99	0.0800	0.0300	0.0975		4286499
2,3,4,7,8-Penta CDF **	pg/g	3.77	0.211	9.99	0.0800	0.300	1.13		4286499
1,2,3,4,7,8-Hexa CDF **	pg/g	21.9	0.283	9.99	0.0800	0.100	2.19		4286499
1,2,3,6,7,8-Hexa CDF **	pg/g	29.7	0.297	9.99	0.0800	0.100	2.97		4286499
2,3,4,6,7,8-Hexa CDF **	pg/g	21.2	0.272	9.99	0.0800	0.100	2.12		4286499
1,2,3,7,8,9-Hexa CDF **	pg/g	0.748	0.290	9.99	0.0800	0.100	0.0748		4286499
1,2,3,4,6,7,8-Hepta CDF **	pg/g	862	0.221	9.99	0.0800	0.0100	8.62		4286499
1,2,3,4,7,8,9-Hepta CDF **	pg/g	28.1	0.223	9.99	0.0800	0.0100	0.281		4286499
Octa CDF **	pg/g	740	0.241	20.0	0.160	0.000300	0.222		4286499
Total Tetra CDF **	pg/g	47.7	0.266	2.00	0.0800			13	4286499
Total Penta CDF **	pg/g	299	0.213	9.99	0.0800			13	4286499
Total Hexa CDF **	pg/g	1330	0.285	9.99	0.0800			11	4286499
Total Hepta CDF **	pg/g	2460	0.222	9.99	0.0800			4	4286499
Confirmation 2,3,7,8-Tetra CDF **	pg/g	2.99	0.11	2.0	1.8	0.100	0.299		4292733
TOTAL TOXIC EQUIVALENCY	pg/g						45.1		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	95							4286499
C13-1234678 HeptaCDD *	%	123							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL961							
Sampling Date		2015/10/19 11:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-210ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDF **	%	96							4286499
C13-123478 HexaCDD *	%	87							4286499
C13-123478 HexaCDF **	%	88							4286499
C13-1234789 HeptaCDF **	%	105							4286499
C13-123678 HexaCDD *	%	88							4286499
C13-123678 HexaCDF **	%	85							4286499
C13-12378 PentaCDD *	%	108							4286499
C13-12378 PentaCDF **	%	97							4286499
C13-123789 HexaCDF **	%	105							4286499
C13-234678 HexaCDF **	%	88							4286499
C13-23478 PentaCDF **	%	124							4286499
C13-2378 TetraCDD *	%	89							4286499
C13-2378 TetraCDF **	%	96							4286499
C13-OCDD *	%	97							4286499
Confirmation C13-2378 TetraCDF **	%	94							4292733

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

* CDD = Chloro Dibenzo-p-Dioxin

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Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL962							
Sampling Date		2015/10/19 12:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-211ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	1.49	0.215	2.00	0.0800	1.00	1.49		4286499
1,2,3,7,8-Penta CDD *	pg/g	7.56	0.211	10.0	0.0800	1.00	7.56		4286499
1,2,3,4,7,8-Hexa CDD *	pg/g	13.8	0.192	10.0	0.0800	0.100	1.38		4286499
1,2,3,6,7,8-Hexa CDD *	pg/g	298	0.205	10.0	0.0800	0.100	29.8		4286499
1,2,3,7,8,9-Hexa CDD *	pg/g	39.8	0.204	10.0	0.0800	0.100	3.98		4286499
1,2,3,4,6,7,8-Hepta CDD *	pg/g	2390	0.220	10.0	0.0800	0.0100	23.9		4286499
Octa CDD *	pg/g	11900 (1)	1.01	20.0	0.160	0.000300	3.57		4286499
Total Tetra CDD *	pg/g	21.2	0.215	2.00	0.0800			10	4286499
Total Penta CDD *	pg/g	72.6	0.211	10.0	0.0800			11	4286499
Total Hexa CDD *	pg/g	903	0.205	10.0	0.0800			6	4286499
Total Hepta CDD *	pg/g	3560	0.220	10.0	0.0800			2	4286499
2,3,7,8-Tetra CDF **	pg/g	10.9	0.203	2.00	0.0800	0.100	1.09		4286499
1,2,3,7,8-Penta CDF **	pg/g	8.78	0.408	10.0	0.0800	0.0300	0.263		4286499
2,3,4,7,8-Penta CDF **	pg/g	9.07	0.400	10.0	0.0800	0.300	2.72		4286499
1,2,3,4,7,8-Hexa CDF **	pg/g	44.2	0.207	10.0	0.0800	0.100	4.42		4286499
1,2,3,6,7,8-Hexa CDF **	pg/g	40.7	0.218	10.0	0.0800	0.100	4.07		4286499
2,3,4,6,7,8-Hexa CDF **	pg/g	36.4	0.199	10.0	0.0800	0.100	3.64		4286499
1,2,3,7,8,9-Hexa CDF **	pg/g	2.52	0.213	10.0	0.0800	0.100	0.252		4286499
1,2,3,4,6,7,8-Hepta CDF **	pg/g	1620	0.215	10.0	0.0800	0.0100	16.2		4286499
1,2,3,4,7,8,9-Hepta CDF **	pg/g	47.4	0.217	10.0	0.0800	0.0100	0.474		4286499
Octa CDF **	pg/g	1350	0.201	20.0	0.160	0.000300	0.405		4286499
Total Tetra CDF **	pg/g	89.7	0.203	2.00	0.0800			14	4286499
Total Penta CDF **	pg/g	566	0.404	10.0	0.0800			13	4286499
Total Hexa CDF **	pg/g	2510	0.209	10.0	0.0800			11	4286499
Total Hepta CDF **	pg/g	4710	0.216	10.0	0.0800			4	4286499
Confirmation 2,3,7,8-Tetra CDF **	pg/g	7.34	0.11	2.0	1.8	0.100	0.734		4292733
TOTAL TOXIC EQUIVALENCY	pg/g						105		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	71							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) Results from 5xdiln

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL962							
Sampling Date		2015/10/19 12:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-211ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	123							4286499
C13-1234678 HeptaCDF **	%	93							4286499
C13-123478 HexaCDD *	%	75							4286499
C13-123478 HexaCDF **	%	74							4286499
C13-1234789 HeptaCDF **	%	102							4286499
C13-123678 HexaCDD *	%	75							4286499
C13-123678 HexaCDF **	%	79							4286499
C13-12378 PentaCDD *	%	91							4286499
C13-12378 PentaCDF **	%	77							4286499
C13-123789 HexaCDF **	%	90							4286499
C13-234678 HexaCDF **	%	77							4286499
C13-23478 PentaCDF **	%	106							4286499
C13-2378 TetraCDD *	%	62							4286499
C13-2378 TetraCDF **	%	66							4286499
C13-OCDD *	%	103 (1)							4286499
Confirmation C13-2378 TetraCDF **	%	63							4292733

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) Results from 5xdiln

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Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL963							
Sampling Date		2015/10/19 12:10							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-211ABC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	<1.08	1.08	2.00	0.0800	1.00	1.08		4286499
1,2,3,7,8-Penta CDD *	pg/g	6.23	1.27	10.0	0.0800	1.00	6.23		4286499
1,2,3,4,7,8-Hexa CDD *	pg/g	12.2	1.18	10.0	0.0800	0.100	1.22		4286499
1,2,3,6,7,8-Hexa CDD *	pg/g	212	1.26	10.0	0.0800	0.100	21.2		4286499
1,2,3,7,8,9-Hexa CDD *	pg/g	33.3	1.25	10.0	0.0800	0.100	3.33		4286499
1,2,3,4,6,7,8-Hepta CDD *	pg/g	1770	1.06	10.0	0.0800	0.0100	17.7		4286499
Octa CDD *	pg/g	8640	1.16	20.0	0.160	0.000300	2.59		4286499
Total Tetra CDD *	pg/g	14.7	1.08	2.00	0.0800			3	4286499
Total Penta CDD *	pg/g	67.9	1.27	10.0	0.0800			5	4286499
Total Hexa CDD *	pg/g	752	1.26	10.0	0.0800			6	4286499
Total Hepta CDD *	pg/g	2810	1.06	10.0	0.0800			2	4286499
2,3,7,8-Tetra CDF **	pg/g	8.25	1.11	2.00	0.0800	0.100	0.825		4286499
1,2,3,7,8-Penta CDF **	pg/g	7.19	1.04	10.0	0.0800	0.0300	0.216		4286499
2,3,4,7,8-Penta CDF **	pg/g	6.81	1.02	10.0	0.0800	0.300	2.04		4286499
1,2,3,4,7,8-Hexa CDF **	pg/g	36.7	1.11	10.0	0.0800	0.100	3.67		4286499
1,2,3,6,7,8-Hexa CDF **	pg/g	45.0	1.16	10.0	0.0800	0.100	4.50		4286499
2,3,4,6,7,8-Hexa CDF **	pg/g	33.2	1.07	10.0	0.0800	0.100	3.32		4286499
1,2,3,7,8,9-Hexa CDF **	pg/g	2.01	1.14	10.0	0.0800	0.100	0.201		4286499
1,2,3,4,6,7,8-Hepta CDF **	pg/g	1460	1.32	10.0	0.0800	0.0100	14.6		4286499
1,2,3,4,7,8,9-Hepta CDF **	pg/g	49.8	1.33	10.0	0.0800	0.0100	0.498		4286499
Octa CDF **	pg/g	1340	1.09	20.0	0.160	0.000300	0.402		4286499
Total Tetra CDF **	pg/g	93.6	1.11	2.00	0.0800			11	4286499
Total Penta CDF **	pg/g	557	1.03	10.0	0.0800			12	4286499
Total Hexa CDF **	pg/g	2260	1.12	10.0	0.0800			11	4286499
Total Hepta CDF **	pg/g	4330	1.33	10.0	0.0800			4	4286499
TOTAL TOXIC EQUIVALENCY	pg/g						83.6		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	92							4286499
C13-1234678 HeptaCDD *	%	116							4286499
C13-1234678 HeptaCDF **	%	88							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL963							
Sampling Date		2015/10/19 12:10							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-211ABC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-123478 HexaCDD *	%	84							4286499
C13-123478 HexaCDF **	%	90							4286499
C13-1234789 HeptaCDF **	%	102							4286499
C13-123678 HexaCDD *	%	87							4286499
C13-123678 HexaCDF **	%	87							4286499
C13-12378 PentaCDD *	%	109							4286499
C13-12378 PentaCDF **	%	95							4286499
C13-123789 HexaCDF **	%	102							4286499
C13-234678 HexaCDF **	%	87							4286499
C13-23478 PentaCDF **	%	124							4286499
C13-2378 TetraCDD *	%	89							4286499
C13-2378 TetraCDF **	%	96							4286499
C13-OCDD *	%	90							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL964							
Sampling Date		2015/10/19 13:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-250ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	1.43	0.271	2.00	0.0800	1.00	1.43		4286499
1,2,3,7,8-Penta CDD *	pg/g	7.81	0.233	10.0	0.0800	1.00	7.81		4286499
1,2,3,4,7,8-Hexa CDD *	pg/g	13.9	0.238	10.0	0.0800	0.100	1.39		4286499
1,2,3,6,7,8-Hexa CDD *	pg/g	274	0.254	10.0	0.0800	0.100	27.4		4286499
1,2,3,7,8,9-Hexa CDD *	pg/g	37.8	0.253	10.0	0.0800	0.100	3.78		4286499
1,2,3,4,6,7,8-Hepta CDD *	pg/g	2170	0.277	10.0	0.0800	0.0100	21.7		4286499
Octa CDD *	pg/g	11600	0.266	20.0	0.160	0.000300	3.48		4286499
Total Tetra CDD *	pg/g	27.2	0.271	2.00	0.0800			11	4286499
Total Penta CDD *	pg/g	85.3	0.233	10.0	0.0800			11	4286499
Total Hexa CDD *	pg/g	871	0.254	10.0	0.0800			7	4286499
Total Hepta CDD *	pg/g	3310	0.277	10.0	0.0800			2	4286499
2,3,7,8-Tetra CDF **	pg/g	11.4	0.205	2.00	0.0800	0.100	1.14		4286499
1,2,3,7,8-Penta CDF **	pg/g	8.68	0.216	10.0	0.0800	0.0300	0.260		4286499
2,3,4,7,8-Penta CDF **	pg/g	8.58	0.212	10.0	0.0800	0.300	2.57		4286499
1,2,3,4,7,8-Hexa CDF **	pg/g	43.3	0.111	10.0	0.0800	0.100	4.33		4286499
1,2,3,6,7,8-Hexa CDF **	pg/g	48.4	0.117	10.0	0.0800	0.100	4.84		4286499
2,3,4,6,7,8-Hexa CDF **	pg/g	38.2	0.107	10.0	0.0800	0.100	3.82		4286499
1,2,3,7,8,9-Hexa CDF **	pg/g	2.43	0.114	10.0	0.0800	0.100	0.243		4286499
1,2,3,4,6,7,8-Hepta CDF **	pg/g	1680	0.296	10.0	0.0800	0.0100	16.8		4286499
1,2,3,4,7,8,9-Hepta CDF **	pg/g	50.5	0.298	10.0	0.0800	0.0100	0.505		4286499
Octa CDF **	pg/g	1420	0.260	20.0	0.160	0.000300	0.426		4286499
Total Tetra CDF **	pg/g	132	0.205	2.00	0.0800			16	4286499
Total Penta CDF **	pg/g	651	0.214	10.0	0.0800			12	4286499
Total Hexa CDF **	pg/g	2530	0.112	10.0	0.0800			12	4286499
Total Hepta CDF **	pg/g	4640	0.297	10.0	0.0800			4	4286499
Confirmation 2,3,7,8-Tetra CDF **	pg/g	7.60	0.10	2.0	1.8	0.100	0.760		4292733
TOTAL TOXIC EQUIVALENCY	pg/g						102		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	100							4286499

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGL964							
Sampling Date		2015/10/19 13:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-250ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	150 (1)							4286499
C13-1234678 HeptaCDF **	%	117							4286499
C13-123478 HexaCDD *	%	99							4286499
C13-123478 HexaCDF **	%	104							4286499
C13-1234789 HeptaCDF **	%	126							4286499
C13-123678 HexaCDD *	%	97							4286499
C13-123678 HexaCDF **	%	101							4286499
C13-12378 PentaCDD *	%	113							4286499
C13-12378 PentaCDF **	%	105							4286499
C13-123789 HexaCDF **	%	119							4286499
C13-234678 HexaCDF **	%	103							4286499
C13-23478 PentaCDF **	%	132							4286499
C13-2378 TetraCDD *	%	99							4286499
C13-2378 TetraCDF **	%	113							4286499
C13-OCDD *	%	138							4286499
Confirmation C13-2378 TetraCDF **	%	102							4292733

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) Recovery exceeds method criteria due to matrix effects

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TEST SUMMARY

Maxxam ID: BGL954 **Collected:** 2015/10/16
Sample ID: SED-206ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286499	2015/11/17	2015/11/29	Kay Shaw
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4292733	N/A	2015/11/30	Vica Cioranic
Moisture	BAL	4256569	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGL955 **Collected:** 2015/10/16
Sample ID: SED-207ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286499	2015/11/17	2015/11/29	Kay Shaw
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4292733	N/A	2015/11/30	Vica Cioranic
Moisture	BAL	4256569	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGL956 **Collected:** 2015/10/16
Sample ID: SED-207AC(1-2) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286499	2015/11/17	2015/11/29	Kay Shaw
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4292733	N/A	2015/11/30	Vica Cioranic
Moisture	BAL	4256569	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGL957 **Collected:** 2015/10/19
Sample ID: SED-208ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286499	2015/11/17	2015/11/29	Kay Shaw
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4292733	N/A	2015/11/30	Vica Cioranic
Moisture	BAL	4256569	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGL958 **Collected:** 2015/10/19
Sample ID: SED-208ABC(1-2) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286499	2015/11/17	2015/11/29	Kay Shaw
Moisture	BAL	4256569	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGL959 **Collected:** 2015/10/19
Sample ID: SED-209ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286499	2015/11/17	2015/11/29	Kay Shaw
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4292733	N/A	2015/11/30	Vica Cioranic
Moisture	BAL	4256569	N/A	2015/11/03	Jessy Mathew Vinod

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TEST SUMMARY

Maxxam ID: BGL960 **Collected:** 2015/10/19
Sample ID: SED-209AB(1-2) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286499	2015/11/17	2015/12/01	Kay Shaw
Moisture	BAL	4256569	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGL961 **Collected:** 2015/10/19
Sample ID: SED-210ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286499	2015/11/17	2015/11/29	Kay Shaw
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4292733	N/A	2015/11/30	Vica Cioranic
Moisture	BAL	4256569	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGL962 **Collected:** 2015/10/19
Sample ID: SED-211ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286499	2015/11/17	2015/12/01	Kay Shaw
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4292733	N/A	2015/12/01	Vica Cioranic
Moisture	BAL	4256569	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGL963 **Collected:** 2015/10/19
Sample ID: SED-211ABC(1-2) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286499	2015/11/17	2015/11/29	Kay Shaw
Moisture	BAL	4256569	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGL964 **Collected:** 2015/10/19
Sample ID: SED-250ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286499	2015/11/17	2015/11/29	Kay Shaw
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4292733	N/A	2015/11/30	Vica Cioranic
Moisture	BAL	4256569	N/A	2015/11/03	Jessy Mathew Vinod

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.4°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4256569	MYG	RPD - Sample/Sample Dup	Moisture	2015/11/03	0.95		%	20
4286499	KKS	Spiked Blank	37CL4 2378 Tetra CDD	2015/11/28		87	%	35 - 197
			C13-1234678 HeptaCDD	2015/11/28		68	%	23 - 140
			C13-1234678 HeptaCDF	2015/11/28		58	%	28 - 143
			C13-123478 HexaCDD	2015/11/28		64	%	32 - 141
			C13-123478 HexaCDF	2015/11/28		66	%	26 - 152
			C13-1234789 HeptaCDF	2015/11/28		63	%	26 - 138
			C13-123678 HexaCDD	2015/11/28		66	%	28 - 130
			C13-123678 HexaCDF	2015/11/28		66	%	26 - 123
			C13-12378 PentaCDD	2015/11/28		84	%	25 - 181
			C13-12378 PentaCDF	2015/11/28		76	%	24 - 185
			C13-123789 HexaCDF	2015/11/28		70	%	29 - 147
			C13-234678 HexaCDF	2015/11/28		54	%	28 - 136
			C13-23478 PentaCDF	2015/11/28		92	%	21 - 178
			C13-2378 TetraCDD	2015/11/28		75	%	25 - 164
			C13-2378 TetraCDF	2015/11/28		80	%	24 - 169
			C13-OCDD	2015/11/28		36	%	17 - 157
			2,3,7,8-Tetra CDD	2015/11/28		101	%	67 - 158
			1,2,3,7,8-Penta CDD	2015/11/28		87	%	25 - 181
			1,2,3,4,7,8-Hexa CDD	2015/11/28		102	%	70 - 164
			1,2,3,6,7,8-Hexa CDD	2015/11/28		93	%	76 - 134
			1,2,3,7,8,9-Hexa CDD	2015/11/28		96	%	64 - 162
			1,2,3,4,6,7,8-Hepta CDD	2015/11/28		76	%	70 - 140
			Octa CDD	2015/11/28		95	%	78 - 144
			2,3,7,8-Tetra CDF	2015/11/28		98	%	75 - 158
			1,2,3,7,8-Penta CDF	2015/11/28		97	%	80 - 134
			2,3,4,7,8-Penta CDF	2015/11/28		87	%	68 - 160
			1,2,3,4,7,8-Hexa CDF	2015/11/28		102	%	72 - 134
			1,2,3,6,7,8-Hexa CDF	2015/11/28		100	%	84 - 130
			2,3,4,6,7,8-Hexa CDF	2015/11/28		99	%	70 - 156
			1,2,3,7,8,9-Hexa CDF	2015/11/28		91	%	78 - 130
			1,2,3,4,6,7,8-Hepta CDF	2015/11/28		102	%	82 - 122
			1,2,3,4,7,8,9-Hepta CDF	2015/11/28		93	%	78 - 138
			Octa CDF	2015/11/28		111	%	63 - 170
4286499	KKS	Method Blank	37CL4 2378 Tetra CDD	2015/11/29		92	%	35 - 197
			C13-1234678 HeptaCDD	2015/11/29		112	%	23 - 140
			C13-1234678 HeptaCDF	2015/11/29		92	%	28 - 143
			C13-123478 HexaCDD	2015/11/29		89	%	32 - 141
			C13-123478 HexaCDF	2015/11/29		86	%	26 - 152
			C13-1234789 HeptaCDF	2015/11/29		97	%	26 - 138
			C13-123678 HexaCDD	2015/11/29		88	%	28 - 130
			C13-123678 HexaCDF	2015/11/29		87	%	26 - 123
			C13-12378 PentaCDD	2015/11/29		122	%	25 - 181
			C13-12378 PentaCDF	2015/11/29		102	%	24 - 185
			C13-123789 HexaCDF	2015/11/29		103	%	29 - 147
			C13-234678 HexaCDF	2015/11/29		90	%	28 - 136
			C13-23478 PentaCDF	2015/11/29		127	%	21 - 178
			C13-2378 TetraCDD	2015/11/29		88	%	25 - 164
			C13-2378 TetraCDF	2015/11/29		99	%	24 - 169
			C13-OCDD	2015/11/29		83	%	17 - 157
			2,3,7,8-Tetra CDD	2015/11/29	<0.214, EDL=0.214		pg/g	
			1,2,3,7,8-Penta CDD	2015/11/29	<0.154, EDL=0.154		pg/g	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			1,2,3,4,7,8-Hexa CDD	2015/11/29	<0.190, EDL=0.190		pg/g	
			1,2,3,6,7,8-Hexa CDD	2015/11/29	<0.203, EDL=0.203		pg/g	
			1,2,3,7,8,9-Hexa CDD	2015/11/29	<0.203, EDL=0.203		pg/g	
			1,2,3,4,6,7,8-Hepta CDD	2015/11/29	<0.210, EDL=0.210		pg/g	
			Octa CDD	2015/11/29	0.384, EDL=0.217		pg/g	
			Total Tetra CDD	2015/11/29	<0.214, EDL=0.214		pg/g	
			Total Penta CDD	2015/11/29	<0.154, EDL=0.154		pg/g	
			Total Hexa CDD	2015/11/29	<0.203, EDL=0.203		pg/g	
			Total Hepta CDD	2015/11/29	<0.210, EDL=0.210		pg/g	
			2,3,7,8-Tetra CDF	2015/11/29	<0.128, EDL=0.128		pg/g	
			1,2,3,7,8-Penta CDF	2015/11/29	<0.149, EDL=0.149		pg/g	
			2,3,4,7,8-Penta CDF	2015/11/29	<0.146, EDL=0.146		pg/g	
			1,2,3,4,7,8-Hexa CDF	2015/11/29	<0.213, EDL=0.213		pg/g	
			1,2,3,6,7,8-Hexa CDF	2015/11/29	<0.224, EDL=0.224		pg/g	
			2,3,4,6,7,8-Hexa CDF	2015/11/29	<0.205, EDL=0.205		pg/g	
			1,2,3,7,8,9-Hexa CDF	2015/11/29	<0.219, EDL=0.219		pg/g	
			1,2,3,4,6,7,8-Hepta CDF	2015/11/29	0.289, EDL=0.214		pg/g	
			1,2,3,4,7,8,9-Hepta CDF	2015/11/29	<0.216, EDL=0.216		pg/g	
			Octa CDF	2015/11/29	<0.206, EDL=0.206		pg/g	
			Total Tetra CDF	2015/11/29	<0.128, EDL=0.128		pg/g	
			Total Penta CDF	2015/11/29	<0.147, EDL=0.147		pg/g	
			Total Hexa CDF	2015/11/29	<0.215, EDL=0.215		pg/g	
			Total Hepta CDF	2015/11/29	0.289, EDL=0.215		pg/g	
4286499	KKS	RPD - Sample/Sample Dup	2,3,7,8-Tetra CDD	2015/11/30	NC		%	25
			1,2,3,7,8-Penta CDD	2015/11/30	NC		%	25
			1,2,3,4,7,8-Hexa CDD	2015/11/30	NC		%	25
			1,2,3,6,7,8-Hexa CDD	2015/11/30	0.37		%	25
			1,2,3,7,8,9-Hexa CDD	2015/11/30	NC		%	25

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			1,2,3,4,6,7,8-Hepta CDD	2015/11/30	4.5		%	25
			Octa CDD	2015/11/30	4.7		%	25
			Total Tetra CDD	2015/11/30	NC		%	25
			Total Penta CDD	2015/11/30	NC		%	25
			Total Hexa CDD	2015/11/30	2.9		%	25
			Total Hepta CDD	2015/11/30	5.0		%	25
			2,3,7,8-Tetra CDF	2015/11/30	NC		%	25
			1,2,3,7,8-Penta CDF	2015/11/30	NC		%	25
			2,3,4,7,8-Penta CDF	2015/11/30	NC		%	25
			1,2,3,4,7,8-Hexa CDF	2015/11/30	NC		%	25
			1,2,3,6,7,8-Hexa CDF	2015/11/30	NC		%	25
			2,3,4,6,7,8-Hexa CDF	2015/11/30	NC		%	25
			1,2,3,7,8,9-Hexa CDF	2015/11/30	NC		%	25
			1,2,3,4,6,7,8-Hepta CDF	2015/11/30	3.8		%	25
			1,2,3,4,7,8,9-Hepta CDF	2015/11/30	NC		%	25
			Octa CDF	2015/11/30	2.4		%	25
			Total Tetra CDF	2015/11/30	3.0		%	25
			Total Penta CDF	2015/11/30	2.1		%	25
			Total Hexa CDF	2015/11/30	7.4		%	25
			Total Hepta CDF	2015/11/30	5.7		%	25
4292733	VCI	Method Blank	Confirmation 2,3,7,8-Tetra CDF	2015/11/30	<0.11, EDL=0.11		pg/g	
			Confirmation C13-2378 TetraCDF	2015/11/30		49	%	40 - 135

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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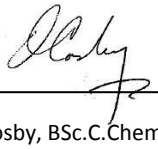
Maxxam Job #: B5M2677
Report Date: 2015/12/03

Apex Laboratories
Client Project #: A5J0576

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brad Newman, Scientific Specialist



Owen Cosby, BSc.C.Chem, Supervisor, HRMS Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam
A Bureau Veritas Group Company

Your Project #: A5J0568
Your C.O.C. #: na

Attention:Philip Nerenberg

Apex Laboratories
12232 SW Garden Place
Tigard, OR
USA 97223

Report Date: 2015/12/02
Report #: R3791309
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5M2697
Received: 2015/10/30, 15:45

Sample Matrix: SEDIMENT
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dioxins/Furans in Soil (1613B) (1)	6	2015/11/17	2015/11/21	BRL SOP-00410	EPA 1613B m
Dioxins/Furans in Soil (1613B) (1)	3	2015/11/17	2015/11/22	BRL SOP-00410	EPA 1613B m
Dioxins/Furans in Soil (1613B) (1)	1	2015/11/24	2015/11/28	BRL SOP-00410	EPA 1613B m
2378TCDF Confirmation (M8290A/M1613)	6	N/A	2015/11/25	BRL SOP-00406	EPA M8290A / M1613
2378TCDF Confirmation (M8290A/M1613)	2	N/A	2015/11/26	BRL SOP-00406	EPA M8290A / M1613
2378TCDF Confirmation (M8290A/M1613)	1	N/A	2015/11/30	BRL SOP-00406	EPA M8290A / M1613
Moisture	10	N/A	2015/11/03	CAM SOP-00445	Carter 2nd ed 51.2 m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.

Confirmatory runs for 2,3,7,8-TCDF are performed only if the primary result is greater than the RDL.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Melissa DiGrazia, Project Manager - ATUT
Email: MDiGrazia@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

RESULTS OF ANALYSES OF SEDIMENT

Maxxam ID		BGM014	BGM015	BGM016			
Sampling Date		2015/10/15 11:30	2015/10/15 11:40	2015/10/15 13:10			
COC Number		na	na	na			
	UNITS	SED-200ABC(0-1) COMP	SED-200AC(1-2) COMP	SED-201ABC(0-1) COMP	RDL	MDL	QC Batch
Moisture	%	28	30	41	1.0	0.50	4256573

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		BGM017	BGM018	BGM019			
Sampling Date		2015/10/15 13:20	2015/10/15 15:15	2015/10/16 08:00			
COC Number		na	na	na			
	UNITS	SED-201ABC(1-2) COMP	SED-202ABC(0-1) COMP	SED-203ABC(0-1) COMP	RDL	MDL	QC Batch
Moisture	%	32	40	40	1.0	0.50	4256573

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		BGM020	BGM021	BGM022			
Sampling Date		2015/10/16 08:10	2015/10/16 09:00	2015/10/16 09:10			
COC Number		na	na	na			
	UNITS	SED-203AC(1-2) COMP	SED-204ABC(0-1) COMP	SED-204AC(1-2) COMP	RDL	MDL	QC Batch
Moisture	%	36	42	55	1.0	0.50	4256573

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		BGM023			
Sampling Date		2015/10/16 10:30			
COC Number		na			
	UNITS	SED-205ABC(0-1) COMP	RDL	MDL	QC Batch
Moisture	%	34	1.0	0.50	4256573

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM014							
Sampling Date		2015/10/15 11:30							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-200ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	0.446	0.0819	0.998	0.400	1.00	0.446		4281361
1,2,3,7,8-Penta CDD *	pg/g	2.49	0.0836	4.99	0.400	1.00	2.49		4281361
1,2,3,4,7,8-Hexa CDD *	pg/g	4.06	0.106	4.99	0.400	0.100	0.406		4281361
1,2,3,6,7,8-Hexa CDD *	pg/g	154	0.111	4.99	0.400	0.100	15.4		4281361
1,2,3,7,8,9-Hexa CDD *	pg/g	16.4	0.101	4.99	0.400	0.100	1.64		4281361
1,2,3,4,6,7,8-Hepta CDD *	pg/g	1400	0.460	4.99	0.400	0.0100	14.0		4281361
Octa CDD *	pg/g	7720 (1)	0.610	49.9	0.800	0.000300	2.32		4281361
Total Tetra CDD *	pg/g	4.68	0.0819	0.998	0.400			4	4281361
Total Penta CDD *	pg/g	79.1	0.0836	4.99	0.400			9	4281361
Total Hexa CDD *	pg/g	479	0.106	4.99	0.400			6	4281361
Total Hepta CDD *	pg/g	2120	0.460	4.99	0.400			2	4281361
2,3,7,8-Tetra CDF **	pg/g	8.53	0.0859	0.998	0.400	0.100	0.853		4281361
1,2,3,7,8-Penta CDF **	pg/g	4.29	0.0895	4.99	0.400	0.0300	0.129		4281361
2,3,4,7,8-Penta CDF **	pg/g	5.04	0.0874	4.99	0.400	0.300	1.51		4281361
1,2,3,4,7,8-Hexa CDF **	pg/g	22.7	0.148	4.99	0.400	0.100	2.27		4281361
1,2,3,6,7,8-Hexa CDF **	pg/g	17.3	0.152	4.99	0.400	0.100	1.73		4281361
2,3,4,6,7,8-Hexa CDF **	pg/g	13.3	0.142	4.99	0.400	0.100	1.33		4281361
1,2,3,7,8,9-Hexa CDF **	pg/g	0.865	0.148	4.99	0.400	0.100	0.0865		4281361
1,2,3,4,6,7,8-Hepta CDF **	pg/g	367	0.0815	4.99	0.400	0.0100	3.67		4281361
1,2,3,4,7,8,9-Hepta CDF **	pg/g	12.6	0.0799	4.99	0.400	0.0100	0.126		4281361
Octa CDF **	pg/g	347	0.236	9.98	0.800	0.000300	0.104		4281361
Total Tetra CDF **	pg/g	29.5	0.0859	0.998	0.400			12	4281361
Total Penta CDF **	pg/g	110	0.0884	4.99	0.400			13	4281361
Total Hexa CDF **	pg/g	948	0.148	4.99	0.400			12	4281361
Total Hepta CDF **	pg/g	1140	0.0807	4.99	0.400			4	4281361
Confirmation 2,3,7,8-Tetra CDF **	pg/g	7.33	0.58	1.0	0.90	0.100	0.733		4287747
TOTAL TOXIC EQUIVALENCY	pg/g						48.4		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	81							4281361

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1)
** From 5X Dilution **

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM014							
Sampling Date		2015/10/15 11:30							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-200ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	70							4281361
C13-1234678 HeptaCDF **	%	59							4281361
C13-123478 HexaCDD *	%	71							4281361
C13-123478 HexaCDF **	%	76							4281361
C13-1234789 HeptaCDF **	%	55							4281361
C13-123678 HexaCDD *	%	73							4281361
C13-123678 HexaCDF **	%	78							4281361
C13-12378 PentaCDD *	%	86							4281361
C13-12378 PentaCDF **	%	77							4281361
C13-123789 HexaCDF **	%	75							4281361
C13-234678 HexaCDF **	%	69							4281361
C13-23478 PentaCDF **	%	86							4281361
C13-2378 TetraCDD *	%	75							4281361
C13-2378 TetraCDF **	%	66							4281361
C13-OCDD *	%	64 (1)							4281361
Confirmation C13-2378 TetraCDF **	%	65							4287747

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1)
** From 5X Dilution **

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Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM015							
Sampling Date		2015/10/15 11:40							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-200AC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	0.127	0.0826	1.00	0.400	1.00	0.127		4281361
1,2,3,7,8-Penta CDD *	pg/g	0.400	0.109	5.00	0.400	1.00	0.400		4281361
1,2,3,4,7,8-Hexa CDD *	pg/g	0.685	0.0893	5.00	0.400	0.100	0.0685		4281361
1,2,3,6,7,8-Hexa CDD *	pg/g	15.7	0.0936	5.00	0.400	0.100	1.57		4281361
1,2,3,7,8,9-Hexa CDD *	pg/g	2.12	0.0855	5.00	0.400	0.100	0.212		4281361
1,2,3,4,6,7,8-Hepta CDD *	pg/g	132	0.185	5.00	0.400	0.0100	1.32		4281361
Octa CDD *	pg/g	717	0.195	10.0	0.800	0.000300	0.215		4281361
Total Tetra CDD *	pg/g	1.41	0.0826	1.00	0.400			4	4281361
Total Penta CDD *	pg/g	9.78	0.109	5.00	0.400			5	4281361
Total Hexa CDD *	pg/g	55.5	0.0896	5.00	0.400			5	4281361
Total Hepta CDD *	pg/g	220	0.185	5.00	0.400			2	4281361
2,3,7,8-Tetra CDF **	pg/g	0.905	0.0804	1.00	0.400	0.100	0.0905		4281361
1,2,3,7,8-Penta CDF **	pg/g	0.463	0.115	5.00	0.400	0.0300	0.0139		4281361
2,3,4,7,8-Penta CDF **	pg/g	0.495	0.113	5.00	0.400	0.300	0.149		4281361
1,2,3,4,7,8-Hexa CDF **	pg/g	1.73	0.101	5.00	0.400	0.100	0.173		4281361
1,2,3,6,7,8-Hexa CDF **	pg/g	1.67	0.104	5.00	0.400	0.100	0.167		4281361
2,3,4,6,7,8-Hexa CDF **	pg/g	1.60	0.0967	5.00	0.400	0.100	0.160		4281361
1,2,3,7,8,9-Hexa CDF **	pg/g	<0.161 (1)	0.161	5.00	0.400	0.100	0.0161		4281361
1,2,3,4,6,7,8-Hepta CDF **	pg/g	68.4	0.108	5.00	0.400	0.0100	0.684		4281361
1,2,3,4,7,8,9-Hepta CDF **	pg/g	2.08	0.106	5.00	0.400	0.0100	0.0208		4281361
Octa CDF **	pg/g	67.7	0.129	10.0	0.800	0.000300	0.0203		4281361
Total Tetra CDF **	pg/g	4.35	0.0804	1.00	0.400			7	4281361
Total Penta CDF **	pg/g	8.79	0.114	5.00	0.400			10	4281361
Total Hexa CDF **	pg/g	113	0.100	5.00	0.400			10	4281361
Total Hepta CDF **	pg/g	191	0.107	5.00	0.400			4	4281361
TOTAL TOXIC EQUIVALENCY	pg/g						5.41		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	91							4281361
C13-1234678 HeptaCDD *	%	55							4281361

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM015							
Sampling Date		2015/10/15 11:40							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-200AC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDF **	%	46							4281361
C13-123478 HexaCDD *	%	64							4281361
C13-123478 HexaCDF **	%	70							4281361
C13-1234789 HeptaCDF **	%	47							4281361
C13-123678 HexaCDD *	%	69							4281361
C13-123678 HexaCDF **	%	74							4281361
C13-12378 PentaCDD *	%	63							4281361
C13-12378 PentaCDF **	%	56							4281361
C13-123789 HexaCDF **	%	69							4281361
C13-234678 HexaCDF **	%	65							4281361
C13-23478 PentaCDF **	%	63							4281361
C13-2378 TetraCDD *	%	82							4281361
C13-2378 TetraCDF **	%	68							4281361
C13-OCDD *	%	32							4281361

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

* CDD = Chloro Dibenzo-p-Dioxin

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Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM016							
Sampling Date		2015/10/15 13:10							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-201ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	1.97	0.0956	0.995	0.400	1.00	1.97		4281361
1,2,3,7,8-Penta CDD *	pg/g	18.7	0.140	4.97	0.400	1.00	18.7		4281361
1,2,3,4,7,8-Hexa CDD *	pg/g	40.6	0.0870	4.97	0.400	0.100	4.06		4281361
1,2,3,6,7,8-Hexa CDD *	pg/g	833	0.0911	4.97	0.400	0.100	83.3		4281361
1,2,3,7,8,9-Hexa CDD *	pg/g	104	0.0832	4.97	0.400	0.100	10.4		4281361
1,2,3,4,6,7,8-Hepta CDD *	pg/g	7340 (1)	0.759	49.7	0.400	0.0100	73.4		4281361
Octa CDD *	pg/g	47900 (1)	0.798	99.5	0.800	0.000300	14.4		4281361
Total Tetra CDD *	pg/g	22.8	0.0956	0.995	0.400			9	4281361
Total Penta CDD *	pg/g	231	0.140	4.97	0.400			12	4281361
Total Hexa CDD *	pg/g	2530	0.0873	4.97	0.400			8	4281361
Total Hepta CDD *	pg/g	12300 (1)	0.759	49.7	0.400			2	4281361
2,3,7,8-Tetra CDF **	pg/g	38.0	0.119	0.995	0.400	0.100	3.80		4281361
1,2,3,7,8-Penta CDF **	pg/g	25.7	0.116	4.97	0.400	0.0300	0.771		4281361
2,3,4,7,8-Penta CDF **	pg/g	29.2	0.113	4.97	0.400	0.300	8.76		4281361
1,2,3,4,7,8-Hexa CDF **	pg/g	106	0.621	4.97	0.400	0.100	10.6		4281361
1,2,3,6,7,8-Hexa CDF **	pg/g	85.6	0.639	4.97	0.400	0.100	8.56		4281361
2,3,4,6,7,8-Hexa CDF **	pg/g	83.8	0.597	4.97	0.400	0.100	8.38		4281361
1,2,3,7,8,9-Hexa CDF **	pg/g	4.01	0.620	4.97	0.400	0.100	0.401		4281361
1,2,3,4,6,7,8-Hepta CDF **	pg/g	1720	0.110	4.97	0.400	0.0100	17.2		4281361
1,2,3,4,7,8,9-Hepta CDF **	pg/g	53.4	0.108	4.97	0.400	0.0100	0.534		4281361
Octa CDF **	pg/g	1350	0.153	9.95	0.800	0.000300	0.405		4281361
Total Tetra CDF **	pg/g	121	0.119	0.995	0.400			13	4281361
Total Penta CDF **	pg/g	429	0.114	4.97	0.400			14	4281361
Total Hexa CDF **	pg/g	3820	0.619	4.97	0.400			12	4281361
Total Hepta CDF **	pg/g	1780	0.109	4.97	0.400			3	4281361
Confirmation 2,3,7,8-Tetra CDF **	pg/g	27.3	0.45	0.99	0.89	0.100	2.73		4287747
TOTAL TOXIC EQUIVALENCY	pg/g						265		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	85							4281361

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 10X Dilution **

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM016							
Sampling Date		2015/10/15 13:10							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-201ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	50 (1)							4281361
C13-1234678 HeptaCDF **	%	46							4281361
C13-123478 HexaCDD *	%	56							4281361
C13-123478 HexaCDF **	%	59							4281361
C13-1234789 HeptaCDF **	%	42							4281361
C13-123678 HexaCDD *	%	67							4281361
C13-123678 HexaCDF **	%	62							4281361
C13-12378 PentaCDD *	%	67							4281361
C13-12378 PentaCDF **	%	59							4281361
C13-123789 HexaCDF **	%	62							4281361
C13-234678 HexaCDF **	%	58							4281361
C13-23478 PentaCDF **	%	65							4281361
C13-2378 TetraCDD *	%	68							4281361
C13-2378 TetraCDF **	%	65							4281361
C13-OCDD *	%	35 (1)							4281361
Confirmation C13-2378 TetraCDF **	%	71							4287747

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 10X Dilution **

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Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM017							
Sampling Date		2015/10/15 13:20							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-201ABC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	2.11	0.0903	0.999	0.400	1.00	2.11		4281361
1,2,3,7,8-Penta CDD *	pg/g	3.19	0.0863	5.00	0.400	1.00	3.19		4281361
1,2,3,4,7,8-Hexa CDD *	pg/g	5.31	0.221	5.00	0.400	0.100	0.531		4281361
1,2,3,6,7,8-Hexa CDD *	pg/g	144	0.231	5.00	0.400	0.100	14.4		4281361
1,2,3,7,8,9-Hexa CDD *	pg/g	18.5	0.211	5.00	0.400	0.100	1.85		4281361
1,2,3,4,6,7,8-Hepta CDD *	pg/g	1180	0.131	5.00	0.400	0.0100	11.8		4281361
Octa CDD *	pg/g	6000 (1)	0.573	50.0	0.800	0.000300	1.80		4281361
Total Tetra CDD *	pg/g	37.2	0.0903	0.999	0.400			13	4281361
Total Penta CDD *	pg/g	149	0.0863	5.00	0.400			12	4281361
Total Hexa CDD *	pg/g	596	0.222	5.00	0.400			6	4281361
Total Hepta CDD *	pg/g	1820	0.131	5.00	0.400			2	4281361
2,3,7,8-Tetra CDF **	pg/g	8.63	0.138	0.999	0.400	0.100	0.863		4281361
1,2,3,7,8-Penta CDF **	pg/g	3.67	0.0937	5.00	0.400	0.0300	0.110		4281361
2,3,4,7,8-Penta CDF **	pg/g	3.94	0.0914	5.00	0.400	0.300	1.18		4281361
1,2,3,4,7,8-Hexa CDF **	pg/g	30.3	0.247	5.00	0.400	0.100	3.03		4281361
1,2,3,6,7,8-Hexa CDF **	pg/g	24.8	0.254	5.00	0.400	0.100	2.48		4281361
2,3,4,6,7,8-Hexa CDF **	pg/g	14.3	0.238	5.00	0.400	0.100	1.43		4281361
1,2,3,7,8,9-Hexa CDF **	pg/g	1.19	0.247	5.00	0.400	0.100	0.119		4281361
1,2,3,4,6,7,8-Hepta CDF **	pg/g	800	0.200	5.00	0.400	0.0100	8.00		4281361
1,2,3,4,7,8,9-Hepta CDF **	pg/g	24.7	0.196	5.00	0.400	0.0100	0.247		4281361
Octa CDF **	pg/g	1000	0.205	9.99	0.800	0.000300	0.300		4281361
Total Tetra CDF **	pg/g	55.2	0.138	0.999	0.400			14	4281361
Total Penta CDF **	pg/g	104	0.0925	5.00	0.400			13	4281361
Total Hexa CDF **	pg/g	1360	0.246	5.00	0.400			12	4281361
Total Hepta CDF **	pg/g	2400	0.198	5.00	0.400			4	4281361
Confirmation 2,3,7,8-Tetra CDF **	pg/g	6.46	0.36	1.0	0.90	0.100	0.646		4287747
TOTAL TOXIC EQUIVALENCY	pg/g						53.2		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	79							4281361

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1)
** From 5X Dilution **

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM017							
Sampling Date		2015/10/15 13:20							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-201ABC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	65							4281361
C13-1234678 HeptaCDF **	%	53							4281361
C13-123478 HexaCDD *	%	76							4281361
C13-123478 HexaCDF **	%	83							4281361
C13-1234789 HeptaCDF **	%	54							4281361
C13-123678 HexaCDD *	%	88							4281361
C13-123678 HexaCDF **	%	82							4281361
C13-12378 PentaCDD *	%	78							4281361
C13-12378 PentaCDF **	%	69							4281361
C13-123789 HexaCDF **	%	87							4281361
C13-234678 HexaCDF **	%	76							4281361
C13-23478 PentaCDF **	%	78							4281361
C13-2378 TetraCDD *	%	72							4281361
C13-2378 TetraCDF **	%	73							4281361
C13-OCDD *	%	33 (1)							4281361
Confirmation C13-2378 TetraCDF **	%	90							4287747

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1)
** From 5X Dilution **

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Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM018							
Sampling Date		2015/10/15 15:15							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-202ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	<0.146 (1)	0.146	0.998	0.400	1.00	0.146		4281361
1,2,3,7,8-Penta CDD *	pg/g	2.33	0.0735	4.99	0.400	1.00	2.33		4281361
1,2,3,4,7,8-Hexa CDD *	pg/g	3.54	0.103	4.99	0.400	0.100	0.354		4281361
1,2,3,6,7,8-Hexa CDD *	pg/g	98.9	0.108	4.99	0.400	0.100	9.89		4281361
1,2,3,7,8,9-Hexa CDD *	pg/g	12.5	0.0986	4.99	0.400	0.100	1.25		4281361
1,2,3,4,6,7,8-Hepta CDD *	pg/g	713	0.0858	4.99	0.400	0.0100	7.13		4281361
Octa CDD *	pg/g	3610	0.237	9.98	0.800	0.000300	1.08		4281361
Total Tetra CDD *	pg/g	1.94	0.113	0.998	0.400			3	4281361
Total Penta CDD *	pg/g	30.8	0.0735	4.99	0.400			10	4281361
Total Hexa CDD *	pg/g	299	0.103	4.99	0.400			6	4281361
Total Hepta CDD *	pg/g	1110	0.0858	4.99	0.400			2	4281361
2,3,7,8-Tetra CDF **	pg/g	4.12	0.0819	0.998	0.400	0.100	0.412		4281361
1,2,3,7,8-Penta CDF **	pg/g	2.85	0.0929	4.99	0.400	0.0300	0.0855		4281361
2,3,4,7,8-Penta CDF **	pg/g	3.49	0.0907	4.99	0.400	0.300	1.05		4281361
1,2,3,4,7,8-Hexa CDF **	pg/g	11.4	0.226	4.99	0.400	0.100	1.14		4281361
1,2,3,6,7,8-Hexa CDF **	pg/g	11.1	0.233	4.99	0.400	0.100	1.11		4281361
2,3,4,6,7,8-Hexa CDF **	pg/g	11.8	0.217	4.99	0.400	0.100	1.18		4281361
1,2,3,7,8,9-Hexa CDF **	pg/g	0.523	0.226	4.99	0.400	0.100	0.0523		4281361
1,2,3,4,6,7,8-Hepta CDF **	pg/g	438	0.0915	4.99	0.400	0.0100	4.38		4281361
1,2,3,4,7,8,9-Hepta CDF **	pg/g	12.0	0.0897	4.99	0.400	0.0100	0.120		4281361
Octa CDF **	pg/g	351	0.196	9.98	0.800	0.000300	0.105		4281361
Total Tetra CDF **	pg/g	15.2	0.0819	0.998	0.400			11	4281361
Total Penta CDF **	pg/g	50.4	0.0918	4.99	0.400			12	4281361
Total Hexa CDF **	pg/g	693	0.225	4.99	0.400			11	4281361
Total Hepta CDF **	pg/g	1280	0.0906	4.99	0.400			4	4281361
Confirmation 2,3,7,8-Tetra CDF **	pg/g	3.31	0.40	1.0	0.90	0.100	0.331		4287747
TOTAL TOXIC EQUIVALENCY	pg/g						31.7		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	89							4281361

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM018							
Sampling Date		2015/10/15 15:15							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-202ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	43							4281361
C13-1234678 HeptaCDF **	%	30							4281361
C13-123478 HexaCDD *	%	51							4281361
C13-123478 HexaCDF **	%	53							4281361
C13-1234789 HeptaCDF **	%	33							4281361
C13-123678 HexaCDD *	%	61							4281361
C13-123678 HexaCDF **	%	54							4281361
C13-12378 PentaCDD *	%	61							4281361
C13-12378 PentaCDF **	%	55							4281361
C13-123789 HexaCDF **	%	61							4281361
C13-234678 HexaCDF **	%	46							4281361
C13-23478 PentaCDF **	%	63							4281361
C13-2378 TetraCDD *	%	60							4281361
C13-2378 TetraCDF **	%	68							4281361
C13-OCDD *	%	22							4281361
Confirmation C13-2378 TetraCDF **	%	87							4287747

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM019							
Sampling Date		2015/10/16 08:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-203ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	0.741	0.0789	0.999	0.400	1.00	0.741		4281361
1,2,3,7,8-Penta CDD *	pg/g	7.26	0.0985	4.99	0.400	1.00	7.26		4281361
1,2,3,4,7,8-Hexa CDD *	pg/g	14.9	0.265	4.99	0.400	0.100	1.49		4281361
1,2,3,6,7,8-Hexa CDD *	pg/g	343	0.278	4.99	0.400	0.100	34.3		4281361
1,2,3,7,8,9-Hexa CDD *	pg/g	45.5	0.254	4.99	0.400	0.100	4.55		4281361
1,2,3,4,6,7,8-Hepta CDD *	pg/g	3320 (1)	0.941	49.9	0.400	0.0100	33.2		4281361
Octa CDD *	pg/g	25100 (1)	1.46	99.9	0.800	0.000300	7.53		4281361
Total Tetra CDD *	pg/g	15.1	0.0789	0.999	0.400			10	4281361
Total Penta CDD *	pg/g	125	0.0985	4.99	0.400			11	4281361
Total Hexa CDD *	pg/g	1050	0.266	4.99	0.400			6	4281361
Total Hepta CDD *	pg/g	5390 (1)	0.941	49.9	0.400			2	4281361
2,3,7,8-Tetra CDF **	pg/g	15.5	0.123	0.999	0.400	0.100	1.55		4281361
1,2,3,7,8-Penta CDF **	pg/g	8.87	0.0722	4.99	0.400	0.0300	0.266		4281361
2,3,4,7,8-Penta CDF **	pg/g	9.70	0.0704	4.99	0.400	0.300	2.91		4281361
1,2,3,4,7,8-Hexa CDF **	pg/g	48.4	0.429	4.99	0.400	0.100	4.84		4281361
1,2,3,6,7,8-Hexa CDF **	pg/g	49.5	0.441	4.99	0.400	0.100	4.95		4281361
2,3,4,6,7,8-Hexa CDF **	pg/g	33.5	0.412	4.99	0.400	0.100	3.35		4281361
1,2,3,7,8,9-Hexa CDF **	pg/g	1.48	0.428	4.99	0.400	0.100	0.148		4281361
1,2,3,4,6,7,8-Hepta CDF **	pg/g	1190	0.0840	4.99	0.400	0.0100	11.9		4281361
1,2,3,4,7,8,9-Hepta CDF **	pg/g	33.4	0.0823	4.99	0.400	0.0100	0.334		4281361
Octa CDF **	pg/g	1310	0.539	9.99	0.800	0.000300	0.393		4281361
Total Tetra CDF **	pg/g	90.7	0.123	0.999	0.400			13	4281361
Total Penta CDF **	pg/g	168	0.0713	4.99	0.400			14	4281361
Total Hexa CDF **	pg/g	1960	0.427	4.99	0.400			11	4281361
Total Hepta CDF **	pg/g	3390	0.0832	4.99	0.400			4	4281361
Confirmation 2,3,7,8-Tetra CDF **	pg/g	11.0	0.54	1.0	0.90	0.100	1.10		4287747
TOTAL TOXIC EQUIVALENCY	pg/g						119		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	95							4281361

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 10X Dilution **

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM019							
Sampling Date		2015/10/16 08:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-203ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDD *	%	38 (1)							4281361
C13-1234678 HeptaCDF **	%	31							4281361
C13-123478 HexaCDD *	%	58							4281361
C13-123478 HexaCDF **	%	64							4281361
C13-1234789 HeptaCDF **	%	38							4281361
C13-123678 HexaCDD *	%	68							4281361
C13-123678 HexaCDF **	%	65							4281361
C13-12378 PentaCDD *	%	71							4281361
C13-12378 PentaCDF **	%	64							4281361
C13-123789 HexaCDF **	%	72							4281361
C13-234678 HexaCDF **	%	59							4281361
C13-23478 PentaCDF **	%	73							4281361
C13-2378 TetraCDD *	%	73							4281361
C13-2378 TetraCDF **	%	79							4281361
C13-OCDD *	%	25 (1)							4281361
Confirmation C13-2378 TetraCDF **	%	79							4287747

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 10X Dilution **

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Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM020							
Sampling Date		2015/10/16 08:10							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-203AC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	<0.107	0.107	1.00	0.400	1.00	0.107		4286291
1,2,3,7,8-Penta CDD *	pg/g	0.800	0.106	5.00	0.400	1.00	0.800		4286291
1,2,3,4,7,8-Hexa CDD *	pg/g	1.29	0.0977	5.00	0.400	0.100	0.129		4286291
1,2,3,6,7,8-Hexa CDD *	pg/g	30.9	0.104	5.00	0.400	0.100	3.09		4286291
1,2,3,7,8,9-Hexa CDD *	pg/g	3.79	0.104	5.00	0.400	0.100	0.379		4286291
1,2,3,4,6,7,8-Hepta CDD *	pg/g	251	0.105	5.00	0.400	0.0100	2.51		4286291
Octa CDD *	pg/g	725	0.105	10.0	0.800	0.000300	0.218		4286291
Total Tetra CDD *	pg/g	3.57	0.107	1.00	0.400			4	4286291
Total Penta CDD *	pg/g	11.4	0.106	5.00	0.400			6	4286291
Total Hexa CDD *	pg/g	109	0.104	5.00	0.400			6	4286291
Total Hepta CDD *	pg/g	386	0.105	5.00	0.400			2	4286291
2,3,7,8-Tetra CDF **	pg/g	1.38	0.108	1.00	0.400	0.100	0.138		4286291
1,2,3,7,8-Penta CDF **	pg/g	0.805	0.206	5.00	0.400	0.0300	0.0242		4286291
2,3,4,7,8-Penta CDF **	pg/g	1.04	0.203	5.00	0.400	0.300	0.312		4286291
1,2,3,4,7,8-Hexa CDF **	pg/g	4.57	0.108	5.00	0.400	0.100	0.457		4286291
1,2,3,6,7,8-Hexa CDF **	pg/g	4.44	0.114	5.00	0.400	0.100	0.444		4286291
2,3,4,6,7,8-Hexa CDF **	pg/g	4.81	0.104	5.00	0.400	0.100	0.481		4286291
1,2,3,7,8,9-Hexa CDF **	pg/g	0.244	0.111	5.00	0.400	0.100	0.0244		4286291
1,2,3,4,6,7,8-Hepta CDF **	pg/g	198	0.107	5.00	0.400	0.0100	1.98		4286291
1,2,3,4,7,8,9-Hepta CDF **	pg/g	5.18	0.108	5.00	0.400	0.0100	0.0518		4286291
Octa CDF **	pg/g	180	0.107	10.0	0.800	0.000300	0.0540		4286291
Total Tetra CDF **	pg/g	17.1	0.108	1.00	0.400			12	4286291
Total Penta CDF **	pg/g	85.3	0.204	5.00	0.400			11	4286291
Total Hexa CDF **	pg/g	351	0.109	5.00	0.400			11	4286291
Total Hepta CDF **	pg/g	631	0.107	5.00	0.400			4	4286291
Confirmation 2,3,7,8-Tetra CDF **	pg/g	0.97	0.10	1.0	0.90	0.100	0.0970		4292733
TOTAL TOXIC EQUIVALENCY	pg/g						11.2		
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	97							4286291
C13-1234678 HeptaCDD *	%	64							4286291

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM020							
Sampling Date		2015/10/16 08:10							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-203AC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDF **	%	60							4286291
C13-123478 HexaCDD *	%	72							4286291
C13-123478 HexaCDF **	%	72							4286291
C13-1234789 HeptaCDF **	%	75							4286291
C13-123678 HexaCDD *	%	71							4286291
C13-123678 HexaCDF **	%	75							4286291
C13-12378 PentaCDD *	%	96							4286291
C13-12378 PentaCDF **	%	83							4286291
C13-123789 HexaCDF **	%	92							4286291
C13-234678 HexaCDF **	%	71							4286291
C13-23478 PentaCDF **	%	102							4286291
C13-2378 TetraCDD *	%	82							4286291
C13-2378 TetraCDF **	%	89							4286291
C13-OCDD *	%	48							4286291
Confirmation C13-2378 TetraCDF **	%	86							4292733

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

* CDD = Chloro Dibenzo-p-Dioxin

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Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM021							
Sampling Date		2015/10/16 09:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-204ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	2.14	0.147	0.998	0.400	1.00	2.14		4281361
1,2,3,7,8-Penta CDD *	pg/g	15.3	0.129	4.99	0.400	1.00	15.3		4281361
1,2,3,4,7,8-Hexa CDD *	pg/g	37.3	0.0977	4.99	0.400	0.100	3.73		4281361
1,2,3,6,7,8-Hexa CDD *	pg/g	706	0.102	4.99	0.400	0.100	70.6		4281361
1,2,3,7,8,9-Hexa CDD *	pg/g	66.6	0.0935	4.99	0.400	0.100	6.66		4281361
1,2,3,4,6,7,8-Hepta CDD *	pg/g	3950 (1)	1.41	49.9	0.400	0.0100	39.5		4281361
Octa CDD *	pg/g	14400 (1)	1.30	99.8	0.800	0.000300	4.32		4281361
Total Tetra CDD *	pg/g	51.1	0.147	0.998	0.400			8	4281361
Total Penta CDD *	pg/g	510	0.129	4.99	0.400			11	4281361
Total Hexa CDD *	pg/g	2790	0.0980	4.99	0.400			8	4281361
Total Hepta CDD *	pg/g	6380 (1)	1.41	49.9	0.400			2	4281361
2,3,7,8-Tetra CDF **	pg/g	22.5	0.114	0.998	0.400	0.100	2.25		4281361
1,2,3,7,8-Penta CDF **	pg/g	14.1	0.0940	4.99	0.400	0.0300	0.423		4281361
2,3,4,7,8-Penta CDF **	pg/g	12.2	0.0918	4.99	0.400	0.300	3.66		4281361
1,2,3,4,7,8-Hexa CDF **	pg/g	145	0.111	4.99	0.400	0.100	14.5		4281361
1,2,3,6,7,8-Hexa CDF **	pg/g	<99.9 (2)	99.9	4.99	0.400	0.100	9.99		4281361
2,3,4,6,7,8-Hexa CDF **	pg/g	74.8	0.107	4.99	0.400	0.100	7.48		4281361
1,2,3,7,8,9-Hexa CDF **	pg/g	5.82	0.111	4.99	0.400	0.100	0.582		4281361
1,2,3,4,6,7,8-Hepta CDF **	pg/g	3720	0.0943	4.99	0.400	0.0100	37.2		4281361
1,2,3,4,7,8,9-Hepta CDF **	pg/g	103	0.0925	4.99	0.400	0.0100	1.03		4281361
Octa CDF **	pg/g	2670	0.114	9.98	0.800	0.000300	0.801		4281361
Total Tetra CDF **	pg/g	219	0.114	0.998	0.400			12	4281361
Total Penta CDF **	pg/g	312	0.0929	4.99	0.400			13	4281361
Total Hexa CDF **	pg/g	5870	0.111	4.99	0.400			10	4281361
Total Hepta CDF **	pg/g	9220	0.0934	4.99	0.400			4	4281361
Confirmation 2,3,7,8-Tetra CDF **	pg/g	19.3	0.62	1.0	0.90	0.100	1.93		4287747
TOTAL TOXIC EQUIVALENCY	pg/g						220		

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) 10X DILUTION

(2) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM021							
Sampling Date		2015/10/16 09:00							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-204ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	80							4281361
C13-1234678 HeptaCDD *	%	51							4281361
C13-1234678 HeptaCDF **	%	31							4281361
C13-123478 HexaCDD *	%	43							4281361
C13-123478 HexaCDF **	%	50							4281361
C13-1234789 HeptaCDF **	%	32							4281361
C13-123678 HexaCDD *	%	50							4281361
C13-123678 HexaCDF **	%	50							4281361
C13-12378 PentaCDD *	%	54							4281361
C13-12378 PentaCDF **	%	52							4281361
C13-123789 HexaCDF **	%	55							4281361
C13-234678 HexaCDF **	%	43							4281361
C13-23478 PentaCDF **	%	57							4281361
C13-2378 TetraCDD *	%	56							4281361
C13-2378 TetraCDF **	%	56							4281361
C13-OCDD *	%	28							4281361
Confirmation C13-2378 TetraCDF **	%	60							4287747

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM022							
Sampling Date		2015/10/16 09:10							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-204AC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	1.42	0.0878	0.997	0.400	1.00	1.42		4281361
1,2,3,7,8-Penta CDD *	pg/g	14.1	0.137	4.99	0.400	1.00	14.1		4281361
1,2,3,4,7,8-Hexa CDD *	pg/g	20.1	0.128	4.99	0.400	0.100	2.01		4281361
1,2,3,6,7,8-Hexa CDD *	pg/g	372	0.134	4.99	0.400	0.100	37.2		4281361
1,2,3,7,8,9-Hexa CDD *	pg/g	69.3	0.122	4.99	0.400	0.100	6.93		4281361
1,2,3,4,6,7,8-Hepta CDD *	pg/g	253 (1)	0.130	49.9	0.400	0.0100	2.53		4281361
Octa CDD *	pg/g	1630 (1)	0.0840	99.7	0.800	0.000300	0.489		4281361
Total Tetra CDD *	pg/g	13.4	0.0878	0.997	0.400			10	4281361
Total Penta CDD *	pg/g	156	0.137	4.99	0.400			12	4281361
Total Hexa CDD *	pg/g	1300	0.128	4.99	0.400			7	4281361
Total Hepta CDD *	pg/g	426 (1)	0.130	49.9	0.400			2	4281361
2,3,7,8-Tetra CDF **	pg/g	19.2	0.143	0.997	0.400	0.100	1.92		4281361
1,2,3,7,8-Penta CDF **	pg/g	11.3	0.0969	4.99	0.400	0.0300	0.339		4281361
2,3,4,7,8-Penta CDF **	pg/g	12.4	0.0946	4.99	0.400	0.300	3.72		4281361
1,2,3,4,7,8-Hexa CDF **	pg/g	43.6	0.0962	4.99	0.400	0.100	4.36		4281361
1,2,3,6,7,8-Hexa CDF **	pg/g	<48.1 (2)	48.1	4.99	0.400	0.100	4.81		4281361
2,3,4,6,7,8-Hexa CDF **	pg/g	40.4	0.0925	4.99	0.400	0.100	4.04		4281361
1,2,3,7,8,9-Hexa CDF **	pg/g	1.81	0.0961	4.99	0.400	0.100	0.181		4281361
1,2,3,4,6,7,8-Hepta CDF **	pg/g	1260	0.103	4.99	0.400	0.0100	12.6		4281361
1,2,3,4,7,8,9-Hepta CDF **	pg/g	<42.7 (2)	42.7	4.99	0.400	0.0100	0.427		4281361
Octa CDF **	pg/g	1090	0.109	9.97	0.800	0.000300	0.327		4281361
Total Tetra CDF **	pg/g	118	0.143	0.997	0.400			13	4281361
Total Penta CDF **	pg/g	224	0.0957	4.99	0.400			13	4281361
Total Hexa CDF **	pg/g	2230	0.0959	4.99	0.400			11	4281361
Total Hepta CDF **	pg/g	1260	0.102	4.99	0.400			1	4281361
Confirmation 2,3,7,8-Tetra CDF **	pg/g	15.7	0.40	1.0	0.90	0.100	1.57		4287747
TOTAL TOXIC EQUIVALENCY	pg/g						97.1		

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) 10X DILUTION

(2) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM022							
Sampling Date		2015/10/16 09:10							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-204AC(1-2) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	81							4281361
C13-1234678 HeptaCDD *	%	71							4281361
C13-1234678 HeptaCDF **	%	42							4281361
C13-123478 HexaCDD *	%	47							4281361
C13-123478 HexaCDF **	%	54							4281361
C13-1234789 HeptaCDF **	%	38							4281361
C13-123678 HexaCDD *	%	53							4281361
C13-123678 HexaCDF **	%	55							4281361
C13-12378 PentaCDD *	%	48							4281361
C13-12378 PentaCDF **	%	46							4281361
C13-123789 HexaCDF **	%	53							4281361
C13-234678 HexaCDF **	%	49							4281361
C13-23478 PentaCDF **	%	51							4281361
C13-2378 TetraCDD *	%	60							4281361
C13-2378 TetraCDF **	%	48							4281361
C13-OCDD *	%	51							4281361
Confirmation C13-2378 TetraCDF **	%	63							4287747

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM023							
Sampling Date		2015/10/16 10:30							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-205ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg/g	0.939	0.108	0.999	0.400	1.00	0.939		4281361
1,2,3,7,8-Penta CDD *	pg/g	5.99	0.101	4.99	0.400	1.00	5.99		4281361
1,2,3,4,7,8-Hexa CDD *	pg/g	12.8	0.0862	4.99	0.400	0.100	1.28		4281361
1,2,3,6,7,8-Hexa CDD *	pg/g	256	0.0904	4.99	0.400	0.100	25.6		4281361
1,2,3,7,8,9-Hexa CDD *	pg/g	41.6	0.0825	4.99	0.400	0.100	4.16		4281361
1,2,3,4,6,7,8-Hepta CDD *	pg/g	1980 (1)	1.17	49.9	0.400	0.0100	19.8		4281361
Octa CDD *	pg/g	11700 (1)	1.22	99.9	0.800	0.000300	3.51		4281361
Total Tetra CDD *	pg/g	24.9	0.108	0.999	0.400			11	4281361
Total Penta CDD *	pg/g	165	0.101	4.99	0.400			11	4281361
Total Hexa CDD *	pg/g	946	0.0865	4.99	0.400			5	4281361
Total Hepta CDD *	pg/g	3140 (1)	1.17	49.9	0.400			2	4281361
2,3,7,8-Tetra CDF **	pg/g	17.1	0.123	0.999	0.400	0.100	1.71		4281361
1,2,3,7,8-Penta CDF **	pg/g	5.80	0.108	4.99	0.400	0.0300	0.174		4281361
2,3,4,7,8-Penta CDF **	pg/g	6.25	0.105	4.99	0.400	0.300	1.88		4281361
1,2,3,4,7,8-Hexa CDF **	pg/g	51.7	0.0940	4.99	0.400	0.100	5.17		4281361
1,2,3,6,7,8-Hexa CDF **	pg/g	<45.8 (2)	45.8	4.99	0.400	0.100	4.58		4281361
2,3,4,6,7,8-Hexa CDF **	pg/g	27.1	0.0905	4.99	0.400	0.100	2.71		4281361
1,2,3,7,8,9-Hexa CDF **	pg/g	1.41	0.0940	4.99	0.400	0.100	0.141		4281361
1,2,3,4,6,7,8-Hepta CDF **	pg/g	1440	0.0665	4.99	0.400	0.0100	14.4		4281361
1,2,3,4,7,8,9-Hepta CDF **	pg/g	44.7	0.0651	4.99	0.400	0.0100	0.447		4281361
Octa CDF **	pg/g	1780	0.105	9.99	0.800	0.000300	0.534		4281361
Total Tetra CDF **	pg/g	102	0.123	0.999	0.400			13	4281361
Total Penta CDF **	pg/g	147	0.106	4.99	0.400			12	4281361
Total Hexa CDF **	pg/g	2110	0.0938	4.99	0.400			10	4281361
Total Hepta CDF **	pg/g	3960	0.0658	4.99	0.400			4	4281361
Confirmation 2,3,7,8-Tetra CDF **	pg/g	13.3	0.34	1.0	0.90	0.100	1.33		4287747
TOTAL TOXIC EQUIVALENCY	pg/g						92.6		

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

(1) 10X DILUTION

(2) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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DIOXINS AND FURANS BY HRMS (SEDIMENT)

Maxxam ID		BGM023							
Sampling Date		2015/10/16 10:30							
COC Number		na				TOXIC EQUIVALENCY		# of	
	UNITS	SED-205ABC(0-1) COMP	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)									
37CL4 2378 Tetra CDD *	%	91							4281361
C13-1234678 HeptaCDD *	%	69							4281361
C13-1234678 HeptaCDF **	%	46							4281361
C13-123478 HexaCDD *	%	63							4281361
C13-123478 HexaCDF **	%	72							4281361
C13-1234789 HeptaCDF **	%	48							4281361
C13-123678 HexaCDD *	%	69							4281361
C13-123678 HexaCDF **	%	71							4281361
C13-12378 PentaCDD *	%	83							4281361
C13-12378 PentaCDF **	%	76							4281361
C13-123789 HexaCDF **	%	80							4281361
C13-234678 HexaCDF **	%	67							4281361
C13-23478 PentaCDF **	%	87							4281361
C13-2378 TetraCDD *	%	77							4281361
C13-2378 TetraCDF **	%	82							4281361
C13-OCDD *	%	34							4281361
Confirmation C13-2378 TetraCDF **	%	87							4287747

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

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TEST SUMMARY

Maxxam ID: BGM014 **Collected:** 2015/10/15
Sample ID: SED-200ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4281361	2015/11/17	2015/11/21	Owen Cosby
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4287747	N/A	2015/11/25	Branko Vrzic
Moisture	BAL	4256573	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGM015 **Collected:** 2015/10/15
Sample ID: SED-200AC(1-2) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4281361	2015/11/17	2015/11/21	Owen Cosby
Moisture	BAL	4256573	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGM015 Dup **Collected:** 2015/10/15
Sample ID: SED-200AC(1-2) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4281361	2015/11/17	2015/11/21	Owen Cosby

Maxxam ID: BGM016 **Collected:** 2015/10/15
Sample ID: SED-201ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4281361	2015/11/17	2015/11/21	Owen Cosby
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4287747	N/A	2015/11/25	Branko Vrzic
Moisture	BAL	4256573	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGM017 **Collected:** 2015/10/15
Sample ID: SED-201ABC(1-2) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4281361	2015/11/17	2015/11/21	Owen Cosby
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4287747	N/A	2015/11/25	Branko Vrzic
Moisture	BAL	4256573	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGM018 **Collected:** 2015/10/15
Sample ID: SED-202ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4281361	2015/11/17	2015/11/21	Owen Cosby
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4287747	N/A	2015/11/25	Branko Vrzic
Moisture	BAL	4256573	N/A	2015/11/03	Jessy Mathew Vinod

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Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

TEST SUMMARY

Maxxam ID: BGM019 **Collected:** 2015/10/16
Sample ID: SED-203ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4281361	2015/11/17	2015/11/21	Owen Cosby
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4287747	N/A	2015/11/25	Branko Vrzic
Moisture	BAL	4256573	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGM020 **Collected:** 2015/10/16
Sample ID: SED-203AC(1-2) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4286291	2015/11/24	2015/11/28	Kay Shaw
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4292733	N/A	2015/11/30	Vica Cioranic
Moisture	BAL	4256573	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGM021 **Collected:** 2015/10/16
Sample ID: SED-204ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4281361	2015/11/17	2015/11/22	Owen Cosby
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4287747	N/A	2015/11/25	Branko Vrzic
Moisture	BAL	4256573	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGM022 **Collected:** 2015/10/16
Sample ID: SED-204AC(1-2) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4281361	2015/11/17	2015/11/22	Owen Cosby
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4287747	N/A	2015/11/26	Branko Vrzic
Moisture	BAL	4256573	N/A	2015/11/03	Jessy Mathew Vinod

Maxxam ID: BGM023 **Collected:** 2015/10/16
Sample ID: SED-205ABC(0-1) COMP **Shipped:**
Matrix: SEDIMENT **Received:** 2015/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Soil (1613B)	HRMS/MS	4281361	2015/11/17	2015/11/22	Owen Cosby
2378TCDF Confirmation (M8290A/M1613)	HRMS/MS	4287747	N/A	2015/11/26	Branko Vrzic
Moisture	BAL	4256573	N/A	2015/11/03	Jessy Mathew Vinod

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.4°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4256573	MYG	RPD - Sample/Sample Dup	Moisture	2015/11/03	5.5		%	20
4281361	OBC	Spiked Blank	37CL4 2378 Tetra CDD	2015/11/20		95	%	35 - 197
			C13-1234678 HeptaCDD	2015/11/20		100	%	23 - 140
			C13-1234678 HeptaCDF	2015/11/20		85	%	28 - 143
			C13-123478 HexaCDD	2015/11/20		106	%	32 - 141
			C13-123478 HexaCDF	2015/11/20		112	%	26 - 152
			C13-1234789 HeptaCDF	2015/11/20		79	%	26 - 138
			C13-123678 HexaCDD	2015/11/20		113	%	28 - 130
			C13-123678 HexaCDF	2015/11/20		114	%	26 - 123
			C13-12378 PentaCDD	2015/11/20		108	%	25 - 181
			C13-12378 PentaCDF	2015/11/20		94	%	24 - 185
			C13-123789 HexaCDF	2015/11/20		107	%	29 - 147
			C13-234678 HexaCDF	2015/11/20		104	%	28 - 136
			C13-23478 PentaCDF	2015/11/20		106	%	21 - 178
			C13-2378 TetraCDD	2015/11/20		89	%	25 - 164
			C13-2378 TetraCDF	2015/11/20		98	%	24 - 169
			C13-OCDD	2015/11/20		75	%	17 - 157
			2,3,7,8-Tetra CDD	2015/11/20		103	%	67 - 158
			1,2,3,7,8-Penta CDD	2015/11/20		87	%	25 - 181
			1,2,3,4,7,8-Hexa CDD	2015/11/20		105	%	70 - 164
			1,2,3,6,7,8-Hexa CDD	2015/11/20		98	%	76 - 134
			1,2,3,7,8,9-Hexa CDD	2015/11/20		103	%	64 - 162
			1,2,3,4,6,7,8-Hepta CDD	2015/11/20		85	%	70 - 140
			Octa CDD	2015/11/20		111	%	78 - 144
			2,3,7,8-Tetra CDF	2015/11/20		99	%	75 - 158
			1,2,3,7,8-Penta CDF	2015/11/20		94	%	80 - 134
			2,3,4,7,8-Penta CDF	2015/11/20		84	%	68 - 160
			1,2,3,4,7,8-Hexa CDF	2015/11/20		104	%	72 - 134
			1,2,3,6,7,8-Hexa CDF	2015/11/20		104	%	84 - 130
			2,3,4,6,7,8-Hexa CDF	2015/11/20		108	%	70 - 156
			1,2,3,7,8,9-Hexa CDF	2015/11/20		98	%	78 - 130
			1,2,3,4,6,7,8-Hepta CDF	2015/11/20		122	%	82 - 122
			1,2,3,4,7,8,9-Hepta CDF	2015/11/20		105	%	78 - 138
			Octa CDF	2015/11/20		111	%	63 - 170
4281361	OBC	Method Blank	37CL4 2378 Tetra CDD	2015/11/21		89	%	35 - 197
			C13-1234678 HeptaCDD	2015/11/21		76	%	23 - 140
			C13-1234678 HeptaCDF	2015/11/21		64	%	28 - 143
			C13-123478 HexaCDD	2015/11/21		78	%	32 - 141
			C13-123478 HexaCDF	2015/11/21		83	%	26 - 152
			C13-1234789 HeptaCDF	2015/11/21		60	%	26 - 138
			C13-123678 HexaCDD	2015/11/21		85	%	28 - 130
			C13-123678 HexaCDF	2015/11/21		89	%	26 - 123
			C13-12378 PentaCDD	2015/11/21		97	%	25 - 181
			C13-12378 PentaCDF	2015/11/21		85	%	24 - 185
			C13-123789 HexaCDF	2015/11/21		82	%	29 - 147
			C13-234678 HexaCDF	2015/11/21		81	%	28 - 136
			C13-23478 PentaCDF	2015/11/21		105	%	21 - 178
			C13-2378 TetraCDD	2015/11/21		76	%	25 - 164
			C13-2378 TetraCDF	2015/11/21		84	%	24 - 169
			C13-OCDD	2015/11/21		57	%	17 - 157
			2,3,7,8-Tetra CDD	2015/11/21	<0.0991, EDL=0.0991		pg/g	
			1,2,3,7,8-Penta CDD	2015/11/21	<0.0962, EDL=0.0962		pg/g	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			1,2,3,4,7,8-Hexa CDD	2015/11/21	<0.116, EDL=0.116		pg/g	
			1,2,3,6,7,8-Hexa CDD	2015/11/21	0.188, EDL=0.121		pg/g	
			1,2,3,7,8,9-Hexa CDD	2015/11/21	<0.111, EDL=0.111		pg/g	
			1,2,3,4,6,7,8-Hepta CDD	2015/11/21	1.05, EDL=0.0843		pg/g	
			Octa CDD	2015/11/21	6.02, EDL=0.101		pg/g	
			Total Tetra CDD	2015/11/21	<0.198, EDL=0.198 (1)		pg/g	
			Total Penta CDD	2015/11/21	<0.0962, EDL=0.0962		pg/g	
			Total Hexa CDD	2015/11/21	0.567, EDL=0.116		pg/g	
			Total Hepta CDD	2015/11/21	1.80, EDL=0.0843		pg/g	
			2,3,7,8-Tetra CDF	2015/11/21	<0.0785, EDL=0.0785		pg/g	
			1,2,3,7,8-Penta CDF	2015/11/21	<0.0822, EDL=0.0822		pg/g	
			2,3,4,7,8-Penta CDF	2015/11/21	<0.0802, EDL=0.0802		pg/g	
			1,2,3,4,7,8-Hexa CDF	2015/11/21	<0.0771, EDL=0.0771		pg/g	
			1,2,3,6,7,8-Hexa CDF	2015/11/21	<0.0794, EDL=0.0794		pg/g	
			2,3,4,6,7,8-Hexa CDF	2015/11/21	<0.0742, EDL=0.0742		pg/g	
			1,2,3,7,8,9-Hexa CDF	2015/11/21	0.117, EDL=0.0771		pg/g	
			1,2,3,4,6,7,8-Hepta CDF	2015/11/21	<0.688, EDL=0.688 (1)		pg/g	
			1,2,3,4,7,8,9-Hepta CDF	2015/11/21	<0.104, EDL=0.104		pg/g	
			Octa CDF	2015/11/21	0.816, EDL=0.124		pg/g	
			Total Tetra CDF	2015/11/21	<0.0785, EDL=0.0785		pg/g	
			Total Penta CDF	2015/11/21	<0.0812, EDL=0.0812		pg/g	
			Total Hexa CDF	2015/11/21	0.714, EDL=0.0769		pg/g	
			Total Hepta CDF	2015/11/21	0.927, EDL=0.105		pg/g	
4281361	OBC	RPD - Sample/Sample Dup	2,3,7,8-Tetra CDD	2015/11/21	NC (1)		%	25
			1,2,3,7,8-Penta CDD	2015/11/21	NC		%	25
			1,2,3,4,7,8-Hexa CDD	2015/11/21	NC		%	25
			1,2,3,6,7,8-Hexa CDD	2015/11/21	NC		%	25
			1,2,3,7,8,9-Hexa CDD	2015/11/21	NC		%	25

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			1,2,3,4,6,7,8-Hepta CDD	2015/11/21	13		%	25
			Octa CDD	2015/11/21	6.6		%	25
			Total Tetra CDD	2015/11/21	NC		%	25
			Total Penta CDD	2015/11/21	NC		%	25
			Total Hexa CDD	2015/11/21	20		%	25
			Total Hepta CDD	2015/11/21	13		%	25
			2,3,7,8-Tetra CDF	2015/11/21	NC		%	25
			1,2,3,7,8-Penta CDF	2015/11/21	NC		%	25
			2,3,4,7,8-Penta CDF	2015/11/21	NC		%	25
			1,2,3,4,7,8-Hexa CDF	2015/11/21	NC		%	25
			1,2,3,6,7,8-Hexa CDF	2015/11/21	NC		%	25
			2,3,4,6,7,8-Hexa CDF	2015/11/21	NC		%	25
			1,2,3,7,8,9-Hexa CDF	2015/11/21	NC (1)		%	25
			1,2,3,4,6,7,8-Hepta CDF	2015/11/21	11		%	25
			1,2,3,4,7,8,9-Hepta CDF	2015/11/21	NC		%	25
			Octa CDF	2015/11/21	6.7		%	25
			Total Tetra CDF	2015/11/21	NC		%	25
			Total Penta CDF	2015/11/21	NC		%	25
			Total Hexa CDF	2015/11/21	14		%	25
			Total Hepta CDF	2015/11/21	4.0		%	25
4286291	KKS	Spiked Blank	37CL4 2378 Tetra CDD	2015/11/28		95	%	35 - 197
			C13-1234678 HeptaCDD	2015/11/28		77	%	23 - 140
			C13-1234678 HeptaCDF	2015/11/28		78	%	28 - 143
			C13-123478 HexaCDD	2015/11/28		79	%	32 - 141
			C13-123478 HexaCDF	2015/11/28		78	%	26 - 152
			C13-1234789 HeptaCDF	2015/11/28		82	%	26 - 138
			C13-123678 HexaCDD	2015/11/28		78	%	28 - 130
			C13-123678 HexaCDF	2015/11/28		85	%	26 - 123
			C13-12378 PentaCDD	2015/11/28		102	%	25 - 181
			C13-12378 PentaCDF	2015/11/28		88	%	24 - 185
			C13-123789 HexaCDF	2015/11/28		95	%	29 - 147
			C13-234678 HexaCDF	2015/11/28		78	%	28 - 136
			C13-23478 PentaCDF	2015/11/28		106	%	21 - 178
			C13-2378 TetraCDD	2015/11/28		79	%	25 - 164
			C13-2378 TetraCDF	2015/11/28		87	%	24 - 169
			C13-OCDD	2015/11/28		71	%	17 - 157
			2,3,7,8-Tetra CDD	2015/11/28		107	%	67 - 158
			1,2,3,7,8-Penta CDD	2015/11/28		85	%	25 - 181
			1,2,3,4,7,8-Hexa CDD	2015/11/28		103	%	70 - 164
			1,2,3,6,7,8-Hexa CDD	2015/11/28		99	%	76 - 134
			1,2,3,7,8,9-Hexa CDD	2015/11/28		110	%	64 - 162
			1,2,3,4,6,7,8-Hepta CDD	2015/11/28		101	%	70 - 140
			Octa CDD	2015/11/28		97	%	78 - 144
			2,3,7,8-Tetra CDF	2015/11/28		99	%	75 - 158
			1,2,3,7,8-Penta CDF	2015/11/28		98	%	80 - 134
			2,3,4,7,8-Penta CDF	2015/11/28		85	%	68 - 160
			1,2,3,4,7,8-Hexa CDF	2015/11/28		101	%	72 - 134
			1,2,3,6,7,8-Hexa CDF	2015/11/28		91	%	84 - 130
			2,3,4,6,7,8-Hexa CDF	2015/11/28		104	%	70 - 156
			1,2,3,7,8,9-Hexa CDF	2015/11/28		89	%	78 - 130
			1,2,3,4,6,7,8-Hepta CDF	2015/11/28		101	%	82 - 122
			1,2,3,4,7,8,9-Hepta CDF	2015/11/28		97	%	78 - 138
			Octa CDF	2015/11/28		103	%	63 - 170
4286291	KKS	Method Blank	37CL4 2378 Tetra CDD	2015/11/28		75	%	35 - 197

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			C13-1234678 HeptaCDD	2015/11/28		74	%	23 - 140
			C13-1234678 HeptaCDF	2015/11/28		71	%	28 - 143
			C13-123478 HexaCDD	2015/11/28		72	%	32 - 141
			C13-123478 HexaCDF	2015/11/28		71	%	26 - 152
			C13-1234789 HeptaCDF	2015/11/28		76	%	26 - 138
			C13-123678 HexaCDD	2015/11/28		72	%	28 - 130
			C13-123678 HexaCDF	2015/11/28		72	%	26 - 123
			C13-12378 PentaCDD	2015/11/28		86	%	25 - 181
			C13-12378 PentaCDF	2015/11/28		79	%	24 - 185
			C13-123789 HexaCDF	2015/11/28		89	%	29 - 147
			C13-234678 HexaCDF	2015/11/28		72	%	28 - 136
			C13-23478 PentaCDF	2015/11/28		90	%	21 - 178
			C13-2378 TetraCDD	2015/11/28		73	%	25 - 164
			C13-2378 TetraCDF	2015/11/28		79	%	24 - 169
			C13-OCDD	2015/11/28		68	%	17 - 157
			2,3,7,8-Tetra CDD	2015/11/28	<0.106, EDL=0.106		pg/g	
			1,2,3,7,8-Penta CDD	2015/11/28	<0.103, EDL=0.103		pg/g	
			1,2,3,4,7,8-Hexa CDD	2015/11/28	<0.0954, EDL=0.0954		pg/g	
			1,2,3,6,7,8-Hexa CDD	2015/11/28	<0.102, EDL=0.102		pg/g	
			1,2,3,7,8,9-Hexa CDD	2015/11/28	<0.102, EDL=0.102		pg/g	
			1,2,3,4,6,7,8-Hepta CDD	2015/11/28	<0.136, EDL=0.136 (1)		pg/g	
			Octa CDD	2015/11/28	0.432, EDL=0.102		pg/g	
			Total Tetra CDD	2015/11/28	<0.106, EDL=0.106		pg/g	
			Total Penta CDD	2015/11/28	<0.103, EDL=0.103		pg/g	
			Total Hexa CDD	2015/11/28	<0.102, EDL=0.102		pg/g	
			Total Hepta CDD	2015/11/28	0.113, EDL=0.109		pg/g	
			2,3,7,8-Tetra CDF	2015/11/28	<0.102, EDL=0.102		pg/g	
			1,2,3,7,8-Penta CDF	2015/11/28	<0.102, EDL=0.102		pg/g	
			2,3,4,7,8-Penta CDF	2015/11/28	<0.0997, EDL=0.0997		pg/g	
			1,2,3,4,7,8-Hexa CDF	2015/11/28	<0.104, EDL=0.104		pg/g	
			1,2,3,6,7,8-Hexa CDF	2015/11/28	<0.109, EDL=0.109		pg/g	
			2,3,4,6,7,8-Hexa CDF	2015/11/28	<0.0997, EDL=0.0997		pg/g	
			1,2,3,7,8,9-Hexa CDF	2015/11/28	<0.106, EDL=0.106		pg/g	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			1,2,3,4,6,7,8-Hepta CDF	2015/11/28	0.194, EDL=0.108		pg/g	
			1,2,3,4,7,8,9-Hepta CDF	2015/11/28	<0.109, EDL=0.109		pg/g	
			Octa CDF	2015/11/28	<0.103, EDL=0.103		pg/g	
			Total Tetra CDF	2015/11/28	0.115, EDL=0.102		pg/g	
			Total Penta CDF	2015/11/28	<0.101, EDL=0.101		pg/g	
			Total Hexa CDF	2015/11/28	<0.105, EDL=0.105		pg/g	
			Total Hepta CDF	2015/11/28	0.209, EDL=0.108		pg/g	
4287747	BY	Method Blank	Confirmation 2,3,7,8-Tetra CDF	2015/11/25	<0.33, EDL=0.33		pg/g	
			Confirmation C13-2378 TetraCDF	2015/11/25		73	%	40 - 135
4292733	VCI	Method Blank	Confirmation 2,3,7,8-Tetra CDF	2015/11/30	<0.11, EDL=0.11		pg/g	
			Confirmation C13-2378 TetraCDF	2015/11/30		49	%	40 - 135

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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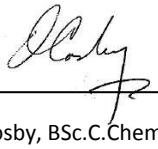
Maxxam Job #: B5M2697
Report Date: 2015/12/02

Apex Laboratories
Client Project #: A5J0568

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brad Newman, Scientific Specialist



Owen Cosby, BSc.C.Chem, Supervisor, HRMS Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

APPENDIX B
WATER AND WETLAND DETERMINATIONS

Oregon
Kate Brown, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

August 24, 2015

Avison Lumber Company
Attn: Bill Avison
500 E 5th Street
PO Box 419
Molalla, OR 97038

Re: WD #2015-0279 Wetland Delineation Report for the Proposed Floragon Property Bear Creek Reach 3
DEQ Soil Remediation Project, Clackamas County;
T 5S R 2E S 17A Portion of TL 100, 101, and 102
City of Molalla Local Wetlands Inventory, Bear Creek Segment R-BC-9

Dear Mr. Avison:

The Department of State Lands has reviewed the wetland delineation report prepared by SWCA Environmental Consultants for the site referenced above. Please note that the study area includes only a portion of the tax lots described above (see the attached map). Based upon the information presented in the report, we concur with the waterway boundaries as mapped in Figure 5 of the report. Within the study area, one waterway, a segment of Bear Creek, was identified.

The creek is subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined).

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. Please phone me at 503-986-5232 if you have any questions.

Sincerely,

Peter Ryan, PWS
Jurisdiction Coordinator

Approved by

Kathy Verble, CPSS
Aquatic Resource Specialist

Enclosures

ec: C. Mirth Walker, PWS, SWCA Environmental Consultants
City of Molalla Planning Department (Map enclosed for updating LWI)
Dominic Yballe, Corps of Engineers
Anita Huffman, DSL

WD# 2015-0279

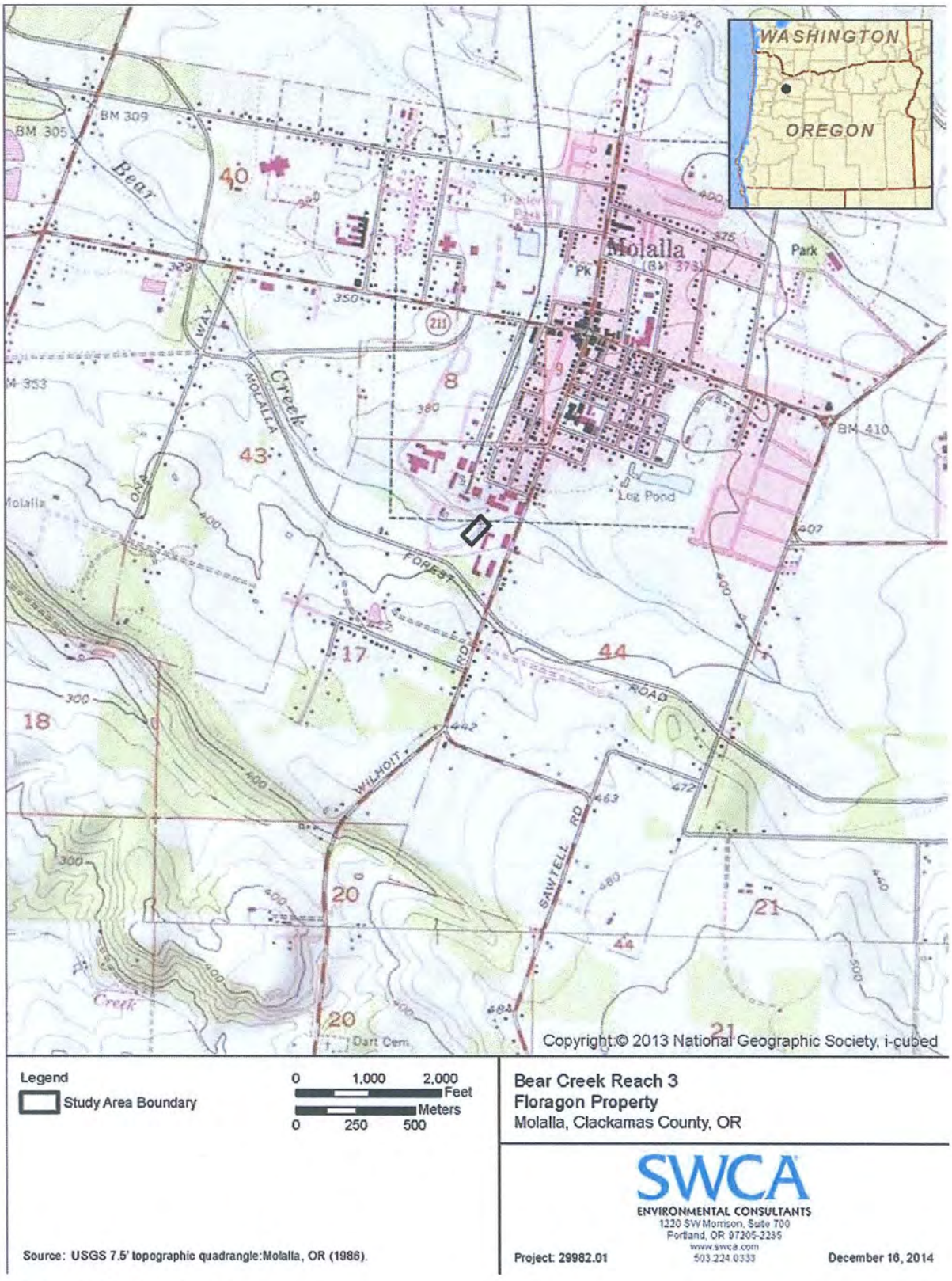
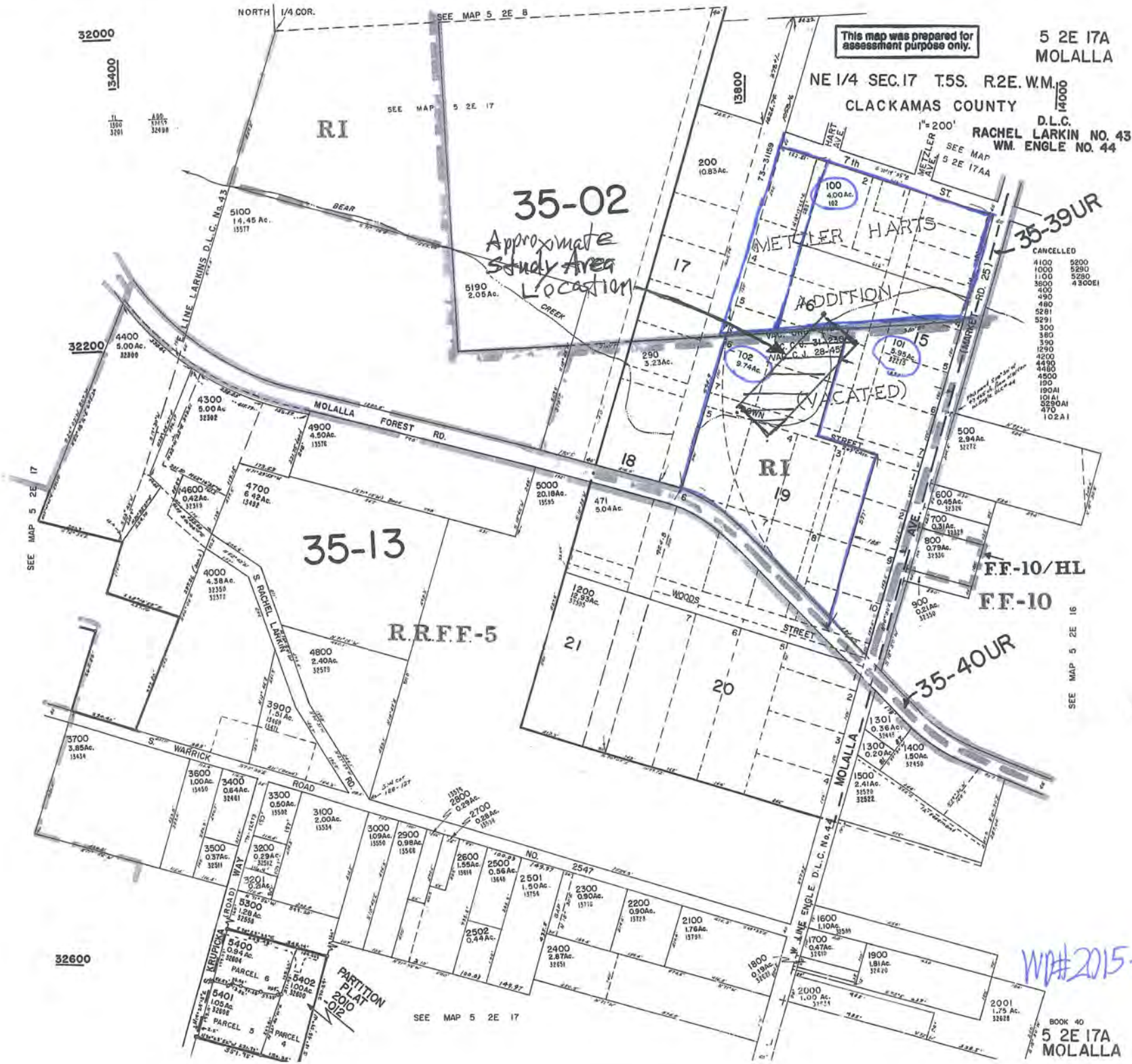
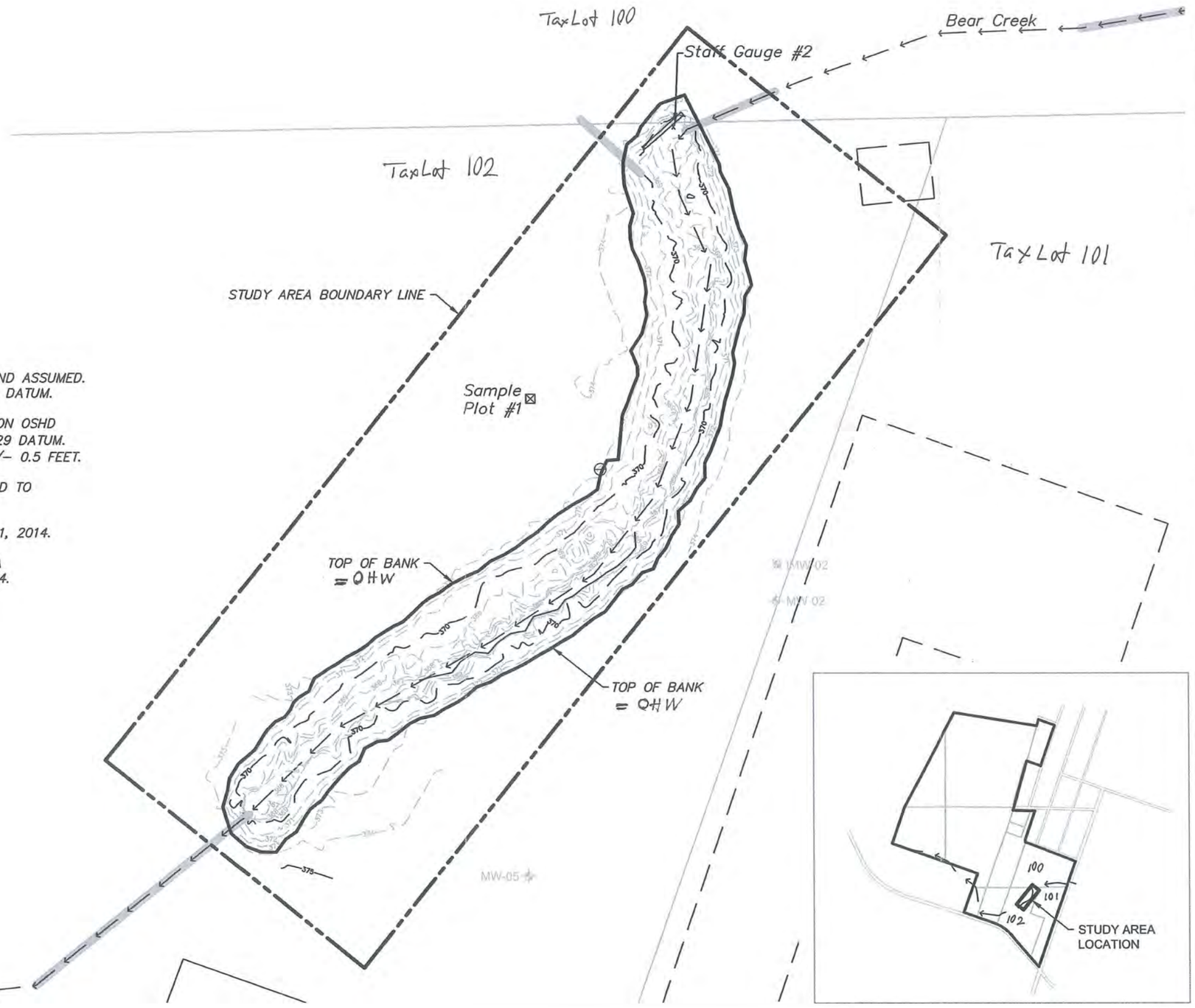


Figure 1. Site location map.


This map was prepared for assessment purpose only.
5 2E 17A
MOLALLA
NE 1/4 SEC. 17 T.5S. R.2E. W.M.
CLACKAMAS COUNTY
1"= 200'
D.L.C.
RACHEL LARKIN NO. 43
WM. ENGLE NO. 44
NORTH 1/4 COR.
SEE MAP 5 2E 8
SEE MAP 5 2E 17
SEE MAP 5 2E 17AA
RI
35-02
Approximate Study Area Location
35-13
R.R.F.F-5
F.F-10/HL
F.F-10
35-39UR
35-40UR
METZLER
HARTS
ADDITION
(VACATED)
MOLALLA FOREST RD.
S. RACHEL LARKIN RD.
S. WARRICK ROAD
KRUPICKA (ROAD) WAY
PARTITION PLAT 2010-012
PARCEL 6
PARCEL 5
PARCEL 4
W. LINE ENGLE D.L.C. NO. 44
E. LINE LARKINS D.L.C. NO. 43
MARKET RD. 25
HART AVE.
METZLER AVE.
7th ST.
WOODS STREET
BEAR CREEK
CANCELLED
BOOK 40
5 2E 17A
MOLALLA
WP#2015-0279

LEGEND

- Top of Bank (TOB) = Ordinary High Water Mark (OHWM)
- Bear Creek Flow Direction
- Former Building Footprints
- Current Building Footprints
- Culvert
- MW-01 Monitoring Well
- Sample Plot
- Study Area Boundary Line



SURVEY NOTES:

THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM.

THE VERTICAL DATUM FOR THIS SURVEY IS BASED UPON OSHD BENCHMARK RAIT. THE ELEVATION IS 240.377' NGVD 29 DATUM. STUDY AREA AND DATA PLOT POINT ACCURACY IS +/- 0.5 FEET.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A LOOP FIELD TRAVERSE.

SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014.

DSL WD # 2015-0279

Approval Issued 8/24/2015

Approval Expires 8/24/2020

N

APPROXIMATE SCALE IN FEET

0 20 40 80

PROJECT NO.	2015-01
DATE: 12-10-14	FIGURE NO. 5
FILE: 2015-01	
DRAWN: JJT	
APPROVED: CR	

BEAR CREEK
WATERS SURVEY

FLORAGON PROPERTY
7TH & HART ST.
MOLALLA, OREGON

EES
ENVIRONMENTAL CONSULTING, INC.
240 N Broadway #203, Portland, OR 97227
(503) 847-2740
www.ees-environmental.com

D:\Client Autocad\EES-Autocad\2015-01 Floragon (2)\Nov 2014\2015-01_BM - 112514.dwg 2.17.2014

Oregon
Kate Brown, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

June 1, 2016

Avison Lumber Company
Attn: Bill Avison
500 E 5th Street
PO Box 419
Molalla, OR 97038

Re: WD #2016-0177 Wetland Delineation Report for a Proposed DEQ Soil Remediation Project, Clackamas County;
T 5S R 2E S17 Portion of Tax Lot 2480;
S 17A Portion of Tax Lots 100, 101, 102, 200 and 290
City of Molalla Local Wetlands Inventory, Wetland BC-22A and BC-22E

Dear Mr. Avison:

The Department of State Lands has reviewed the wetland delineation report prepared by SWCA Environmental Consultants for the site referenced above. Please note that the two study areas include only a portion of the tax lots described above (see the attached map). Based upon the information presented in the report, we concur with the wetland and waterway boundaries as mapped in Figure 5 of the report. Within the two study areas, two wetlands (totaling approximately 0.09 acres) and several segments of Bear Creek were identified.

The wetlands and the creek are subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in wetlands or below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined).

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you

work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. Please phone me at 503-986-5232 if you have any questions.

Sincerely,

Peter Ryan, PWS
Jurisdiction Coordinator

Approved by

Kathy Verble, CPSS
Aquatic Resource Specialist

Enclosures

ec: C. Mirth Walker, PWS, SWCA Environmental Consultants
City of Molalla Planning Department (Map enclosed for updating LWI)
Dominic Yballe, Corps of Engineers
Anita Huffman, DSL

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

This form must be included with any wetland delineation report submitted to the Department of State Lands for review and approval. A wetland delineation report submittal is not "complete" unless the fully completed and signed report cover form and the required fee are submitted. Attach this form to the front of an unbound report or include a hard copy of the completed form with a CD/DVD that includes a single PDF file of the report cover form and report (minimum 300 dpi resolution) and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279.** A single PDF attachment of the completed cover from and report may be e-mailed to **Wetland_Delineation@dsl.state.or.us**. For submittal of PDF files larger than 10 MB, e-mail instructions on how to access the file from your ftp or other file sharing website. Fees can be paid by check or credit card. Make the check payable to the Oregon Department of State Lands. To pay the fee by credit card, call 503-986-5200.

☒ Applicant ☐ Owner Name, Firm and Address: **Bill Avison** **Avison Lumber Company** **500 E 5th St.** **PO Box 419,** **Molalla, OR 97038**	Business phone # Mobile phone # (optional) E-mail: **bill@avison.com**
☒ Authorized Legal Agent, Name and Address: **C. Mirth Walker, PWS** **SWCA Environmental Consultants** **1220 SW Morrison St., Suite 700, Portland, OR 97205**	Business phone # **503-224-0333 ext. 6250** Mobile phone # **503-860-1708** E-mail: **cmwalker@swca.com**

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: **C. Mirth Walker** Signature: [redacted]

Date: **4/7/2016** Special instructions regarding site access: **Contact consultant to arrange site access.**

Project and Site Information (using decimal degree format for lat/long.,enter centroid of site or start & end points of linear project)

Project Name: **Floragon Property Bear Creek Reaches 1-2 and 4-5**	Latitude: **45.13940**	Longitude: **-122.58361**
Proposed Use: **DEQ soil remediation**	Tax Map # **5 2E 17A** ~~5 2E 17~~	
Project Street Address (or other descriptive location): **Approximately 1000 feet northwest of the intersection between S. Molalla Avenue and S. Molalla Forest Road.** City: **Molalla** County: **Clackamas**	Township **5S** Range **2E** Section **17A**, ~~17~~ QQ **NE** Tax Lot(s) **200, 102, 290, 280,** (17A) 100,101 (17) **(Portions)** Waterway: **Bear Creek** River Mile: **NA** NWI Quad(s): **Molalla**	

Wetland Delineation Information

Wetland Consultant Name, Firm and Address:
C. Mirth Walker, PWS
SWCA Environmental Consultants
1220 SW Morrison Street, Suite 700
Portland, OR 97205

Phone # **503-224-0333 ext. 6250**
Mobile phone # **503-860-1708**
E-mail: **cmwalker@swca.com**

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: [redacted] Date: **April 7, 2016**

Primary Contact for report review and site access is ☒ Consultant ☐ Applicant/Owner ☐ Authorized Agent

Wetland/Waters Present? ☒ Yes ☐ No | Study Area size: **3.90 acres** | Total Wetland Acreage: **0.09 (1.01 water)**

Check Box Below if Applicable:	**Fees:**
☐ R-F permit application submitted	☒ Fee payment submitted **$412 to be paid by c.c.**
☐ Mitigation bank site	☐ Fee ($100) for resubmittal of rejected report
☐ Wetland restoration/enhancement project (not mitigation)	☐ No fee for request for reissuance of an expired report
☐ Industrial Land Certification Program Site	
☐ Reissuance of a recently expired delineation Previous DSL # Expiration date ____	

Other Information:	Y	N	
Has previous delineation/application been made on parcel?	☒	☐	If known, previous DSL # WD#2015-0279
Does LWI, if any, show wetland or waters on parcel?	☒	☐	

For Office Use Only

DSL Reviewer: PR Fee Paid Date: ____/____/____ DSL WD # 2016-0177

Date Delineation Received: 4 / 7 / 16 DSL Project # ____ DSL Site # ____

Scanned: ☒ Final Scan: ☐ DSL WN # ____ DSL App. # ____

Electronic Submittal

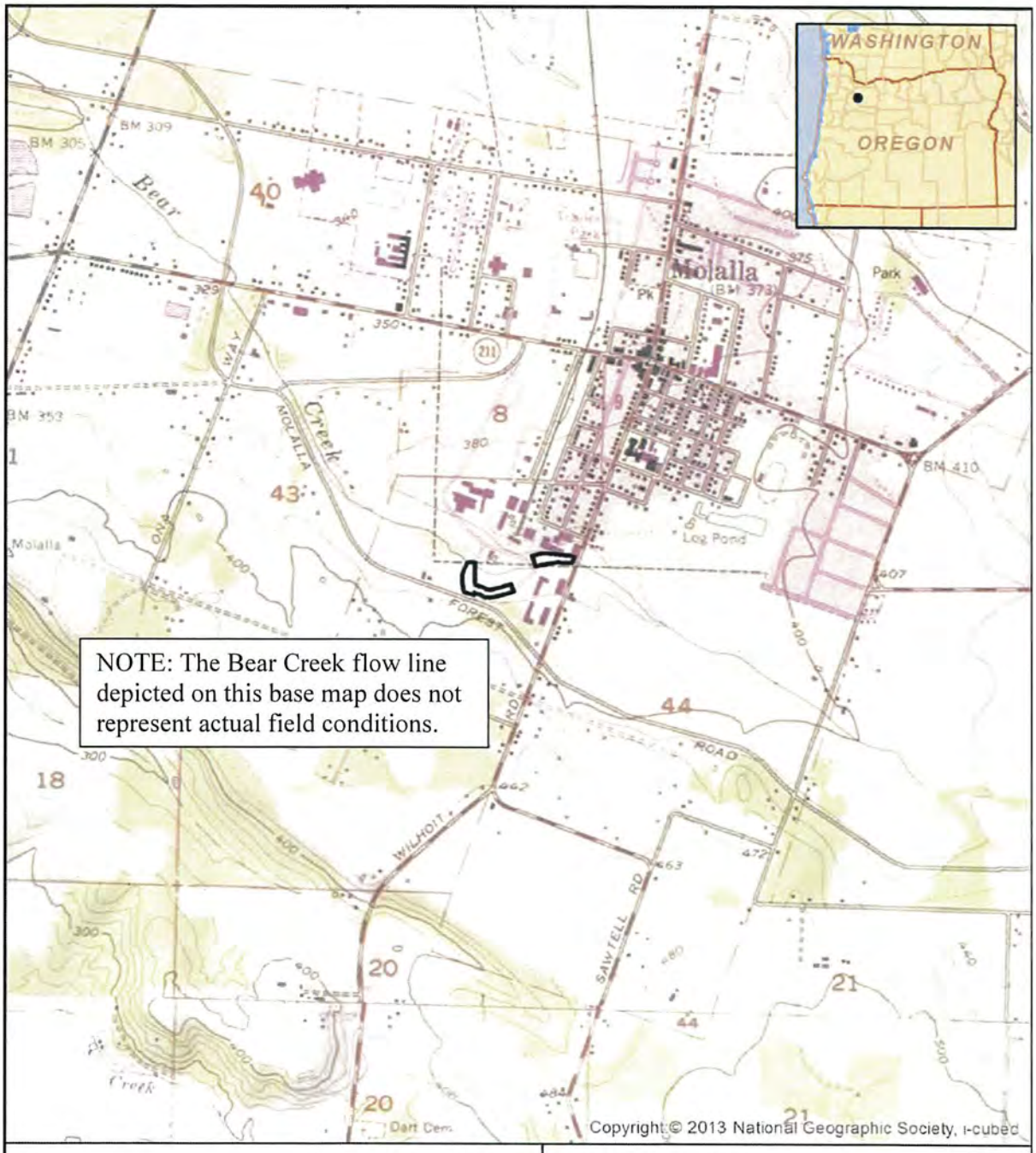
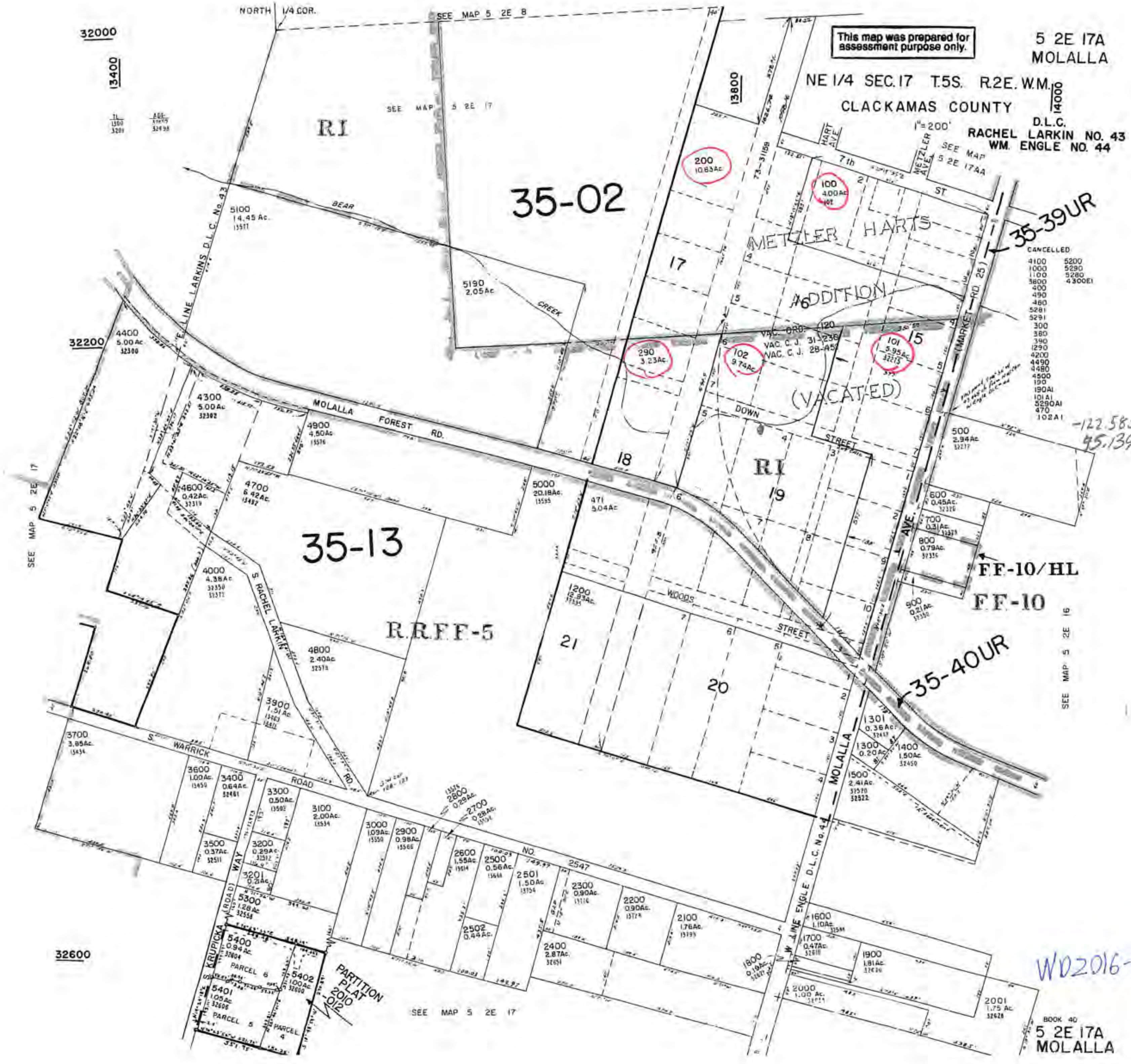


Figure 1. Site location map.

WD 2016-0177


This map was prepared for assessment purpose only.
5 2E 17A
MOLALLA
NE 1/4 SEC.17 T.5S. R.2E. W.M.
CLACKAMAS COUNTY
1"=200'
D.L.C.
RACHEL LARKIN NO. 43
WM. ENGLE NO. 44
SEE MAP 5 2E 8
SEE MAP 5 2E 17
SEE MAP 5 2E 16
SEE MAP 5 2E 17AA
NORTH 1/4 COR.
35-02
35-13
RI
R.R.F.F-5
FF-10/HL
FF-10
35-39UR
35-40UR
MOLALLA FOREST RD.
MOLALLA AVE.
(MARKET RD. 25)
S. WARRICK ROAD
S. RACHEL LARKIN RD
KRUPICKA (ROAD) WAY
WOODS STREET
DOWN STREET
7th ST
HART AVE
METZLER AVE
METZLER HARTS ADDITION
(VACATED)
VAC. ORD. 120
VAC. C. J. 31-236
VAC. C. J. 28-459
E. LINE LARKINS D.L.C. No. 43
W. LINE ENGLE D.L.C. No. 44
BEAR CREEK
PARTITION PLAT 2010-012
CANCELLED
4100 1000 1100 3600 400 490 480 5281 5291 300 380 390 1290 4200 4490 4480 4500 190 190A1 101A1 5290A1 470 102A1
5200 5290 5280 4300E1
32000
13400
32200
32600
13800
14000
5100 14.45Ac.
5190 2.05Ac.
200 10.83Ac.
100 4.00Ac.
290 3.23Ac.
102 9.74Ac.
101 5.95Ac.
4400 5.00Ac.
4300 5.00Ac.
4900 4.50Ac.
4600 0.42Ac.
4700 6.42Ac.
5000 20.18Ac.
471 5.04Ac.
4000 4.38Ac.
4800 2.40Ac.
1200 12.93Ac.
3900 1.51Ac.
3700 3.85Ac.
3600 1.00Ac.
3400 0.64Ac.
3300 0.50Ac.
3100 2.00Ac.
3000 1.09Ac.
2900 0.98Ac.
2800 0.29Ac.
2700 0.28Ac.
2600 1.55Ac.
2500 0.56Ac.
2501 1.50Ac.
2502 0.44Ac.
2300 0.90Ac.
2200 0.90Ac.
2100 1.76Ac.
2400 2.87Ac.
3500 0.37Ac.
3200 0.29Ac.
3201 0.21Ac.
5300 1.28Ac.
5400 0.94Ac.
5401 1.05Ac.
5402 1.00Ac.
PARCEL 6
PARCEL 5
PARCEL 4
500 2.94Ac.
600 0.45Ac.
700 0.31Ac.
800 0.79Ac.
900 0.21Ac.
1301 0.36Ac.
1300 0.20Ac.
1400 1.50Ac.
1500 2.41Ac.
1600 1.10Ac.
1700 0.47Ac.
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2000 1.00Ac.
2001 1.75Ac.
17
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NO. 2547
BOOK 40
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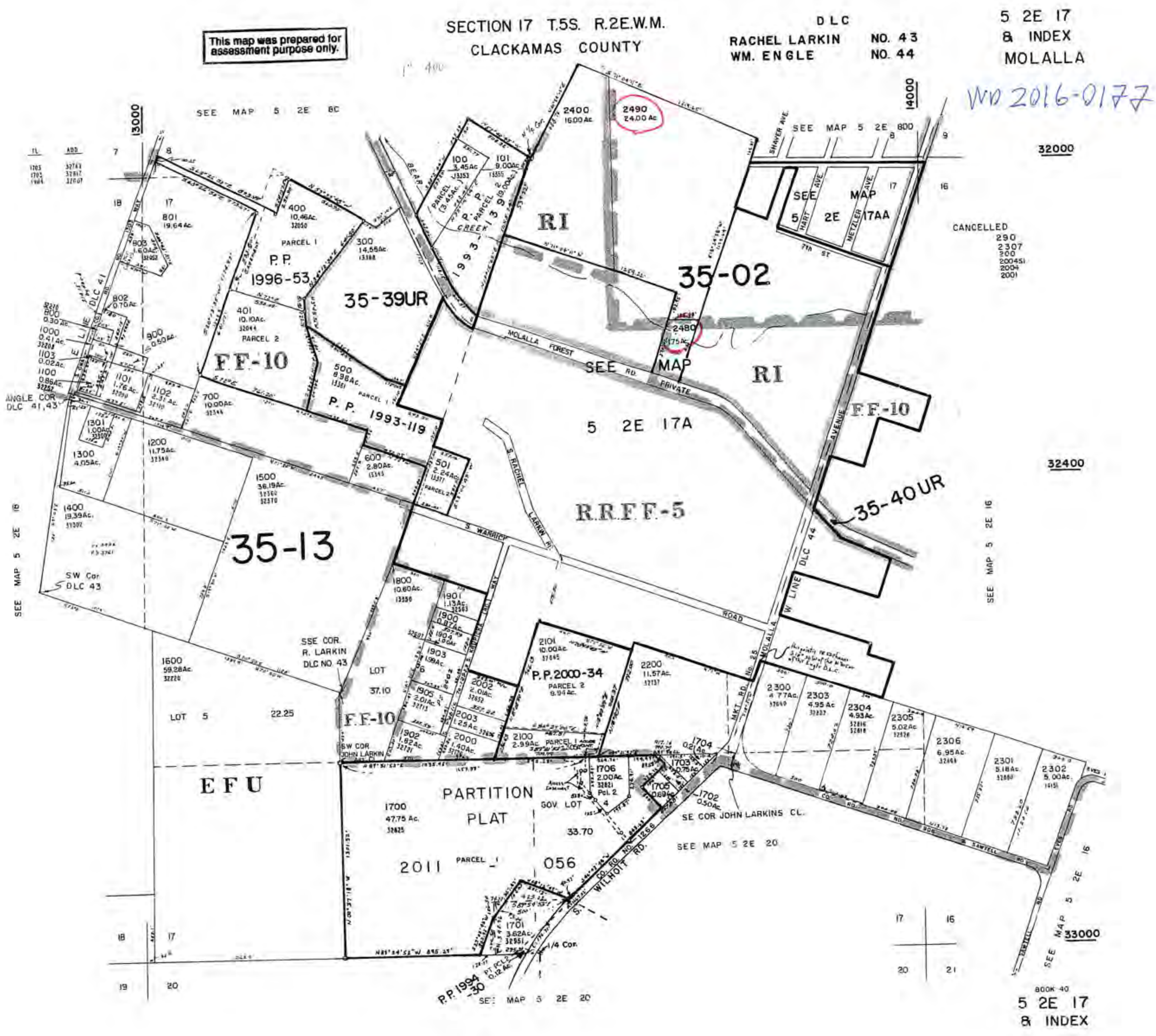
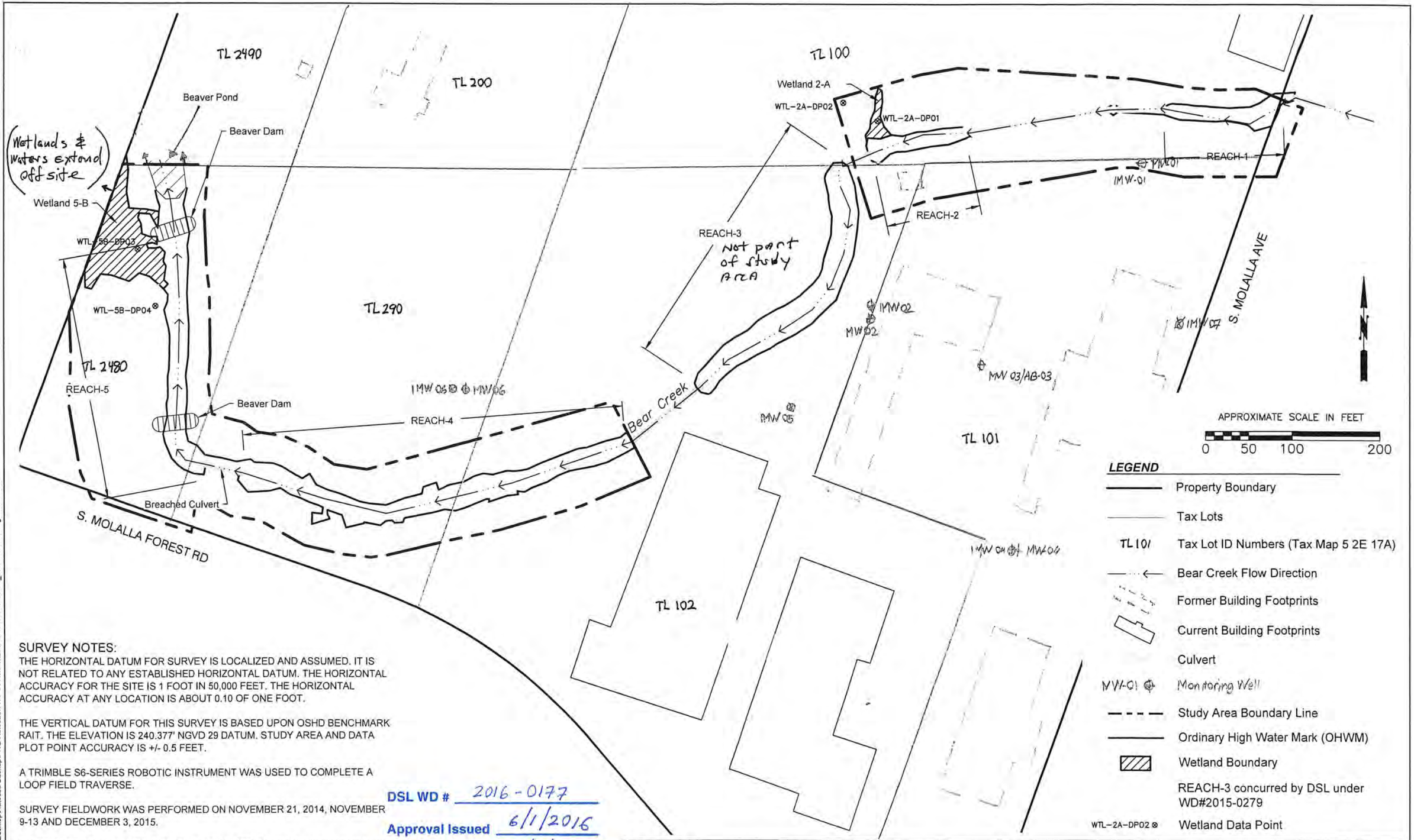
45.1394
WD2016-0177


This map was prepared for assessment purpose only.
SECTION 17 T.5S. R.2E.W.M.
CLACKAMAS COUNTY
DLC
RACHEL LARKIN NO. 43
WM. ENGLE NO. 44
5 2E 17
& INDEX
MOLALLA
WD 2016-0177
SEE MAP 5 2E 8C
SEE MAP 5 2E 8DD
SEE MAP 5 2E 16
SEE MAP 5 2E 17AA
SEE MAP 5 2E 20
SEE MAP 5 2E 18
13000
14000
32000
32400
33000
CANCELLED
290
2307
200
200451
2004
2001
35-02
35-39UR
35-13
35-40UR
5 2E 17A
RRFF-5
RI
FF-10
EFU
P.P. 1996-53
P.P. 1993-119
P.P. 2000-34
P.P. 1994-30
PARTITION PLAT 2011-056
2490 24.00 Ac.
2400 16.00 Ac.
MOLALLA FOREST RD.
MOLALLA AVENUE
WILHOIT RD.
SE COR JOHN LARKINS CL.
SSE COR. R. LARKIN DLC NO. 43
SW Cor DLC 43
ANGLE COR DLC 41,43
BOOK 40
5 2E 17
& INDEX



SURVEY NOTES:

THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM. THE HORIZONTAL ACCURACY FOR THE SITE IS 1 FOOT IN 50,000 FEET. THE HORIZONTAL ACCURACY AT ANY LOCATION IS ABOUT 0.10 OF ONE FOOT.

THE VERTICAL DATUM FOR THIS SURVEY IS BASED UPON OSHD BENCHMARK RAIT. THE ELEVATION IS 240.377' NGVD 29 DATUM. STUDY AREA AND DATA PLOT POINT ACCURACY IS +/- 0.5 FEET.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A LOOP FIELD TRAVERSE.

SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014, NOVEMBER 9-13 AND DECEMBER 3, 2015.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014 (REACH 3), NOVEMBER 2 AND 23, 2015 (REACH-1, -2, -4, AND -5).

DSL WD # 2016-0177
Approval Issued 6/1/2016
Approval Expires 6/1/2021

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

DATE:	1-26-16
FILE NAME:	1177-01
DRAWN BY:	JJT
APPROVED BY:	PE

FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

BEAR CREEK WATER SURVEY

Project No. 1177-01
Figure No. 5

C:\Users\Josh\Desktop\Autocad Backup\PNG-Autocad\1177-01 Avison\2016\Jan 2016\1177-01_WTL-012616.dwg 2.17.2014

APPENDIX C
HUMAN HEALTH RISK ASSESSMENT

HUMAN HEALTH RISK ASSESSMENT

Floragon Property
Molalla, Oregon

DEQ VCP Site ID No. 0009

Prepared for:

AVISON LUMBER COMPANY
P.O. Box 419
Molalla, Oregon 97038

Prepared by:

PNG ENVIRONMENTAL, INC.

1177-01
September 16, 2016

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1 INTRODUCTION

On behalf of PNG Environmental, Inc. (PNG), Technical Assessment Services (TAS) prepared this Human Health Risk Assessment (HHRA) report for the Floragon facility located in Molalla, Oregon. A baseline HHRA was developed as part of the Phase 1 Remedial Investigation (RI) Report (PNG 2011). Additional site characterization and risk assessment efforts conducted through 2015 have been completed during subsequent phases of RI work at the Floragon site (PNG 2016a). Phase 1 and Phase 2 RI and risk assessment activities have led to interim remedial actions which resulted in No Further Action determinations and overall reduced risk at most of the Floragon site such that the current focus is limited to a five-acre study area which consists of Bear Creek and the former Dip Tank Area. This report provides an updated HHRA for the Dip Tank Area and Bear Creek Sediments, both located on the Floragon site and generally referred to as the Phase 3 Remedial Investigation (RI) Study Area.

A summary of the RI and risk assessment status is included in the main body of the Final RI Report (PNG 2016b).

1.1 PROJECT BACKGROUND

A site-wide RI of the original 105 acre Floragon Site was completed and submitted to the Oregon Department of Environmental Quality (DEQ) in 2011. (PNG 2011) The property was subsequently divided into functional parcel groups based on physical location and areas of potential environmental concern.

- The Floragon Uplands Risk Assessment was completed and submitted in early 2014 (EES 2014a). This assessment enabled final cleanup of limited affected portions of the 85-acre Northern Upland Parcels Area. A No Further Action Determination was issued by DEQ in March 2014.
- A Focused Risk Evaluation for the 16-acre SE corner of the Site was completed and submitted in September 2014 (EES 2014b). Protective measures were implemented at this portion of the site in late 2015, with an NFA determination pending (DEQ 2015a).
- A risk analysis of dioxins and furans (referred to generally as “dioxin”) in Bear Creek was performed and submitted to DEQ as a series of Technical Memos; the first in 2012 addressed human health and the second in 2015 which addressed ecological risk (TAS 2012; PNG 2015)

This report presents an HHRA limited to the remaining five-acre study area at the Floragon site, consisting of the former Dip Tank Area (soil and groundwater) and Bear Creek sediments. RI Figures 1 and 2 illustrate this study area.

1.2 PROJECT DESCRIPTION

The overall Floragon site consists of 105 acres which extend across the City of Molalla boundaries into Clackamas County. Property history, description, and ecology have been previously described in the Phase 1 RI and baseline HHRA report (PNG 2011). Previously addressed areas of the site include approximately 85 acres of the Northern Parcels Upland portion of the site located north of Bear Creek (EES 2014a) and a 16 acre portion of the site located in the SE Corner adjacent to Bear Creek (EES 2014b).

The focus of this updated HHRA is soil and groundwater at the former Dip Tank area located southeast of Bear Creek and sediments located in Bear Creek on the Floragon property.

1.3 SITE LAND AND WATER USE

The Floragon property is currently zoned Light and Heavy Industrial. A Beneficial Land and Water Use Determination (BWUD) was completed as part of the Floragon RI (PNG 2011). The BWUD, as supported by subsequent RI work and discussion with DEQ, indicates that groundwater underlying the Site is not a source of drinking water and shallow groundwater is unlikely to be tapped as a future drinking water source. The City of Molalla provides drinking water and is likely to continue to do so in the future. Although several vicinity properties use groundwater for drinking and irrigation, the identified water wells are developed and screened in the regional aquifer at depths near or deeper than approximately 100 feet, and the drinking water aquifer is isolated from shallow (water table generally observed at depths of two to five feet in the Dip Tank area adjacent to Bear Creek), localized site-related contaminants. There have been no known changes in land use designation since the submittal of the RI report in 2011.

Bear Creek provides ecological beneficial water uses, but does not contain notable fish populations due to its ephemeral nature, nor are threatened, endangered, or sensitive species identified in Bear Creek (SWCA 2016).

2 RISK ASSESSMENT AND INITIAL SCREENING

Analytical data for this Dip Tank/Bear Creek risk assessment are available from soil (0-3 feet below ground surface [bgs]), drainage areas (Catch Basins) and groundwater in the Dip Tank area, and sediments in Bear Creek. RI Data collected between 2010 and 2015 (including a small 2005 data-set from the Dip Tank area, collected by others) included the following:

- Forty-three surface soil samples.
- Twenty-three groundwater samples.
- Forty-six sediment samples.

Sample locations are presented in RI Figures 3 and 4.

Media samples were analyzed for metals, dioxin, pentachlorophenol (PCP), polynuclear aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and petroleum hydrocarbons (gasoline, diesel, and oil range). Standard laboratory quality control procedures were used and the analytical data are considered good quality and useable for the risk assessment. For the purposes of this risk assessment, dioxin concentrations are expressed as 2,3,7,8-tetrachlorodibenzodioxin (2,3,7,8-TCDD) using the mammalian toxicity equivalency factor approach for the HHRA (USEPA 2007).

Non-detects for all analytes, except for dioxin, were reported at the method reporting limit (MRL). Non-detects for dioxin were reported at the Estimated Detection Limit (EDL). These MRLs and EDLs and were incorporated into the data set consistent with United States Environmental Protection Agency's (EPA) ProUCL statistical software programs. Summary statistics for the analytical data in each exposure medium are provided in Appendix A, Tables 1-3.

The preferred Exposure Point Concentration (EPC) was the 90th percentile upper confidence limit on the arithmetic mean (90UCL) of both detected and non-detected analyte concentrations. This was calculated using the EPA's ProUCL Version 5.0 statistical software. Analyte concentrations reported by the laboratory below MRLs and EDLs were included in the 90UCL calculations at their full detection limit (USEPA 2013a).

As requested by DEQ, the 95UCL was first calculated to determine the ProUCL preferred statistical method for calculating the 95UCL. The ProUCL program was then rerun and the 90UCL values selected as the EPC were the same type as recommended for the 95UCL calculations. If there were insufficient data for ProUCL to calculate an EPC, then as per the ProUCL technical guide, the maximum detected concentration was selected as the EPC.

The data were initially screened using the following criteria:

- Background: Metals (i.e., inorganic contaminants of Interest [COIs]) in soil and sediment with maximum detected concentrations less than their respective default Portland Basin area background concentrations in soil (DEQ 2013a) were eliminated from further assessment. No background/reference samples were available or obtained for groundwater; therefore, no background screening was conducted for groundwater samples.
- Detection and Reporting Limit: COIs that were not detected were removed from further consideration unless the maximum MRL or EDL concentrations were greater than background concentrations (if available) and greater than the lowest available medium-specific human health risk-based screening concentrations (HHRBSCs; Appendix A, Table 4).

- Maximum Detection (or EDL) Screening: COIs with a maximum detected concentration less than the minimum human health screening concentration were removed from further consideration.
- VOCs not detected in groundwater and eliminated from consideration in previous Floragon Risk Assessment Reports were eliminated in this analysis (PNG 2011, 2012, 2013b, 2015a, 2015b, 2016a; EES 2013, 2014, 2015; DEQ 2012, 2013, 2014, 2015b-g, 2016). .

The human health risk-based screening values used for the initial screening were default DEQ Risk-Based Concentrations (RBCs) for the applicable direct and indirect human exposure pathways (DEQ 2015h), EPA Regional Screening Levels (RSLs) for industrial soil and tap water (USEPA 2016), and DEQ RBCs or EPA RSLs for surrogate chemicals where available and appropriate. Table C2-1 lists COIs retained following the initial screening.

3 HUMAN HEALTH RISK ASSESSMENT

The HHRA evaluated the potential for adverse health effects from current and future human exposures to hazardous substances present in surface soil and groundwater in the Dip Tank area and from exposure to sediments in Bear Creek. The first step of this process is to select chemicals of potential concern (COPCs) from the COIs identified after the initial screening described in the preceding section.

COPCs were identified using approved human health risk-based screening procedures. The likely concentration of chemical to which the receptor may be exposed is calculated. This chemical concentration is called the exposure point concentration (EPC). The EPCs were then compared to acceptable doses of the COPCs using DEQ approved screening values (DEQ 2015). Appropriate screening values are determined on the basis of potential receptors and exposure pathways. The following are the primary elements of the HHRA.

- Hazard Identification and Selection of COPCs.
- Exposure Assessment.
- Toxicity Assessment.
- Risk Characterization.
- Uncertainty Analysis.
- Discussion and Summary of Human Health Risks.

3.1 HAZARD IDENTIFICATION AND SELECTION OF COPCS

This section presents the rationale for the selection of the COPCs. The media of interest for human health included surface soil, groundwater, and sediment.

The EPCs calculated for each of the COIs in these media were compared to their respective RBCs taken from the DEQ RBC Spreadsheet (DEQ 2015). When DEQ-generated RBCs were not available, the most recent values listed in the EPA's Regional Screening Level Table for exposure to soil and tap water were used (EPA 2016).

As a preliminary screen, the maximum concentration of the COIs in surface soil and sediments were compared to the minimum human health RBCs for direct contact with soil for an occupational worker. Groundwater EPCs were screened against occupational RBCs for tap water.

3.2 EXPOSURE ASSESSMENT

Potential exposures to contaminated media are determined by the development of a conceptual human health exposure model (CHEM). The CHEM includes identification of exposure media, the populations which may be potentially exposed populations, the potential exposure pathways and the concentrations to which these populations may be exposed. A conceptual site model (CSM) for the Floragon Site was submitted in the 2011 RI report (PNG 2011) and is updated as described below for the study area.

3.2.1 Human Health Conceptual Site Exposure Model (HHCSM)

The HHCSM is a flow chart that delineates contaminant sources, release mechanisms, transport routes, exposure media, potential receptor populations, and potential exposure routes. The CHEM for the Dip Tank and Bear Creek sediments is presented in Figure 5. Justification and discussion of the potential exposure routes and receptors are provided in the following sections.

Potentially Exposed Population

The site is zoned for industrial use. Current and future site receptors include occupational workers and trespassers. Currently, the Dip Tank Area is entirely paved and therefore direct contact with soil by current occupational workers and trespassers is unlikely to occur. In the future, excavation and construction workers may encounter surface soil, sediments, and/or shallow groundwater during site re-development, demolition, and/or construction.

Exposure to Bear Creek sediments is a potentially complete exposure pathway during the course of future site remediation, demolition and/or construction activities. Therefore, exposure to sediments by a future occupational worker, a future construction worker, and a future excavation worker were also included as a possible scenario. Any occupational exposure scenario is extremely unlikely to occur within the creek (Bear Creek sediments within the Phase III RI investigation study area are submerged throughout the entire year) and construction/excavation exposures if any, would be very brief in duration.

Although no on-site residential use is permitted by zoning and no such future use is anticipated, downstream sections of Bear Creek are adjacent to some residential properties. Therefore, potentially exposed populations for Bear Creek sediments include current and future recreational users of the creek and trespassers. During periods of flooding, small volumes of Bear Creek sediments may potentially be carried onto downstream residential properties, thereby providing a complete pathway for exposure to current and future residents. Therefore, these third-party receptor scenarios were conservatively included in this risk assessment.

Identification of Potential Exposure Pathways

This section evaluates potential pathways for human exposures to the identified COPCs. Potential exposure pathways were identified as:

- Incidental ingestion of soil or sediment.
- Incidental ingestion of groundwater by an excavation worker.
- Inhalation of soil and dust particulates.
- Dermal contact with soil, groundwater, and sediment.
- Inhalation of volatiles from soil and groundwater into indoor and outdoor air.

Complete pathways of exposure require a receptor, a pathway, and a source. The BWUD (PNG 2011 and 2016b) concluded that shallow groundwater in the Locality of the Facility (LOF) is not a drinking water source. Therefore, drinking water pathways for potentially impacted groundwater are incomplete. With the exception of direct contact with shallow groundwater in a trench by the excavation worker, potential exposure to groundwater is limited to inhalation of volatiles intruding into indoor air and volatilization to outdoor air.

3.2.2 Exposure Assumptions

Exposure factors include body weight, averaging time, exposure frequency, exposure duration, and chemical bioavailability. The duration and extent of exposure to surface soil by the trespasser is considered to be less than that anticipated for the future occupational worker. The exposure assumptions for the trespasser are consistent with those used in the Floragon Site HHRA (PNG 2011).

Assumptions used for exposure to dioxin in Bear Creek Sediments were consistent with assumptions and input parameters previously submitted to DEQ (TAS 2012).

3.2.3 Exposure Point Concentrations

The EPC represents the reasonably likely concentration of a chemical in a medium of exposure to which a receptor will likely be exposed. The arithmetic mean of data (including non-detects at their reporting limit) represents the EPC for the central tendency exposure (CTE) scenario. The 90UCL represents the EPC for the RME scenario. Table 1 (Appendix B) presents EPCs for the selected COPCs. The methodology for statistically deriving these EPCs is discussed in Section 2 of this report. Tables 2-8 (Appendix B) present the result of the statistical analysis used in this risk assessment report.

3.3 TOXICITY ASSESSMENT

The purpose of the toxicity assessment is to present the carcinogenic and non-carcinogenic critical toxicity factors for the COPCs. These toxicity values quantitatively describe the relationship between the extent of exposure to a COPC and the potential increased likelihood of adverse effects. The sources for obtaining toxicity values are listed below.

- Integrated Risk Information System (IRIS) computer database (USEPA 2013b).
- Oregon DEQ RBC Table (DEQ 2015b).
- Oregon DEQ Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites (DEQ 2003).
- EPA Region 3 RBC Screening Tables (USEPA 2016).

Chemicals are classified into those that cause cancer and those that may cause other, noncancer health effects. The method for assessing the potential for these two different types of health effects differs. Where a chemical can cause both cancer and noncancer health effects, the risk characterization calculates the potential for both types of effects (e.g., 2,3,7,8-TCDD). The following sections provide background information on the toxicity values for noncarcinogenic and carcinogenic chemicals. The RBCs developed by DEQ (DEQ 2015) and used in the risk-based screening represent the most conservative toxicity endpoint.

3.3.1 Non-Carcinogenic Toxicity Values

The potential for toxicity of non-carcinogenic COPCs is determined using reference doses (RfDs) and reference concentrations (RfCs). The reference dose or concentration represents an estimated intake rate that is unlikely to produce measurable adverse effects over a lifetime of exposure. They are determined by the EPA RfD Work Group or from the health effects assessment documents developed by the EPA Office of Research and Development. An RfD and RfC assume a threshold for adverse non-carcinogenic effects. That is, exposures below these reference values are considered unlikely to cause any adverse health effects. Reference values are route-specific, i.e., they may be different for ingestion, inhalation, or other routes of exposure.

3.3.2 Carcinogenic Toxicity Values

Chemicals that cause cancer are classified according to the type of scientific information available about the types of cancer they might produce. This classification system is called the Weight of Evidence (WOE). The 1986 guidelines (USEPA 1986) established five WOE categories, ranging from known human carcinogens (Group A) to chemicals which have been determined not to cause cancer (Group E). Some chemicals have been re-evaluated under the 1996 Proposed Guidelines for Carcinogen Risk Assessment.

Unlike non-carcinogens, carcinogenic chemicals are assumed not to have a threshold value below which no human health effects are likely to be seen. The potential for developing cancer from exposure to a carcinogenic chemical (toxicity value) is determined using a slope factor. The slope factor represents a conservative estimate of the potential cancer risk associated with exposure. It is used with the acceptable daily does (ADD) to calculate the increased probability of developing cancer over a lifetime. This is measured in terms of excess cancer risk (ECR). Slope factors are determined by the EPA Carcinogen Risk Assessment Verification Endeavor Workgroup, or from the health effects assessment documents developed by the EPA Office of Research and Development.

3.3.3 Human Health Risk Based Screening

The COIs identified after the initial screening were screened against default risk-based screening criteria (DEQ 2015b). Chemicals retained following this preliminary screening were identified as COPCs. The potential for unacceptable human health risk is quantified in the risk characterization which is discussed in the following section.

EPCs were screened against published RBCs for the following representative site receptors to determine Chemicals of Concern (COCs) (DEQ 2015b).

- Current and Future Occupational Workers.
  - Dip Tank Area soil - direct contact with surface soil.
  - Dip Tank Area groundwater - inhalation of volatiles in indoor and outdoor air.
  - Bear Creek sediments- direct contact.
- Current and Future Trespassers.
  - Dip Tank surface soils - direct contact.
  - Bear Creek sediments - direct contact.
- Future Construction Workers.
  - Dip Tank Area -direct contact with surface soil.
  - Dip Tank Area groundwater - inhalation of volatiles in outdoor air.
  - Bear Creek sediments- direct contact.
- Future Excavation Workers.
  - Dip Tank Area soil - direct contact with surface soil.
  - Dip Tank Area groundwater – direct contact and inhalation of volatiles in the trench.
  - Bear Creek sediments – direct contact.
- Offsite Future Residents.
  - Bear Creek sediments - direct contact.
- Current and Future Recreational Users of Bear Creek (See Section 3.2.1).
  - Offsite Bear Creek Sediments - direct contact.

SURFACE SOIL IN THE DIP TANK AREA

Three COPCs were identified in surface soil in the Dip Tank area: total arsenic, 2,3,7,8-TCDD Total Toxic Equivalents (TEQ), and 1,2,3-trichloropropane. These chemicals exceeded the risk-based screening criteria as follows:

Total Arsenic

The maximum concentration of arsenic detected in surface soils in the Dip Tank Area was 9.4 milligrams per kilogram (mg/Kg) which exceeded the occupational human

heath RBC of 1.9 mg/Kg and slightly exceeded the Portland area background concentration of arsenic of 8.8 mg/Kg (DEQ 2013). An EPC of 3.8 mg/Kg was calculated for arsenic in soil. This concentration exceeds the RBC for occupational exposure by a factor of 2 (ECR = 2E-06). No known site source of arsenic has been identified.

2,3,7,8-TCDD TEQ

An EPC of 1.6E-05 was calculated for 2,3,7,8-TCDD TEQ in surface soils in the Dip Tank Area. This concentration exceeds the RBC for occupational exposure by a factor of 2 (ECR = 2E-06).

1,2,3-Trichloropropane

The minimum MRL of 1,2,3-trichloropropane exceeded the minimum human health screening value, but the compound was not detected and has no known site source. This chemical was removed from further consideration in the 2011 RI (PNG 2011) based on likelihood of historic use at the Site and therefore will not be considered in this risk assessment.

GROUNDWATER IN THE DIP TANK AREA

Nineteen COPCs were identified in groundwater in the Dip Tank area. Of these, none were detected except for pentachlorophenol. However, all were evaluated as COPCs because the minimum MRL exceeded the minimum human health screening value.

Fourteen of the COPCs in groundwater were previously addressed in the 2011 RI (PNG 2011) and removed from further consideration:

- Dibenz(a,h)anthracene was eliminated because the compound is nonvolatile and the indoor and outdoor air pathways are incomplete.
- 1,1-dichloropropene and 1,2-dichloropropane were eliminated because concentrations in groundwater based on the maximum MRLs did not pose an unacceptable risk to the excavation worker.
- 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, and chloroform were eliminated from further consideration because the maximum detection limit did not exceed the Federal Maximum Contaminant Levels (MCL) and vapor intrusion and volatilization to outdoor air was not considered a significant pathway of exposure for applicable receptors.
- The following chemicals were eliminated based on the low likelihood of historical use at the site:
  - 1,2-dibromo-3-chloropropane.
  - 1,2-dibromoethane.
  - 1,2-dichloroethane.
  - cis-1,3-dichloropropene.
  - trans-1,3-dichloropropene.
  - 2,2-dichloropropane.
  - carbon tetrachloride.
  - vinyl chloride.

The COPCs retained for groundwater evaluation are benzo(a)pyrene, pentachlorophenol, 1,1,2-trichloroethane, 1,4-dichlorobenzene, and hexachlorobutadiene.

With the exception of potential direct contact with shallow groundwater by the excavation worker, the only complete pathways for exposure are vapor intrusion into indoor air and volatilization into outdoor air. Of the five COPCs in groundwater; benzo(a)pyrene, pentachlorophenol, and hexachlorobutadiene are nonvolatile and therefore were removed from further consideration for all other potential receptors, leaving only 1,1,2-trichloroethane and 1,4-dichlrobenzene as COPCs.

BEAR CREEK SEDIMENTS

Five COPCs were identified in Bear Creek sediments: total arsenic, 2,3,7,8-TCDD TEQ, benz(a)anthracene, benzo(a)pyrene, and dibenz(a,h)anthracene.

3.4 RISK CHARACTERIZATION

The COIs identified after the initial screening were screened against default Risk-Based screening criteria (DEQ 2015b). Chemicals retained following this preliminary screening were identified as COPCs. The potential for unacceptable human health risk is quantified in the risk characterization which is discussed as follows and in Section 4.

3.4.1 RBC Screening

EPCs were screened against published RBCs for the following receptors:

- Current Occupational Worker – direct contact with Bear Creek sediment; inhalation of indoor and outdoor air.
- Future Occupational Worker - direct contact with Dip Tank area surface soil and Bear Creek sediment; inhalation of indoor and outdoor air.
- Future Construction Worker – direct contact with Dip Tank area surface soil and Bear Creek sediment; inhalation of outdoor air.
- Future Excavation Worker – direct contact with Dip Tank area surface soil and groundwater; inhalation of volatiles and particulates in the trench.
- Future Trespasser – direct contact with Dip Tank area surface soils; direct contact with sediments in Bear Creek.
- Future Resident– direct contact with offsite sediments in Bear Creek
- Current and Future Recreational User – direct contact with sediments in Bear Creek.

The RBC Screening is presented in Appendix C.

Occupational Worker

Potentially complete pathways of exposure for the occupational worker were determined to be direct contact with soil in the Dip Tank area (if pavement surfaces were to be removed), inhalation of volatiles from groundwater in indoor and outdoor air, and casual direct contact with sediments in Bear Creek (Table C3-1).

The Total ECR for this receptor is 6E-06. COCs were identified as total arsenic and dioxin expressed as 2,3,7,8-TCDD TEQ. No unacceptable noncancer risks are anticipated for this receptor (HI = 0.34, < 1.0). No unacceptable risks or hazards were identified for groundwater COPCs.

Arsenic

Arsenic was detected in 8 of 13 samples. The maximum detected arsenic concentration was 9.4 mg/Kg in B9-12(1.5) Comp, slightly exceeding natural background concentrations (DEQ 2013). All other detections were below the background concentration for arsenic in Portland Basin soil.

Dioxin

Dioxin expressed as total TEQ 2,3,7,8-TCDD exceeded the regulatory standard for excess cancer risk of 1E-06 for this receptor.

Construction Worker

Complete pathways of exposure for the future construction worker were determined to be direct contact with soil in the Dip Tank area, inhalation of volatiles from groundwater in outdoor air, and casual (infrequent) direct contact with sediments in Bear Creek (Table C3-2).

Dioxin expressed as total TEQ 2,3,7,8-TCDD exceeded the regulatory standard of 1E-06 for this receptor. No unacceptable noncancer risks are anticipated for this receptor (HI = 0.58, < 1.0). No unacceptable risks or hazards were identified for groundwater COPCs.

Excavation Worker

Complete pathways of exposure for the future excavation worker were determined to be direct contact with soil in the Dip Tank area, direct contact with groundwater in a trench, inhalation of volatiles from groundwater in a trench and in outdoor air, and casual direct contact with sediments in Bear Creek (Table C3-3).

Dioxin expressed as total TEQ 2,3,7,8-TCDD exceeded the regulatory standard of 1E-06 for this receptor. No unacceptable noncancer risks are anticipated for this receptor (HI = 0.02, < 1.0). No unacceptable risks or hazards were identified for groundwater COPCs.

Offsite Residential

The only complete pathway of exposure for the off-site and potential future resident was determined to be direct contact with sediments in Bear Creek (Table C3-4). This exposure pathway is unlikely based on site conditions (see Sections 3.2.1, 3.3.3, and 4.2.1)

The total ECR for this receptor is 7E-05. Chemicals of concern were identified as total arsenic, dioxin expressed as 2,3,7,8-TCDD TEQ, benz(a)anthracene, benzo(a)pyrene and dibenz(a,h)anthracene.

Arsenic

Arsenic was detected in 11 of 21 sediment samples. The maximum arsenic detected was 10.7 mg/Kg with a mean of 3.755 mg/Kg and median concentration of 4.75 mg/Kg. The highest concentration was located at AB-28. Three of the samples collected in 2010 had detections limits higher than regional soil background levels. Samples collected in 2012 and 2015 were all below background levels for typical Portland-Basin soils (DEQ 2013).

Dioxin

Dioxin expressed as total TEQ 2,3,7,8-TCDD exceeded the regulatory standard for excess cancer risk of 1E-06 for this receptor. The Hazard Index (HI), representing noncancer health impacts, exceeded the regulatory standard by a factor of 2.4 (HI = 2.4, > 1.0).

SVOCs

Unacceptable risk from benz(a)anthracene, benzo(a)pyrene, and dibenz (a,h)anthracene were the result of one detection at sample location AB 28 in 2010. All other samples were nondetect for these constituents.

Recreational User

The complete pathway of exposure for the current and future recreational user was determined to be direct contact with sediments in Bear Creek (Table C3-5).

The total ECR for this receptor is 7E-06, with no unacceptable noncancer health impacts anticipated (HI = 0.23, <1.0). Chemicals of concern were identified as dioxin expressed as 2,3,7,8-TCDD TEQ, and benzo(a)pyrene.

Dioxin

Dioxin exceeded the regulatory standard of 1E-06 for this receptor. The Hazard Index, representing noncancer health impacts, was below the regulatory standard (HI = 0.21, <1.0).

Benzo(a)pyrene

Unacceptable risk from benzo(a)pyrene was the result of one detection at sample location AB-28 in 2010. All other samples were nondetect.

Trespasser

Complete pathways of exposure for the current and future trespasser were determined to be direct contact with soil in the Dip Tank area and sediments in Bear Creek. The ECR for this receptor was 8E-08 which does not exceed the regulatory standard of 1E-06. The HI for noncancer human health impacts is 0.03 which does not exceed the regulatory standard of 1.0. Therefore, no unacceptable health risks are anticipated for this receptor (Table C3-6).

3.4.2 Dioxin Congener Analysis

The RBC screening determined that exposure to dioxin was the primary driver of unacceptable risk. In compliance with the practices at the time the Phase 1 RI was conducted in 2010-2011, dioxin were screened in terms of TEF wherein, the congeners of dioxin were converted to their 2,3,7,8-TCDD equivalents, an EPC was calculated for each designated area (e.g. Dip Tank, Bear Creek sediments) and screened as a total TCDD TEQ (Table C3-7).

Consistent with DEQ and EPA practices, when TCDD TEQ values exceed the RBC screening criteria, it is acceptable to evaluate the potential toxicity of individual congeners subject to the following criteria.

- The total ECR from the individual congeners does not exceed 1E-05.
- No individual congener ECR exceeds 1E-06.

Therefore, in cases where 2,3,7,8-TCDD TEQ values exceeded the regulatory criteria for carcinogens of 1E-06, a congener analysis was performed according to conventional practices at the time the Phase 1 RI was submitted and, subsequently, to evaluate several potential exposure scenarios for the Dip Tank soils and Bear Creek sediments.

As previously applied by DEQ in this situation, the regulatory standard for individual carcinogens (1E-06) was applied to each individual congener and an ECR standard for acceptable cumulative risk of 1E-05 for multiple congeners was applied. This analysis was performed for receptors determined to have cumulative risks governed by dioxin in the ECR range between 1E-06 and 1E-05. Appendix C provides congener-specific ECR calculations for the identified receptor scenarios.

The results of the congener specific risk analysis are discussed below.

3.4.3 Risk Characterization for the Dip Tank Area

Dioxin were detected in soils in the Dip Tank Area. The ECR for a trespasser in the Dip Tank Area did not demonstrate the potential for unacceptable risk. The ECR for dioxin exceeded the regulatory standard of 1E-06 for occupational worker, construction worker, and excavation worker. Therefore, a congener specific evaluation was performed for these receptors (Table C3-8).

The congener analysis helps to identify the specific sampling locations of concern that drive the overall unacceptable risk in the Dip Tank Area. In addition, guidance for congener analysis provides a modified criteria for defining unacceptable risk for dioxin.

The dataset for the Dip Tank Area is represented by 22 sampling locations. Table C3-9 presents the sum of the ECRs by location for occupational receptors represented by a current and future worker, a future construction worker, and a future excavation worker.

Twelve sampling locations exceeded the regulatory standard of ECR = 1E-06 for the current and future occupational receptor and four sampling locations exceeded the regulatory standard for the future construction worker. Two of these samples (AB-19A and AB-19B) were collected from Catch Basin sediments and are not representative of typical site soils. These two catch basin samples will be addressed separately under the FS.

None of the sampling locations exceeded the regulatory standard for carcinogens for the excavation worker scenario. Since the cumulative risk from dioxin is less than 1E-05 and none of the individual congeners exceed the regulatory standard of 1E-06, no further analysis is required for the excavation worker and no unacceptable human health impacts are anticipated for this receptor.

Occupational Worker

Table C3-9 indicates potential ECRs for twelve dioxin sampling locations exceeded the regulatory standard for carcinogens. Of these, eight did not exceed the ECR standard for total TEQ cumulative risk of 1E-05. Individual congener analysis determined that individual congeners at five locations (AB-08/0-6, B1-4(0.5) COMP, B17-20 (0.5) and (1.5) COMP, and B29-32 (0.5) COMP) did not exceed the regulatory standard for individual carcinogens of 1E-06.

- Table C3-10 presents the five soil locations at the Dip Tank portion of the site wherein the cumulative risk is greater than 1E-06 but less than 1E-05 and individual congeners do not exceed the regulatory standard of ECR = 1E-06. Therefore, no unacceptable human health impacts are anticipated in these areas.

- Table C3-11 presents those locations wherein the cumulative risk is greater than 1E-05 and individual congeners exceed the regulatory standard of 1E-06 (considered to be unacceptable risk criteria).

Construction Worker

Potential ECRs for four sampling locations exceeded the regulatory standard for carcinogens (Table C3-9). None of these locations exceeded the ECR standard for cumulative risk of 1E-05. Individual congener analysis determined that congeners at two locations (AB-05/0-6, B13-16 (0.5) COMP) did not exceed the regulatory standard for individual carcinogens of 1E-06. Therefore no unacceptable human health impacts are anticipated in these two areas.

- Table C3-12 presents two locations at the Dip Tank portion of the site wherein the cumulative risk is greater than 1E-06, but less than 1E-05 and individual congeners do not exceed the regulatory standard of ECR = 1E-06.
- Table C3-13 presents two locations wherein the cumulative risk is less than or equal to 1E-05 but individual congeners exceed the regulatory standard of 1E-06 Unacceptable risk criteria).

3.4.4 Risk Characterization for the Bear Creek Sediments

Dioxin were found in sediments in Bear Creek which traverses the Floragon site. The ECR for dioxin did not exceed the regulatory standard of 1E-06 for an occupational, construction worker or excavation worker exposure to Creek sediments. In addition, the ECR for a trespasser exposure to Bear Creek sediments did not exceed the regulatory criteria for carcinogens of 1E-06. However, exposure to Creek sediments under residential conditions and recreational use did result in ECRs which exceeded the regulatory standard of 1E-06 (Table C3-14). Therefore, a congener specific evaluation was performed for the resident and the recreational user of the creek.

The congener analysis helps to identify specific sampling locations of concern that drive the overall unacceptable risk in Bear Creek sediments. In addition, guidance for congener analysis provides a modified criteria for defining unacceptable risk for dioxin.

The dataset for Bear Creek sediments is represented by 38 samples collected at various transect locations and depths. Table C3-15 presents the sum of ECRs for the individual congeners at each location for residential and recreational exposures.

Twenty-nine of the sampling locations exceeded the regulatory standard of ECR = 1E-06 for residential exposure to Bear Creek sediments, and eleven sampling locations exceeded the regulatory standard for recreational exposures to Bear Creek sediments. Individual congener analysis was performed for each sampling location wherein the 2,3,7,8-TCDD TEQ concentration exceeded the 1E-06 regulatory standard. The results are presented below.

Residential Exposure

Potential ECRs for twenty-nine sampling locations exceeded the regulatory standard for carcinogens. Of these, twenty-seven did not exceed the ECR standard for cumulative risk of 1E-05. Individual congener analysis determined that individual congeners at nine locations (SED COMP 1, SED COMP 4, SED COMP 6, AB-25-3 COMP, SED-200-AC (1-2) COMP, SED-202 ABC (0-1) COMP, SED 203-AC (1-2) COMP, SED 208-ABC (1-2) COMP and SED 209-AB (1-2) COMP) did not exceed the regulatory standard for individual carcinogens of 1E-06.

- Table C3-16 presents the 18 sediment locations at Bear Creek wherein the cumulative risk is greater than 1E-06, but less than 1E-05 and individual congeners do not exceed the regulatory standard of ECR = 1E-06. No unacceptable human health impacts are anticipated from the sampling locations delineated in Table C3-16.
- Table C3-17 presents nine sample locations where the cumulative acceptable risk is less than or equal to 1E-05, but one or more individual congeners exceed the regulatory standard of 1E-06 (unacceptable risk criteria).
- Two sampling locations (AB-25 and SED-207 ABC (1-2) COMP) exceed the criteria for both cumulative and individual risk (Table C3-18).

Recreational Exposure

Potential ECRs for twenty-nine sampling locations exceeded the regulatory standard for carcinogens. Of these, none exceeded the ECR standard for cumulative risk of 1E-05. Individual congener analysis determined that individual congeners at ten locations did not exceed the regulatory standard for individual carcinogens of 1E-06.

- Table C3-19 presents those locations on Bear Creek wherein the cumulative risk is greater than 1E-06, but less than 1E-05 and individual congeners do not exceed the regulatory standard of ECR = 1E-06. No unacceptable human health impacts are anticipated at these sampling locations.
- Table C3-20 presents one sampling location that did not exceed the cumulative acceptable risk of 1E-05, but has an individual congener exceeding the individual regulatory standard of 1E-06 (unacceptable risk criteria).

3.5 UNCERTAINTY ANALYSIS

Risk assessment is a complex process requiring the integration of contaminant release information, fate and transport of chemicals, toxicity information, and risk characterization. Inherent in each of these steps are varying degrees of uncertainty that may influence the results of the risk assessment process. Uncertainties associated with the different components of a risk assessment can affect the degree of confidence that can be placed on the risk assessment results.

3.5.1 Data Collection and Evaluation

Several sources of uncertainty are associated with the raw data collection. A primary source of these uncertainties lies within the design and execution of the sampling plan. A sampling plan is designed in such a way as to be representative of site conditions, thus eliminating significant gaps in the data. Also, included within this plan is the protocol for the laboratory analysis of the samples, as this is limited to samples collected from the site and is dependent upon the homogeneity of the samples collected.

Limits of detection add to the uncertainty of the data. With the exception of dioxin, non-detects were identified at the MRL which is higher than the standard method detection limit (MDL) generally used in risk assessments. Non-detects for dioxin were reported at the EDL. Inclusion of different detection limit introduces additional uncertainty in the analysis. Use of the MRL tends to overestimate risk.

Inclusion of discrete and composite soil samples in a single dataset may be a source of uncertainty when calculating exposure point concentrations. And depth of sampling is an important consideration when addressing reasonably likely pathways of exposure.

Numerous Bear Creek sediment samples have been collected at the Floragon property and analyzed for dioxin. Each sediment sample is a transect composite of three (where possible) sub-samples collected in close proximity to each other. Dioxin distribution in Bear Creek at the site is generally centered near the relative high concentrations in Reach 3 around AB-25, but other relative "spikes" in concentration both upstream and downstream of Reach 3 appear localized and are likely to be associated with different contributing urban sources and stormwater outfalls collecting runoff from adjacent roadways which appear not be site-related.

The RI report (PNG 2016b) provides supplemental characterization details regarding contaminant distribution and creek flow characteristics.

3.5.2 Human Health Exposure Assessment

There are several sources of uncertainty in the exposure assessment that can affect the estimates of exposure and therefore the risk characterization. In all exposure assessments there are uncertainties associated with the sampling data and how well the data represent site conditions. Additionally, there are uncertainties associated with how well the exposure assumptions represent actual exposure conditions.

EPCs are calculated to determine a high end average concentration to which a receptor may be exposed. Most data is easily incorporated into the ProUCL Statistical Program to general the EPCs. Over the years, the preferred methodology for addressing non-detects has varied. Current guidance requires the use of the full detection limit when calculating EPCs. Use of the full value may tend to overestimate potential risk. At the Floragon site, for all analytes except for dioxin, non-detects are reported at the MRL. MRLs are higher than MDLs and therefore use of this higher value in the risk assessment would tend to overestimate potential human health risk.

One of the primary uncertainties associated with the exposure assessment is the determination of how many and how often people may be on-site. Assumptions regarding use are expected to overestimate rather than underestimate exposures and, therefore, risks. Also, there are uncertainties associated with the probability of adverse effects in a human population that is highly variable (e.g., due to sex, age, genetic predisposition, activity level, and/or lifestyle).

EPA and DEQ standard default exposure assumptions were used for current and future occupational workers, future construction workers, future trench workers, and current and future residents (see Section 3.2.1). Exposure assumptions for the trespasser and recreational user of Bear Creek were developed based on professional judgment but were designed to be conservative. To be consistent, the input parameters used for these non-standard receptors are consistent with those previously approved and used in the risk evaluation of other portions of this site (PNG 2011; EES 2014a, 2014b).

Most exposure scenarios considered in this risk assessment are theoretical but very conservative and result in multiple layers of protection:

- Construction and excavation worker exposures at the Dip Tank Area are generally reasonably likely but duration of exposure, if any, would be very brief. Construction exposures in Bear Creek are also very unlikely. The conservative assumptions used for these scenarios would tend to overestimate potential risk.
- Occupational and trespasser exposures to dioxin under the Dip Tank Area paved surfaces and in Bear Creek sediments are highly unlikely. Therefore, inclusion of these pathways of exposure would tend to overestimate potential risk.

- Recreational exposures to creek sediments on the Floragon site are very unlikely, and residential exposures at site-related concentrations are virtually impossible based on current zoning and known creek dynamics (PNG 2016b). Potential downstream exposures to dioxin in Bear Creek sediments would be infrequent at best. Therefore, inclusion of these scenarios is provided for reference but presents extremely protective and unrealistic scenarios that would tend to overestimate overall risk to site related contaminants.

3.5.3 Risk Characterization

The uncertainties in the risk characterization are associated with:

- The validity of adding risks or hazard quotients for multiple chemicals.
- The validity of adding risks or hazard quotients across pathways.
- The validity of the critical underlying assumptions in the dose-response model for carcinogens that there is no threshold for carcinogenesis.
- The probability of adverse effects in a human population that is highly variable in genetic disposition, age, activity level, and lifestyle.

Uncertainties associated with the different components of a risk assessment can affect the degree of confidence that can be placed on the risk assessment results. Conservative assumptions were used throughout this risk assessment may minimize the impact of the uncertainties associated with the risk assessment process and likely overestimate the potential risk so as to be protective for current and future receptors.

4 SUMMARY AND DISCUSSION OF HUMAN HEALTH RISK ASSESSMENT

The following section summarizes and discusses the results of the HHRA for the Dip Tank Area and the Bear Creek sediments.

4.1 DIP TANK AREA

4.1.1 Groundwater

Two COPCs were identified in groundwater in the Dip Tank Area. The complete pathways of exposure were determined to be inhalation of volatiles intruding into indoor air (occupational exposure) and volatilization from groundwater into outdoor air (occupational worker, construction worker, and excavation worker). RBC screening determined that concentrations of 1,1,2-trichloroethane and 1,4-dichlorobenzene did not exceed the regulatory standard for carcinogens of 1E-06 and noncancer HI of 1.0 and therefore no unacceptable human health risk or hazards are anticipated from exposure to volatiles in groundwater.

4.1.2 Soil and Catch Basin Sediments

Three COPCs (total arsenic, 1,2,3-trichloropropane and 2,3,7,8-TCDD TEQ) were identified in the Dip Tank area soils.

Dioxin

Dioxin in soil, represented as 2,3,7,8-TCDD TEQ, were found to present an unacceptable human health risk for the occupational worker, the construction worker, and the excavation worker. The ECR for each potential receptor was calculated to be 2E-06.

As was done in previously submitted and DEQ-approved reports regarding other portions of the Floragon property, a congener analysis was performed to characterize dioxin risks. Consistent with EPA's guidance on congener analysis, the acceptable criteria was considered to be 1E-05 for cumulative risk when the ECRs of all congeners are summed, provided that individual congener ECRs not to exceed 1E-06.

- For 7 of the 22 soil sampling locations, unacceptable ECR criteria were calculated for the occupational worker. Two of these sampling locations (AB19A and AB19B) are Catch Basin sediment samples and will be addressed as part of future source control activities. Under current conditions, the Dip Tank Area is covered by pavement and therefore the pathway for the direct exposure pathway for soils on this portion of the site is incomplete.
- Regarding construction worker exposures, only 2 of the 22 sample locations did not meet the acceptable criteria of a cumulative risk at or below 1E-05 and an individual risk at or below 1E-06. These sampling locations include AB-06/0-6 (shallow soil) and AB19B (Catch Basin sediment). All other locations meet the acceptable risk criteria for cumulative and individual risk.
- All of the sampling locations met the criteria for cumulative and individual risk for the excavation worker.
- There was no unacceptable risk for the trespasser on the Dip Tank portion of the site.

Other COPCs

- Concentrations of total arsenic did not exceed the published background concentration of arsenic in Portland Basin soils (DEQ 2013) except at one location (B9-12 (1.5) COMP) where there was a slight exceedance (9.4 mg/Kg). Arsenic was not detected in one sample collected from Catch Basin sediment, but the analytical MRL was almost three times the background concentration, and this elevated MRL is inconsistent with other detected concentrations which are below background arsenic concentrations. Inclusion of this one sample skews the EPC statistics for arsenic, which is therefore not regarded as a site-related contaminant.
- As Catch Basins will be addressed for source control as part of future site maintenance and remedial actions, removal of the Catch Basin samples from the dataset could be considered. In that case, the maximum concentration of arsenic is 9.4 mg/Kg, the arithmetic average is 2.95 mg/Kg, the median concentration is 2.26 mg/Kg and the 90 UCL is 3.9 mg/Kg. Therefore, arsenic could be eliminated as a COPCs based on residual risk, assuming elimination of the AB-19A and AB-19B Catch Basin data.
- There were no detections of 1,2,3-Trichloropropane in soil. Inclusion as a COPC was based on MDLs which exceeded the minimum human health screening criteria. 1,2,3-trichloropropane was removed from consideration as a COPC based on prior risk assessment (PNG 2011) and therefore it was also removed from consideration for purposes of this report.

4.2 BEAR CREEK SEDIMENTS

Five COPCs were identified in Bear Creek sediments, including total arsenic, benz(a)anthracene, benzo(a)pyrene, dibenz(a,h) anthracene and dioxin represented as 2,3,7,8-TCDD TEQ.

4.2.1 Dioxin

Dioxin are present in Bear Creek sediments at the Floragon site. The ECR for dioxin did not exceed the regulatory standard of 1E-06 for occupational, construction worker, or excavation worker exposures to creek sediments. In addition, the ECR for a trespasser exposure to Bear Creek sediments did not exceed the regulatory standard for carcinogens of 1E-06.

Exposure to certain specific and localized upstream sediments under theoretical residential conditions and recreational use did result in ECRs which exceeded the regulatory standard of 1E-06. Such non-occupational conditions cannot reasonably occur at the industrial site, and downstream sediment locations at the Floragon site (located in closer proximity to offsite residential and recreational land use) do not represent unacceptable risk conditions. The premise for residential and recreational use exposure scenarios evaluated in this risk assessment is the overflow of only the most highly-contaminated portions of Bear Creek sediments during flooding of the creek onto downstream residential properties which border portions of the Site. RI Figures 6, 7, 8, and 9 present a view of the location of these samples, zoning issues and proximity to residential properties.

A congener specific evaluation was performed to evaluate potential risks for these non-occupational receptors (Table C3-21).

- The ECR for residential exposures to dioxin in sediments was calculated to be 2E-05 and the noncancer HI was 2.4. These values exceed the regulatory standard of 1E-06 for the ECR and 1.0 for the HI.
- Nine sampling locations did not exceed the acceptable cumulative ECR of 1E-05, but did have individual congeners exceeding the regulatory standard of 1E-06. All of these samples were collected from the site's upstream portions of Bear Creek above the beaver dam areas, including AB-23, AB-28, AB-25 1COMP, AB-25-2COMP, SED-201 ABC (0-1) COMP, SED-203 ABC (0-1) COMP, SED 204ABC (0-1) COMP, SED 204 AC (1-2) COMP and SED 209-ABC (0-1) COMP. One additional sampling location exceeded both the acceptable cumulative and individual risk (AB-25 and SED-207-ABC (1-2) COMP).

The sampling locations listed above are in upstream portions of the site which are very unlikely to impact residential properties. All other sediment sample locations meet the acceptable criteria for cumulative and individual risk. Therefore no unacceptable human health impacts are anticipated from residential exposures to Bear Creek sediments where flooding may cause sediments to overflow onto adjacent properties.

Under a residential use scenario, one location (SED 207 ABC (1-2) COMP) met the acceptable cumulative risk criteria but exceeded the criteria for individual congener risk. This sample is located on the Floragon property zoned light industrial. While there is some potential for trespasser exposure, this is an extremely unlikely location and depth for recreational use. All other locations met the both cumulative and individual acceptable risk standard. Therefore no unacceptable human health impacts are anticipated for any site recreational use of Bear Creek.

4.2.2 Other COPCs

- Of the 21 sediment samples analyzed for metals, one detection (AB-28) exceeded the regional soil background concentration for total arsenic. In addition, three samples were non-detects at detection limits which exceeded typical background concentrations. These four samples were collected in 2010. Subsequent sampling in 2012 and 2015 indicated arsenic in sediments did not exceed typical background concentrations. Among these samples, the maximum concentration is 6.84 mg/Kg, arithmetic average is 3.6 mg/Kg and median concentration is 3.44 mg/Kg.
- The EPCs for PAHs including benzo(a)anthracene, benzo(a)pyrene, and dibenz(a,h)anthracene were represented by the sampling results of the one and only detect out of 16 sediment samples, collected at AB-28.

Based on current and reasonably likely future conditions, reasonably likely exposure scenarios, exposure factors that do not rely on high reporting limits for non-detects, and planned future source-control maintenance of Catch Basin areas, no unacceptable human health risks are anticipated from exposures to other chemicals identified at the site.

5 LIMITATIONS

PNG has prepared this report for use by Avison Lumber Company. This report may be made available to future property owners and to regulatory agencies. This report is not intended for use by others and the information contained herein is not applicable to other sites.

Our interpretation of subsurface conditions is based on field observations and chemical analytical data. Areas with contamination may exist in portions of the site that were not explored or analyzed.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices and laws, rules, and regulations at the time that the report was prepared. No other conditions, express or implied, should be understood.

PNG ENVIRONMENTAL, INC.

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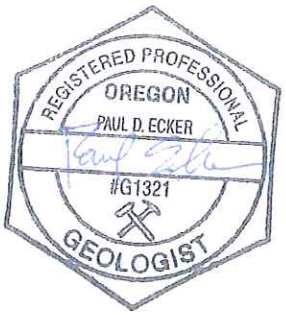

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TABLES

Table C2-1
Chemicals of Interest Remaining After Initial Screening
Floragon Property
Molalla, Oregon

Chemical of Interest (COI)	Surface Soil	Groundwater	Sediments
Total Arsenic	X		X
2,3,7,8-TCDD (dioxin)	X		
2,3,7,8-TEQ	X		X
1,2,3-Trichloropropane	X		
Benz(a)anthracene			X
Benzo(a)pyrene		X	X
Dibenz(a,h)anthracene		X	X
1,1,2-Trichloroethane		X	
1,2-Dibromoethane		X	
1,2-Dichloroethane		X	
1,3-Dichloropropene, cis-		X	
1,3-Dichloropropene, trans-		X	
1,4-Dichlorobenzene		X	
2,2-Dichloropropane		X	
Carbon tetrachloride		X	
Chloroform		X	
Vinyl chloride		X	

Notes:
Shaded cells indicate analyte was not detected. The Method Reporting Limit (MRL) was greater than minimum screening value.
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent.
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December 2010.

Table C3-1
Occupational Worker - RBC Screening
Floragon Property
Molalla, Oregon

COPC	Medium	ECR	HI
Arsenic, Total	Soil	**2.00E-06**	0.012
2,3,7,8-TCDD TEQ	Soil	**2.00E-06**	0.04
1,1,2-Trichloroethane	Groundwater	7.00E-14	0.00000006
1,4-Dichlorobenzene	Groundwater	8.00E-13	NA
Total Arsenic	Bear Creek Sediment	4.00E-07	0.015
2,3,7,8-TCDD TEQ	Bear Creek Sediment	1.00E-06	0.32
Benz(a)anthracene	Bear Creek Sediment	2.00E-08	NA
Benzo(a)pyrene	Bear Creek Sediment	2.00E-07	NA
Dibenz(a,h)anthracene	Bear Creek Sediment	3.00E-08	NA
	TOTALS	**6.00E-06**	0.34

Notes:
Shaded cells indicate analyte was not detected. The Method Reporting Limit (MRL) was greater than minimum screening value.
Bold = ECR > 1.00E-06
RBC = Risk Based Concentration
COPC = Chemical of Potential Concern
ECR = Excess Cancer Risk
HI = Hazard Index
NA = Not Applicable
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent.
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December 2010.

Table C3-2
Construction Worker - RBC Screening
Floragon Property
Molalla, Oregon

COPC	Medium	ECR	HI
Arsenic, Total	Soil	3.00E-07	0.04
2,3,7,8-TCDD TEQ	Soil	**2.00E-06**	0.07
1,1,2-Trichloroethane	Groundwater	5.00E-10	0.00002
1,4-Dichlorobenzene	Groundwater	NA	NA
Total Arsenic	Bear Creek Sediment	3.00E-07	0.047
2,3,7,8-TCDDTEQ	Bear Creek Sediment	7.00E-07	0.53
Benz(a)anthracene	Bear Creek Sediment	1.00E-08	NA
Benzo(a)pyrene	Bear Creek Sediment	1.00E-07	NA
Dibenz(a,h)anthracene	Bear Creek Sediment	2.00E-08	NA
	TOTALS	**3.00E-06**	0.58

Notes:

Shaded cells indicate analyte was not detected. The Method Reporting Limit (MRL) was greater than minimum screening value.

Bold = ECR > 1.00E-06

RBC = Risk Based Concentration

COPC = Chemical of Potential Concern

ECR = Excess Cancer Risk

HI = Hazard Index

NA = Not Applicable

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December 2010.

Table C3-3
Excavation Worker - RBC Screening
Floragon Property
Molalla, Oregon

COPC	Medium	ECR	HI
Arsenic, Total	Soil	9.00E-09	0.001
2,3,7,8-TCDD TEQ	Soil	**2.00E-06**	0.00246
1,1,2-Trichloroethane	Groundwater	5.00E-13	0.00001
1,4-Dichlorobenzene	Groundwater	3.00E-12	0.0000006
Total Arsenic	Bear Creek Sediment	1.00E-08	0.002
2,3,7,8-TCDD TEQ	Bear Creek Sediment	3.00E-08	0.019
Benz(a)anthracene	Bear Creek Sediment	4.00E-10	NA
Benzo(a)pyrene	Bear Creek Sediment	5.00E-09	NA
Dibenz(a,h)anthracene	Bear Creek Sediment	6.00E-10	NA
	TOTALS	**2.00E-06**	0.02

Notes:
Shaded cells indicate analyte was not detected. The Method Reporting Limit (MRL) was greater than minimum screening value.
Bold = ECR > 1.00E-06
RBC=Risk Based Concentration
COPC = Chemical of Potential Concern
ECR = Excess Cancer Risk
HI = Hazard Index
NA = Not Applicable
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent.
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December 2010.

Table C3-4
Offsite Residential Exposure - RBC Screening
Floragon Property
Molalla, Oregon

COPC	Medium	ECR	HI
Total Arsenic	Bear Creek Sediments	**1E-05**	0.21
2,3,7,8-TCDD TEQ	Bear Creek Sediments	**3E-05**	**2.4**
Benz(a)anthracene	Bear Creek Sediments	**2E-06**	NA
Benzo(a)pyrene	Bear Creek Sediments	**2E-05**	NA
Benzo(b+k) fluoranthene	Bear Creek Sediments	**3E-06**	NA
Dibenz(a,h)anthracene	Bear Creek Sediments	**3E-06**	NA
	TOTALS	**7E-05**	**2.58**

Notes:
Bold = ECR > 1.00E-06 and/or HI > 1.0
RBC= Risk Based Concentration
ECR= Excess Cancer Risk
HI= Hazard Index
NA = Not Applicable
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December 2010.

Table C3-5
Recreational User of Bear Creek - RBC Screening
Floragon Property
Molalla, Oregon

COPC	Medium	ECR	HI
Total Arsenic	Bear Creek Sediment	1.00E-06	0.018
2,3,7,8-TCDD TEQ	Bear Creek Sediment	**2.00E-06**	0.21
Benz(a)anthracene	Bear Creek Sediment	2.00E-07	NA
Benzo(a)pyrene	Bear Creek Sediment	**3.00E-06**	NA
Dibenz(a,h)anthracene	Bear Creek Sediment	4.00E-07	NA
	TOTALS	**7.00E-06**	0.23

Notes:
Bold = ECR > 1.00E-06
RBC= Risk Based Concentration
COPC = Chemical of Potential Concern
ECR = Excess Cancer Risk
HI = Hazard Index
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent.
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December 2010.

Table C3-6
Trespasser - RBC Screening
Floragon Property
Molalla, Oregon

COPC	Medium	ECR	HI
Arsenic, Total	Soil	1.00E-08	0.0002
2,3,7,8-TCDD TEQ	Soil	4.00E-09	0.0004
Total Arsenic	Bear Creek Sediment	1.00E-08	0.008
2,3,7,8-TCDD TEQ	Bear Creek Sediment	3.00E-08	0.02
Benz(a)anthracene	Bear Creek Sediment	5.00E-10	-
Benzo(a)pyrene	Bear Creek Sediment	6.00E-09	-
Dibenz(a,h)anthracene	Bear Creek Sediment	2.00E-08	-
	TOTALS	8E-08	0.03

Notes:
RBC = Risk Based Concentration
COPC = Chemical of Potential Concern
ECR = Excess Cancer Risk
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent.
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December 2010.

Table C3-7
Summary of 2,3,7,8-TCDD TEQ Risk Characterization
Floragon Property
Molalla, Oregon

Receptor	Medium	Chemical	ECR
Occupational Worker	Dip Tank Soils	2,3,7,8-TCDD TEQ	**2E-06**
	Bear Creek Sediments	2,3,7,8-TCDD TEQ	1E-06
Construction Worker	Dip Tank Soils	2,3,7,8-TCDD TEQ	**2E-06**
	Bear Creek Sediments	2,3,7,8-TCDD TEQ	7E-07
Excavation Worker	Dip Tank Soils	2,3,7,8-TCDD TEQ	**2E-06**
	Bear Creek Sediments	2,3,7,8-TCDD TEQ	3E-08
Trespasser	Dip Tank Soils	2,3,7,8-TCDD TEQ	4E-09
	Bear Creek Sediments	2,3,7,8-TCDD TEQ	3E-08
Future Resident	Bear Creek Sediments	2,3,7,8-TCDD TEQ	**3E-05**
Recreational User	Bear Creek Sediments	2,3,7,8-TCDD TEQ	**2E-06**

Notes:
Bold = ECR > 1.00E-06
ECR = Excess Cancer Risk
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent.
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December 2010.

Table C3-8
2,3,7,8-TCDD TEQ Risk Characterization - Dip Tank Area
Floragon Property
Molalla, Oregon

Receptor	Medium	Chemical	ECR
Occupational Worker	Dip Tank Soils	2,3,7,8-TCDD TEQ	**2E-06**
Construction Worker	Dip Tank Soils	2,3,7,8-TCDD TEQ	**2E-06**
Excavation Worker	Dip Tank Soils	2,3,7,8-TCDD TEQ	**2E-06**
Trespasser	Dip Tank Soils	2,3,7,8-TCDD TEQ	4E-09

Notes:

Bold = ECR > 1.00E-06

ECR = Excess Cancer Risk

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December

Table C3-9
Total ECR for 2,3,7,8-TCDD TEQ by Sampling Location - Dip Tank Area
Floragon Property
Molalla, Oregon

Sampling Location	Occupational Worker	Construction Worker	Excavation Worker
AB-03/1	**7.00E-06**	9.00E-07	3.00E-08
AB-05/0-6	**1.00E-05**	**(2.00E-06)**	7.00E-08
AB-06/0-6	**1.00E-04**	**1.00E-05**	5.00E-07
AB-08/0-6	**(2.00E-06)**	3.00E-07	9.00E-09
B1-4 (0.5) COMP	**(2.00E-06)**	2.00E-07	9.00E-09
B1-4 (1.5) COMP	7.00E-07	8.00E-08	3.00E-09
B5-8 (0.5) COMP	8.00E-07	1.00E-07	4.00E-09
B5-8 (1.5) COMP	3.00E-07	4.00E-08	1.00E-09
B9-12 (0.5) CIMP	9.00E-07	1.00E-07	4.00E-09
B9-12 (1.5) COMP	9.00E-07	1.00E-07	4.00E-09
B13-16 (0.5) COMP	**2.00E-05**	**(3.00E-06)**	1.00E-07
B13-16 (1.5) COMP	**8.00E-06**	1.00E-06	4.00E-08
B17-20 (0.5) COMP	**(2.00E-06)**	3.00E-07	1.00E-08
B17-20 (1.5) COMP	**(3.00E-06)**	4.00E-07	1.00E-08
B21-24 (0.5) COMP	1.00E-06	2.00E-07	6.00E-09
B21-24 (1.5) COMP	2.00E-07	2.00E-08	7.00E-10
B25-28 (0.5) COMP	3.00E-07	3.00E-08	1.00E-09
B25-28 (1.5) COMP	3.00E-08	3.00E-09	1.00E-10
B29-32 (0.5) COMP	**(2.00E-06)**	3.00E-07	9.00E-09
B29-32 (1.5) COMP	2.00E-07	3.00E-08	1.00E-09
AB-19A[a]	**5.00E-06**	6.00E-07	2.00E-08
AB-19B[a]	**5.00E-05**	**7.00E-06**	2.00E-07

Notes:
[a] Catch Basin Sample
ECR = Excess Cancer Risk
Bold = ECR > 1.00E-06
(Values in Parentheses) do not exceed individual congener risk criteria, see Table C3-10.
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent.
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December 2010.

Table C3-10
Dip Tank Locations with Acceptable Cumulative and Individual Risk - Occupational Receptors
Floragon Property
Molalla, Oregon

Analyte	AB-08/0-6	B1-4 (0.5) COMP	B17-20 (0.5) COMP	B17-20 (1.5) COMP	B29-32 (0.5) COMP
2,3,7,8-TCDD	1.00E-07	1.00E-08	2.00E-08	2.00E-08	9.00E-09
1,2,3,7,8-PeCDD	8.00E-07	1.00E-07	2.00E-07	3.00E-07	1.00E-07
1,2,3,4,7,8-HxCDD	4.00E-08	6.00E-07	3.00E-08	5.00E-08	5.00E-08
1,2,3,6,7,8-HxCDD	5.00E-07	5.00E-07	1.00E-06	1.00E-06	1.00E-06
1,2,3,7,8,9-HxCDD	1.00E-07	6.00E-08	1.00E-07	2.00E-07	2.00E-07
1,2,3,4,6,7,8-HpCDD	2.00E-07	5.00E-07	8.00E-07	1.00E-06	8.00E-07
OCDD	2.00E-08	6.00E-08	2.00E-07	2.00E-07	2.00E-07
2,3,7,8-TCDF	1.00E-07	6.00E-09	2.00E-08	4.00E-08	3.00E-08
1,2,3,7,8-PeCDF	2.00E-08	2.00E-09	9.00E-09	1.00E-08	4.00E-09
2,3,4,7,8-PeCDF	2.00E-07	2.00E-08	1.00E-07	2.00E-07	5.00E-08
1,2,3,4,7,8-HxCDF	7.00E-08	1.00E-07	1.00E-07	1.00E-07	4.00E-08
1,2,3,6,7,8-HxCDF	1.00E-07	8.00E-08	1.00E-07	1.00E-07	4.00E-08
2,3,4,6,7,8-HxCDF	7.00E-08	5.00E-08	9.00E-08	1.00E-07	5.00E-08
1,2,3,7,8,9-HxCDF	1.00E-08	4.00E-09	6.00E-09	5.00E-09	3.00E-09
1,2,3,4,6,7,8-HpCDF	2.00E-07	4.00E-07	3.00E-07	2.00E-07	7.00E-08
1,2,3,4,7,8,9-HpCDF	8.00E-09	1.00E-08	6.00E-09	6.00E-09	8.00E-09
OCDF	3.00E-09	2.00E-08	6.00E-09	5.00E-09	8.00E-09
Cumulative ECR	2E-06	2E-06	2E-06	3E-06	2E-06

Notes:

All values are ECRs (Excess Cancer Risk)

Table C3-11
Individual Congener Analysis - ECRs for Occupational Exposures in Dip Tank Area
Floragon Property
Molalla, Oregon

Analyte	AB-03/1	AB-05/0-6	AB-06/0-6	B13-16 (0.5) COMP	B13-16 (1.5) COMP	AB-19A[a]	AB-19B[a]
2,3,7,8-TCDD	1.00E-07	1.00E-07	**2.00E-06**	1.00E-07	5.00E-08	2.00E-07	**2.00E-06**
1,2,3,7,8-PeCDD	4.00E-07	**2.00E-06**	2.00E-05	**4.00E-06**	7.00E-07	**2.00E-06**	**2.00E-05**
1,2,3,4,7,8-HxCDD	8.00E-08	2.00E-07	1.00E-06	5.00E-07	1.00E-07	2.00E-07	**2.00E-06**
1,2,3,6,7,8-HxCDD	**2.00E-06**	**6.00E-06**	**3.00E-05**	**1.00E-05**	**3.00E-06**	1.00E-06	**1.00E-05**
1,2,3,7,8,9-HxCDD	4.00E-07	**2.00E-06**	**4.00E-06**	**2.00E-06**	5.00E-07	7.00E-07	**6.00E-06**
1,2,3,4,6,7,8-HpCDD	**5.00E-06**	**5.00E-06**	**5.00E-05**	**7.00E-06**	**3.00E-06**	1.00E-06	**1.00E-05**
OCDD	9.00E-07	2.00E-07	**3.00E-06**	1.00E-06	4.00E-07	2.00E-07	**2.00E-06**
2,3,7,8-TCDF	5.00E-08	1.00E-07	**2.00E-06**	4.00E-07	3.00E-07	1.00E-07	1.00E-06
1,2,3,7,8-PeCDF	1.00E-08	3.00E-08	2.00E-07	1.00E-07	5.00E-08	2.00E-08	2.00E-07
2,3,4,7,8-PeCDF	2.00E-07	3.00E-07	**4.00E-06**	1.00E-06	6.00E-07	2.00E-07	**3.00E-06**
1,2,3,4,7,8-HxCDF	1.00E-07	6.00E-07	**4.00E-06**	1.00E-06	4.00E-07	1.00E-07	1.00E-06
1,2,3,6,7,8-HxCDF	1.00E-07	1.00E-06	**2.00E-06**	1.00E-06	3.00E-07	2.00E-07	**3.00E-06**
2,3,4,6,7,8-HxCDF	1.00E-07	8.00E-07	**2.00E-06**	8.00E-07	4.00E-07	2.00E-07	**2.00E-06**
1,2,3,7,8,9-HxCDF	8.00E-09	5.00E-08	9.00E-08	9.00E-08	2.00E-08	6.00E-09	6.00E-08
1,2,3,4,6,7,8-HpCDF	4.00E-07	**2.00E-06**	**9.00E-06**	**2.00E-06**	1.00E-06	3.00E-07	**2.00E-06**
1,2,3,4,7,8,9-HpCDF	1.00E-08	8.00E-08	**2.00E-06**	9.00E-08	4.00E-08	2.00E-08	1.00E-07
OCDF	6.00E-09	4.00E-08	**2.00E-06**	4.00E-08	4.00E-08	1.00E-08	4.00E-08

Notes:

[a] Catch Basin Sample

Bold = ECR > 1.00E-06

ECR= Excess Cancer Risk

Table C3-12
Dip Tank Locations with Acceptable Cumulative and Individual Risk - Construction Workers
Floragon Property
Molalla, Oregon

Analyte	AB-05/0-6	B13-16 (0.5) COMP
2,3,7,8-TCDD	9.00E-09	1.00E-08
1,2,3,7,8-PeCDD	2.00E-07	3.00E-07
1,2,3,4,7,8-HxCDD	2.00E-08	5.00E-08
1,2,3,6,7,8-HxCDD	6.00E-07	9.00E-07
1,2,3,7,8,9-HxCDD	1.00E-07	2.00E-07
1,2,3,4,6,7,8-HpCDD	4.00E-07	6.00E-07
OCDD	2.00E-08	1.00E-07
2,3,7,8-TCDF	1.00E-08	4.00E-08
1,2,3,7,8-PeCDF	3.00E-09	1.00E-08
2,3,4,7,8-PeCDF	3.00E-08	1.00E-07
1,2,3,4,7,8-HxCDF	6.00E-08	1.00E-07
1,2,3,6,7,8-HxCDF	9.00E-08	1.00E-07
2,3,4,6,7,8-HxCDF	7.00E-08	8.00E-08
1,2,3,7,8,9-HxCDF	4.00E-09	9.00E-09
1,2,3,4,6,7,8-HpCDF	2.00E-07	2.00E-07
1,2,3,4,7,8,9-HpCDF	8.00E-09	8.00E-09
OCDF	3.00E-09	4.00E-09
Cumulative ECR	2E-06	3E-06

Notes:

All values are ECRs (Excess Cancer Risk)

Table C3-13
Individual Congener Analysis - ECRs for Construction Worker Exposures in Dip Tank Area
Floragon Property
Molalla, Oregon

Analyte	AB-06/0-6	AB-19B[a]
2,3,7,8-TCDD	1.00E-07	2.00E-07
1,2,3,7,8-PeCDD	2.00E-06	**2.00E-06**
1,2,3,4,7,8-HxCDD	9.00E-08	2.00E-07
1,2,3,6,7,8-HxCDD	**3.00E-06**	1.00E-06
1,2,3,7,8,9-HxCDD	4.00E-07	5.00E-07
1,2,3,4,6,7,8-HpCDD	**5.00E-06**	1.00E-06
OCDD	3.00E-07	2.00E-07
2,3,7,8-TCDF	2.00E-07	9.00E-08
1,2,3,7,8-PeCDF	2.00E-08	2.00E-08
2,3,4,7,8-PeCDF	3.00E-07	2.00E-07
1,2,3,4,7,8-HxCDF	4.00E-07	1.00E-07
1,2,3,6,7,8-HxCDF	2.00E-07	2.00E-07
2,3,4,6,7,8-HxCDF	2.00E-07	2.00E-07
1,2,3,7,8,9-HxCDF	8.00E-09	6.00E-09
1,2,3,4,6,7,8-HpCDF	9.00E-07	2.00E-07
1,2,3,4,7,8,9-HpCDF	2.00E-07	1.00E-08
OCDF	1.00E-07	3.00E-09

Notes:
[a] Catch Basin Sample
Bold = ECR > 1.00E-06
ECR = Excess Cancer Risk

Table C3-14
2,3,7,8-TCDD TEQ Risk Characterization - Bear Creek Sediments
Floragon Property
Molalla, Oregon

Receptor	Medium	Chemical	ECR
Occupational Worker	Bear Creek Sediments	2,3,7,8-TCDD TEQ	1E-06
Construction Worker	Bear Creek Sediments	2,3,7,8-TCDD TEQ	7E-07
Excavation Worker	Bear Creek Sediments	2,3,7,8-TCDD TEQ	3E-08
Trespasser	Bear Creek Sediments	2,3,7,8-TCDD TEQ	3E-08
Future Resident	Bear Creek Sediments	2,3,7,8-TCDD TEQ	**3E-05**
Recreational User	Bear Creek Sediments	2,3,7,8-TCDD TEQ	**2E-06**

Notes:
Bold = ECR > 1.00E-06
ECR= Excess Cancer Risk
TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent.
TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December 2010.

Table C3-15
Total ECR by Sampling Location for 2,3,7,8-TCDD - Bear Creek Sediments
Floragon Property
Molalla, Oregon

Sampling Location	Resident	Recreational Use of Bear Creek
AB-23	**8.00E-06**	**(2.00E-06)**
AB-25	**2.00E-05**	**(6.00E-06)**
AB-28	**7.00E-06**	**(2.00E-06)**
SED-COMP 1	9.00E-07	3.00E-07
SED-COMP 2	**(2.00E-06)**	6.00E-07
SED-COMP 3	**(3.00E-06)**	1.00E-06
SED-COMP 3 Dup	**(2.00E-06)**	6.00E-07
SED-COMP 4	4.00E-07	1.00E-07
SED-COMP 5	**(6.00E-06)**	**(2.00E-06)**
SED-COMP 6	2.00E-07	6.00E-08
SED-COMP 7	**(2.00E-06)**	7.00E-07
SED-COMP 8	**(2.00E-06)**	6.00E-07
AB-25-0 COMP	**(3.00E-06)**	9.00E-07
AB-25-1 COMP	**7.00E-06**	**(2.00E-06)**
AB-25-2 COMP	**5.00E-06**	**(2.00E-06)**
AB-25-3 COMP	7.00E-07	2.00E-07
AB-25-4 COMP	**(4.00E-06)**	1.00E-06
SED-200ABC (0-1) COMP	**(2.00E-06)**	6.00E-07
SED-200AC (1-2) COMP	2.00E-07	7.00E-08
SED-201ABC (0-1) COMP	**1.00E-05**	**(4.00E-06)**
SED-201ABC (1-2) COMP	**(2.00E-06)**	7.00E-07
SED-202ABC (0-1) COMP	1.00E-06	4.00E-07
SED-203ABC (0-1) COMP	**5.00E-06**	**(2.00E-06)**
SED-203AC (1-2) COMP	5.00E-07	1.00E-07
SED-204ABC (0-1) COMP	**1.00E-05**	**(3.00E-06)**
SED-204AC (1-2) COMP	**4.00E-06**	1.00E-06
SED-205ABC (0-1) COMP	**(4.00E-06)**	1.00E-06
SED-206ABC (0-1) COMP	**(5.00E-06)**	1.00E-06
SED-207ABC (0-1) COMP	**(3.00E-06)**	8.00E-07
SED-207ABC (1-2) COMP	**2.00E-05**	**5.00E-06**
SED-208ABC (0-1) COMP	**(2.00E-06)**	5.00E-07
SED-208ABC (1-2) COMP	4.00E-07	1.00E-07
SED-209ABC (0-1) COMP	**7.00E-06**	**(2.00E-06)**
SED-209AB (1-2) COMP	1.00E-06	3.00E-07
SED-210ABC (0-1) COMP	**(2.00E-06)**	6.00E-07
SED-211ABC (0-1) COMP	**(5.00E-06)**	1.00E-06
SED-211ABC (0-1) COMP Dup	**(5.00E-06)**	1.00E-06
SED-211ABC (1-2) COMP	**(4.00E-06)**	1.00E-06

Notes:

Bold = ECR > 1.00E-06

(Values in Parentheses) do not exceed individual congener risk criteria, see Table C3-16.

ECR = Excess Cancer Risk

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100R 10/005. December 2010.

Table C3-16
Bear Creek Locations with Acceptable Cumulative and Individual Risk - Residential Exposure
Floragon Property
Molalla, Oregon

Analyte	SED COMP 2	SED COMP 3	SED COMP 3 Dup	SED COMP 5	SED COMP 7	SED COMP 8	AB-25-0 COMP	AB-25-4 COMP	SED-200 ABC (0-1) COMP	SED-201 ABC (1-2) COMP	SED-205 ABC (0-1) COMP	SED-206 ABC (0-1) COMP	SED-207 ABC (0-1) COMP	SED-208 ABC (0-1) COMP	SED-210 ABC (0-1) COMP	SED-211 ABC (0-1) COMP	SED-211 ABC (0-1) COMP Dup	SED-211 ABC (1-2) COMP
2,3,7,8-TCDD	2E-08	2E-08	2E-08	4E-08	3E-08	2E-08	7E-08	6E-08	2E-08	1E-07	4E-08	6E-08	3E-08	3E-08	2E-08	7E-08	7E-08	5E-08
1,2,3,7,8-PeCDD	2E-07	3E-07	2E-07	3E-07	2E-07	1E-07	4E-07	4E-07	1E-07	1E-07	3E-07	5E-07	2E-07	2E-07	2E-07	3E-07	4E-07	3E-07
1,2,3,4,7,8-HxCDD	3E-08	6E-08	3E-08	8E-08	2E-08	3E-08	6E-08	8E-08	2E-08	2E-08	6E-08	7E-08	3E-08	2E-08	3E-08	6E-08	6E-08	6E-08
1,2,3,6,7,8-HxCDD	5E-07	8E-07	5E-07	1E-06	7E-07	6E-07	8E-07	1E-06	7E-07	7E-07	1E-06	1E-06	8E-07	6E-07	5E-07	1E-06	1E-06	1E-06
1,2,3,7,8,9-HxCDD	9E-08	1E-07	7E-08	2E-07	8E-08	7E-08	2E-07	2E-07	7E-08	8E-08	2E-07	2E-07	1E-07	9E-08	9E-08	2E-07	2E-07	2E-07
1,2,3,4,6,7,8-HpCDD	5E-07	8E-07	5E-07	1E-06	5E-07	5E-07	7E-07	1E-06	6E-07	5E-07	9E-07	1E-06	6E-07	5E-07	4E-07	1E-06	1E-06	8E-07
OCDD	6E-08	1E-07	6E-08	2E-07	5E-08	7E-08	9E-08	2E-07	1E-07	8E-08	2E-07	2E-07	6E-08	9E-08	3E-08	2E-07	2E-07	1E-07
2,3,7,8-TCDF	2E-08	4E-08	3E-08	6E-08	7E-08	3E-08	5E-08	7E-08	4E-08	4E-08	8E-08	7E-08	6E-08	4E-08	2E-08	5E-08	5E-08	4E-08
1,2,3,7,8-PeCDF	6E-09	1E-08	6E-09	2E-08	5E-09	7E-09	1E-08	1E-08	6E-09	5E-09	8E-09	1E-08	6E-09	6E-09	4E-09	1E-08	1E-08	1E-08
2,3,4,7,8-PeCDF	3E-07	4E-07	3E-07	6E-07	3E-07	3E-07	1E-07	1E-07	7E-08	5E-08	9E-08	1E-07	6E-08	7E-08	5E-08	1E-07	1E-07	9E-08
1,2,3,4,7,8-HxCDF	6E-08	8E-08	7E-08	2E-07	4E-08	5E-08	1E-07	2E-07	1E-07	1E-07	2E-07	2E-07	1E-07	6E-08	1E-07	2E-07	2E-07	2E-07
1,2,3,6,7,8-HxCDF	7E-08	9E-08	6E-08	1E-07	6E-08	4E-08	1E-07	2E-07	8E-08	1E-07	2E-07	2E-07	1E-07	6E-08	1E-07	2E-07	2E-07	2E-07
2,3,4,6,7,8-HxCDF	1E-07	2E-07	1E-07	3E-07	1E-07	1E-07	1E-07	1E-07	6E-08	7E-08	1E-07	2E-07	1E-07	6E-08	1E-07	2E-07	2E-07	2E-07
1,2,3,7,8,9-HxCDF	3E-08	5E-08	4E-08	9E-08	3E-08	3E-08	5E-09	7E-09	4E-09	5E-09	6E-09	7E-09	7E-09	3E-09	3E-09	1E-08	1E-08	9E-09
1,2,3,4,6,7,8-HpCDF	1E-07	2E-07	1E-07	4E-07	9E-08	8E-08	3E-07	4E-07	2E-07	4E-07	7E-07	4E-07	3E-07	2E-07	4E-07	7E-07	8E-07	7E-07
1,2,3,4,7,8,9-HpCDF	5E-09	7E-09	6E-09	1E-08	3E-09	3E-09	1E-08	1E-08	6E-09	1E-08	2E-08	1E-08	1E-08	5E-09	1E-08	2E-08	2E-08	2E-08
OCDF	3E-09	4E-09	3E-09	8E-09	1E-09	1E-09	5E-09	9E-09	5E-09	1E-08	2E-08	9E-09	1E-08	4E-09	1E-08	2E-08	2E-08	2E-08
Cumulative ECR	2E-06	3E-06	2E-06	6E-06	2E-06	2E-06	3E-06	4E-06	2E-06	2E-06	4E-06	5E-06	3E-06	2E-06	2E-06	5E-06	5E-06	4E-06

Notes:
All values are ECRs (Excess Cancer Risk)

Table C3-17
Individual Congener Analysis - Residential Exposures to Bear Creek Sediments
Locations Meeting Cumulative Risk Criteria, but Exceeding Individual Risk Criteria
Floragon Property
Molalla, Oregon

Analyte	AB-23	AB-28	AB-25-1 COMP	AB-25-2 COMP	SED-201 ABC (0-1) COMP	SED-203 ABC (0-1) COMP	SED-204 ABC (0-1) COMP	SED-204 AC (1-2) COMP	SED-209 ABC (0-1) COMP
2,3,7,8-TCDD	1.00E-07	2.00E-07	7.00E-08	5.00E-08	9.00E-08	3.00E-08	1.00E-07	6.00E-08	7.00E-08
1,2,3,7,8-PeCDD	8.00E-07	8.00E-07	6.00E-07	5.00E-07	9.00E-07	3.00E-07	7.00E-07	6.00E-07	7.00E-07
1,2,3,4,7,8-HxCDD	1.00E-07	1.00E-07	1.00E-07	9.00E-08	2.00E-07	7.00E-08	2.00E-07	9.00E-08	1.00E-07
1,2,3,6,7,8-HxCDD	**2.00E-06**	**2.00E-06**	**2.00E-06**	1.00E-06	**4.00E-06**	**2.00E-06**	**3.00E-06**	**2.00E-06**	**2.00E-06**
1,2,3,7,8,9-HxCDD	3.00E-07	3.00E-07	3.00E-07	2.00E-07	5.00E-07	2.00E-07	3.00E-07	3.00E-07	3.00E-07
1,2,3,4,6,7,8-HpCDD	**2.00E-06**	**2.00E-06**	**2.00E-06**	**2.00E-06**	**3.00E-06**	**2.00E-06**	**2.00E-06**	1.00E-07	1.00E-06
OCDD	3.00E-07	2.00E-07	3.00E-07	2.00E-07	7.00E-07	3.00E-07	2.00E-07	2.00E-08	2.00E-07
2,3,7,8-TCDF	1.00E-07	1.00E-07	1.00E-07	9.00E-08	2.00E-07	7.00E-08	1.00E-07	9.00E-08	9.00E-08
1,2,3,7,8-PeCDF	3.00E-08	2.00E-08	2.00E-08	1.00E-08	4.00E-08	1.00E-08	2.00E-08	2.00E-08	2.00E-08
2,3,4,7,8-PeCDF	4.00E-07	4.00E-07	2.00E-07	2.00E-07	4.00E-07	1.00E-07	2.00E-07	2.00E-07	2.00E-07
1,2,3,4,7,8-HxCDF	2.00E-07	2.00E-07	3.00E-07	2.00E-07	5.00E-07	2.00E-07	7.00E-07	2.00E-07	3.00E-07
1,2,3,6,7,8-HxCDF	3.00E-07	3.00E-07	3.00E-07	2.00E-07	4.00E-07	2.00E-07	5.00E-07	2.00E-07	3.00E-07
2,3,4,6,7,8-HxCDF	3.00E-07	3.00E-07	2.00E-07	1.00E-07	4.00E-07	2.00E-07	3.00E-07	2.00E-07	3.00E-07
1,2,3,7,8,9-HxCDF	2.00E-08	1.00E-08	1.00E-08	8.00E-09	2.00E-08	7.00E-09	3.00E-08	8.00E-09	1.00E-08
1,2,3,4,6,7,8-HpCDF	5.00E-07	8.00E-07	6.00E-07	5.00E-07	8.00E-07	5.00E-07	**2.00E-06**	6.00E-07	9.00E-07
1,2,3,4,7,8,9-HpCDF	2.00E-08	3.00E-08	2.00E-08	2.00E-08	2.00E-08	2.00E-08	5.00E-08	2.00E-08	3.00E-08
OCDF	1.00E-08	2.00E-08	1.00E-08	9.00E-09	2.00E-08	2.00E-08	4.00E-08	1.00E-08	2.00E-08

Notes:
All values are ECRs (Excess Cancer Risk)
Bold = ECR > 1.00E-06

Table C3-18
Individual Congener Analysis - Residential Exposures to Bear Creek Sediments
Locations Exceeding Both Cumulative and Individual Risk Criteria
Floragon Property
Molalla, Oregon

Analyte	AB-25	SED-207 ABC (1-2) COMP
2,3,7,8-TCDD	3.00E-07	3.00E-07
1,2,3,7,8-PeCDD	**2.00E-06**	5.00E-07
1,2,3,4,7,8-HxCDD	3.00E-07	2.00E-07
1,2,3,6,7,8-HxCDD	**5.00E-06**	**5.00E-06**
1,2,3,7,8,9-HxCDD	8.00E-07	7.00E-07
1,2,3,4,6,7,8-HpCDD	**5.00E-06**	**5.00E-06**
OCDD	5.00E-07	3.00E-07
2,3,7,8-TCDF	2.00E-07	4.00E-07
1,2,3,7,8-PeCDF	6.00E-08	2.00E-08
2,3,4,7,8-PeCDF	8.00E-07	2.00E-07
1,2,3,4,7,8-HxCDF	6.00E-07	1.00E-06
1,2,3,6,7,8-HxCDF	8.00E-07	7.00E-07
2,3,4,6,7,8-HxCDF	6.00E-07	6.00E-07
1,2,3,7,8,9-HxCDF	4.00E-08	4.00E-08
1,2,3,4,6,7,8-HpCDF	**2.00E-06**	**3.00E-06**
1,2,3,4,7,8,9-HpCDF	7.00E-08	1.00E-07
OCDF	5.00E-08	1.00E-07

Notes:
All values are ECRs (Excess Cancer Risk)
Bold = ECR > 1.00E-06

Table C3-19
Individual Congener Analysis - Recreational Exposures to Bear Creek Sediments
Locations with Acceptable Cumulative and Individual Risk
Floragon Property
Molalla, Oregon

Analyte	AB-23	AB-25	AB-28	SED COMP 5	AB-25-1 COMP	AB-25-2 COMP	SED-201 ABC (0-1) COMP	SED-203 ABC (0-1) COMP	SED-204 ABC (0-1) COMP	SED-209 ABC (0-1) COMP
2,3,7,8-TCDD	3.00E-08	7.00E-08	6.00E-08	1.00E-08	2.00E-08	2.00E-08	3.00E-08	1.00E-08	3.00E-08	2.00E-08
1,2,3,7,8-PeCDD	2.00E-07	7.00E-07	2.00E-07	1.00E-07	2.00E-07	1.00E-07	2.00E-07	1.00E-07	2.00E-07	2.00E-07
1,2,3,4,7,8-HxCDD	3.00E-08	9.00E-08	4.00E-08	2.00E-08	3.00E-08	3.00E-08	5.00E-08	2.00E-08	5.00E-08	3.00E-08
1,2,3,6,7,8-HxCDD	7.00E-07	1.00E-06	6.00E-07	4.00E-07	6.00E-07	4.00E-07	1.00E-06	5.00E-07	9.00E-07	6.00E-07
1,2,3,7,8,9-HxCDD	1.00E-07	2.00E-07	9.00E-08	5.00E-08	1.00E-07	7.00E-08	1.00E-07	6.00E-08	9.00E-08	1.00E-07
1,2,3,4,6,7,8-HpCDD	7.00E-07	1.00E-06	6.00E-07	4.00E-07	6.00E-07	5.00E-07	1.00E-06	4.00E-07	5.00E-07	4.00E-07
OCDD	1.00E-07	2.00E-07	7.00E-08	6.00E-08	8.00E-08	6.00E-08	2.00E-07	1.00E-07	6.00E-08	6.00E-08
2,3,7,8-TCDF	4.00E-08	7.00E-08	3.00E-08	2.00E-08	4.00E-08	3.00E-08	5.00E-08	2.00E-08	3.00E-08	3.00E-08
1,2,3,7,8-PeCDF	8.00E-09	2.00E-08	7.00E-09	5.00E-09	5.00E-09	4.00E-09	1.00E-08	4.00E-09	6.00E-09	6.00E-09
2,3,4,7,8-PeCDF	1.00E-07	2.00E-07	1.00E-07	2.00E-07	6.00E-08	5.00E-08	1.00E-07	4.00E-08	5.00E-08	6.00E-08
1,2,3,4,7,8-HxCDF	7.00E-08	2.00E-07	7.00E-08	4.00E-08	8.00E-08	7.00E-08	1.00E-07	6.00E-08	2.00E-07	8.00E-08
1,2,3,6,7,8-HxCDF	7.00E-08	2.00E-07	8.00E-08	4.00E-08	9.00E-08	6.00E-08	1.00E-07	7.00E-08	1.00E-07	8.00E-08
2,3,4,6,7,8-HxCDF	8.00E-08	2.00E-07	8.00E-08	9.00E-08	6.00E-08	4.00E-08	1.00E-07	4.00E-08	1.00E-07	7.00E-08
1,2,3,7,8,9-HxCDF	5.00E-09	1.00E-08	4.00E-09	3.00E-08	3.00E-09	2.00E-09	5.00E-09	2.00E-09	8.00E-09	3.00E-09
1,2,3,4,6,7,8-HpCDF	2.00E-07	5.00E-07	2.00E-07	1.00E-07	2.00E-07	1.00E-07	2.00E-07	2.00E-07	5.00E-07	3.00E-07
1,2,3,4,7,8,9-HpCDF	5.00E-09	2.00E-08	8.00E-09	4.00E-09	6.00E-09	4.00E-09	7.00E-09	4.00E-09	1.00E-08	8.00E-09
OCDF	4.00E-09	1.00E-08	6.00E-09	2.00E-09	3.00E-09	3.00E-09	5.00E-09	5.00E-09	1.00E-08	7.00E-09
Cumulative ECR	2E-06	6E-06	2E-06	2E-06	2E-06	2E-06	4E-06	2E-06	3E-06	2E-06

Notes:
All values are ECRs (Excess Cancer Risk)

Table C3-20
Individual Congener Analysis - Recreational Exposures to Bear Creek Sediments
Locations Meeting Cumulative Risk Criteria, but Exceeding Individual Risk Criteria
Floragon Property
Molalla, Oregon

Analyte	SED-207 ABC (1-2) COMP
2,3,7,8-TCDD	8.00E-08
1,2,3,7,8-PeCDD	2.00E-07
1,2,3,4,7,8-HxCDD	5.00E-08
1,2,3,6,7,8-HxCDD	**2.00E-06**
1,2,3,7,8,9-HxCDD	2.00E-07
1,2,3,4,6,7,8-HpCDD	1.00E-06
OCDD	9.00E-08
2,3,7,8-TCDF	1.00E-07
1,2,3,7,8-PeCDF	6.00E-09
2,3,4,7,8-PeCDF	5.00E-08
1,2,3,4,7,8-HxCDF	3.00E-07
1,2,3,6,7,8-HxCDF	2.00E-07
2,3,4,6,7,8-HxCDF	2.00E-07
1,2,3,7,8,9-HxCDF	1.00E-08
1,2,3,4,6,7,8-HpCDF	8.00E-07
1,2,3,4,7,8,9-HpCDF	4.00E-08
OCDF	3.00E-08

Notes:
All values are ECRs (Excess Cancer Risk)
Bold = ECR > 1.00E-06

Table C3-21
Bear Creek Sediment Locations Exceeding Acceptable Cumulative or Individual Risk or Both Residential Exposure
Floragon Property
Molalla, Oregon

Sampling Location	Zoning	Adjacent to Residential?
AB-23	Light Industrial	No - off S Molalla Forest Road
AB-25	Light Industrial	No - near Dip Tank area
AB-28	Heavy Industrial	No - off S Molalla Avenue
AB-25-1 COMP	Light Industrial	No - near Dip Tank area
AB-25-2 COMP	Light Industrial	No - near Dip Tank area
SED-201ABC (0-1) COMP	Light Industrial	No - off S Molalla Forest Road
SED-203ABC (0-1) COMP	Light Industrial	No - off S Molalla Forest Road
SED-204ABC (0-1) COMP	Light Industrial	No - off S Molalla Forest Road
SED-204AC (1-2) COMP	Light Industrial	No - off S Molalla Forest Road
SED-207ABC (1-2) COMP	Light Industrial	No - off S Molalla Forest Road
SED-209ABC (0-1) COMP	Heavy Industrial	No- Near Dip Tank

FIGURES

APPROXIMATE SCALE IN FEET

0 250 500

N

North Drainage Ditch

84-Acre
North Parcels
Upland Area
(NFA March 2014)

HART AVENUE

7TH STREET

FORMER
HYSTER SHOP
AREA

RI Study Area

Bear Creek

Beaver Pond

Beaver Dam #3

Beaver Dam #2

FORMER
LOG POND
AREA

Bear Creek

Beaver Dam #1

FORMER
DIP TANK
AREA

16-Acre
SE Corner Area
(NFA Pending)

S. MOLALLA FOREST ROAD

S. MOLALLA AVENUE

LEGEND

- Property Boundary
- Tax Lots
- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Beaver Pond
- RI Study Area

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FILE NAME:	1177-01
DRAWN BY:	JJT
APPROVED BY:	PE

FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

OVERVIEW MAP
RI STUDY AREA

Project No. 1177-01

Figure No. 1

APPROXIMATE SCALE IN FEET

0 250 500

North Drainage Ditch

84-Acre
North Parcels
Upland Area
(NFA March 2014)

HART AVENUE

7TH STREET

RI Study Area

Bear Creek

Beaver Pond

Beaver Dam #3

Beaver Dam #2

Beaver Dam #1

Bear Creek

FORMER DIP TANK AREA

16-Acre
SE Corner Area
(NFA Pending)

S. MOLALLA FOREST ROAD

S. MOLALLA AVENUE

LEGEND

- Property Boundary
- Tax Lots
- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Beaver Pond
- RI Study Area

Note: Aerial photograph provided by Google Earth Pro™ 2012.

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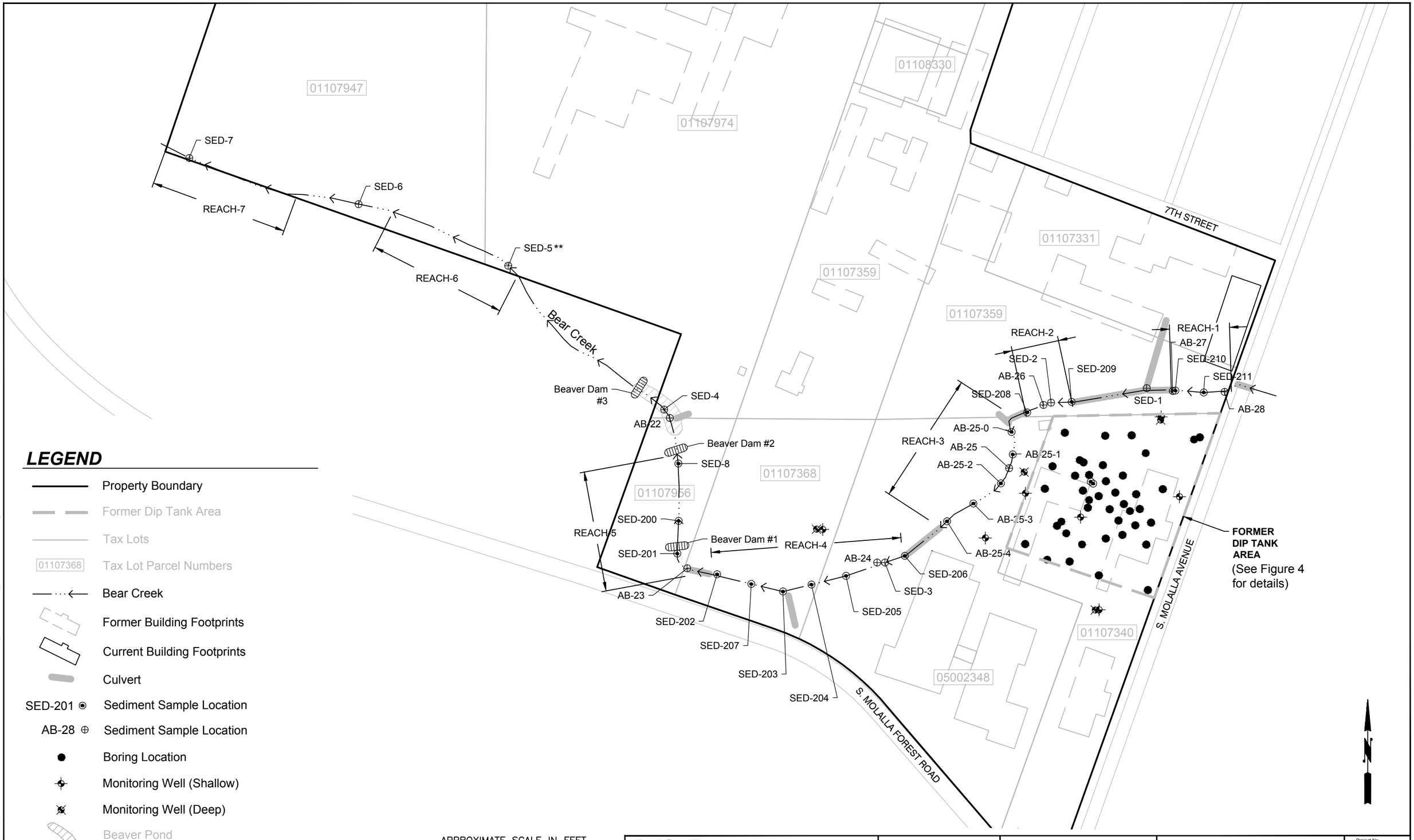
OVERVIEW MAP
AERIAL 2012

Project No. 1177-01

Figure No. 2



LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- 01107368 Tax Lot Parcel Numbers
- Bear Creek
- Former Building Footprints
- Current Building Footprints
- Culvert
- SED-201 Sediment Sample Location
- AB-28 Sediment Sample Location
- Boring Location
- Monitoring Well (Shallow)
- Monitoring Well (Deep)
- Beaver Pond

APPROXIMATE SCALE IN FEET

0 100 200 400

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BEAR CREEK SEDIMENT &
DIP TANK AREA
SAMPLE LOCATIONS

Project No. 1177-01

Figure No. 3

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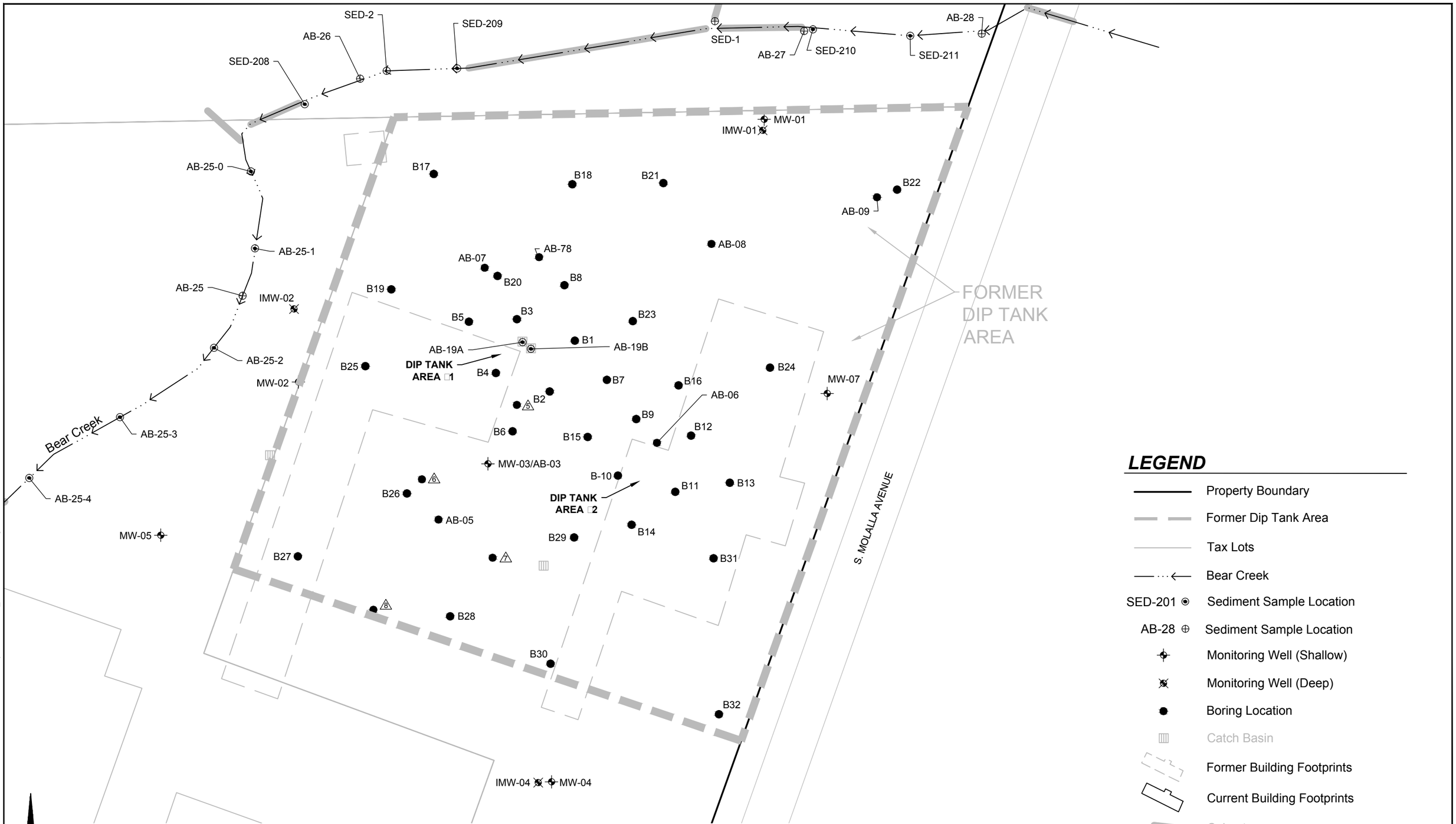

LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- SED-201 Sediment Sample Location
- AB-28 Sediment Sample Location
- Monitoring Well (Shallow)
- Monitoring Well (Deep)
- Boring Location
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert

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FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

SAMPLE LOCATIONS
DIP TANK AREA

Project No. 1177-01

Figure No. 4

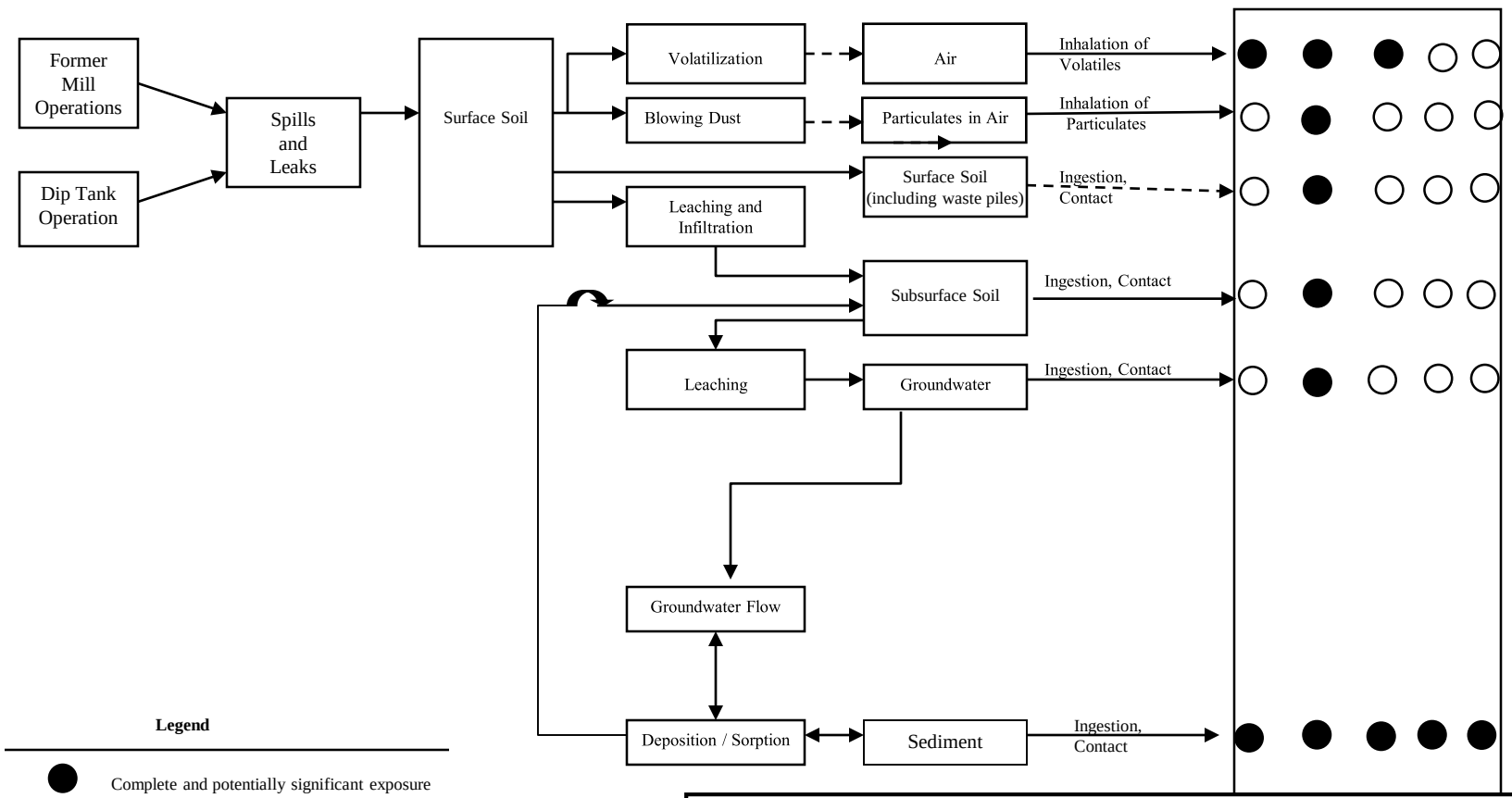
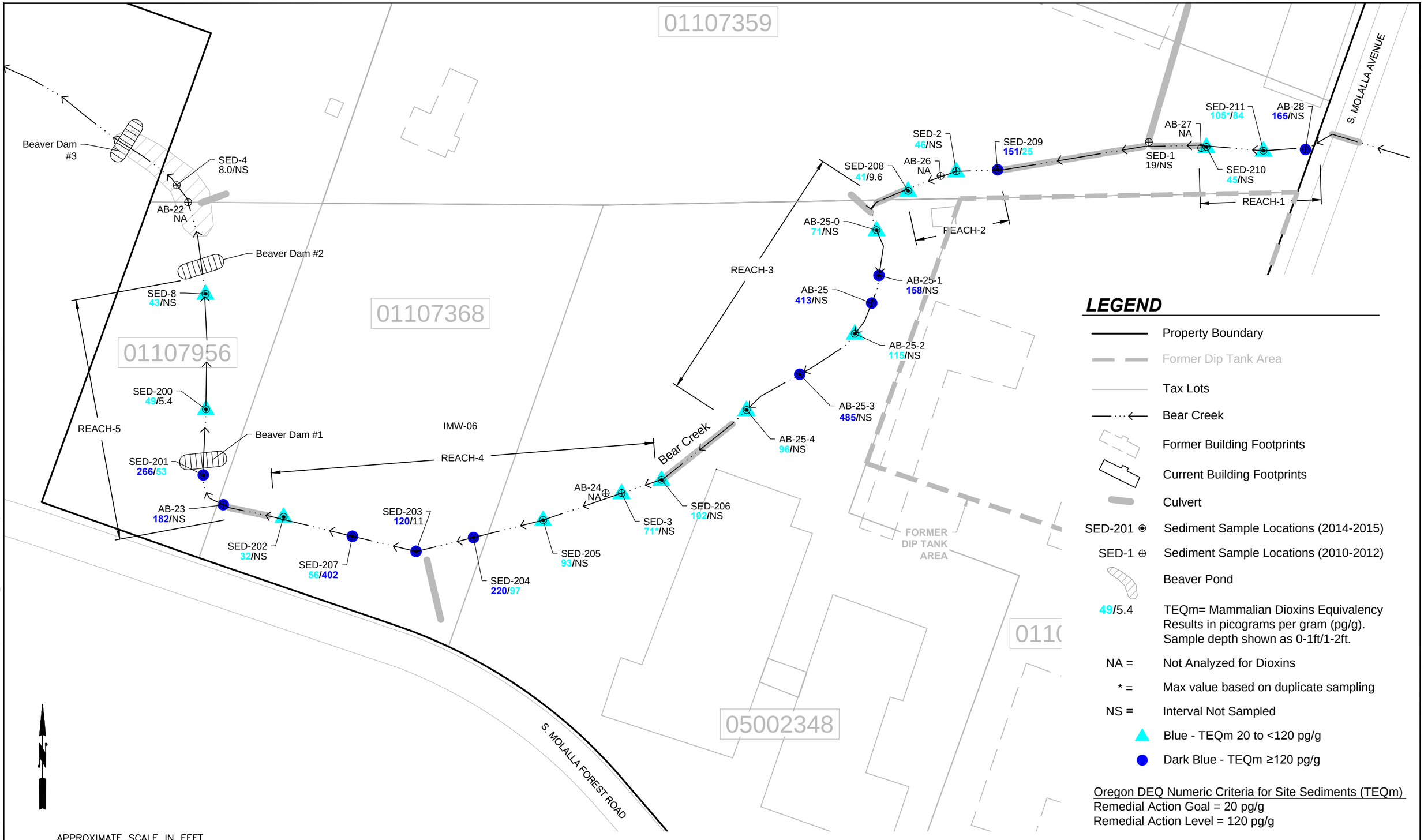


Figure 5

Human Health Conceptual Site Exposure Model

Dip Tank and Bear Creek Sediments-
Floragon Property
Molalla, Oregon



LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Former Building Footprints
- Current Building Footprints
- Culvert
- SED-201 — Sediment Sample Locations (2014-2015)
- SED-1 — Sediment Sample Locations (2010-2012)
- Beaver Pond
- 49/5.4 — TEQm= Mammalian Dioxins Equivalency Results in picograms per gram (pg/g). Sample depth shown as 0-1ft/1-2ft.
- NA = Not Analyzed for Dioxins
- * = Max value based on duplicate sampling
- NS = Interval Not Sampled
- Blue - TEQm 20 to <120 pg/g
- Dark Blue - TEQm ≥120 pg/g

Oregon DEQ Numeric Criteria for Site Sediments (TEQm)
Remedial Action Goal = 20 pg/g
Remedial Action Level = 120 pg/g

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FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

DIOXIN TEQm
BEAR CREEK SEDIMENTS AND
PHASE 3 RI CREEK STUDY AREA

Project No. 1177-01

Figure No. 6

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Beaver Dam #3
Beaver Pond
Wetland 5-B
Beaver Dam #2
WTL-5B-DP03
WTL-5B-DP04
TL 5280
REACH-5
Beaver Dam #1
REACH-4
Breached Culvert
S. MOLALLA FOREST RD
TL 290
IMW-06
MW-06
Bear Creek
Wetland 2-A
WTL-2A-DP02
WTL-2A-DP01
REACH-3
REACH-2
REACH-1
MW-01
IMW-01
376.00
375.00
377.00
IMW-02
MW-02
MW-03/AB-03
IMW-07
S. MOLALLA AVE
MW-05
TL 101
TL 102
378.00
390.00
IMW-04
MW-04

APPROXIMATE SCALE IN FEET
0 50 100 200

LEGEND

- Property Boundary
- Tax Lots
- TL 101 — Tax Lot ID Numbers (Tax Map 5 2E 17A)
- Bear Creek Flow Direction
- Former Building Footprints
- Current Building Footprints
- Culvert
- MW-01 — Monitoring Well
- Study Area Boundary Line
- Ordinary High Water Mark (OHWM)
- Wetland Boundary

REACH-3 concurred by DSL under WD#2015-0279

REACH-1, -2, -4 and -5 concurred by DSL under WD#2016-0177

WTL-2A-DP02 — Wetland Data Point

SURVEY NOTES:

THE HORIZONTAL DATUM FOR SURVEY IS LOCALIZED AND ASSUMED. IT IS NOT RELATED TO ANY ESTABLISHED HORIZONTAL DATUM. THE HORIZONTAL ACCURACY FOR THE SITE IS 1 FOOT IN 50,000 FEET. THE HORIZONTAL ACCURACY AT ANY LOCATION IS ABOUT 0.10 OF ONE FOOT.

THE VERTICAL DATUM FOR THIS SURVEY IS BASED UPON OSHD BENCHMARK RAIT. THE ELEVATION IS 240.377' NGVD 29 DATUM. STUDY AREA AND DATA PLOT POINT ACCURACY IS +/- 0.5 FEET.

A TRIMBLE S6-SERIES ROBOTIC INSTRUMENT WAS USED TO COMPLETE A LOOP FIELD TRAVERSE.

SURVEY FIELDWORK WAS PERFORMED ON NOVEMBER 21, 2014, NOVEMBER 9-13 AND DECEMBER 3, 2015.

WATERS DELINEATION FIELDWORK CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS ON NOVEMBER 19, 2014 (REACH 3), NOVEMBER 2 AND 23, 2015 (REACH-1, -2, -4, AND -5).

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FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

BEAR CREEK WETLAND
AND WATER SURVEY

Project No. 1177-01
Figure No. 7

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01107947
01107974
01107974
CB-03
CB-02
AB-59
01107331
01107359
CB-04
CB-05
AB-37
S. MOLALLA AVE.
01107359
Outfall
Bear Creek
S. MOLALLA FOREST RD
01107956
01107368
AB-19A
AB-19B
CB-10
Former
Dip Tank
Area
01107340
05002348
CB-06
CB-07
CB-09
16-Acre
SE Corner
Area
CB-08
N
APPROXIMATE SCALE IN FEET
0
250
500

LEGEND

- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Generalized Topographic Slope / Flow Direction
- ? = Indicates Unknown Discharge / Outfall Location
- Seasonal Standing Water
- Tax Lots
- Catch Basin
- Culvert
- RI Study Area Boundary

Source: Aerial photograph provided by Google Earth Pro ™ (2010)

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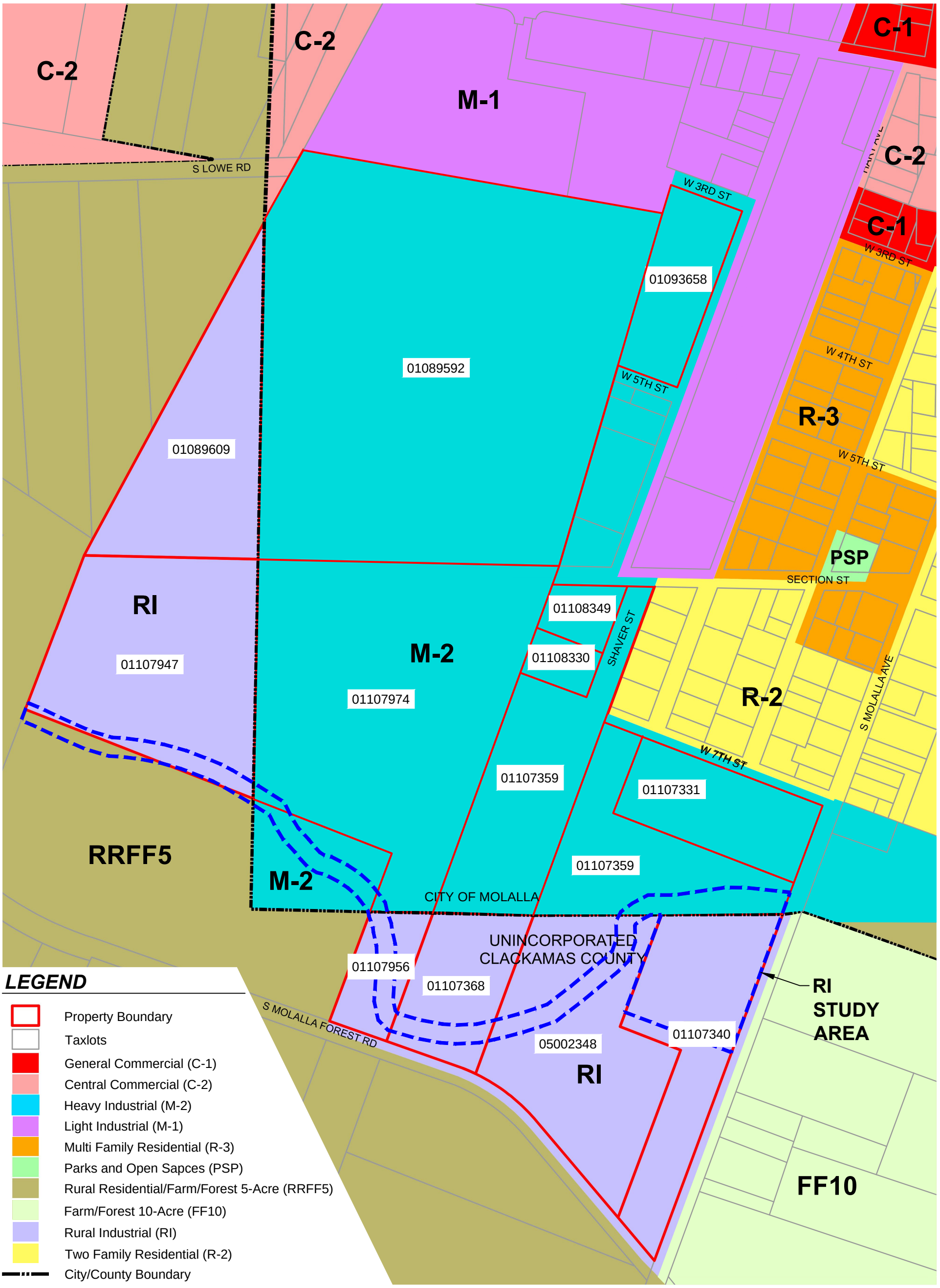
FLORAGON PROPERTY
7TH AND HART ST.
MOLOLLA, OREGON

DRAINAGE FEATURES
2010 AERIAL

Project No. 1177-01
Figure No. 8



Source: Clackamas County Zoning Map Department of Planning (January 12, 2015) and City of Molalla Zoning Map (November 2014)

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FLORAGON PROPERTY
7TH AND HART ST.
MOLOLLA, OREGON

OVERVIEW ZONING MAP

Project No. 1177-01

Figure No. 9

APPENDIX A
HUMAN HEALTH DATA SUMMARY AND INITIAL SCREENING

APPENDIX A / TABLE 1
DATA SUMMARY AND INITIAL SCREENING
ALL SOIL SAMPLES
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration[a] (mg/kg)	Minimum Sample Reporting Limit (mg/kg)	Maximum Sample Reporting Limit (mg/kg)	Minimum Human Health Risk-Based Screening Concentration (mg/kg)	Background/ Reference Concentration[b] (mg/kg)	Detected?	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background/ Reference?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Metals																
Antimony	9	3	33%	1.74E-01	2.29E+00	1.14E+00	1.14E+00	2.46E-01	1.08E+01	3.13E+01	4.00E+00	YES	no	no	No	no
Arsenic, total	13	8	62%	1.10E+00	9.40E+00	3.82E+00	3.82E+00	1.20E+00	2.16E+01	1.90E+00	8.80E+00	YES	no	YES	Yes	YES
Barium	4	4	100%	3.60E+01	6.70E+01	6.76E+01	6.76E+01	Not Applicable	Not Applicable	1.50E+04	0.00E+00	YES	YES	YES	No	no
Beryllium	9	5	56%	7.25E-01	1.36E+00	1.14E+00	1.14E+00	1.13E+00	1.08E+01	1.50E+03	0.00E+00	YES	no	YES	No	no
Cadmium	13	6	46%	2.11E-01	3.84E+00	9.74E-01	9.74E-01	2.20E-01	1.08E+01	2.10E+03	1.00E+00	YES	no	YES	No	no
Chromium, Total	13	13	100%	1.80E+01	6.85E+01	4.10E+01	4.10E+01	Not Applicable	Not Applicable	2.11E+02	4.20E+01	YES	YES	YES	No	no
Copper	9	9	100%	1.38E+01	2.63E+02	1.05E+02	1.05E+02	Not Applicable	Not Applicable	3.10E+03	3.60E+01	YES	YES	YES	No	no
Lead	13	13	100%	2.80E+00	1.00E+02	4.52E+01	4.52E+01	Not Applicable	Not Applicable	4.00E+02	1.70E+01	YES	YES	YES	No	no
Mercury	13	3	23%	6.10E-02	9.73E-01	2.53E-01	2.53E-01	5.70E-02	1.17E-01	2.30E+01	7.00E-02	YES	no	YES	No	no
Nickel	13	9	69%	1.04E+01	3.28E+01	1.90E+01	1.90E+01	2.20E+00	2.30E+00	1.40E+04	3.80E+01	YES	no	no	No	no
Selenium	9	2	22%	7.24E-01	1.18E+00	1.27E+00	1.27E+00	1.23E+00	2.16E+01	3.91E+02	2.00E+00	YES	no	no	No	no
Silver	13	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.20E-01	1.85E+00	3.90E+02	1.00E+00	no	no	YES	No	no
Thallium	9	1	11%	1.62E-01	1.61E-01	1.61E-01	1.61E-01	1.02E+00	2.30E+00	5.16E+00	0.00E+00	YES	no	YES	No	no
Zinc	9	9	100%	1.90E+01	3.68E+03	1.73E+03	1.73E+03	Not Applicable	Not Applicable	2.35E+04	8.60E+01	YES	YES	YES	No	no
Pesticides/Polychlorinated Biphenyls (PCBs)/Dioxins																
2,3,7,8-TCDD (dioxin)	22	13	59%	1.86E-07	2.72E-05	7.80E-06	7.80E-06	Not Applicable	Not Applicable	4.70E-06	Not Applicable	YES	YES	Not Calculated	Yes	YES
2,3,7,8-TEQ	22	22	100%	9.00E-06	1.60E-05	1.55E-05	1.55E-05	Not Applicable	Not Applicable	4.70E-06	Not Applicable	YES	YES	Not Calculated	Yes	YES
1,2,3,7,8-PeCDD	22	21	95%	3.84E-07	2.97E-04	2.17E-04	2.17E-04	1.10E-07	1.10E-07	4.70E-06	Not Applicable	YES	no	Not Calculated	Yes	YES
1,2,3,4,7,8-HxCDD	22	21	95%	6.04E-08	2.69E-05	1.73E-05	1.73E-05	1.19E-08	1.19E-08	4.70E-07	Not Applicable	YES	no	Not Calculated	Yes	YES
1,2,3,6,7,8-HxCDD	22	22	100%	6.92E-08	5.00E-04	2.08E-04	2.08E-04	Not Applicable	Not Applicable	4.70E-07	Not Applicable	YES	YES	Not Calculated	Yes	YES
1,2,3,7,8,9-HxCDD	22	22	100%	4.06E-08	8.99E-05	2.68E-05	2.68E-05	Not Applicable	Not Applicable	4.70E-07	Not Applicable	YES	YES	Not Calculated	Yes	YES
1,2,3,4,6,7,8-HpCDD	22	22	100%	9.67E-08	8.50E-04	1.83E-04	1.83E-04	Not Applicable	Not Applicable	4.70E-08	Not Applicable	YES	YES	Not Calculated	Yes	YES
OCDD	22	22	100%	2.96E-08	4.86E-05	1.41E-05	1.41E-05	Not Applicable	Not Applicable	1.41E-09	Not Applicable	YES	YES	Not Calculated	Yes	YES
2,3,7,8-TCDF	22	21	95%	1.82E-08	3.46E-05	8.17E-06	8.17E-06	1.05E-08	1.05E-08	4.70E-07	Not Applicable	YES	no	Not Calculated	Yes	YES
1,2,3,7,8-PeCDF	22	21	95%	6.81E-09	3.48E-06	1.15E-06	1.15E-06	3.48E-09	3.48E-09	1.41E-07	Not Applicable	YES	no	Not Calculated	Yes	YES
2,3,4,7,8-PeCDF	22	20	91%	8.04E-08	5.64E-05	1.59E-05	1.59E-05	3.39E-08	5.46E-08	1.41E-06	Not Applicable	YES	no	Not Calculated	Yes	YES
1,2,3,4,7,8-HxCDF	22	22	100%	1.13E-08	1.42E-05	2.51E-05	2.51E-05	Not Applicable	Not Applicable	4.70E-07	Not Applicable	YES	YES	Not Calculated	Yes	YES
1,2,3,6,7,8-HxCDF	22	22	100%	1.51E-08	4.19E-05	1.34E-05	1.34E-05	Not Applicable	Not Applicable	4.70E-07	Not Applicable	YES	YES	Not Calculated	Yes	YES
1,2,3,7,8,9-HxCDF	22	17	77%	1.16E-08	1.49E-06	5.43E-07	5.43E-07	8.27E-09	1.17E-08	4.70E-07	Not Applicable	YES	no	Not Calculated	Yes	YES
1,2,3,4,6,7,8-HpCDF	22	22	100%	1.87E-08	1.49E-04	3.52E-05	3.52E-05	Not Applicable	Not Applicable	4.70E-08	Not Applicable	YES	YES	Not Calculated	Yes	YES
1,2,3,4,7,8,9-HpCDF	22	21	95%	1.37E-09	2.64E-05	5.09E-06	5.09E-06	8.79E-09	8.79E-09	4.70E-08	Not Applicable	YES	no	Not Calculated	Yes	YES
OCDF	22	21	95%	6.15E-10	2.46E-05	4.61E-06	4.61E-06	7.17E-07	7.17E-07	1.41E-09	Not Applicable	YES	YES	Not Calculated	Yes	YES
Polynuclear Aromatic Hydrocarbons																
Acenaphthene	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.47E-03	2.00E-01	6.10E+04	Not Applicable	no	no	Not Calculated	No	no
Acenaphthylene	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.47E-03	2.00E-01	6.10E+04	Not Applicable	no	no	Not Calculated	No	no
Anthracene	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.47E-03	2.00E-01	3.10E+05	Not Applicable	no	no	Not Calculated	No	no
Benz(a)anthracene	14	1	7%	2.36E-02	2.36E-02	2.36E-02	2.36E-02	5.70E-03	2.00E-01	1.50E-01	Not Applicable	YES	no	Not Calculated	No	no
Benzo(a)pyrene	10	0	0%	6.80E-02	8.83E-02	Not Applicable	0.00E+00	2.21E-03	2.00E-01	1.50E-02	Not Applicable	no	no	Not Calculated	Yes	no
Benzo(b)fluoranthene	10	0	0%	3.32E-02	1.10E-01	Not Applicable	0.00E+00	2.21E-03	2.00E-01	1.50E-01	Not Applicable	no	no	Not Calculated	No	no
Benzo(g,h,i)perylene	10	0	0%	1.11E-01	1.11E-01	Not Applicable	0.00E+00	1.47E-03	2.00E-01	1.80E+03	Not Applicable	no	no	Not Calculated	No	no
Benzo(k)fluoranthene	10	0	0%	3.70E-02	3.70E-02	Not Applicable	0.00E+00	2.21E-03	2.00E-01	1.50E+00	Not Applicable	no	no	Not Calculated	No	no
Chrysene	10	1	10%	2.41E-02	2.02E-01	Not Applicable	2.41E-02	5.20E-03	2.00E-01	1.50E+01	Not Applicable	YES	no	Not Calculated	No	no
Dibenz(a,h)anthracene	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.47E-03	2.00E-01	1.50E-02	Not Applicable	no	no	Not Calculated	No	no
Fluoranthene	14	1	7%	3.10E-03	3.10E-03	Not Applicable	3.10E-03	5.70E-03	2.00E-01	2.40E+03	Not Applicable	YES	no	Not Calculated	No	no
Fluorene	10	0	0%	1.20E-01	3.59E+00	Not Applicable	0.00E+00	1.47E-03	2.00E-01	3.10E+03	Not Applicable	no	no	Not Calculated	No	no
Indeno(1,2,3-cd)pyrene	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.47E-03	2.00E-01	1.50E-01	Not Applicable	no	no	Not Calculated	No	no
Naphthalene	13	3	23%	5.80E-03	4.83E-02	2.41E-02	2.41E-02	1.14E-02	3.98E-01	5.30E+00	Not Applicable	YES	no	Not Calculated	No	no
Phenanthrene	14	2	14%	1.90E-03	3.10E-03	3.31E-03	3.31E-03	5.70E-03	2.00E-01	2.00E-01	Not Applicable	YES	no	Not Calculated	No	no
Pyrene	10	1	10%	3.10E-03	3.10E-03	Not Applicable	3.10E-03	1.50E-03	2.00E-01	1.80E+03	Not Applicable	YES	no	Not Calculated	No	no
Semi-Volatile Organic Compounds																
2,3,4,5-Tetrachlorophenol	21	1	5%	6.51E-02	6.51E-02	Not Applicable	6.51E-02	2.24E-02	7.60E-01	1.83E+03	Not Applicable	YES	no	Not Calculated	No	no
2,3,4,6-Tetrachlorophenol	25	4	16%	2.87E-02	6.96E+00	0.751	7.51E-01	2.31E-02	5.98E-01	1.83E+03	Not Applicable	YES	no	Not Calculated	No	no
2,4,5-Trichlorophenol	25	2	8%	1.12E-02	8.96E-02	Not Applicable	8.96E-02	2.31E-02	5.98E-01	6.11E+03	Not Applicable	YES	no	Not Calculated	No	no

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FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration[a] (mg/kg)	Minimum Sample Reporting Limit (mg/kg)	Maximum Sample Reporting Limit (mg/kg)	Minimum Human Health Risk-Based Screening Concentration (mg/kg)	Background/ Reference Concentration[b] (mg/kg)	Detected?	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background/ Reference?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Semi-Volatile Organic Compounds (cont'd)																
2,4,6-Trichlorophenol	25	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.35E-03	5.98E-01	4.90E+01	Not Applicable	no	no	Not Calculated	No	no
2-Chlorophenol	25	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.40E-03	5.98E-01	6.34E+01	Not Applicable	no	no	Not Calculated	No	no
2,4-Dichlorophenol	25	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.35E-03	5.98E-01	1.83E+02	Not Applicable	no	no	Not Calculated	No	no
3,4-Dichlorophenol	21	2	10%	2.00E-02	4.66E-01	0.384	3.84E-01	2.31E-02	5.98E-01	1.83E+02	Not Applicable	YES	no	Not Calculated	No	no
3+4-Chlorophenol	25	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.70E-03	5.98E-01	6.34E+01	Not Applicable	no	no	Not Calculated	No	no
Bis(2-ethylhexyl)phthalate	1	1	100%	1.31E-01	1.31E-01	Not Applicable	1.31E-01	Not Applicable	Not Applicable	3.90E+01	Not Applicable	YES	YES	Not Calculated	No	no
Pentachlorophenol	35	11	31%	1.70E-02	5.10E+00	0.756	7.56E-01	1.40E-02	5.98E-01	1.00E+00	Not Applicable	YES	no	Not Calculated	Yes	no
Volatile Organic Compounds																
1,1,1,2-Tetrachloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	3.19E+00	Not Applicable	no	no	Not Calculated	No	no
1,1,1-Trichloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	5.30E+03	Not Applicable	no	no	Not Calculated	No	no
1,1,2,2-Tetrachloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	4.08E-01	Not Applicable	no	no	Not Calculated	No	no
1,1,2-Trichloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	5.80E+00	Not Applicable	no	no	Not Calculated	No	no
1,1-Dichloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	5.80E+01	Not Applicable	no	no	Not Calculated	No	no
1,1-Dichloroethene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.80E+03	Not Applicable	no	no	Not Calculated	No	no
1,1-Dichloropropene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	7.77E-01	Not Applicable	no	no	Not Calculated	No	no
1,2,3-Trichlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-01	4.09E-01	6.22E+01	Not Applicable	no	no	Not Calculated	No	no
1,2,3-Trichloropropane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	3.40E-02	Not Applicable	no	YES	Not Calculated	No	YES
1,2,4-Trichlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-01	4.09E-01	6.22E+01	Not Applicable	no	no	Not Calculated	No	no
1,2,4-Trimethylbenzene	3	0	0%	1.87E+00	1.87E+00	Not Applicable	0.00E+00	6.33E-02	8.19E-02	1.10E+02	Not Applicable	no	no	Not Calculated	No	no
1,2-Dibromo-3-chloropropane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-01	4.09E-01	4.60E-01	Not Applicable	no	no	Not Calculated	No	no
1,2-Dibromoethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.40E-01	Not Applicable	no	no	Not Calculated	No	no
1,2-Dichlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	2.20E+03	Not Applicable	no	no	Not Calculated	No	no
1,2-Dichloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	3.20E+00	Not Applicable	no	no	Not Calculated	No	no
1,2-Dichloroethene, cis-	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.60E+02	Not Applicable	no	no	Not Calculated	No	no
1,2-Dichloroethene, trans-	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.60E+03	Not Applicable	no	no	Not Calculated	No	no
1,2-Dichloropropane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	3.42E-01	Not Applicable	no	no	Not Calculated	No	no
1,3,5-Trimethylbenzene	3	0	0%	2.94E-01	2.94E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	7.80E+02	Not Applicable	no	no	Not Calculated	No	no
1,3-Dichlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	5.31E+02	Not Applicable	no	no	Not Calculated	No	no
1,3-Dichloropropane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.05E+02	Not Applicable	no	no	Not Calculated	No	no
1,3-Dichloropropene, cis-	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	7.77E-01	Not Applicable	no	no	Not Calculated	No	no
1,3-Dichloropropene, trans-	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	7.77E-01	Not Applicable	no	no	Not Calculated	No	no
1,4-Dichlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.40E+01	Not Applicable	no	no	Not Calculated	No	no
2,2-Dichloropropane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	3.42E-01	Not Applicable	no	no	Not Calculated	No	no
2-Butanone	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-01	8.19E-01	2.23E+04	Not Applicable	no	no	Not Calculated	No	no
2-Chlorotoluene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	1.58E+02	Not Applicable	no	no	Not Calculated	No	no
2-Hexanone	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-01	8.19E-01	No Data	Not Applicable	no	no	Not Calculated	No	no
4-Chlorotoluene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	1.58E+02	Not Applicable	no	no	Not Calculated	No	no
4-Isopropyltoluene	3	0	0%	2.18E-02	1.87E+01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	No Data	Not Applicable	no	no	Not Calculated	Not Calculated	no
4-Methyl-2-pentanone	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-01	8.19E-01	No Data	Not Applicable	no	no	Not Calculated	No	no
Acetone	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.27E+00	1.64E+00	5.43E+04	Not Applicable	no	no	Not Calculated	No	no
Benzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.58E-02	2.05E-02	8,2	Not Applicable	no	no	Not Calculated	No	no
Bromobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	2.78E+01	Not Applicable	no	no	Not Calculated	No	no
Bromochloromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	No Data	Not Applicable	no	no	Not Calculated	No	no
Bromodichloromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	3.40E+00	Not Applicable	no	no	Not Calculated	No	no
Bromoform	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	5.70E+01	Not Applicable	no	no	Not Calculated	No	no
Bromomethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-01	8.19E-01	4.60E+01	Not Applicable	no	no	Not Calculated	No	no
Butylbenzene, n-	3	0	0%	1.49E-01	8.77E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	2.40E+02	Not Applicable	no	no	Not Calculated	No	no
Butylbenzene, sec-	3	0	0%	1.93E-01	4.05E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	2.20E+02	Not Applicable	no	no	Not Calculated	No	no
Butylbenzene, tert-	3	0	0%	1.23E-01	1.23E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	3.90E+02	Not Applicable	no	no	Not Calculated	No	no
Carbon tetrachloride	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	4.09E-02	7.23E-02	7.50E+00	Not Applicable	no	no	Not Calculated	No	no
Chlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	5.30E+02	Not Applicable	no	no	Not Calculated	No	no
Chloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-01	8.19E-01	1.60E+05	Not Applicable	no	no	Not Calculated	No	no
Chloroform	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	5.80E+00	Not Applicable	no	no	Not Calculated	No	no
Chloromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-01	4.09E-01	4.69E+01	Not Applicable	no	no	Not Calculated	No	no

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Volatile Organic Compounds (cont'd)																
Dibromochloromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.27E-01	1.64E-01	7.60E+00	Not Applicable	no	no	Not Calculated	No	no
Dibromomethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	No Data	Not Applicable	no	no	Not Calculated	No	no
Dichlorodifluoromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.27E-01	1.64E-01	9.39E+01	Not Applicable	no	no	Not Calculated	No	no
Ethylbenzene	3	0	0%	5.95E-01	5.95E-01	Not Applicable	0.00E+00	3.17E-02	4.09E-02	3.40E+01	Not Applicable	no	no	Not Calculated	No	no
Hexachlorobutadiene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.27E-01	1.64E-01	6.24E+00	Not Applicable	no	no	Not Calculated	No	no
Isopropylbenzene	3	0	0%	1.79E-01	3.77E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	3.50E+03	Not Applicable	no	no	Not Calculated	No	no
Methyl tert-butyl ether (MTBE)	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	2.50E+02	Not Applicable	no	no	Not Calculated	No	no
Methylene chloride	3	0	0%	8.47E-02	3.78E-01	Not Applicable	0.00E+00	3.17E-01	4.09E-01	7.60E+01	Not Applicable	no	no	Not Calculated	No	no
Propylbenzene, n-	3	0	0%	1.95E-01	8.43E-01	Not Applicable	0.00E+00	3.17E-02	4.09E-02	2.40E+02	Not Applicable	no	no	Not Calculated	No	no
Styrene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	7.90E+03	Not Applicable	no	no	Not Calculated	No	no
Tetrachloroethene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	2.20E+02	Not Applicable	no	no	Not Calculated	No	no
Toluene	3	0	0%	7.99E-02	1.24E+01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	5.80E+03	Not Applicable	no	no	Not Calculated	No	no
Trichloroethene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	6.70E+00	Not Applicable	no	no	Not Calculated	No	no
Trichlorofluoromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.27E-01	1.64E-01	7.60E+03	Not Applicable	no	no	Not Calculated	No	no
Vinyl chloride	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	3.60E-01	Not Applicable	no	no	Not Calculated	No	no
Xylene, m,p-	3	0	0%	2.77E-01	2.77E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	1.40E+03	Not Applicable	no	no	Not Calculated	No	no
Xylene, o-	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.40E+03	Not Applicable	no	no	Not Calculated	No	no
Petroleum Hydrocarbons																
NWTPH-Gx Gasoline	8	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.20E+00	1.56E+02	1.20E+03	Not Applicable	no	no	Not Calculated	No	no
NWTPH-Dx Diesel	29	2	7%	2.21E+02	7.01E+02	8.51E+01	8.51E+01	8.40E+00	3.90E+02	1.10E+03	Not Applicable	YES	no	Not Calculated	No	no
NWTPH-Dx Heavy Oil	29	18	62%	5.20E+01	4.26E+03	1.41E+03	1.41E+03	1.70E+01	7.10E+01	2.80E+03	Not Applicable	YES	no	Not Calculated	Yes	no

Notes:
[a] Upper confidence limit on the mean or median of detected values
[b] Default ODEQ (2010) background concentrations for metals.
mg/kg = Milligram per kilogram

APPENDIX A / TABLE 2
DATA SUMMARY AND INITIAL SCREENING
ALL GROUNDWATER DISSOLVED SAMPLES
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/L)	Maximum Detected Concentration (mg/L)	Upper Confidence Limit (mg/L)	Exposure Point Concentration[a] (mg/L)	Minimum Sample Reporting Limit (mg/L)	Maximum Sample Reporting Limit (mg/L)	Minimum Human Health Risk-Based Screening Concentration (mg/L)	Background/ Reference Concentration[b] (mg/L)	Detected?	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Metals																
Antimony	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.46E-02	1.00E-03	no	no	no	No	no
Arsenic, total	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	5.20E-04	2.00E-03	no	YES	no	No	YES
Beryllium	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	No Data	0.00E+00	no	no	NA	No	no
Cadmium	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	No Data	0.00E+00	no	no	NA	No	no
Chromium, Total	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	No Data	1.00E-03	no	no	YES	No	no
Copper	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	4.00E-03	4.00E-03	8.00E-01	9.00E-03	no	no	no	No	no
Lead	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.50E-02	1.33E-02	no	no	no	No	no
Mercury	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	8.00E-05	8.00E-05	6.00E-03	1.00E-04	no	no	no	No	no
Nickel	4	2	50%	2.46E-03	3.20E-03	3.23E-03	3.23E-03	2.00E-03	2.00E-03	NO DATA	5.50E-03	YES	no	no	Not Calculated	no
Selenium	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	1.82E-01	2.00E-04	no	no	YES	No	no
Silver	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.00E-01	1.00E-03	no	no	no	No	no
Thallium	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	2.41E-03	0.00E+00	no	no	NA	No	no
Zinc	5	1	20%	2.30E-02	2.30E-02	Not Applicable	2.30E-02	4.00E-03	4.00E-03	1.09E+01	3.80E-02	YES	no	no	No	no
Polynuclear Aromatic Hydrocarbons																
Acenaphthene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	5.10E-01	Not Applicable	no	no	Not Calculated	No	no
Acenaphthylene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	5.10E-01	Not Applicable	no	no	Not Calculated	No	no
Anthracene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	1.83E+03	Not Applicable	no	no	Not Calculated	No	no
Benz(a)anthracene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	2.90E-05	Not Applicable	no	no	Not Calculated	No	no
Benzo(a)pyrene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	3.40E-06	Not Applicable	no	YES	Not Calculated	No	YES
Benzo(b)fluoranthene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	3.40E-05	Not Applicable	no	no	Not Calculated	No	no
Benzo(g,h,i)perylene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	1.10E-01	Not Applicable	no	no	Not Calculated	No	no
Benzo(k)fluoranthene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	3.40E-04	Not Applicable	no	no	Not Calculated	No	no
Chrysene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	9.21E+00	Not Applicable	no	no	Not Calculated	No	no
Dibenz(a,h)anthracene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	3.40E-06	Not Applicable	no	YES	Not Calculated	No	YES
Fluoranthene	12	3	25%	1.01E-05	1.19E-05	1.15E-05	1.15E-05	1.87E-05	7.48E-05	1.46E+03	Not Applicable	YES	no	Not Calculated	No	no
Fluorene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	2.80E-01	Not Applicable	no	no	Not Calculated	No	no
Indeno(1,2,3-cd)pyrene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	3.40E-05	Not Applicable	no	no	Not Calculated	No	no
Naphthalene	20	8	40%	1.92E-05	4.49E-05	3.27E-05	3.97E-03	3.74E-05	5.00E-03	1.70E-04	Not Applicable	YES	no	Not Calculated	No	YES
Phenanthrene	12	3	25%	9.99E-06	1.25E-05	1.26E-05	1.26E-05	1.87E-05	5.00E-04	1.83E+03	Not Applicable	YES	no	Not Calculated	No	no
Pyrene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	1.10E-01	Not Applicable	no	no	Not Calculated	No	no
Semi-Volatile Organic Compounds																
2,3,4,5-Tetrachlorophenol	21	1	5%	6.38E-03	6.38E-03	Not Applicable	6.38E-03	5.71E-05	1.41E-03	1.09E+00	Not Applicable	YES	no	Not Calculated	No	no
2,3,4,6-Tetrachlorophenol	22	2	9%	1.60E-02	8.77E-02	Not Applicable	8.77E-02	5.60E-05	1.41E-03	1.09E+00	Not Applicable	YES		Not Calculated	No	no
2,4,5-Trichlorophenol	16	1	6%	9.38E-03	9.38E-03	Not Applicable	9.38E-03	5.60E-05	1.41E-03	3.65E+00	Not Applicable	YES	no	Not Calculated	No	no
2,4,6-Trichlorophenol	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.00E-05	1.61E-03	4.40E-03	Not Applicable	no	no	Not Calculated	No	no
2,4-Dichlorophenol	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.00E-05	1.61E-03	1.09E-01	Not Applicable	no	no	Not Calculated	No	no
2,6-Dichlorophenol	14	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.60E-05	5.80E-05	1.09E-01	Not Applicable	no		Not Calculated	No	no
2-Chlorophenol	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.00E-05	1.61E-03	3.04E-02	Not Applicable	no	no	Not Calculated	No	no
2-Methylnaphthalene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	4.20E-03	2.70E-02	Not Applicable	no	no	Not Calculated	No	no
3,4-Dichlorophenol	21	1	5%	2.74E-03	2.74E-03	Not Applicable	2.74E-03	5.61E-05	1.81E-03	1.09E-01	Not Applicable	YES	no	Not Calculated	No	no
3,4-Methylphenol	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-02	4.20E-02	3.65E+01	Not Applicable	no	no	Not Calculated	No	no
3+4-chlorphenols	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.90E-04	3.23E-03	3.04E+01	Not Applicable	no	no	Not Calculated	No	no
Benzoic acid	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.70E-02	8.30E-02	1.46E+02	Not Applicable	no	no	Not Calculated	No	no
Bis(2-ethylhexyl)phthalate	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	4.20E-03	5.60E-03	Not Applicable	no	no	Not Calculated	No	no
Butylbenzylphthalate	2	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	1.90E-03	7.30E+00	Not Applicable	no	no	Not Calculated	No	no
Dibenzofuran	6	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	1.22E-02	Not Applicable	#REF!	#REF!	Not Calculated	No	no
Diethylphthalate	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	4.20E-03	2.92E+01	Not Applicable	no	no	Not Calculated	No	no
Dimethylphthalate	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	4.20E-03	3.65E+02	Not Applicable	no	no	Not Calculated	No	no
Di-n-Butylphthalate	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	4.20E-03	3.65E+00	Not Applicable	no	no	Not Calculated	No	no
iodopropynyl butylcarbamate	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.80E-04	1.61E-03	NO DATA	Not Applicable	no	no	Not Calculated	No	no
Pentachlorophenol	24	4	17%	1.13E-04	2.56E-01	2.73E-02	2.73E-02	1.87E-04	2.10E-02	4.40E-05	Not Applicable	YES	YES	Not Calculated	Yes	YES
Phenol	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.70E-03	8.30E-03	1.09E+01	Not Applicable	no	no	NA	No	no

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HUMAN HEALTH RISK ASSESSMENT
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MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/L)	Maximum Detected Concentration (mg/L)	Upper Confidence Limit (mg/L)	Exposure Point Concentration[a] (mg/L)	Minimum Sample Reporting Limit (mg/L)	Maximum Sample Reporting Limit (mg/L)	Minimum Human Health Risk-Based Screening Concentration (mg/L)	Background/ Reference Concentration[b] (mg/L)	Detected?	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Volatile Organic Compounds																
1,1,1,2-Tetrachloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	4.32E-04	Not Applicable	no	YES	Not Calculated	No	YES
1,1,1-Trichloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	9.10E+00	Not Applicable	no	no	Not Calculated	No	no
1,1,2,2-Tetrachloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	5.53E-05	Not Applicable	no	YES	Not Calculated	No	YES
1,1,2-Trichloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.30E-04	Not Applicable	no	YES	Not Calculated	No	YES
1,1-Dichloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.80E-03	Not Applicable	no	no	Not Calculated	No	no
1,1-Dichloroethene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.80E-01	Not Applicable	no	no	Not Calculated	No	no
1,1-Dichloropropene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	3.95E-04	Not Applicable	no	YES	Not Calculated	No	YES
1,2,3-Trichlorobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	7.16E-03	Not Applicable	no	no	Not Calculated	No	no
1,2,3-Trichloropropane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	5.60E-06	Not Applicable	no	YES	Not Calculated	No	YES
1,2,4-Trichlorobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	7.16E-03	Not Applicable	no	no	Not Calculated	No	no
1,2,4-Trimethylbenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.50E-02	Not Applicable	no	no	Not Calculated	No	no
1,2-Dibromo-3-chloropropane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-03	5.00E-03	4.76E-05	Not Applicable	no	YES	Not Calculated	No	YES
1,2-Dibromoethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	6.30E-06	Not Applicable	no	YES	Not Calculated	No	YES
1,2-Dichlorobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	3.00E-01	Not Applicable	no	no	Not Calculated	No	no
1,2-Dichloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.40E-04	Not Applicable	no	YES	Not Calculated	No	YES
1,2-Dichloroethene, cis-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	3.60E-02	Not Applicable	no	no	Not Calculated	No	no
1,2-Dichloroethene, trans-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	3.60E-01	Not Applicable	no	no	Not Calculated	No	no
1,2-Dichloropropane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.65E-04	Not Applicable	no	YES	Not Calculated	No	YES
1,3,5-Trimethylbenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.10E-01	Not Applicable	no	no	Not Calculated	No	no
1,3-Dichlorobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.83E-01	Not Applicable	no	no	Not Calculated	No	no
1,3-Dichloropropane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.22E-01	Not Applicable	no	no	Not Calculated	No	no
1,3-Dichloropropene, cis-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	3.95E-04	Not Applicable	no	YES	Not Calculated	No	YES
1,3-Dichloropropene, trans-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	3.95E-04	Not Applicable	no	YES	Not Calculated	No	YES
1,4-Dichlorobenzene	8	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	4.20E-03	4.80E-04	Not Applicable	no	YES	Not Calculated	No	YES
2,2-Dichloropropane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.65E-04	Not Applicable	no	YES	Not Calculated	No	YES
2-Butanone	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	2.50E-01	6.97E+00	Not Applicable	no	no	Not Calculated	No	no
2-Chlorotoluene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.22E-01	Not Applicable	no	no	Not Calculated	No	no
2-Hexanone	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	1.00E-02	No Data	Not Applicable	no	no	Not Calculated	No	no
4-Chlorotoluene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.22E-01	Not Applicable	no	no	Not Calculated	No	no
4-Isopropyltoluene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	6.80E-01	Not Applicable	no	no	Not Calculated	No	no
4-Methyl-2-pentanone	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	1.00E-02	No Data	Not Applicable	no	no	Not Calculated	No	no
Acetone	5	1	20%	3.03E-01	3.03E-01	Not Applicable	3.03E-01	2.00E-02	2.00E-02	5.48E+00	Not Applicable	YES	no	Not Calculated	No	no
Benzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.50E-04	2.50E-04	4.60E-04	Not Applicable	no	no	Not Calculated	No	no
Bromobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.03E-02	Not Applicable	no	no	Not Calculated	No	no
Bromochloromethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	No Data	Not Applicable	no	no	Not Calculated	No	no
Bromoform	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	3.30E-03	Not Applicable	no	no	Not Calculated	No	no
Bromomethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	7.50E-03	Not Applicable	no	no	Not Calculated	No	no
Butylbenzene, n-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	2.43E-01	Not Applicable	no	no	Not Calculated	No	no
Butylbenzene, sec-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	2.43E-01	Not Applicable	no	no	Not Calculated	No	no
Butylbenzene, tert-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.43E-01	Not Applicable	no	no	Not Calculated	No	no
Carbon tetrachloride	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	4.60E-04	Not Applicable	no	YES	Not Calculated	No	YES
Chlorobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	7.70E-02	Not Applicable	no	no	Not Calculated	No	no
Chloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	2.10E+00	Not Applicable	no	no	Not Calculated	No	no
Chloroform	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	2.20E-04	Not Applicable	no	YES	Not Calculated	No	YES
Chloromethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.90E-01	Not Applicable	no	no	Not Calculated	No	no
Dibromochloromethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	6.80E-04	Not Applicable	no	no	Not Calculated	No	no
Dibromomethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	No Data	Not Applicable	no	no	Not Calculated	No	no
Dichlorodifluoromethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	3.95E-01	Not Applicable	no	no	Not Calculated	No	no
Ethylbenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.50E-03	Not Applicable	no	no	Not Calculated	No	no
Hexachlorobutadiene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	8.62E-04	Not Applicable	no	YES	Not Calculated	No	YES
Isopropylbenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	6.80E-01	Not Applicable	no	no	Not Calculated	No	no
Methyl tert-butyl ether (MTBE)	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.40E-02	Not Applicable	no	no	Not Calculated	No	no

APPENDIX A / TABLE 2
DATA SUMMARY AND INITIAL SCREENING
ALL GROUNDWATER DISSOLVED SAMPLES
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/L)	Maximum Detected Concentration (mg/L)	Upper Confidence Limit (mg/L)	Exposure Point Concentration[a] (mg/L)	Minimum Sample Reporting Limit (mg/L)	Maximum Sample Reporting Limit (mg/L)	Minimum Human Health Risk-Based Screening Concentration (mg/L)	Background/ Reference Concentration[b] (mg/L)	Detected?	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Volatile Organic Compounds (cont'd)																
Methylene chloride	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-03	5.00E-03	4.28E-03	Not Applicable	no	YES	Not Calculated	No	YES
Propylbenzene, n-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.43E-01	Not Applicable	no	no	Not Calculated	No	no
Styrene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.20E+00	Not Applicable	no	no	Not Calculated	No	no
Tetrachloroethene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.20E-02	Not Applicable	no	no	Not Calculated	No	no
Toluene	3	1	33%	1.10E-03	1.10E-03	Not Applicable	1.10E-03	5.00E-04	5.00E-04	1.10E+00	Not Applicable	YES	no	Not Calculated	No	no
Trichloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	NO DATA	Not Applicable	no		Not Calculated	No	no
Trichlorofluoromethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.10E+00	Not Applicable	no	no	Not Calculated	No	no
Vinyl chloride	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.70E-05	Not Applicable	no	YES	Not Calculated	No	YES
Xylene, m,p-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.90E-01	Not Applicable	no	no	Not Calculated	No	no
Xylene, o-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.90E-01	Not Applicable	no	no	Not Calculated	No	no
Petroleum Hydrocarbons																
NWTPH-Gx Gasoline	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	9.35E-02	1.00E-01	No Data	Not Applicable	no	no	Not Calculated	No	no
NWTPH-Dx Diesel	24	13	54%	4.10E-02	1.11E+00	2.92E-01	2.92E-01	7.50E-02	2.50E-01	No Data	Not Applicable	YES	no	Not Calculated	Not Calculated	no
NWTPH-Dx Heavy Oil	24	15	63%	8.20E-02	1.25E+01	4.12E+00	4.12E+00	1.50E-01	5.00E-01	No Data	Not Applicable	YES	no	Not Calculated	Not Calculated	no
Notes:																
[a] Upper confidence limit on the mean or median of detected values																
[b] Default ODEQ (2010) background concentrations for metals.																
mg/L = Milligram per liter																

APPENDIX A / TABLE 3
DATA SUMMARY AND INITIAL SCREENING
ALL SEDIMENT SAMPLES
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration[a] (mg/kg)	Minimum Sample Reporting Limit (mg/kg)	Maximum Sample Reporting Limit (mg/kg)	Minimum Human Health Risk-Based Screening Concentration (mg/kg)	Background/ Reference Concentration[b] (mg/kg)	Detected?	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Metals																
Antimony	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.12E+00	1.08E+01	3.13E+01	1.00E+00	No	no	YES	No	no
Arsenic, total	21	11	52%	1.80E+00	1.07E+01	4.55E+00	4.55E+00	1.30E+00	1.02E+01	1.90E+00	8.80E+00	Yes	no	YES	Yes	YES
Barium	14	5	36%	1.22E+02	2.08E+02	1.39E+02	1.39E+02	7.89E+01	3.06E+02	1.50E+04	0.00E+00	Yes	no	YES	No	no
Beryllium	16	3	19%	1.49E+00	1.91E+00	1.55E+00	1.55E+00	1.26E+00	5.09E+00	1.50E+03	0.00E+00	Yes	no	YES	No	no
Cadmium	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.12E+00	5.09E+00	2.10E+03	5.00E-01	No	no	YES	No	no
Chromium, Total	21	14	67%	1.16E+01	5.75E+01	3.70E+01	3.70E+01	2.83E+01	9.88E+01	2.11E+02	3.00E+01	Yes	no	YES	No	no
Copper	16	16	100%	1.78E+01	6.59E+01	4.04E+01	4.04E+01	Not Applicable	Not Applicable	3.10E+03	1.20E+01	Yes	YES	YES	No	no
Lead	21	21	100%	3.70E+00	1.10E+02	3.11E+01	3.11E+01	Not Applicable	Not Applicable	4.00E+02	2.00E+00	Yes	YES	YES	No	no
Mercury	21	9	43%	7.10E-02	1.30E+00	2.82E-01	2.82E-01	5.30E-02	4.07E-01	2.30E+01	2.00E-01	Yes	no	YES	No	no
Nickel	16	16	100%	7.25E+00	3.59E+01	2.22E+01	2.22E+01	Not Applicable	Not Applicable	1.40E+04	2.00E+01	Yes	YES	YES	No	no
Selenium	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.23E+00	1.02E+01	3.91E+02	4.00E-01	No	no	YES	No	no
Silver	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.58E-01	5.09E+00	3.90E+02	4.00E-01	No	no	YES	No	no
Thallium	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.12E+00	5.09E+00	5.16E+00	0.00E+00	No	no	YES	No	no
Zinc	16	7	44%	1.05E+02	4.43E+02	1.73E+02	1.73E+02	2.53E+01	1.69E+02	2.35E+04	5.30E+01	Yes	no	Yes	No	no
Pesticides/Polychlorinated Biphenyls (PCBs)/Dioxins																
2,3,7,8-TCDD (dioxin)	38	30	79%	1.27E-07	6.30E-06	1.58E-06	1.58E-06	1.97E-07	1.08E-06	4.70E-06	0.00E+00	Yes	no	NA	Yes	no
2,3,7,8-TEQ	38	38	100%	4.40E-06	4.13E-04	1.21E-04	1.21E-04	Not Applicable	Not Applicable	4.70E-06	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
1,2,3,7,8-PeCDD	38	38	100%	4.00E-07	5.10E-05	1.02E-05	1.02E-05	Not Applicable	Not Applicable	4.70E-06	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
1,2,3,4,7,8-HxCDD	38	36	95%	6.85E-08	6.50E-06	1.73E-06	1.73E-06	6.98E-08	1.67E-06	4.70E-07	Not Applicable	Yes	no	Not Calculated	Yes	YES
1,2,3,6,7,8-HxCDD	38	37	97%	1.56E-07	1.80E-05	5.03E-06	5.03E-06	Not Applicable	Not Applicable	4.70E-07	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
1,2,3,7,8,9-HxCDD	38	38	100%	9.89E-07	1.16E-04	3.40E-05	1.87E-04	3.60E-06	3.60E-06	4.70E-07	Not Applicable	Yes	YES	Not Calculated	Yes	YES
1,2,3,4,6,7,8-HpCDD	38	38	100%	9.93E-07	1.10E-04	3.02E-05	3.02E-05	Not Applicable	Not Applicable	4.70E-08	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
OCDD	38	38	100%	1.35E-07	1.40E-05	3.99E-06	3.99E-06	Not Applicable	Not Applicable	1.41E-09	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
2,3,7,8-TCDF	38	38	100%	7.19E-08	9.56E-07	1.90E-06	1.90E-06	Not Applicable	Not Applicable	4.70E-07	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
1,2,3,7,8-PeCDF	38	38	100%	1.39E-08	1.30E-06	3.14E-07	3.14E-07	Not Applicable	Not Applicable	1.41E-07	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
2,3,4,7,8-PeCDF	38	38	100%	1.49E-07	1.70E-05	4.80E-06	4.80E-06	Not Applicable	Not Applicable	1.41E-06	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
1,2,3,4,7,8-HxCDF	38	38	100%	1.25E-07	2.24E-05	5.09E-06	5.09E-06	Not Applicable	Not Applicable	4.70E-07	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
1,2,3,6,7,8-HxCDF	38	33	87%	1.67E-07	1.70E-05	3.91E-06	3.91E-06	1.10E-07	1.51E-05	4.70E-07	Not Applicable	Yes	no	Not Calculated	Yes	YES
1,2,3,7,8,9-HxCDF	38	36	95%	2.44E-08	1.98E-06	4.36E-07	4.36E-07	1.61E-08	6.90E-08	4.70E-07	Not Applicable	Yes	no	Not Calculated	Yes	no
1,2,3,4,6,7,8-HpCDF	38	38	100%	2.65E-07	6.22E-05	1.38E-05	1.38E-05	Not Applicable	Not Applicable	4.70E-08	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
1,2,3,4,7,8,9-Hp-CDF	38	38	100%	1.18E-08	3.17E-06	4.93E-07	4.93E-07	Not Applicable	Not Applicable	4.70E-08	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
OCDF	38	38	100%	4.26E-09	2.18E-06	3.75E-07	3.75E-07	Not Applicable	Not Applicable	1.41E-09	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
Polynuclear Aromatic Hydrocarbons																
Acenaphthene	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	8.80E-02	4.70E+03	Not Applicable	No	no	Not Calculated	No	no
Acenaphthylene	16	1	6%	4.49E-02	4.49E-02	2.18E-02	4.49E-02	9.50E-03	8.83E-02	4.70E+03	Not Applicable	Yes	no	Not Calculated	No	no
Anthracene	16	1	6%	5.27E-02	5.27E-02	2.18E-02	5.27E-02	9.50E-03	8.83E-02	2.30E+04	Not Applicable	Yes	no	Not Calculated	No	no
Benz(a)anthracene	16	1	6%	2.87E-01	2.87E-01	2.18E-02	2.87E-01	9.50E-03	8.83E-02	1.50E-01	Not Applicable	Yes	no	Not Calculated	Yes	YES
Benzo(a)pyrene	16	1	6%	3.54E-01	3.54E-01	2.67E-02	3.54E-01	1.43E-02	8.83E-02	1.50E-02	Not Applicable	Yes	no	Not Calculated	Yes	YES
Benzo(b)fluoranthene	15	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-02	8.80E-02	1.50E-01	Not Applicable	No	no	Not Calculated	No	no
Benzo(b+k) fluoranthese	1	1	100%	5.17E-01	5.17E-01	Not Applicable	5.17E-01	Not Applicable	Not Applicable	1.50E-01	Not Applicable	Yes	Not Calculated	Not Calculated	Yes	YES
Benzo(g,h,i)perylene	16	1	6%	3.27E-01	3.27E-01	Not Applicable	3.27E-01	1.06E-02	8.83E-02	1.80E+03	Not Applicable	Yes	no	Not Calculated	No	no
Benzo(k)fluoranthene	15	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-02	8.80E-02	1.50E+00	Not Applicable	No	no	Not Calculated	No	no
Chrysene	16	1	6%	3.56E-01	3.56E-01	2.18E-02	3.56E-01	1.06E-02	8.83E-02	1.50E+01	Not Applicable	Yes	no	Not Calculated	No	no
Dibenz(a,h)anthracene	16	1	6%	4.30E-02	4.30E-02	2.48E-02	4.30E-02	1.06E-02	8.83E-02	1.50E-02	Not Applicable	Yes	no	Not Calculated	Yes	YES
Fluoranthene	16	1	6%	6.81E-01	6.81E-01	2.18E-02	6.81E-01	1.06E-02	8.83E-02	2.40E+03	Not Applicable	Yes	no	Not Calculated	No	no
Fluorene	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	8.80E-02	3.10E+03	Not Applicable	No	no	Not Calculated	No	no
Indeno(1,2,3-cd)pyrene	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	3.21E-01	1.50E-01	Not Applicable	No	no	Not Calculated	No	no
Naphthalene	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	1.76E-01	5.30E+00	Not Applicable	No	no	Not Calculated	No	no
Phenanthrene	16	1	6%	3.03E-01	3.03E-01	2.18E-02	3.03E-01	1.06E-02	8.83E-02	2.30E+04	Not Applicable	Yes	no	Not Calculated	No	no
Pyrene	16	1	6%	7.80E-01	7.80E-01	2.18E-02	7.80E-01	1.06E-02	8.83E-02	1.80E+03	Not Applicable	Yes	no	Not Calculated	No	no

APPENDIX A / TABLE 3
DATA SUMMARY AND INITIAL SCREENING
ALL SEDIMENT SAMPLES
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration[a] (mg/kg)	Minimum Sample Reporting Limit (mg/kg)	Maximum Sample Reporting Limit (mg/kg)	Minimum Human Health Risk-Based Screening Concentration (mg/kg)	Background/ Reference Concentration[b] (mg/kg)	Detected?	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Semi-Volatile Organic Compounds																
2,3,4,5-Tetrachlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	1.83E+03	Not Applicable	No	no	Not Calculated	No	no
2,3,4,6-Tetrachlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	1.83E+03	Not Applicable	No	no	Not Calculated	No	no
2,4,5-Trichlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	6.11E+03	Not Applicable	No	no	Not Calculated	No	no
2,4,6-Trichlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	4.40E+01	Not Applicable	No	no	Not Calculated	No	no
2,4-Dichlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	1.83E+02	Not Applicable	No	no	Not Calculated	No	no
2-Chlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	6.34E+01	Not Applicable	No	no	Not Calculated	No	no
3,4-Dichlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	4.80E-02	0.598.945	1.83E+02	Not Applicable	No	no	Not Calculated	No	no
3+4-Chlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.19E-01	5.29E-01	2.36E+02	Not Applicable	No	no	Not Calculated	No	no
Carbazole	9	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-02	3.70E-02	8.62E+01	Not Applicable	No	no	Not Calculated	No	no
Pentachlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	1.00E+00	Not Applicable	No	no	Not Calculated	No	no
Petroleum Hydrocarbons																
NWTPH-Gx Gasoline	7	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.50E+01	9.20E+01	1.20E+03	Not Applicable	No	no	Not Calculated	No	no
NWTPH-Dx Diesel	7	2	29%	1.18E+02	1.49E+02	1.26E+02	1.26E+02	6.30E+01	2.30E+02	1.10E+03	Not Applicable	Yes	no	Not Calculated	No	no
NWTPH-Dx Heavy Oil	7	2	29%	1.05E+03	1.06E+03	7.14E+02	7.14E+02	1.25E+02	4.60E+02	2.80E+03	Not Applicable	Yes	no	Not Calculated	No	no

Notes:

[a] Upper confidence limit on the mean or median of detected values

[b] Default ODEQ (2010) background concentrations for metals.

mg/kg = Milligrams per kilogram

APPENDIX A / TABLE 4
HUMAN HEALTH RISK-BASED SCREENING CONCENTRATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
"CAL-Modified PRG"	88-06-2	2.46E+01	ca	9.60E-01	ca	6.95E+00	ca	9.61E-02	ca
1,1,1,2-Tetrachloroethane	630-20-6	7.28E+00	ca	4.32E-01	ca	3.19E+00	ca	2.60E-01	ca
1,1,1-Trichloroethane	71-55-6	1.20E+03	sat	9.10E+03	nc	5.30E+03	sat	2.30E+03	nc
1,1,2,2-Tetrachloroethane	79-34-5	9.29E-01	ca	5.53E-02	ca	4.08E-01	ca	3.31E-02	ca
1,1,2-Trichloroethane	79-00-5	2.50E+01	ca*	2.30E-01	ca	5.20E+00	ca*	1.20E-01	ca
1,1,2-Trichloropropane	598-77-6	2.70E+02	nc	3.04E+01	nc	7.10E+01	nc	1.83E+01	nc
1,1-Biphenyl	92-52-4	2.33E+04	nc	3.04E+02	nc	3.01E+03	nc	1.83E+02	nc
1,1-Dichloroethane	75-34-3	2.50E+02	nc	2.30E+00	nc	5.20E+01	nc	5.21E+02	nc
1,1-Dichloroethene	75-35-4	2.70E+04	nc	3.40E+02	nc	1.80E+03	nc	2.08E+02	nc
1,1-Dichloropropene	542-75-6	1.76E+00	ca	3.95E-01	ca	7.77E-01	ca	4.80E-01	ca
1,1-Difluoroethane	75-37-6	No Data		6.94E+04	nc	No Data		4.16E+04	nc
1,1-Dimethylhydrazine	57-14-7	6.63E-01	ca	2.59E-02	ca	1.87E-01	ca	1.92E-03	ca
1,1'-Sulfonylbis (4-chlorobenzene)	80-07-9	5.11E+03	nc	1.82E+02	nc	3.91E+02	nc	1.83E+01	nc
1,2,3-Trichlorobenzene	120-82-1	2.16E+02	nc	7.16E+00	nc	6.22E+01	nc	3.65E+00	nc
1,2,3-Trichloropropane	96-18-4	7.60E-02	ca	5.60E-03	ca	3.40E-02	ca	3.36E-03	ca
1,2,3-Trichloropropene	96-19-5	1.70E+01	nc	2.18E+00	nc	5.20E+00	nc	1.10E+00	nc
1,2,4,5-Tetrachlorobenzene	95-94-3	1.85E+02	nc	1.09E+01	nc	1.83E+01	nc	1.10E+00	nc
1,2,4-Tribromobenzene	615-54-3	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc	1.83E+01	nc
1,2,4-Trichlorobenzene	120-82-1	2.16E+02	nc	7.16E+00	nc	6.22E+01	nc	3.65E+00	nc
1,2,4-Trimethylbenzene	95-63-6	2.00E+03	nc	1.50E+01	nc	1.10E+02	nc	6.21E+00	nc
1,2-Dibromo-3-chloropropane	96-12-8	2.02E+00	ca**	4.76E-02	ca**	4.60E-01	ca**	2.09E-01	nc
1,2-Dibromoethane	106-93-4	6.80E-01	ca	6.30E-03	ca	1.40E-01	ca	3.40E-03	ca
1,2-Dichlorobenzene	95-50-1	3.50E+04	sat	3.70E+02	nc	2.20E+03	sat	2.09E+02	nc
1,2-Dichloroethane	107-06-2	1.50E+01	ca*	1.40E-01	ca*	3.20E+00	ca*	7.39E-02	ca*
1,2-Dichloroethene, cis-	156-59-2	1.00E+04	nc	3.60E+02	nc	7.80E+02	nc	3.65E+01	nc
1,2-Dichloroethene, trans-	156-60-5	9.20E+03	nc	1.10E+02	nc	5.90E+02	nc	7.30E+01	nc
1,2-Dichloropropane	78-87-5	7.42E-01	ca*	1.65E-01	ca*	3.42E-01	ca*	9.89E-02	ca*
1,2-Dimethylhydrazine	540-73-8	4.66E-02	ca	1.82E-03	ca	1.31E-02	ca	1.82E-04	ca
1,2-Dinitrobenzene	528-29-0	6.16E+01	nc	3.65E+00	nc	6.11E+00	nc	3.65E-01	nc
1,2-Diphenylhydrazine	122-66-7	2.15E+00	ca	8.40E-02	ca	6.08E-01	ca	8.40E-03	ca
1,2-Epoxybutane	106-88-7	3.51E+03	nc	2.08E+02	nc	3.48E+02	nc	2.09E+01	nc
1,3,5-Trimethylbenzene	108-67-8	1.60E+03	nc	1.20E+01	nc	9.40E+01	nc	6.21E+00	nc
1,3,5-Trinitrobenzene	99-35-4	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
1,3-Butadiene	106-99-0	1.24E-01	ca*	1.02E-01	ca*	5.81E-02	ca*	6.11E-02	ca*
1,3-Dichlorobenzene	541-73-1	6.00E+02	sat	1.83E+02	nc	5.31E+02	nc	1.10E+02	nc
1,3-Dichloropropane	142-28-9	3.61E+02	nc	1.22E+02	nc	1.05E+02	nc	7.30E+01	nc
1,3-Dichloropropene	542-75-6	1.76E+00	ca	3.95E-01	ca	7.77E-01	ca	4.80E-01	ca
1,3-Dichloropropene, cis-	542-75-6	1.76E+00	ca	3.95E-01	ca	7.77E-01	ca	4.80E-01	ca
1,3-Dichloropropene, trans-	542-75-6	1.76E+00	ca	3.95E-01	ca	7.77E-01	ca	4.80E-01	ca
1,3-Dinitrobenzene	99-65-0	6.16E+01	nc	3.65E+00	nc	6.11E+00	nc	3.65E-01	nc
1,4-Dibromobenzene	106-37-6	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
1,4-Dichloro-2-butene	764-41-0	1.79E-02	ca	1.20E-03	ca	7.91E-03	ca	7.23E-04	ca
1,4-Dichlorobenzene	106-46-7	6.30E+01	ca	4.20E-01	ca	1.30E+01	ca	3.06E-01	ca
1,4-Dinitrobenzene	100-25-4	6.16E+01	nc	3.65E+00	nc	6.11E+00	nc	3.65E-01	nc
1,4-Dioxane	123-91-1	2.40E+02	ca	5.20E+00	ca	5.30E+01	ca	6.11E-01	ca
1,4-Dithiane	505-29-3	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
1,6-Hexamethylene diisocyanate	822-06-0	1.76E+00	nc	1.04E-01	nc	1.75E-01	nc	1.04E-02	nc
1-Butanol	71-36-3	6.14E+04	nc	3.65E+03	nc	6.10E+03	nc	9.49E+00	nc

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HUMAN HEALTH RISK-BASED SCREENING CONCENTRATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
1-Chloro-1,1-difluoroethane (HCFC-142b)	75-68-3	3.40E+02	sat	8.69E+04	nc	3.40E+02	sat	5.22E+04	nc
1-Chlorobutane	109-69-3	4.80E+02	sat	2.43E+03	nc	4.80E+02	sat	1.46E+03	nc
2-(2,4,5-Trichlorophenoxy) propionic acid	93-72-1	4.92E+03	nc	2.92E+02	nc	4.89E+02	nc	2.92E+01	nc
2-(2-Methyl-1,4-chlorophenoxy) propionic acid	16484-77-8	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
2-(2-Methyl-4-chlorophenoxy) propionic acid	93-65-2	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
2,2-Dichloropropane	78-87-5	7.42E-01	ca*	1.65E-01	ca*	3.42E-01	ca*	9.89E-02	ca*
2,3,4,5-Tetrachlorophenol	58-90-2	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
2,3,4,6-Tetrachlorophenol	58-90-2	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
2,3,7,8-TCDD (dioxin)	1746-01-6	2.00E-05	ca	4.40E-07	ca	4.50E-06	ca	4.48E-08	ca
2,3-Dichloropropanol	616-23-9	1.85E+03	nc	1.09E+02	nc	1.83E+02	nc	1.10E+01	nc
2,4,5-Trichlorophenol	95-95-4	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	3.65E+02	nc
2,4,5-Trichlorophenoxyacetic Acid	93-76-5	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
2,4,6-Trichloroaniline	634-93-5	5.07E+01	ca	1.98E+00	ca	1.43E+01	ca	1.98E-01	ca
2,4,6-Trichloroaniline hydrochloride	33663-50-2	5.94E+01	ca	2.32E+00	ca	1.68E+01	ca	2.32E-01	ca
2,4,6-Trichlorophenol	88-06-2	2.00E+02	nc**	5.20E+00	nc**	4.40E+01	nc**	3.65E-01	nc**
2,4,6-Trinitrotoluene	118-96-7	5.75E+01	ca**	2.24E+00	ca**	1.62E+01	ca**	2.24E-01	ca**
2,4-Dichlorophenol	120-83-2	1.85E+03	nc	1.09E+02	nc	1.83E+02	nc	1.10E+01	nc
2,4-Dichlorophenoxyacetic Acid (2,4-D)	94-75-7	7.70E+03	nc	3.70E+02	nc	6.10E+02	nc	3.65E+01	nc
2,4-Dimethylaniline	95-68-1	2.30E+00	ca	8.96E-02	ca	6.49E-01	ca	8.96E-03	ca
2,4-Dimethylaniline hydrochloride	21436-96-4	2.97E+00	ca	1.16E-01	ca	8.39E-01	ca	1.16E-02	ca
2,4-Dimethylphenol	105-67-9	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
2,4-Dinitrophenol	51-28-5	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
2,4-Dinitrotoluene	121-14-2	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
2,6-Dimethylphenol	576-26-1	3.69E+02	nc	2.19E+01	nc	3.67E+01	nc	2.19E+00	nc
2,6-Dinitrotoluene	606-20-2	7.70E+02	nc	3.70E+01	nc	6.10E+01	nc	3.65E+00	nc
2-Butanone	78-93-3	1.13E+05	nc	6.97E+03	nc	2.23E+04	nc	5.11E+03	nc
2-Chloro-1,3-butadiene	126-99-8	1.19E+01	nc	1.43E+01	nc	3.62E+00	nc	7.30E+00	nc
2-Chloroacetophenone	532-27-4	1.11E-01	nc	5.22E-02	nc	3.26E-02	nc	3.13E-02	nc
2-Chlorophenol	95-57-8	2.36E+02	nc	3.04E+01	nc	6.34E+01	nc	1.83E+01	nc
2-Chloropropane	75-29-6	5.89E+02	nc	1.74E+02	nc	1.70E+02	nc	1.04E+02	nc
2-Chlorotoluene	95-49-8	5.60E+02	nc	1.22E+02	nc	1.58E+02	nc	7.30E+01	nc
2-Ethoxyethanol	110-80-5	1.00E+05	max	1.46E+04	nc	2.44E+04	nc	2.09E+02	nc
2-Ethoxyethanol acetate	111-15-9	1.00E+05	max	1.09E+04	nc	1.83E+04	nc	1.10E+03	nc
2-Hexanone		No Data		No Data		No Data		No Data	
2-Mercaptobenzothiazole	149-30-4	5.94E+01	ca	2.32E+00	ca	1.68E+01	ca	2.32E-01	ca
2-Methoxy-5-nitroaniline	99-59-2	3.75E+01	ca	1.46E+00	ca	1.06E+01	ca	1.46E-01	ca
2-Methoxyethanol	109-86-4	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	2.09E+01	nc
2-Methoxyethanol acetate	110-49-6	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
2-Methyl-4-chlorophenoxyacetic acid	94-74-6	3.08E+02	nc	1.82E+01	nc	3.06E+01	nc	1.83E+00	nc
2-Methyl-5-nitroaniline	99-55-8	5.22E+01	ca	2.04E+00	ca	1.47E+01	ca	2.04E-01	ca
2-Methylaniline (o-toluidine)	95-53-4	7.18E+00	ca	2.80E-01	ca	2.03E+00	ca	2.80E-02	ca
2-Methylaniline hydrochloride	636-21-5	9.58E+00	ca	3.74E-01	ca	2.70E+00	ca	3.74E-02	ca
2-methylnaphthalene		No Data		No Data		No Data		No Data	
2-Methylphenol	95-48-7	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
2-Nitroaniline	88-74-4	1.83E+03	nc	1.09E+02	nc	1.83E+02	nc	1.10E-01	nc
2-Nitropropane	79-46-9	No Data		1.19E-03	ca	No Data		7.15E-04	ca
2-Phenylphenol	90-43-7	8.89E+02	ca	3.47E+01	ca	2.51E+02	ca	3.54E+00	ca
3,3-Dichlorobenzidine	91-94-1	4.80E+00	ca	1.30E-01	ca	1.10E+00	ca	1.49E-02	ca

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HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
3,3'-Dimethoxybenzidine	119-90-4	1.23E+02	ca	4.80E+00	ca	3.47E+01	ca	4.80E-01	ca
3,3'-Dimethylbenzidine	119-93-7	7.49E-01	ca	2.92E-02	ca	2.11E-01	ca	2.92E-03	ca
3,4-Dichlorophenol	120-83-2	1.85E+03	nc	1.09E+02	nc	1.83E+02	nc	1.10E+01	nc
3,4-Dimethylphenol	95-65-8	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
3-Chlorophenol	95-57-8	2.36E+02	nc	3.04E+01	nc	6.34E+01	nc	1.83E+01	nc
3-Methylphenol	108-39-4	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
3-Nitroaniline	99-09-2	8.21E+01	ca**	3.20E+00	ca**	1.83E+01	nc	3.20E-01	ca**
4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	94-82-6	4.92E+03	nc	2.92E+02	nc	4.89E+02	nc	2.92E+01	nc
4-(2-Methyl-4-chlorophenoxy) butyric acid	94-81-5	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
4,4'-Dichlorobenzophenone	90-98-2	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
4,4'-Methylene bis(2-chloroaniline)	101-14-4	1.33E+01	ca*	5.17E-01	ca*	3.74E+00	ca*	5.17E-02	ca*
4,4'-Methylene bis(N,N'-dimethyl)aniline	101-61-1	3.75E+01	ca	1.46E+00	ca	1.06E+01	ca	1.46E-01	ca
4,4'-Methylene diphenyl diisocyanate	101-68-8	1.05E+02	nc	6.20E+00	nc	1.04E+01	nc	6.21E-01	nc
4,4'-Methylenebisbenzeneamine	101-77-9	6.89E+00	ca	2.69E-01	ca	1.95E+00	ca	2.69E-02	ca
4,6-Dinitro-o-cresol	534-52-1	6.16E+01	nc	3.65E+00	nc	6.11E+00	nc	3.65E-01	nc
4,6-Dinitro-o-cyclohexyl phenol	131-89-5	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
4-Aminopyridine	504-24-5	1.23E+01	nc	7.30E-01	nc	1.22E+00	nc	7.30E-02	nc
4-Chloro-2-methylaniline	95-69-2	2.97E+00	ca	1.16E-01	ca	8.39E-01	ca	1.16E-02	ca
4-Chloro-2-methylaniline hydrochloride	3165-93-3	3.75E+00	ca	1.46E-01	ca	1.06E+00	ca	1.46E-02	ca
4-Chloroaniline	106-47-8	2.46E+03	nc	1.46E+02	nc	2.44E+02	nc	1.46E+01	nc
4-Chlorobenzotrifluoride	98-56-6	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
4-Chlorophenol	95-57-8	2.36E+02	nc	3.04E+01	nc	6.34E+01	nc	1.83E+01	nc
4-Chlorotoluene	95-49-8	5.60E+02	nc	1.22E+02	nc	1.58E+02	nc	7.30E+01	nc
4-Isopropyltoluene		No Data		No Data		No Data		No Data	
4-Methyl-2-pentanone		No Data		No Data		No Data		No Data	
4-Methylphenol	106-44-5	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc	1.83E+01	nc
4-Nitroaniline	100-01-6	8.21E+01	ca*	3.20E+00	ca*	2.32E+01	ca**	3.20E-01	ca*
Acenaphthene	83-32-9	6.10E+04	nc	2.20E+03	nc	4.70E+03	nc	2.19E+02	nc
Acenaphthylene		No Data		No Data		No Data		No Data	
Acephate	30560-19-1	1.98E+02	ca*	7.73E+00	ca*	5.59E+01	ca**	7.73E-01	ca*
Acetaldehyde	75-07-0	2.32E+01	ca**	1.75E+00	ca	1.09E+01	ca**	8.73E-01	ca*
Acetochlor	34256-82-1	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Acetone	67-64-1	5.43E+04	nc	5.48E+03	nc	1.41E+04	nc	3.29E+03	nc
Acetone cyanohydrin	75-86-5	4.92E+02	nc	2.92E+01	nc	4.89E+01	nc	2.92E+00	nc
Acetonitrile	75-05-8	1.82E+03	nc	1.03E+02	nc	4.24E+02	nc	6.21E+01	nc
Acrolein	107-02-8	3.36E-01	nc	4.16E-02	nc	1.03E-01	nc	2.09E-02	nc
Acrylamide	79-06-1	3.83E-01	ca	1.49E-02	ca	1.08E-01	ca	1.49E-03	ca
Acrylic acid	79-10-7	1.00E+05	max	1.82E+04	nc	2.90E+04	nc	1.04E+00	nc
Acrylonitrile	107-13-1	3.60E+00	ca*	4.30E-02	ca*	7.80E-01	ca*	2.83E-02	ca*
Alachlor	15972-60-8	2.14E+01	ca	8.35E-01	ca	6.04E+00	ca	8.40E-02	ca
Alar	1596-84-5	9.23E+04	nc	5.47E+03	nc	9.17E+03	nc	5.48E+02	nc
Aldicarb	116-06-3	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
Aldicarb sulfone	1646-88-4	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
Aldrin	309-00-2	1.30E-01	ca	3.30E-03	ca	2.90E-02	ca*	3.92E-04	ca
Ally	74223-64-6	1.00E+05	max	9.12E+03	nc	1.53E+04	nc	9.13E+02	nc
Allyl alcohol	107-18-6	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc	1.83E+01	nc
Allyl chloride	107-05-1	1.76E+02	nc	1.04E+01	nc	1.75E+01	nc	1.04E+00	nc
Aluminum	7429-90-5	1.00E+05	max	3.65E+04	nc	7.61E+04	nc	5.11E+00	nc

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FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
Aluminum phosphide	20859-73-8	4.09E+02	nc	1.46E+01	nc	3.13E+01	nc		
Amdro	67485-29-4	1.85E+02	nc	1.09E+01	nc	1.83E+01	nc	1.10E+00	nc
Ametryn	834-12-8	5.54E+03	nc	3.28E+02	nc	5.50E+02	nc	3.29E+01	nc
Aminodinitrotoluene	1321-12-6	1.23E+02	nc	7.30E+00	nc	1.22E+01	nc	7.30E-01	nc
Amitraz	33089-61-1	1.54E+03	nc	9.12E+01	nc	1.53E+02	nc	9.13E+00	nc
Ammonia	7664-41-7	No Data		No Data		No Data		1.04E+02	nc
Ammonium sulfamate	7773-06-0	1.00E+05	max	7.30E+03	nc	1.22E+04	nc		
Aniline	62-53-3	3.02E+02	ca*	1.18E+01	ca*	8.53E+01	ca**	1.04E+00	nc
Anthracene	120-12-7	1.00E+05	max	1.83E+03	nc	2.20E+04	nc	1.10E+03	nc
Antimony	7440-36-0	4.09E+02	nc	1.46E+01	nc	3.13E+01	nc		
Apollo	74115-24-5	8.00E+03	nc	4.74E+02	nc	7.94E+02	nc	4.75E+01	nc
Aramite	140-57-8	6.89E+01	ca	2.69E+00	ca	1.95E+01	ca	2.71E-01	ca
Arsenic III		No Data		No Data		No Data		No Data	
Arsenic V		No Data		No Data		No Data		No Data	
Arsenic, Total	7440-38-2	1.70E+00	ca	3.80E-02	ca	3.90E-01	ca*	4.47E-04	ca
Arsine	7784-42-1	No Data		No Data		No Data		5.22E-02	nc
Assure	76578-14-8	5.54E+03	nc	3.28E+02	nc	5.50E+02	nc	3.29E+01	nc
Asulam	3337-71-1	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Atrazine	1912-24-9	7.76E+00	ca	3.03E-01	ca	2.19E+00	ca	3.06E-02	ca
Avermectin B1	71751-41-2	2.46E+02	nc	1.46E+01	nc	2.44E+01	nc	1.46E+00	nc
Azobenzene	103-33-3	1.57E+01	ca	6.11E-01	ca	4.42E+00	ca	6.20E-02	ca
Barium	7440-39-3	6.66E+04	nc	7.30E+03	nc	1.50E+04	nc	5.21E-01	nc
Baygon	114-26-1	2.46E+03	nc	1.46E+02	nc	2.44E+02	nc	1.46E+01	nc
Bayleton	43121-43-3	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
Baythroid	68359-37-5	1.54E+04	nc	9.12E+02	nc	1.53E+03	nc	9.13E+01	nc
Benefin	1861-40-1	1.00E+05	max	1.09E+04	nc	1.83E+04	nc	1.10E+03	nc
Benomyl	17804-35-2	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Bentazon	25057-89-0	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
Benz(a)anthracene	56-55-3	2.70E+00	ca	2.90E-02	ca	1.50E-01	ca	9.21E-03	ca
Benzaldehyde	100-52-7	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	3.65E+02	nc
Benzene	71-43-2	3.40E+01	ca*	3.90E-01	ca	7.30E+00	ca*	2.49E-01	ca
Benzidine	92-87-5	5.50E+01	ca	7.20E-01	ca	3.20E+00	ca	2.92E-05	ca
Benzo(a)pyrene	50-32-8	2.70E-01	ca	2.90E-03	ca	1.50E-02	ca	9.21E-04	ca
Benzo(b)fluoranthene	205-99-2	2.70E+00	ca	2.90E-02	ca	1.50E-01	ca	9.21E-03	ca
Benzo(g,h,i)perylene		No Data		No Data		No Data		No Data	
Benzo(k)fluoranthene	207-08-9	2.70E+01	ca	2.90E-01	ca	1.50E+00	ca	9.21E-02	ca
Benzoic acid	65-85-0	1.00E+05	max	1.46E+05	nc	1.00E+05	max	1.46E+04	nc
Benzotrichloride	98-07-7	1.33E-01	ca	5.17E-03	ca	3.74E-02	ca	5.17E-04	ca
Benzyl alcohol	100-51-6	1.00E+05	max	1.09E+04	nc	1.83E+04	nc	1.10E+03	nc
Benzyl chloride	100-44-7	2.16E+00	ca	6.59E-02	ca	8.90E-01	ca*	3.96E-02	ca
Beryllium	7440-41-7	2.00E+03	ca**	7.30E+01	nc	1.60E+02	nc	8.00E-04	ca*
Chloronaphthalene, beta-	91-58-7	2.34E+04	nc	4.87E+02	nc	4.94E+03	nc	2.92E+02	nc
Bidrin	141-66-2	6.16E+01	nc	3.65E+00	nc	6.11E+00	nc	3.65E-01	nc
Biphenthrin (Talstar)	82657-04-3	9.23E+03	nc	5.47E+02	nc	9.17E+02	nc	5.48E+01	nc
Bis(2-chloro-1-methylethyl)ether	108-60-1	7.35E+00	ca	2.74E-01	ca	2.88E+00	ca	1.92E-01	ca
Bis(2-chloroethyl)ether	111-44-4	5.75E-01	ca	1.02E-02	ca	2.18E-01	ca	6.11E-03	ca
Bis(2-chloroisopropyl)ether	108-60-1	7.35E+00	ca	2.74E-01	ca	2.88E+00	ca	1.92E-01	ca
Bis(2-ethylhexyl)phthalate	117-81-7	1.50E+02	ca	4.10E+00	ca	3.50E+01	ca*	4.80E-01	ca

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HUMAN HEALTH RISK-BASED SCREENING CONCENTRATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
Bis(chloromethyl)ether	542-88-1	4.28E-04	ca	5.15E-05	ca	1.94E-04	ca	3.10E-05	ca
Bisphenol A	80-05-7	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Boron	7440-42-8	1.00E+05	max	7.30E+03	nc	1.60E+04	nc	2.09E+01	nc
Boron trifluoride	7637-07-2	No Data		No Data		No Data		7.30E-01	nc
Bromate	15541-45-4	2.46E+00	ca	9.60E-02	ca	6.95E-01	ca	9.61E-03	ca
Bromobenzene	108-86-1	9.22E+01	nc	2.03E+01	nc	2.78E+01	nc	1.04E+01	nc
Bromochloromethane		No Data		No Data		No Data	ca	No Data	ca
Bromodichloromethane	75-27-4	1.50E+01	ca	1.20E-01	ca	3.00E+00	ca	1.08E-01	ca
Bromoform	75-25-2	3.60E+02	ca*	7.20E+00	ca*	8.10E+01	ca*	1.75E+00	ca*
Bromomethane	74-83-9	7.10E+02	nc	8.70E+00	nc	4.60E+01	nc	5.21E+00	nc
Bromophos	2104-96-3	9.00E+03	nc	1.82E+02	nc	1.80E+03	nc	1.83E+01	nc
Bromoxynil	1689-84-5	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Bromoxynil octanoate	1689-99-2	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Butylate	2008-41-5	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Butylbenzene, n-	104-51-8	2.40E+02	sat	2.43E+02	nc	2.40E+02	sat	1.46E+02	nc
Butylbenzene, sec-	135-9-88	2.20E+02	sat	2.43E+02	nc	2.20E+02	sat	1.46E+02	nc
Butylbenzene, tert-	98-06-6	3.90E+02	sat	2.43E+02	nc	3.90E+02	sat	1.46E+02	nc
Butylbenzylphthalate	85-68-7	1.00E+05	max	7.30E+03	nc	1.22E+04	nc	7.30E+02	nc
Butylphthalyl butylglycolate	85-70-1	1.00E+05	max	3.65E+04	nc	6.11E+04	nc	3.65E+03	nc
Cadmium	7440-43-9	4.51E+02	nc	1.82E+01	nc	3.70E+01	nc	1.07E-03	ca
Caprolactam	105-60-2	1.00E+05	max	1.82E+04	nc	3.06E+04	nc	1.83E+03	nc
Captafol	2425-06-1	2.00E+02	ca**	7.82E+00	ca**	5.66E+01	ca**	7.82E-01	ca**
Captan	133-06-2	4.92E+02	ca	1.92E+01	ca	1.39E+02	ca*	1.92E+00	ca
Carbaryl	63-25-2	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	4.02E+02	nc
Carbazole	86-74-8	8.62E+01	ca	3.36E+00	ca	2.43E+01	ca	3.36E-01	ca
Carbofuran	1563-66-2	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc	1.83E+01	nc
Carbon disulfide	75-15-0	7.20E+02	sat	1.04E+03	nc	3.55E+02	nc	7.30E+02	nc
Carbon tetrachloride	56-23-5	1.50E+01	ca*	1.90E-01	ca*	3.30E+00	ca**	1.28E-01	ca*
Carbosulfan	55285-14-8	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
Carboxin	5234-68-4	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	3.65E+02	nc
Chloramben	133-90-4	9.23E+03	nc	5.47E+02	nc	9.17E+02	nc	5.48E+01	nc
Chloranil	118-75-2	4.28E+00	ca	1.67E-01	ca	1.21E+00	ca	1.68E-02	ca
Chlordane (technical)	12789-03-6	6.47E+00	ca*	1.92E-01	ca*	1.62E+00	ca*	1.92E-02	ca*
Chlorimuron-ethyl	90982-32-4	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Chlorine	7782-50-5	No Data		No Data		No Data		2.08E-01	nc
Chlorine dioxide	10049-04-4	No Data		No Data		No Data		2.09E-01	nc
Chloroacetic acid	79-11-8	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
Chlorobenzene	108-90-7	8.30E+03	nc	9.10E+01	nc	5.30E+02	nc	6.21E+01	nc
Chlorobenzilate	510-15-6	6.38E+00	ca	2.49E-01	ca	1.80E+00	ca	2.49E-02	ca
Chlorodifluoromethane	75-45-6	3.40E+02	sat	8.52E+04	nc	3.40E+02	sat	5.11E+04	nc
Chloroethane	75-00-3	6.49E+00	ca	2.10E+04	ca	3.03E+00	ca	2.32E+00	ca
Chloroform	67-66-3	2.50E+01	ca	1.90E-01	ca	5.10E+00	ca	8.30E-02	ca
Chloromethane	74-87-3	1.56E+02	nc	1.90E+02	nc	4.69E+01	nc	9.49E+01	nc
Chlorothalonil	1897-45-6	1.57E+02	ca*	6.11E+00	ca*	4.42E+01	ca*	6.11E-01	ca*
Chlorotoluene, o-	95-49-8	5.60E+02	nc	1.22E+02	nc	1.58E+02	nc	7.30E+01	nc
Chlorpropham	101-21-3	1.00E+05	max	7.30E+03	nc	1.22E+04	nc	7.30E+02	nc
Chlorpyrifos	2921-88-2	1.85E+03	nc	1.09E+02	nc	1.83E+02	nc	1.10E+01	nc
Chlorpyrifos-methyl	5598-13-0	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc

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HUMAN HEALTH RISK-BASED SCREENING CONCENTRATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
Chlorsulfuron	64902-72-3	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Chlorthiophos	60238-56-4	4.92E+02	nc	2.92E+01	nc	4.89E+01	nc	2.92E+00	nc
Chromium III	16065-83-1	1.00E+05	max	5.50E+04	nc	1.00E+05	max		
Chromium VI	18540-29-9	1.90E+02	ca	1.09E+02	nc	3.80E+01	ca**	2.29E-05	ca
Chromium, Total		4.48E+02	ca	No Data		2.11E+02	ca	1.60E-04	ca
Chrysene	218-01-9	2.70E+02	ca	9.21E+00	ca	1.50E+01	ca	9.21E-01	ca
Cobalt	7440-48-4	1.92E+03	ca*	7.30E+02	nc	9.03E+02	ca**	6.86E-04	ca*
Coke Oven Emissions	8007-45-2	No Data		No Data		No Data		3.10E-03	ca
Copper	7440-50-8	4.10E+04	nc	1.50E+03	nc	3.10E+03	nc	No Data	
Crotonaldehyde	123-73-9	1.15E-02	ca	5.90E-03	ca	5.31E-03	ca	3.54E-03	ca
Cumene (isopropylbenzene)	98-82-8	1.98E+03	nc	6.58E+02	nc	5.72E+02	nc	4.02E+02	nc
Cyanazine	21725-46-2	2.05E+00	ca	8.00E-02	ca	5.79E-01	ca	8.00E-03	ca
Cyanide	57-12-5	1.60E+03	nc	7.30E+02	nc	1.60E+03	nc		
Cyanide (hydrogen)	74-90-8	3.54E+01	nc	6.20E+00	nc	1.08E+01	nc	3.13E+00	nc
Cyanogen	460-19-5	4.30E+02	nc	2.43E+02	nc	1.27E+02	nc	1.46E+02	nc
Cyanogen bromide	506-68-3	9.67E+02	nc	5.48E+02	nc	2.87E+02	nc	3.29E+02	nc
Cyanogen chloride	506-77-4	5.37E+02	nc	3.04E+02	nc	1.59E+02	nc	1.83E+02	nc
Cyclohexane	110-82-7	1.40E+02	sat	1.03E+04	nc	1.40E+02	sat	6.21E+03	nc
Cyclohexanone	108-94-1	1.00E+05	max	1.82E+05	nc	1.00E+05	max	1.83E+04	nc
Cyclohexylamine	108-91-8	1.00E+05	max	7.30E+03	nc	1.22E+04	nc	7.30E+02	nc
Cyhalothrin/Karate	68085-85-8	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc	1.83E+01	nc
Cypermethrin	52315-07-8	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
Cyromazine	66215-27-8	4.62E+03	nc	2.74E+02	nc	4.58E+02	nc	2.74E+01	nc
Dacthal	1861-32-1	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
Dalapon	75-99-0	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
Danitol	39515-41-8	1.54E+04	nc	9.12E+02	nc	1.53E+03	nc	9.13E+01	nc
DDD	72-54-8	1.10E+01	ca	2.40E-01	ca	2.40E+00	ca	2.80E-02	ca
DDE	72-55-9	7.70E+00	ca	1.70E-01	ca	1.70E+00	ca	1.98E-02	ca
DDT	50-29-3	7.70E+00	ca*	1.70E-01	ca*	1.70E+00	ca*	1.98E-02	ca*
Decabromodiphenyl ether	1163-19-5	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
Demeton	8065-48-3	2.46E+01	nc	1.46E+00	nc	2.44E+00	nc	1.46E-01	nc
Di(2-ethylhexyl)adipate	103-23-1	1.44E+03	ca	5.60E+01	ca	4.05E+02	ca	5.60E+00	ca
Diallate	2303-16-4	2.83E+01	ca	1.10E+00	ca	7.97E+00	ca	1.10E-01	ca
Diazinon	333-41-5	5.54E+02	nc	3.28E+01	nc	5.50E+01	nc	3.29E+00	nc
Dibenz(a,h)anthracene	53-70-3	2.70E-01	ca	2.90E-03	ca	1.50E-02	ca	9.21E-04	ca
Dibenzofuran	132-64-9	1.56E+03	nc	1.22E+01	nc	1.45E+02	nc	7.30E+00	nc
Dibromochloromethane	124-48-1	3.40E+01	ca	6.80E-01	ca	7.60E+00	ca	8.00E-02	ca
Dibromomethane		No Data		No Data		No Data		No Data	
Dibutylphthalate	84-74-2	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	3.65E+02	nc
Dicamba	1918-00-9	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
Dichlorodifluoromethane	75-71-8	3.08E+02	nc	3.95E+02	nc	9.39E+01	nc	2.09E+02	nc
Dichloroethylether		1.20E+00		1.10E-02		2.60E-01			
Dichloromethane		3.10E+02		4.40E+00		6.80E+01			
Dichlorvos	62-73-7	5.94E+00	ca*	2.32E-01	ca*	1.68E+00	ca*	2.32E-02	ca*
Dicofol	115-32-2	3.92E+00	ca	1.53E-01	ca	1.11E+00	ca	1.53E-02	ca
Dicyclopentadiene	77-73-6	1.78E+00	nc	4.17E-01	nc	5.45E-01	nc	2.09E-01	nc
Dieldrin	60-57-1	1.30E-01	ca	3.50E-03	ca	3.00E-02	ca	4.18E-04	ca
Diethylene glycol, monobutyl ether	112-34-5	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	2.08E+01	nc

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HUMAN HEALTH RISK-BASED SCREENING CONCENTRATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
Diethylene glycol, monoethyl ether	111-90-0	3.67E+04	nc	2.19E+03	nc	3.66E+03	nc	3.14E+00	nc
Diethylformamide	617-84-5	2.50E+02	nc	1.50E+01	nc	2.40E+01	nc	1.50E+00	nc
Diethylphthalate	84-66-2	1.00E+05	max	2.92E+04	nc	4.89E+04	nc	2.92E+03	nc
Diethylstilbestrol	56-53-1	3.67E-04	ca	1.43E-05	ca	1.03E-04	ca	1.43E-06	ca
Difenzoquat (Avenge)	43222-48-6	4.92E+04	nc	2.92E+03	nc	4.89E+03	nc	2.92E+02	nc
Diflubenzuron	35367-38-5	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Diisononyl phthalate	28553-12-0	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Diisopropyl ether	108-20-3	No Data		No Data		No Data		4.02E+02	nc
Diisopropyl methylphosphonate	1445-75-6	4.92E+04	nc	2.92E+03	nc	4.89E+03	nc	2.92E+02	nc
Dimethipin	55290-64-7	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Dimethoate	60-51-5	1.23E+02	nc	7.30E+00	nc	1.22E+01	nc	7.30E-01	nc
Dimethylamine	124-40-3	2.47E-01	nc	3.47E-02	nc	6.71E-02	nc	2.09E-02	nc
Dimethylphenethylamine	122-09-8	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
Dimethylphthalate	131-11-3	1.00E+05	max	3.65E+05	nc	1.00E+05	max	3.65E+04	nc
Dimethylterephthalate	120-61-6	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	3.65E+02	nc
Di-n-butylphthalate	84-74-2	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	3.65E+02	nc
Dinitrotoluene mixture	25321-14-6	2.53E+00	ca	9.89E-02	ca	7.15E-01	ca	9.89E-03	ca
di-n-Octylphthalate	117-84-0	2.46E+04	nc	1.46E+03	nc	2.44E+03	nc	1.46E+02	nc
Dinoseb	88-85-7	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
Dioxin (2,3,7,8-TCDD)	1746-01-6	1.59E-05	ca	4.48E-07	ca	3.90E-06	ca	4.48E-08	ca
Diphenamid	957-51-7	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
Diphenyl sulfone	127-63-9	1.85E+03	nc	1.09E+02	nc	1.83E+02	nc	1.10E+01	nc
Diphenylamine	122-39-4	1.54E+04	nc	9.12E+02	nc	1.53E+03	nc	9.13E+01	nc
Diquat	85-00-7	1.35E+03	nc	8.03E+01	nc	1.34E+02	nc	8.03E+00	nc
Direct black 38	1937-37-7	2.00E-01	ca	7.82E-03	ca	5.66E-02	ca	7.82E-04	ca
Direct blue 6	2602-46-2	2.13E-01	ca	8.30E-03	ca	6.00E-02	ca	8.30E-04	ca
Direct brown 95	16071-86-6	1.85E-01	ca	7.23E-03	ca	5.23E-02	ca	7.23E-04	ca
Disulfoton	298-04-4	2.46E+01	nc	1.46E+00	nc	2.44E+00	nc	1.46E-01	nc
Diuron	330-54-1	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
Dodine	2439-10-3	2.46E+03	nc	1.46E+02	nc	2.44E+02	nc	1.46E+01	nc
Dysprosium	7429-91-6	1.00E+05	max	3.65E+03	nc	7.82E+03	nc		
Endosulfan	115-29-7	4.60E+03	nc	2.20E+02	nc	3.70E+02	nc	2.19E+01	nc
Endothall	145-73-3	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Endrin	72-20-8	2.30E+02	nc	1.10E+01	nc	1.80E+01	nc	1.10E+00	nc
Epichlorohydrin	106-89-8	2.56E+01	nc	2.03E+00	nc	7.56E+00	nc	1.04E+00	nc
EPTC (S-Ethyl dipropylthiocarbamate)	759-94-4	1.54E+04	nc	9.12E+02	nc	1.53E+03	nc	9.13E+01	nc
Ethephon (2-chloroethyl phosphonic acid)	16672-87-0	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc	1.83E+01	nc
Ethion	563-12-2	3.08E+02	nc	1.82E+01	nc	3.06E+01	nc	1.83E+00	nc
Ethyl acetate	141-78-6	3.70E+04	sat	5.48E+03	nc	1.87E+04	nc	3.29E+03	nc
Ethyl acrylate	140-88-5	4.53E-01	ca	2.33E-01	ca	2.11E-01	ca	1.40E-01	ca
Ethyl chloride	75-00-3	6.49E+00	ca	4.64E+00	ca	3.03E+00	ca	2.32E+00	ca
Ethyl ether	60-29-7	1.80E+03	sat	1.22E+03	nc	1.80E+03	sat	7.30E+02	nc
Ethyl methacrylate	97-63-2	1.40E+02	sat	5.48E+02	nc	1.40E+02	sat	3.29E+02	nc
Ethyl p-nitrophenyl phenylphosphorothioate	2104-64-5	6.16E+00	nc	3.65E-01	nc	6.11E-01	nc	3.65E-02	nc
Ethylbenzene	100-41-4	1.40E+02	sat	1.40E+00	nc	3.00E+01	sat	1.06E+03	nc
Ethylene cyanohydrin	109-78-4	1.00E+05	max	1.09E+04	nc	1.83E+04	nc	1.10E+03	nc
Ethylene diamine	107-15-3	5.54E+04	nc	3.28E+03	nc	5.50E+03	nc	3.29E+02	nc
Ethylene glycol	107-21-1	1.00E+05	max	7.30E+04	nc	1.00E+05	max	7.30E+03	nc

APPENDIX A / TABLE 4
HUMAN HEALTH RISK-BASED SCREENING CONCENTRATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
Ethylene glycol, monobutyl ether	111-76-2	1.00E+05	max	1.82E+04	nc	3.06E+04	nc	1.35E+04	nc
Ethylene oxide	75-21-8	3.38E-01	ca	2.43E-02	ca	1.40E-01	ca	1.92E-02	ca
Ethylene thiourea (ETU)	96-45-7	1.57E+01	ca**	6.11E-01	ca**	4.42E+00	ca**	6.11E-02	ca**
Ethylphthalyl ethyl glycolate	84-72-0	1.00E+05	max	1.09E+05	nc	1.00E+05	max	1.10E+04	nc
Express	101200-48-0	4.92E+03	nc	2.92E+02	nc	4.89E+02	nc	2.92E+01	nc
Fenamiphos	22224-92-6	1.54E+02	nc	9.12E+00	nc	1.53E+01	nc	9.13E-01	nc
Flourine (soluble flouride)	16984-48-8	3.69E+04	nc	2.19E+03	nc	3.67E+03	nc		
Fluometuron	2164-17-2	8.00E+03	nc	4.74E+02	nc	7.94E+02	nc	4.75E+01	nc
Fluoranthene	206-44-0	2.90E+04	nc	1.46E+03	nc	2.30E+03	nc	1.46E+02	nc
Fluorene	86-73-7	4.10E+04	nc	1.50E+03	nc	3.10E+03	nc	1.46E+02	nc
Fluoridone	59756-60-4	4.92E+04	nc	2.92E+03	nc	4.89E+03	nc	2.92E+02	nc
Flurprimidol	56425-91-3	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Flutolanil	66332-96-5	3.69E+04	nc	2.19E+03	nc	3.67E+03	nc	2.19E+02	nc
Fluvalinate	69409-94-5	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
Folpet	133-07-3	4.92E+02	ca	1.92E+01	ca	1.39E+02	ca*	1.92E+00	ca
Fomesafen	72178-02-0	9.07E+00	ca	3.54E-01	ca	2.56E+00	ca	3.54E-02	ca
Fonofos	944-22-9	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
Formaldehyde	50-00-0	1.00E+05	nc	5.47E+03	nc	9.17E+03	nc	1.48E-01	ca
Formic Acid	64-18-6	1.00E+05	max	7.30E+04	nc	1.00E+05	max	3.14E+00	nc
Fosetyl-al	39148-24-8	1.00E+05	max	1.09E+05	nc	1.00E+05	max	1.10E+04	nc
Freon 113	76-13-1	5.60E+03	sat	5.92E+04	nc	5.60E+03	sat	3.13E+04	nc
Furan	110-00-9	8.51E+00	nc	6.08E+00	nc	2.54E+00	nc	3.65E+00	nc
Furazolidone	67-45-8	4.54E-01	ca	1.77E-02	ca	1.28E-01	ca	1.77E-03	ca
Furfural	98-01-1	1.85E+03	nc	1.09E+02	nc	1.83E+02	nc	5.21E+01	nc
Furium	531-82-8	3.45E-02	ca	1.34E-03	ca	9.73E-03	ca	1.34E-04	ca
Furmecyclox	60568-05-0	5.75E+01	ca	2.24E+00	ca	1.62E+01	ca	2.24E-01	ca
Glufosinate-ammonium	77182-82-2	2.46E+02	nc	1.46E+01	nc	2.44E+01	nc	1.46E+00	nc
Glycidaldehyde	765-34-4	2.46E+02	nc	1.46E+01	nc	2.44E+01	nc	1.04E+00	nc
Glyphosate	1071-83-6	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	3.65E+02	nc
Haloxyfop-methyl	69806-40-2	3.08E+01	nc	1.82E+00	nc	3.06E+00	nc	1.83E-01	nc
Harmony	79277-27-3	8.00E+03	nc	4.74E+02	nc	7.94E+02	nc	4.75E+01	nc
HCH (alpha)	319-84-6	3.40E-01	ca	9.00E-03	ca	7.70E-02	ca	1.07E-03	ca
HCH (beta)	319-85-7	1.26E+00	ca	3.74E-02	ca	3.16E-01	ca	3.74E-03	ca
HCH (gamma) Lindane	58-89-9	2.00E+00	ca	5.20E-02	ca	4.40E-01	ca*	5.17E-03	ca
HCH-technical	608-73-1	1.26E+00	ca	3.74E-02	ca	3.16E-01	ca	3.77E-03	ca
Heptachlor	76-44-8	4.80E-01	ca	1.30E-02	ca	1.10E-01	ca	1.48E-03	ca
Heptachlor epoxide	1024-57-3	2.40E-01	ca*	6.20E-03	ca*	5.30E-02	ca*	7.39E-04	ca*
Hexabromobenzene	87-82-1	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
Hexachlorobenzene	118-74-1	1.80E+00	ca	3.50E-02	ca	4.00E-01	ca	4.18E-03	ca
Hexachlorobutadiene	87-68-3	2.21E+01	ca**	8.62E-01	ca*	6.24E+00	ca**	8.62E-02	ca*
Hexachlorocyclopentadiene	77-47-4	3.66E+03	nc	2.19E+02	nc	3.65E+02	nc	2.08E-01	nc
Hexachloroethane	67-72-1	1.50E+02	ca**	4.10E+00	ca**	3.50E+01	ca**	4.80E-01	ca**
Hexachlorophene	70-30-4	1.85E+02	nc	1.09E+01	nc	1.83E+01	nc	1.10E+00	nc
Hexahydro-1,3,5-trinitro-1,3,5-triazine	121-82-4	1.57E+01	ca	6.11E-01	ca	4.42E+00	ca*	6.11E-02	ca
Hexazinone	51235-04-2	2.03E+04	nc	1.20E+03	nc	2.02E+03	nc	1.20E+02	nc
HMX	2691-41-0	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Hydrazine, dimethyl	57-14-7	5.74E-01	ca	2.24E-02	ca	1.62E-01	ca	3.96E-04	ca
Hydrazine, hydrazine sulfate	302-01-2	5.74E-01	ca	2.24E-02	ca	1.62E-01	ca	3.92E-04	ca

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HUMAN HEALTH RISK-BASED SCREENING CONCENTRATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
Hydrazine, monomethyl	60-34-4	5.74E-01	ca	2.24E-02	ca	1.62E-01	ca	3.96E-04	ca
Hydrogen chloride	7647-01-0	No Data		No Data		No Data		2.08E+01	nc
Hydrogen cyanide	74-90-8	3.54E+01	nc	6.20E+00	nc	1.08E+01	nc	3.13E+00	nc
Hydrogen sulfide	7783-06-4	No Data		1.09E+02	nc	No Data		1.04E+00	nc
Imazalil	35554-44-0	8.00E+03	nc	4.74E+02	nc	7.94E+02	nc	4.75E+01	nc
Imazaquin	81335-37-7	1.00E+05	max	9.12E+03	nc	1.53E+04	nc	9.13E+02	nc
Indeno(1,2,3-cd)pyrene	193-39-5	2.70E+00	ca	9.21E-02	ca	1.50E-01	ca	9.21E-03	ca
Iprodione	36734-19-7	2.46E+04	nc	1.46E+03	nc	2.44E+03	nc	1.46E+02	nc
Iron	7439-89-6	1.00E+05	max	1.09E+04	nc	2.35E+04	nc	No Data	
Isobutanol	78-83-1	4.00E+04	sat	1.83E+03	nc	1.25E+04	nc	1.10E+03	nc
Isophorone	78-59-1	5.12E+02	ca*	7.08E+01	ca	5.12E+02	ca*	7.08E+00	ca
Isopropalin	33820-53-0	9.23E+03	nc	5.47E+02	nc	9.17E+02	nc	5.48E+01	nc
Isopropyl methyl phosphonic acid	1832-54-8	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	4.02E+02	nc
Isopropylbenzene	98-82-8	5.30E+04	nc	6.80E+02	nc	3.50E+03	nc	4.02E+02	nc
Isoxaben	82558-50-7	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Kepone	143-50-0	2.15E-01	ca	8.40E-03	ca	6.08E-02	ca	8.40E-04	ca
Lactofen	77501-63-4	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
Lead	7439-92-1	8.00E+02	nc	1.50E+01		4.00E+02	nc	No Data	
Lead, Tetraethyl	78-00-2	6.16E-02	nc	3.65E-03	nc	6.11E-03	nc	No Data	
Linuron	330-55-2	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
Lithium	7439-93-2	2.04E+04	nc	7.30E+02	nc	1.56E+03	nc	No Data	
Londax	83055-99-6	1.00E+05	max	7.30E+03	nc	1.22E+04	nc	7.30E+02	nc
Malathion	121-75-5	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Maleic anhydride	108-31-6	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	3.65E+02	nc
Maleic hydrazide	123-33-1	2.40E+03	sat	3.04E+03	nc	1.67E+03	nc	1.83E+03	nc
Malononitrile	109-77-3	6.16E+01	nc	3.65E+00	nc	6.11E+00	nc	3.65E-01	nc
m-Aminophenol	591-27-5	4.31E+04	nc	2.55E+03	nc	4.28E+03	nc	2.56E+02	nc
Mancozeb	8018-01-7	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
Maneb	12427-38-2	2.87E+01	ca	1.12E+00	ca	8.11E+00	ca*	1.12E-01	ca
Manganese	7439-96-5	2.30E+04	nc	8.80E+02	nc	1.80E+03	nc	5.11E-02	nc
Mephosfolan	950-10-7	5.54E+01	nc	3.28E+00	nc	5.50E+00	nc	3.29E-01	nc
Mepiquat chloride	24307-26-4	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
Mercury	7487-94-7	3.10E+02	nc	1.10E+01	nc	2.30E+01	nc	No Data	
Mercury (elemental)	7439-97-6	No Data		No Data		No Data		3.13E-01	nc
Mercury, methyl	22967-92-6	6.16E+01	nc	3.65E+00	nc	6.11E+00	nc		
Merphos	150-50-5	1.85E+01	nc	1.09E+00	nc	1.83E+00	nc	1.10E-01	nc
Merphos oxide	78-48-8	1.85E+01	nc	1.09E+00	nc	1.83E+00	nc	1.10E-01	nc
Metalaxyl	57837-19-1	3.69E+04	nc	2.19E+03	nc	3.67E+03	nc	2.19E+02	nc
Methacrylonitrile	126-98-7	8.40E+00	nc	1.04E+00	nc	2.06E+00	nc	7.30E-01	nc
Methamidophos	10265-92-6	3.08E+01	nc	1.82E+00	nc	3.06E+00	nc	1.83E-01	nc
Methanol	67-56-1	1.00E+05	max	1.82E+04	nc	3.06E+04	nc	1.83E+03	nc
Methidathion	950-37-8	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
Methomyl	16752-77-5	1.47E+02	nc	1.52E+02	nc	4.43E+01	nc	9.13E+01	nc
Methoxychlor	72-43-5	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc	1.83E+01	nc
Methyl acetate	79-20-9	9.15E+04	nc	6.08E+03	nc	2.21E+04	nc	3.65E+03	nc
Methyl acrylate	96-33-3	2.33E+02	nc	1.83E+02	nc	6.97E+01	nc	1.10E+02	nc
Methyl bromide	74-83-9	1.31E+01	nc	8.66E+00	nc	3.90E+00	nc	5.21E+00	nc
methyl chloride	74-87-3	1.56E+02	nc	1.58E+02	nc	4.69E+01	nc	9.49E+01	nc

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HUMAN HEALTH RISK-BASED SCREENING CONCENTRATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
Methyl ethyl ketone	78-93-3	1.13E+05	nc	6.97E+03	nc	2.23E+04	nc	5.11E+03	nc
Methyl isobutyl ketone	108-10-1	4.70E+04	nc	1.99E+03	nc	5.28E+03	nc	3.14E+03	nc
Methyl Mercaptan	74-93-1	3.51E+02	nc	2.08E+01	nc	3.48E+01	nc	2.08E+00	nc
Methyl methacrylate	80-62-6	2.70E+03	sat	1.42E+03	nc	2.19E+03	nc	7.30E+02	nc
Methyl parathion	298-00-0	1.54E+02	nc	9.12E+00	nc	1.53E+01	nc	9.13E-01	nc
Methyl phosphonic acid	993-13-5	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Methyl styrene (alpha)	98-83-9	6.80E+02	sat	4.26E+02	nc	6.80E+02	sat	2.56E+02	nc
Methyl styrene (mixture)	25013-15-4	5.39E+02	nc	6.04E+01	nc	1.31E+02	nc	4.17E+01	nc
Methyl tert-butyl ether (MTBE)	1634-04-4	1.00E+03	ca	1.20E+01	ca	2.20E+02	ca	3.74E+00	ca
Methylcyclohexane	108-87-2	8.72E+03	nc	5.22E+03	nc	2.59E+03	nc	3.13E+03	nc
Methylene bromide	74-95-3	2.34E+02	nc	6.08E+01	nc	6.69E+01	nc	3.65E+01	nc
Methylene chloride	75-09-2	2.05E+01	ca	4.28E+00	ca	9.11E+00	ca	4.09E+00	ca
Metolaclor (Dual)	51218-45-2	9.23E+04	nc	5.47E+03	nc	9.17E+03	nc	5.48E+02	nc
Metribuzin	21087-64-9	1.54E+04	nc	9.12E+02	nc	1.53E+03	nc	9.13E+01	nc
Mirex	2385-85-5	9.58E-01	ca	3.74E-02	ca	2.70E-01	ca*	3.74E-03	ca
m-Nitrotoluene	99-08-1	1.00E+03	sat	1.22E+02	nc	7.33E+02	nc	7.30E+01	nc
Molinate	2212-67-1	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
Molybdenum	7439-98-7	5.11E+03	nc	1.82E+02	nc	3.91E+02	nc		
Monochloramine	10599-90-3	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	3.65E+02	nc
m-Phenylenediamine	108-45-2	3.69E+03	nc	2.19E+02	nc	3.67E+02	nc	2.19E+01	nc
N,N-Dimethylformamide	68-12-2	6.15E+04	nc	3.65E+03	nc	6.11E+03	nc	3.13E+01	nc
N,N-Diphenyl-1,4 benzenediamine (DPPD)	74-31-7	1.85E+02	nc	1.09E+01	nc	1.83E+01	nc	1.10E+00	nc
Naled	300-76-5	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
Naphthalene	91-20-3	2.30E+01	nc	1.40E-01	nc	4.60E+00	nc	3.13E+00	nc
Napropamide	15299-99-7	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	3.65E+02	nc
n-Hexane	110-54-3	1.10E+02	sat	4.17E+02	nc	1.10E+02	sat	2.09E+02	nc
Nickel	7440-02-0	6.20E+04	nc	7.30E+02	nc	1.20E+04	nc	No Data	
Nickel refinery dust		No Data		No Data		No Data		8.00E-03	ca
Nickel subsulfide	12035-72-2	1.11E+04	ca	No Data		No Data		3.96E-03	ca
Nitrate	14797-55-8	No Data		1.00E+04	nc	No Data		No Data	
Nitrite	14797-65-0	No Data		1.00E+03	nc	No Data		No Data	
Nitrobenzene	98-95-3	1.03E+02	nc	3.40E+00	nc	1.96E+01	nc	2.09E+00	nc
Nitrofurantoin	67-20-9	4.31E+04	nc	2.55E+03	nc	4.28E+03	nc	2.56E+02	nc
Nitrofurazone	59-87-0	1.15E+00	ca	4.48E-02	ca	3.24E-01	ca	4.48E-03	ca
Nitroglycerin	55-63-0	1.23E+02	ca	4.80E+00	ca	3.47E+01	ca	4.80E-01	ca
Nitroguanidine	556-88-7	6.16E+04	nc	3.65E+03	nc	6.11E+03	nc	3.65E+02	nc
N-N-Dimethylaniline	121-69-7	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
N-Nitroso di-n-propylamine	621-64-7	2.46E-01	ca	9.60E-03	ca	6.95E-02	ca	9.61E-04	ca
N-Nitrosodiethanolamine	1116-54-7	6.16E-01	ca	2.40E-02	ca	1.74E-01	ca	2.40E-03	ca
N-Nitrosodiethylamine	55-18-5	1.15E-02	ca	4.48E-04	ca	3.24E-03	ca	4.47E-05	ca
N-Nitrosodimethylamine	62-75-9	3.38E-02	ca	1.32E-03	ca	9.54E-03	ca*	1.37E-04	ca
N-Nitrosodi-n-butylamine	924-16-3	5.81E-02	ca	2.01E-03	ca	2.43E-02	ca	1.20E-03	ca
N-Nitrosodiphenylamine	86-30-6	3.52E+02	ca*	1.37E+01	ca*	9.93E+01	ca*	1.37E+00	ca*
N-Nitroso-N-methylethylamine	10595-95-6	7.83E-02	ca	3.06E-03	ca	2.21E-02	ca	3.06E-04	ca
N-Nitrosopyrrolidine	930-55-2	8.21E-01	ca	3.20E-02	ca	2.32E-01	ca	3.15E-03	ca
Norflurazon	27314-13-2	2.46E+04	nc	1.46E+03	nc	2.44E+03	nc	1.46E+02	nc
NuStar	85509-19-9	4.31E+02	nc	2.55E+01	nc	4.28E+01	nc	2.56E+00	nc
NWTPH-Dx Diesel		No Data		No Data		No Data		No Data	

APPENDIX A / TABLE 4
HUMAN HEALTH RISK-BASED SCREENING CONCENTRATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
NWTPH-Dx Heavy Oil		No Data		No Data		No Data		No Data	
NWTPH-Gx Gasoline		No Data		No Data		No Data		No Data	
o-Chloronitrobenzene	88-73-3	4.49E+00	nc**	1.45E-01	nc**	1.36E+00	nc**	7.30E-02	nc**
Octabromodiphenyl ether	32536-52-0	1.85E+03	nc	1.09E+02	nc	1.83E+02	nc	1.10E+01	nc
Octamethylpyrophosphoramide	152-16-9	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
o-Nitrotoluene	99-08-1	2.25E+00	ca	4.87E-02	ca	8.82E-01	ca	2.92E-02	ca
o-Phenylenediamine	95-54-5	3.67E+01	ca	1.43E+00	ca	1.03E+01	ca	1.43E-01	ca
Oryzalin	19044-88-3	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Oxadiazon	19666-30-9	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc	1.83E+01	nc
Oxamyl	23135-22-0	1.54E+04	nc	9.12E+02	nc	1.53E+03	nc	9.13E+01	nc
Oxyfluorfen	42874-03-3	1.85E+03	nc	1.09E+02	nc	1.83E+02	nc	1.10E+01	nc
p,a,a,a-Tetrachlorotoluene	5216-25-1	8.62E-02	ca	3.36E-03	ca	2.43E-02	ca	3.36E-04	ca
Paclobutrazol	76738-62-0	8.00E+03	nc	4.74E+02	nc	7.94E+02	nc	4.75E+01	nc
Paraquat	4685-14-7	2.77E+03	nc	1.64E+02	nc	2.75E+02	nc	1.64E+01	nc
Parathion	56-38-2	3.69E+03	nc	2.19E+02	nc	3.67E+02	nc	2.19E+01	nc
PCB-Aroclor 1016	12674-11-2	2.12E+01	ca**	9.60E-01	ca**	3.93E+00	nc	9.61E-02	ca**
PCB-Aroclor 1221	12674-11-2	2.12E+01	ca**	9.60E-01	ca**	3.93E+00	nc	9.61E-02	ca**
PCB-Aroclor 1232	12674-11-2	2.12E+01	ca**	9.60E-01	ca**	3.93E+00	nc	9.61E-02	ca**
PCB-Aroclor 1242	12674-11-2	2.12E+01	ca**	9.60E-01	ca**	3.93E+00	nc	9.61E-02	ca**
PCB-Aroclor 1248	12674-11-2	2.12E+01	ca**	9.60E-01	ca**	3.93E+00	nc	9.61E-02	ca**
PCB-Aroclor 1254	11097-69-1	7.44E-01	ca*	3.36E-02	ca*	2.22E-01	ca**	3.36E-03	ca*
PCB-Aroclor 1260	11097-69-1	7.44E-01	ca*	3.36E-02	ca*	2.22E-01	ca**	3.36E-03	ca*
PCB, Total-		9.80E-01		2.80E-02		2.20E-01			
p-Chlorobenzoic acid	74-11-3	1.00E+05	max	7.30E+03	nc	1.22E+04	nc	7.30E+02	nc
p-Chloronitrobenzene	100-00-5	3.70E+01	nc**	1.20E+00	nc**	1.02E+01	nc**	6.21E-01	nc**
Pebulate	1114-71-2	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Pendimethalin	40487-42-1	2.46E+04	nc	1.46E+03	nc	2.44E+03	nc	1.46E+02	nc
Pentabromo-6-chloro cyclohexane	87-84-3	7.49E+01	ca	2.92E+00	ca	2.11E+01	ca	2.92E-01	ca
Pentabromodiphenyl ether	32534-81-9	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
Pentachlorobenzene	608-93-5	4.92E+02	nc	2.92E+01	nc	4.89E+01	nc	2.92E+00	nc
Pentachloronitrobenzene	82-68-8	6.63E+00	ca	2.59E-01	ca	1.87E+00	ca*	2.59E-02	ca
Pentachlorophenol	87-86-5	1.30E+01	ca	4.70E-01	ca	3.00E+00	ca	5.60E-02	ca
Perchlorate	7601-90-3	1.02E+02	ca/nc	3.65E+00	ca/nc	7.82E+00	ca/nc		
Permethrin	52645-53-1	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Phenanthrene									
Phenmedipham	13684-63-4	1.00E+05	max	9.12E+03	nc	1.53E+04	nc	9.13E+02	nc
Phenol	108-95-2	1.00E+05	max	1.09E+04	nc	1.83E+04	nc	1.10E+03	nc
Phenothiazine	92-84-2	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
Phenylmercuric acetate	62-38-4	4.92E+01	nc	2.92E+00	nc	4.89E+00	nc	2.92E-01	nc
Phorate	298-02-2	1.23E+02	nc	7.30E+00	nc	1.22E+01	nc	7.30E-01	nc
Phosmet	732-11-6	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Phosphine	7803-51-2	1.85E+02	nc	1.09E+01	nc	1.83E+01	nc	3.13E-01	nc
Phosphoric acid	7664-38-2	No Data		No Data		No Data		1.04E+01	nc
Phosphorus (white)	7723-14-0	2.04E+01	nc	7.30E-01	nc	1.56E+00	nc		
Phthalic anhydride	85-44-9	1.00E+05	max	7.30E+04	nc	1.00E+05	max	1.24E+02	nc
p-Hydroquinone	123-31-9	3.08E+01	ca	1.20E+00	ca	8.69E+00	ca	1.20E-01	ca
Picloram	1918-02-1	4.31E+04	nc	2.55E+03	nc	4.28E+03	nc	2.56E+02	nc
Pirimiphos-methyl	29232-93-7	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc

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HUMAN HEALTH RISK-BASED SCREENING CONCENTRATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
p-Nitrotoluene	99-99-0	3.04E+01	ca*	6.59E-01	ca*	1.19E+01	ca*	3.96E-01	ca*
Polybrominated biphenyls		1.94E-01	ca*	7.55E-03	ca*	5.46E-02	ca**	7.55E-04	ca*
Polychlorinated biphenyls (PCBs, see IRIS)		No Data		No Data		No Data		No Data	
Polychlorinated terphenyls	61788-33-8	3.83E-01	ca	1.49E-02	ca	1.08E-01	ca	1.49E-03	ca
Polynuclear aromatic hydrocarbons (PAHs)		No Data		No Data		No Data		No Data	
p-Phenylenediamine	106-50-3	1.00E+05	max	6.93E+03	nc	1.16E+04	nc	6.94E+02	nc
p-Phthalic acid	100-21-0	1.00E+05	max	3.65E+04	nc	6.11E+04	nc	3.65E+03	nc
Prochloraz	67747-09-5	1.15E+01	ca	4.48E-01	ca	3.24E+00	ca	4.48E-02	ca
Profluralin	26399-36-0	3.69E+03	nc	2.19E+02	nc	3.67E+02	nc	2.19E+01	nc
Prometon	1610-18-0	9.23E+03	nc	5.47E+02	nc	9.17E+02	nc	5.48E+01	nc
Prometryn	7287-19-6	2.46E+03	nc	1.46E+02	nc	2.44E+02	nc	1.46E+01	nc
Pronamide	23950-58-5	4.62E+04	nc	2.74E+03	nc	4.58E+03	nc	2.74E+02	nc
Propachlor	1918-16-7	8.00E+03	nc	4.74E+02	nc	7.94E+02	nc	4.75E+01	nc
Propanil	709-98-8	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc	1.83E+01	nc
Propargite	2312-35-8	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Propargyl alcohol	107-19-7	1.23E+03	nc	7.30E+01	nc	1.22E+02	nc	7.30E+00	nc
Propazine	139-40-2	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Propham	122-42-9	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Propiconazole	60207-90-1	8.00E+03	nc	4.74E+02	nc	7.94E+02	nc	4.75E+01	nc
Propylbenzene, n-	103-65-1	2.40E+02	sat	2.43E+02	nc	2.40E+02	sat	1.46E+02	nc
Propylene glycol	57-55-6	1.00E+05	max	1.82E+04	nc	3.00E+04	nc	3.14E+00	nc
Propylene glycol, monoethyl ether	52125-53-8	1.00E+05	max	2.55E+04	nc	4.28E+04	nc	2.56E+03	nc
Propylene glycol, monomethyl ether	107-98-2	1.00E+05	max	2.55E+04	nc	4.28E+04	nc	2.09E+03	nc
Propylene oxide	75-56-9	6.60E+00	ca*	2.21E-01	ca	1.93E+00	ca*	5.19E-01	ca*
p-Toluidine	106-49-0	9.07E+00	ca	3.54E-01	ca	2.56E+00	ca	3.54E-02	ca
Pursuit	81335-77-5	1.00E+05	max	9.12E+03	nc	1.53E+04	nc	9.13E+02	nc
Pydrin	51630-58-1	1.54E+04	nc	9.12E+02	nc	1.53E+03	nc	9.13E+01	nc
Pyrene	129-00-0	2.10E+04	nc	1.83E+02	nc	1.70E+03	nc	1.10E+02	nc
Pyridine	110-86-1	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
Quinalphos	13593-03-8	3.08E+02	nc	1.82E+01	nc	3.06E+01	nc	1.83E+00	nc
Quinoline	91-22-5	5.75E-01	ca	2.24E-02	ca	1.62E-01	ca	2.24E-03	ca
RDX (Cyclonite)	121-82-4	1.57E+01	ca	6.11E-01	ca	4.42E+00	ca*	6.11E-02	ca
Resmethrin	10453-86-8	1.85E+04	nc	1.09E+03	nc	1.83E+03	nc	1.10E+02	nc
Ronnel	299-84-3	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Rotenone	83-79-4	2.46E+03	nc	1.46E+02	nc	2.44E+02	nc	1.46E+01	nc
Savey	78587-05-0	1.54E+04	nc	9.12E+02	nc	1.53E+03	nc	9.13E+01	nc
Selenious Acid	7783-00-8	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc		
Selenium	7782-49-2	5.1E+03	nc	1.82E+02	nc	3.91E+02	nc		
Selenourea	630-10-4	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc		
Sethoxydim	74051-80-2	5.54E+04	nc	3.28E+03	nc	5.50E+03	nc	3.29E+02	nc
Silver	7440-22-4	5.10E+03	nc	1.80E+02	nc	3.90E+02	nc		
Simazine	122-34-9	1.44E+01	ca	5.60E-01	ca	4.05E+00	ca*	5.60E-02	ca
Sodium azide	26628-22-8	No Data		No Data		No Data		No Data	
Sodium diethyldithiocarbamate	148-18-5	6.38E+00	ca	2.49E-01	ca	1.80E+00	ca	2.49E-02	ca
Sodium fluoroacetate	62-74-8	1.23E+01	nc	7.30E-01	nc	1.22E+00	nc	7.30E-02	nc
Sodium metavanadate	13718-26-8	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
Strontium, stable	7440-24-6	1.00E+05	max	2.19E+04	nc	4.69E+04	nc		
Strychnine	57-24-9	1.85E+02	nc	1.09E+01	nc	1.83E+01	nc	1.10E+00	nc

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HUMAN HEALTH RISK-BASED SCREENING CONCENTRATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
Styrene	100-42-5	1.70E+03	sat	1.60E+03	nc	7.90E+03	sat	1.06E+03	nc
Systhane	88671-89-0	1.54E+04	nc	9.12E+02	nc	1.53E+03	nc	9.13E+01	nc
Tebuthiuron	34014-18-1	4.31E+04	nc	2.55E+03	nc	4.28E+03	nc	2.56E+02	nc
Temephos	3383-96-8	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Terbacil	5902-51-2	8.00E+03	nc	4.74E+02	nc	7.94E+02	nc	4.75E+01	nc
Terbufos	13071-79-9	1.54E+01	nc	9.12E-01	nc	1.53E+00	nc	9.13E-02	nc
Terbutryn	886-50-0	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
Tetrachloroethene	127-18-4	5.10E+00	ca	9.30E-02	ca	1.10E+00	ca*	3.20E-01	ca
Tetrachlorovinphos	961-11-5	7.18E+01	ca	2.80E+00	ca	2.03E+01	ca*	2.80E-01	ca
Tetraethyldithiopyrophosphate	3689-24-5	3.08E+02	nc	1.82E+01	nc	3.06E+01	nc	1.83E+00	nc
Tetrahydrofuran	109-99-9	2.12E+01	ca	1.62E+00	ca	9.36E+00	ca	9.89E-01	ca
Thallium	7440-28-0	6.75E+01	nc	2.41E+00	nc	5.16E+00	nc		
Thiobencarb	28249-77-6	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
Thiocyanate	N/A	1.00E+05	max	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc
Thiofanox	39196-18-4	1.85E+02	nc	1.09E+01	nc	1.83E+01	nc	1.10E+00	nc
Thiophanate-methyl	23564-05-8	4.92E+04	nc	2.92E+03	nc	4.89E+03	nc	2.92E+02	nc
Thiram	137-26-8	3.08E+03	nc	1.82E+02	nc	3.06E+02	nc	1.83E+01	nc
Tin (inorganic, also see tributyltin oxide)	7440-31-5	1.00E+05	max	2.19E+04	nc	4.69E+04	nc		
Titanium	7440-32-6	1.00E+05	max	1.46E+05	nc	1.00E+05	max	3.14E+01	nc
Toluene	108-88-3	7.70E+04	sat	2.30E+03	nc	5.80E+03	sat	4.02E+02	nc
Toluene-2,4-diamine	95-80-7	5.39E-01	ca	2.10E-02	ca	1.52E-01	ca	2.10E-03	ca
Toluene-2,5-diamine	95-70-5	1.00E+05	max	2.19E+04	nc	3.67E+04	nc	2.19E+03	nc
Toluene-2,6-diamine	823-40-5	1.00E+05	max	7.30E+03	nc	1.22E+04	nc	7.30E+02	nc
Toxaphene	8001-35-2	2.00E+00	ca	5.20E-02	ca	4.40E-01	ca	6.00E-03	ca
Tralomethrin	66841-25-6	4.62E+03	nc	2.74E+02	nc	4.58E+02	nc	2.74E+01	nc
Triallate	2303-17-5	8.00E+03	nc	4.74E+02	nc	7.94E+02	nc	4.75E+01	nc
Triasulfuron	82097-50-5	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
tribromomethane	75-25-2	2.18E+02	ca*	8.51E+00	ca*	6.16E+01	ca*	1.75E+00	ca*
Tributyl phosphate	126-73-8	1.87E+02	ca	7.31E+00	ca	5.29E+01	ca	7.31E-01	ca
Tributyltin oxide (TBTO)	56-35-9	1.85E+02	nc	1.09E+01	nc	1.83E+01	nc		
Trichloroethene	79-01-6	3.90E+00	ca	3.90E-02	ca	8.30E-01	ca	1.68E-02	ca
Trichlorofluoromethane	75-69-4	2.00E+03	sat	1.30E+03	nc	7.60E+03	nc	7.30E+02	nc
Tridiphane	58138-08-2	1.85E+03	nc	1.09E+02	nc	1.83E+02	nc	1.10E+01	nc
Triethylamine	121-44-8	8.61E+01	nc	1.22E+01	nc	2.34E+01	nc	7.30E+00	nc
Trifluralin	1582-09-8	2.24E+02	ca*	8.73E+00	ca*	6.32E+01	ca**	8.73E-01	ca*
Trimellitic Anhydride (TMAN)	552-30-7	8.62E+01	nc	5.11E+00		8.55E+00	nc	5.11E-01	nc
Trimethyl phosphate	512-56-1	4.66E+01	ca	1.82E+00	ca	1.31E+01	ca	1.82E-01	ca
Trinitrophenylmethylnitramine	479-45-8	6.16E+03	nc	3.65E+02	nc	6.11E+02	nc	3.65E+01	nc
Triphenylphosphine oxide	791-28-6	1.23E+04	nc	7.30E+02	nc	1.22E+03	nc	7.30E+01	nc
Tris(2-chloroethyl) phosphate	115-96-8	1.23E+02	ca	4.80E+00	ca	3.47E+01	ca	4.80E-01	ca
Tris(2-ethylhexyl) phosphate	78-42-2	5.39E+02	ca	2.10E+01	ca	1.52E+02	ca*	2.10E+00	ca
Uranium	7440-61-1	2.04E+02	nc	7.30E+00	nc	1.56E+01	nc	No Data	
Vanadium	7440-62-2	1.02E+03	nc	3.65E+01	nc	7.82E+01	nc	No Data	
Vernam	1929-77-7	6.16E+02	nc	3.65E+01	nc	6.11E+01	nc	3.65E+00	nc
Vinclozolin	50471-44-8	1.54E+04	nc	9.12E+02	nc	1.53E+03	nc	9.13E+01	nc
Vinyl acetate	108-05-4	1.40E+03	nc	4.12E+02	nc	4.26E+02	nc	2.09E+02	nc
Vinyl bromide (bromoethene)	593-60-2	4.18E-01	ca*	1.02E-01	ca*	1.93E-01	ca*	6.11E-02	ca*
Vinyl chloride (Child)	75-01-4	7.46E-01		1.98E-02	ca	7.91E-02	ca	1.06E-01	ca

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HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Analyte	CAS No.	"Direct Contact Exposure Pathways"							
		Industrial Soil (mg/kg)		Tap Water (ug/l)		Residential Soil (mg/kg)		Ambient Air (ug/m^3)	
Vinyl chloride	75-01-4	3.90E+00	ca	2.50E-02		3.40E-01		No Data	
Warfarin	81-81-2	1.85E+02	nc	1.09E+01	nc	1.83E+01	nc	1.10E+00	nc
Xylene, m,p-	1330-20-7	2.50E+04	sat	2.00E+02	nc	1.40E+03	nc	1.06E+02	nc
Xylene, o-	1330-20-7	2.50E+04	sat	2.00E+02	nc	1.40E+03	nc	1.06E+02	nc
Xylenes	1330-20-7	4.20E+02	sat	2.06E+02	nc	2.71E+02	nc	1.06E+02	nc
Zinc	7440-66-6	1.00E+05	max	1.09E+04	nc	2.35E+04	nc		
Zinc phosphide	1314-84-7	3.07E+02	nc	1.09E+01	nc	2.35E+01	nc		
Zineb	12122-67-7	3.08E+04	nc	1.82E+03	nc	3.06E+03	nc	1.83E+02	nc

APPENDIX B

COCPS, RISK-BASED SCREENINGS, AND PROUCL CALCULATIONS

APPENDIX B / TABLE 1
CONTAMINANTS OF POTENTIAL CONCERN
ALL MEDIA
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

DIP TANK SOILS									
	Number of Samples	Detects	% detects	Max detected	Mean	Median	90 UCL	EPC	Basis for EPC
Total Arsenic	13	8	62%	9.4	3.65	3.26	3.82	3.8E+00	90%KM(t)
Arsenic no catch basins	11	7	64%	9.4	3.637	2.79	3.846	3.8E+00	90% KM(t)
2,3,7,8-TCDD (dioxin)	22	13	59%	2.2E-03	5.0E-06	1.5E-06	7.80E-06	7.8E-06	90%KM Chebyshev
2,3,7,8-TEQ	22	22	100%	9.0E-06	1.5E-05	1.6E-05	1.55E-05	1.6E-05	student (t)
1,2,3-Trichloropropane	3	0	0%	Not detected				8.2E-02	reporting limit too high; EPC is max MRL
DIP TANK GROUNDWATER									
	Number of Samples	Detects	% detects	Max detected	Mean	Median	90 UCL	EPC	Basis for EPC
Benzo(a)pyrene	12	0	0%	NA	NA	NA	NA	7.0E-05	MRL	not detected MRL too high
Dibenz(a,h)anthracene	12	0	0%	NA	NA	NA	NA	7.0E-05	MRL	not detected MRL too high
Pentachlorophenol	24	4	17%	2.10E-02	6.8E-02	7.0E-03	2.7E-02	2.7E-02	90% KM(t)	
1,1,1,2-Tetrachloroethane	5	0	0%	NA	NA	NA	NA	5.0E-04	MRL	not detected MRL too high
1,1,2,2-Tetrachloroethane	5	0	0%	NA	NA	NA	NA	5.0E-04	MRL	not detected MRL too high
1,1,2-Trichloroethane	5	0	0%	NA	NA	NA	NA	5.0E-04	MRL	not detected MRL too high
1,1-Dichloropropene	5	0	0%	NA	NA	NA	NA	5.0E-04	MRL	not detected MRL too high
1,2-Dibromo-3-chloropropane	5	0	0%	NA	NA	NA	NA	5.0E-03	MRL	not detected MRL too high
1,2-Dibromoethane	5	0	0%	NA	NA	NA	NA	5.0E-04	MRL	not detected MRL too high
1,2-Dichloroethane	5	0	0%	NA	NA	NA	NA	5.0E-04	MRL	not detected MRL too high
1,2-Dichloropropane	5	0	0%	NA	NA	NA	NA	1.0E-03	MRL	not detected MRL too high
1,3-Dichloropropene, cis-	5	0	0%	NA	NA	NA	NA	5.0E-04	MRL	not detected MRL too high
1,3-Dichloropropene, trans-	5	0	0%	NA	NA	NA	NA	1.0E-03	MRL	not detected MRL too high
1,4-Dichlorobenzene	5	0	0%	NA	NA	NA	NA	4.2E-03	MRL	not detected MRL too high
2,2-Dichloropropane	5	0	0%	NA	NA	NA	NA	1.0E-03	MRL	not detected MRL too high
Carbon tetrachloride	5	0	0%	NA	NA	NA	NA	5.0E-04	MRL	not detected MRL too high
Chloroform	5	0	0%	NA	NA	NA	NA	1.0E-03	MRL	not detected MRL too high
Hexachlorobutadiene	5	0	0%	NA	NA	NA	NA	2.0E-03	MRL	not detected MRL too high
Vinyl chloride	5	0	0%	NA	NA	NA	NA	5.0E-04	MRL	not detected MRL too high
BEAR CREEK SEDIMENTS									
	Number of Samples	Detects	% detects	Max detected	Mean	Median	90 UCL	EPC	Basis for EPC	
Total Arsenic	21	11	52%	10.7	3.755	4.75	4.55	4.6E+00	90% KM9t)	Max AB-28 2/2/2010
2,3,7,8-TEQ	38	38	100%	4.13E-04	9.72E-05	7.12E-05	1.21E-04	1.2E-04	Adjusted gamma UCL	
Benz(a)anthracene	16	1	6%	2.87E-01	NA	NA	NA	2.87E-01	Max detected	
Benzo(a)pyrene	16	1	6%	3.54E-01	NA	NA	NA	3.5E-01	Max detected	
Benzo(b+k) fluoranthene	16	1	6%	5.17E-01	NA	NA	NA	5.2E-01	Max detected	
Dibenz(a,h)anthracene	16	1	6%	4.30E-02	NA	NA	NA	4.3E-02	Max detected	

APPENDIX B / TABLE 2
RISK-BASED CONCENTRATION SCREENING AND SUMMARY
DIP TANK SOIL
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration[a] (mg/kg)	Minimum Sample Reporting Limit (mg/kg)	Maximum Sample Reporting Limit (mg/kg)	Minimum Human Health Risk-Based Screening Concentration (mg/kg)	Background/ Reference Concentration[b] (mg/kg)	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background/ Reference?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Metals															
Antimony	9	3	33%	1.74E-01	2.29E+00	1.14E+00	1.14E+00	2.46E-01	1.08E+01	3.13E+01	4.00E+00	no	no	No	no
Arsenic, total	13	8	62%	1.10E+00	9.40E+00	3.82E+00	3.82E+00	1.20E+00	2.16E+01	4.30E-01	7.00E+00	YES	YES	Yes	**YES**
Barium	4	4	100%	3.60E+01	6.70E+01	6.76E+01	6.76E+01	Not Applicable	Not Applicable	1.50E+04	0.00E+00	YES	YES	No	no
Beryllium	9	5	56%	7.25E-01	1.36E+00	1.14E+00	1.14E+00	1.13E+00	1.08E+01	1.50E+03	0.00E+00	no	YES	No	no
Cadmium	13	6	46%	2.11E-01	3.84E+00	9.74E-01	9.74E-01	2.20E-01	1.08E+01	2.10E+03	1.00E+00	no	YES	No	no
Chromium, Total	13	13	100%	1.80E+01	6.85E+01	4.10E+01	4.10E+01	Not Applicable	Not Applicable	2.11E+02	4.20E+01	YES	YES	No	no
Copper	9	9	100%	1.38E+01	2.63E+02	1.05E+02	1.05E+02	Not Applicable	Not Applicable	3.10E+03	3.60E+01	YES	YES	No	no
Lead	13	13	100%	2.80E+00	1.00E+02	4.52E+01	4.52E+01	Not Applicable	Not Applicable	4.00E+02	1.70E+01	YES	YES	No	no
Mercury	13	3	23%	6.10E-02	9.73E-01	2.53E-01	2.53E-01	5.70E-02	1.17E-01	2.30E+01	7.00E-02	no	YES	No	no
Nickel	13	9	69%	1.04E+01	3.28E+01	1.90E+01	1.90E+01	2.20E+00	2.30E+00	1.40E+04	3.80E+01	no	no	No	no
Selenium	9	2	22%	7.24E-01	1.18E+00	1.27E+00	1.27E+00	1.23E+00	2.16E+01	3.91E+02	2.00E+00	no	no	No	no
Silver	13	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.20E-01	1.85E+00	3.90E+02	1.00E+00	no	YES	No	no
Thallium	9	1	11%	1.62E-01	1.61E-01	1.61E-01	1.61E-01	1.02E+00	2.30E+00	5.16E+00	0.00E+00	no	YES	No	no
Zinc	9	9	100%	1.90E+01	3.68E+03	1.73E+03	1.73E+03	Not Applicable	Not Applicable	2.35E+04	8.60E+01	YES	YES	No	no
Pesticides/Polychlorinated Biphenyls (PCBs)/Dioxins															
2,3,7,8-TCDD (dioxin)	22	22	100%	4.40E-07	2.20E-03	8.97E-04	8.97E-04	Not Applicable	Not Applicable	4.70E-06	Not Applicable	YES	Not Calculated	Yes	**YES**
2,3,7,8-TEQ	22	22	100%	9.00E-06	1.60E-05	1.55E-05	1.55E-05	Not Applicable	Not Applicable	4.70E-06	Not Applicable	YES	Not Calculated	Yes	**YES**
1,2,3,7,8-PeCDD	22	21	95%	3.84E-07	2.97E-04	2.17E-04	2.17E-04	1.10E-07	1.10E-07	4.70E-06	Not Applicable	no	Not Calculated	Yes	**YES**
1,2,3,4,7,8-HxCDD	22	21	95%	6.04E-08	2.69E-05	1.73E-05	1.73E-05	1.19E-08	1.19E-08	4.70E-06	Not Applicable	no	Not Calculated	Yes	**YES**
1,2,3,6,7,8-HxCDD	22	22	100%	6.92E-08	5.00E-04	2.08E-04	2.08E-04	Not Applicable	Not Applicable	4.70E-06	Not Applicable	YES	Not Calculated	Yes	**YES**
1,2,3,7,8,9-HxCDD	22	22	100%	4.06E-08	8.99E-05	2.68E-05	2.68E-05	Not Applicable	Not Applicable	4.70E-06	Not Applicable	YES	Not Calculated	Yes	**YES**
1,2,3,4,6,7,8-HpCDD	22	22	100%	9.67E-08	8.50E-04	1.83E-04	1.83E-04	Not Applicable	Not Applicable	4.70E-06	Not Applicable	YES	Not Calculated	Yes	**YES**
OCDD	22	22	100%	2.96E-08	4.86E-05	1.41E-05	1.41E-05	Not Applicable	Not Applicable	4.70E-06	Not Applicable	YES	Not Calculated	Yes	**YES**
2,3,7,8-TCDF	22	21	95%	1.82E-08	3.46E-05	8.17E-06	8.17E-06	1.05E-08	1.05E-08	4.70E-06	Not Applicable	no	Not Calculated	Yes	**YES**
1,2,3,7,8-PeCDF	22	21	95%	6.81E-09	3.48E-06	1.15E-06	1.15E-06	3.48E-09	3.48E-09	4.70E-06	Not Applicable	no	Not Calculated	No	no
2,3,4,7,8-PeCDF	22	20	91%	8.04E-08	5.64E-05	1.59E-05	1.59E-05	3.39E-08	5.46E-08	4.70E-06	Not Applicable	no	Not Calculated	Yes	**YES**
1,2,3,4,7,8-HxCDF	22	22	100%	1.13E-08	1.42E-05	2.51E-05	2.51E-05	Not Applicable	Not Applicable	4.70E-06	Not Applicable	YES	Not Calculated	Yes	**YES**
1,2,3,6,7,8-HxCDF	22	22	100%	1.51E-08	4.19E-05	1.34E-05	1.34E-05	Not Applicable	Not Applicable	4.70E-06	Not Applicable	YES	Not Calculated	Yes	**YES**
1,2,3,7,8,9-HxCDF	22	17	77%	1.16E-08	1.49E-06	5.43E-07	5.43E-07	8.27E-09	1.17E-08	4.70E-06	Not Applicable	no	Not Calculated	No	no
1,2,3,4,6,7,8-HpCDF	22	22	100%	1.87E-08	1.49E-04	3.52E-05	3.52E-05	Not Applicable	Not Applicable	4.70E-06	Not Applicable	YES	Not Calculated	Yes	**YES**
1,2,3,4,7,8,9-HpCDF	22	21	95%	1.37E-09	2.64E-05	5.09E-06	5.09E-06	8.79E-09	8.79E-09	4.70E-06	Not Applicable	no	Not Calculated	Yes	**YES**
OCDF	22	21	95%	6.15E-10	2.46E-05	4.61E-06	4.61E-06	7.17E-07	7.17E-07	4.70E-06	Not Applicable	no	Not Calculated	Yes	no
Pesticides/Polychlorinated Biphenyls (PCBs)/Dioxins															
Acenaphthene	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.47E-03	2.00E-01	6.10E+04	Not Applicable	no	Not Calculated	No	no
Acenaphthylene	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.47E-03	2.00E-01	6.10E+04	Not Applicable	no	Not Calculated	No	no
Anthracene	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.47E-03	2.00E-01	3.10E+05	Not Applicable	no	Not Calculated	No	no
Benz(a)anthracene	14	1	7%	2.36E-02	2.36E-02	2.36E-02	2.36E-02	5.70E-03	2.00E-01	1.50E-01	Not Applicable	no	Not Calculated	No	no
Benzo(a)pyrene	10	0	0%	6.80E-02	8.83E-02	Not Applicable	0.00E+00	2.21E-03	2.00E-01	1.50E-02	Not Applicable	no	Not Calculated	Yes	no
Benzo(b)fluoranthene	10	0	0%	3.32E-02	1.10E-01	Not Applicable	0.00E+00	2.21E-03	2.00E-01	1.50E-01	Not Applicable	no	Not Calculated	No	no
Benzo(g,h,i)perylene	10	0	0%	1.11E-01	1.11E-01	Not Applicable	0.00E+00	1.47E-03	2.00E-01	1.80E+03	Not Applicable	no	Not Calculated	No	no
Benzo(k)fluoranthene	10	0	0%	3.70E-02	3.70E-02	Not Applicable	0.00E+00	2.21E-03	2.00E-01	1.50E+00	Not Applicable	no	Not Calculated	No	no
Chrysene	10	1	10%	2.41E-02	2.02E-01	Not Applicable	2.41E-02	5.20E-03	2.00E-01	1.50E+01	Not Applicable	no	Not Calculated	No	no
Dibenz(a,h)anthracene	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.47E-03	2.00E-01	1.50E-02	Not Applicable	no	Not Calculated	No	no
Fluoranthene	14	1	7%	3.10E-03	3.10E-03	Not Applicable	3.10E-03	5.70E-03	2.00E-01	2.40E+03	Not Applicable	no	Not Calculated	No	no
Fluorene	10	0	0%	1.20E-01	3.59E+00	Not Applicable	0.00E+00	1.47E-03	2.00E-01	3.10E+03	Not Applicable	no	Not Calculated	No	no
Indeno(1,2,3-cd)pyrene	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.47E-03	2.00E-01	1.50E-01	Not Applicable	no	Not Calculated	No	no
Naphthalene	13	3	23%	5.80E-03	4.83E-02	2.41E-02	2.41E-02	1.14E-02	3.98E-01	5.30E+00	Not Applicable	no	Not Calculated	No	no
Phenanthrene	14	2	14%	1.90E-03	3.10E-03	3.31E-03	3.31E-03	5.70E-03	2.00E-01	2.00E-01	Not Applicable	no	Not Calculated	No	no
Pyrene	10	1	10%	3.10E-03	3.10E-03	Not Applicable	3.10E-03	1.50E-03	2.00E-01	1.80E+03	Not Applicable	no	Not Calculated	No	no

APPENDIX B / TABLE 2
RISK-BASED CONCENTRATION SCREENING AND SUMMARY
DIP TANK SOIL
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration[a] (mg/kg)	Minimum Sample Reporting Limit (mg/kg)	Maximum Sample Reporting Limit (mg/kg)	Minimum Human Health Risk-Based Screening Concentration (mg/kg)	Background/ Reference Concentration[b] (mg/kg)	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background/ Reference?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Semi-Volatile Organic Compounds															
2,3,4,5-Tetrachlorophenol	21	1	5%	6.51E-02	6.51E-02	Not Applicable	6.51E-02	2.24E-02	7.60E-01	1.83E+03	Not Applicable	no	Not Calculated	No	no
2,3,4,6-Tetrachlorophenol	25	4	16%	2.87E-02	6.96E+00	0.751	7.51E-01	2.31E-02	5.98E-01	1.83E+03	Not Applicable	no	Not Calculated	No	no
2,4,5-Trichlorophenol	25	2	8%	1.12E-02	8.96E-02	Not Applicable	8.96E-02	2.31E-02	5.98E-01	6.11E+03	Not Applicable	no	Not Calculated	No	no
2,4,6-Trichlorophenol	25	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.35E-03	5.98E-01	4.90E+01	Not Applicable	no	Not Calculated	No	no
2-Chlorophenol	25	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.40E-03	5.98E-01	6.34E+01	Not Applicable	no	Not Calculated	No	no
2,4-Dichlorophenol	25	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.35E-03	5.98E-01	1.83E+02	Not Applicable	no	Not Calculated	No	no
3,4-Dichlorophenol	21	2	10%	2.00E-02	4.66E-01	0.384	3.84E-01	2.31E-02	5.98E-01	1.83E+02	Not Applicable	no	Not Calculated	No	no
3+4-Chlorophenol	25	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.70E-03	5.98E-01	6.34E+01	Not Applicable	no	Not Calculated	No	no
Bis(2-ethylhexyl)phthalate	1	1	100%	1.31E-01	1.31E-01	Not Applicable	1.31E-01	Not Applicable	Not Applicable	3.90E+01	Not Applicable	YES	Not Calculated	No	no
Pentachlorophenol	35	11	31%	1.70E-02	5.10E+00	0.756	7.56E-01	1.40E-02	5.98E-01	1.00E+00	Not Applicable	no	Not Calculated	Yes	no
Volatile Organic Compounds															
1,1,1,2-Tetrachloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	3.19E+00	Not Applicable	no	Not Calculated	No	no
1,1,1-Trichloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	5.30E+03	Not Applicable	no	Not Calculated	No	no
1,1,2,2-Tetrachloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	4.08E-01	Not Applicable	no	Not Calculated	No	no
1,1,2-Trichloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	5.80E+00	Not Applicable	no	Not Calculated	No	no
1,1-Dichloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	5.80E+01	Not Applicable	no	Not Calculated	No	no
1,1-Dichloroethene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.80E+03	Not Applicable	no	Not Calculated	No	no
1,1-Dichloropropene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	7.77E-01	Not Applicable	no	Not Calculated	No	no
1,2,3-Trichlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-01	4.09E-01	6.22E+01	Not Applicable	no	Not Calculated	No	no
1,2,3-Trichloropropane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	3.40E-02	Not Applicable	YES	Not Calculated	No	**YES**
1,2,4-Trichlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-01	4.09E-01	6.22E+01	Not Applicable	no	Not Calculated	No	no
1,2,4-Trimethylbenzene	3	0	0%	1.87E+00	1.87E+00	Not Applicable	0.00E+00	6.33E-02	8.19E-02	1.10E+02	Not Applicable	no	Not Calculated	No	no
1,2-Dibromo-3-chloropropane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-01	4.09E-01	4.60E-01	Not Applicable	no	Not Calculated	No	no
1,2-Dibromoethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.40E-01	Not Applicable	no	Not Calculated	No	no
1,2-Dichlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	2.20E+03	Not Applicable	no	Not Calculated	No	no
1,2-Dichloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	3.20E+00	Not Applicable	no	Not Calculated	No	no
1,2-Dichloroethene, cis-	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.60E+02	Not Applicable	no	Not Calculated	No	no
1,2-Dichloroethene, trans-	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.60E+03	Not Applicable	no	Not Calculated	No	no
1,2-Dichloropropane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	3.42E-01	Not Applicable	no	Not Calculated	No	no
1,3,5-Trimethylbenzene	3	0	0%	2.94E-01	2.94E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	7.80E+02	Not Applicable	no	Not Calculated	No	no
1,3-Dichlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	5.31E+02	Not Applicable	no	Not Calculated	No	no
1,3-Dichloropropane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.05E+02	Not Applicable	no	Not Calculated	No	no
1,3-Dichloropropene, cis-	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	7.77E-01	Not Applicable	no	Not Calculated	No	no
1,3-Dichloropropene, trans-	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	7.77E-01	Not Applicable	no	Not Calculated	No	no
1,4-Dichlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.40E+01	Not Applicable	no	Not Calculated	No	no
2,2-Dichloropropane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	3.42E-01	Not Applicable	no	Not Calculated	No	no
2-Butanone	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-01	8.19E-01	2.23E+04	Not Applicable	no	Not Calculated	No	no
2-Chlorotoluene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	1.58E+02	Not Applicable	no	Not Calculated	No	no
2-Hexanone	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-01	8.19E-01	No Data	Not Applicable	no	Not Calculated	No	no
4-Chlorotoluene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	1.58E+02	Not Applicable	no	Not Calculated	No	no
4-Isopropyltoluene	3	0	0%	2.18E-02	1.87E+01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	3.50E+03	Not Applicable	no	Not Calculated	No	no
4-Methyl-2-pentanone	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-01	8.19E-01	No Data	Not Applicable	no	Not Calculated	No	no
Acetone	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.27E+00	1.64E+00	5.43E+04	Not Applicable	no	Not Calculated	No	no
Benzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.58E-02	2.05E-02	8,2	Not Applicable	no	Not Calculated	No	no
Bromobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	2.78E+01	Not Applicable	no	Not Calculated	No	no
Bromochloromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	No Data	Not Applicable	no	Not Calculated	No	no
Bromodichloromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	3.40E+00	Not Applicable	no	Not Calculated	No	no
Bromoform	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	5.70E+01	Not Applicable	no	Not Calculated	No	no
Bromomethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-01	8.19E-01	4.60E+01	Not Applicable	no	Not Calculated	No	no
Butylbenzene, n-	3	0	0%	1.49E-01	8.77E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	2.40E+02	Not Applicable	no	Not Calculated	No	no
Butylbenzene, sec-	3	0	0%	1.93E-01	4.05E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	2.20E+02	Not Applicable	no	Not Calculated	No	no
Butylbenzene, tert-	3	0	0%	1.23E-01	1.23E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	3.90E+02	Not Applicable	no	Not Calculated	No	no
Carbon tetrachloride	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	4.09E-02	7.23E-02	7.50E+00	Not Applicable	no	Not Calculated	No	no
Chlorobenzene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	5.30E+02	Not Applicable	no	Not Calculated	No	no

APPENDIX B / TABLE 2
RISK-BASED CONCENTRATION SCREENING AND SUMMARY
DIP TANK SOIL
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration[a] (mg/kg)	Minimum Sample Reporting Limit (mg/kg)	Maximum Sample Reporting Limit (mg/kg)	Minimum Human Health Risk-Based Screening Concentration (mg/kg)	Background/ Reference Concentration[b] (mg/kg)	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background/ Reference?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Volatile Organic Compounds (cont'd)															
Chloroethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-01	8.19E-01	1.60E+05	Not Applicable	no	Not Calculated	No	no
Chloroform	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	5.80E+00	Not Applicable	no	Not Calculated	No	no
Chloromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-01	4.09E-01	4.69E+01	Not Applicable	no	Not Calculated	No	no
Dibromochloromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.27E-01	1.64E-01	7.60E+00	Not Applicable	no	Not Calculated	No	no
Dibromomethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	No Data	Not Applicable	no	Not Calculated	No	no
Dichlorodifluoromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.27E-01	1.64E-01	9.39E+01	Not Applicable	no	Not Calculated	No	no
Ethylbenzene	3	0	0%	5.95E-01	5.95E-01	Not Applicable	0.00E+00	3.17E-02	4.09E-02	3.40E+01	Not Applicable	no	Not Calculated	No	no
Hexachlorobutadiene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.27E-01	1.64E-01	6.24E+00	Not Applicable	no	Not Calculated	No	no
Isopropylbenzene	3	0	0%	1.79E-01	3.77E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	3.50E+03	Not Applicable	no	Not Calculated	No	no
Methyl tert-butyl ether (MTBE)	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	2.50E+02	Not Applicable	no	Not Calculated	No	no
Methylene chloride	3	0	0%	8.47E-02	3.78E-01	Not Applicable	0.00E+00	3.17E-01	4.09E-01	7.60E+01	Not Applicable	no	Not Calculated	No	no
Propylbenzene, n-	3	0	0%	1.95E-01	8.43E-01	Not Applicable	0.00E+00	3.17E-02	4.09E-02	2.40E+02	Not Applicable	no	Not Calculated	No	no
Styrene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.33E-02	8.19E-02	7.90E+03	Not Applicable	no	Not Calculated	No	no
Tetrachloroethene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	2.20E+02	Not Applicable	no	Not Calculated	No	no
Toluene	3	0	0%	7.99E-02	1.24E+01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	5.80E+03	Not Applicable	no	Not Calculated	No	no
Trichloroethene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	6.70E+00	Not Applicable	no	Not Calculated	No	no
Trichlorofluoromethane	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.27E-01	1.64E-01	7.60E+03	Not Applicable	no	Not Calculated	No	no
Vinyl chloride	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	3.60E-01	Not Applicable	no	Not Calculated	No	no
Xylene, m,p-	3	0	0%	2.77E-01	2.77E-01	Not Applicable	0.00E+00	6.33E-02	8.19E-02	1.40E+03	Not Applicable	no	Not Calculated	No	no
Xylene, o-	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.17E-02	4.09E-02	1.40E+03	Not Applicable	no	Not Calculated	No	no
Petroleum Hydrocarbons															
NWTPH-Gx Gasoline	8	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	3.20E+00	1.56E+02	1.20E+03	Not Applicable	no	Not Calculated	No	no
NWTPH-Dx Diesel	29	2	7%	2.21E+02	7.01E+02	8.51E+01	8.51E+01	8.40E+00	3.90E+02	1.10E+03	Not Applicable	no	Not Calculated	No	no
NWTPH-Dx Heavy Oil	29	18	62%	5.20E+01	4.26E+03	1.41E+03	1.41E+03	1.70E+01	7.10E+01	2.80E+03	Not Applicable	no	Not Calculated	Yes	no

Notes:

[a] Upper confidence limit on the mean or median of detected values

[b] Default ODEQ (2010) background concentrations for metals.

mg/kg = Milligram per kilogram

APPENDIX B / TABLE 3
RISK-BASED CONCENTRATION SCREENING AND SUMMARY
DIP TANK GROUNDWATER
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/L)	Maximum Detected Concentration (mg/L)	Upper Confidence Limit (mg/L)	Exposure Point Concentration[a] (mg/L)	Minimum Sample Reporting Limit (mg/L)	Maximum Sample Reporting Limit (mg/L)	Minimum Human Health Risk-Based Screening Concentration (mg/L)	Background/ Reference Concentration[b] (mg/L)	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Metals															
Antimony	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.46E-02	1.00E-03	no	no	No	no
Arsenic, total	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	5.20E-04	2.00E-03	YES	no	No	no
Beryllium	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	No Data	0.00E+00	no	NA	No	no
Cadmium	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	No Data	0.00E+00	no	NA	No	no
Chromium, Total	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	No Data	1.00E-03	no	YES	No	no
Copper	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	4.00E-03	4.00E-03	8.00E-01	9.00E-03	no	no	No	no
Lead	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.50E-02	1.33E-02	no	no	No	no
Mercury	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	8.00E-05	8.00E-05	6.00E-03	1.00E-04	no	no	No	no
Nickel	4	2	50%	2.46E-03	3.20E-03	3.23E-03	3.23E-03	2.00E-03	2.00E-03	NO DATA	5.50E-03	no	no	Not Calculated	no
Selenium	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	1.82E-01	2.00E-04	no	YES	No	no
Silver	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.00E-01	1.00E-03	no	no	No	no
Thallium	4	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	2.41E-03	0.00E+00	no	NA	No	no
Zinc	5	1	20%	2.30E-02	2.30E-02	Not Applicable	2.30E-02	4.00E-03	4.00E-03	1.09E+01	3.80E-02	no	no	No	no
Polynuclear Aromatic Hydrocarbons															
Acenaphthene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	5.10E-01	Not Applicable	no	Not Calculated	No	no
Acenaphthylene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	5.10E-01	Not Applicable	no	Not Calculated	No	no
Anthracene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	1.83E+03	Not Applicable	no	Not Calculated	No	no
Benz(a)anthracene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	2.90E-05	Not Applicable	no	Not Calculated	No	no
Benzo(a)pyrene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	3.40E-06	Not Applicable	YES	Not Calculated	No	YES
Benzo(b)fluoranthene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	3.40E-05	Not Applicable	no	Not Calculated	No	no
Benzo(g,h,i)perylene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	1.10E-01	Not Applicable	no	Not Calculated	No	no
Benzo(k)fluoranthene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	3.40E-04	Not Applicable	no	Not Calculated	No	no
Chrysene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	9.21E+00	Not Applicable	no	Not Calculated	No	no
Dibenz(a,h)anthracene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	3.40E-06	Not Applicable	YES	Not Calculated	No	YES
Fluoranthene	12	3	25%	1.01E-05	1.19E-05	1.15E-05	1.15E-05	1.87E-05	7.48E-05	1.46E+03	Not Applicable	no	Not Calculated	No	no
Fluorene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	2.80E-01	Not Applicable	no	Not Calculated	No	no
Indeno(1,2,3-cd)pyrene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	3.40E-05	Not Applicable	no	Not Calculated	No	no
Naphthalene	20	8	40%	1.92E-05	1.92E-05	3.27E-05	3.27E-05	3.74E-05	5.00E-03	1.70E-04	Not Applicable	no	Not Calculated	No	no
Phenanthrene	12	3	25%	9.99E-06	1.25E-05	1.26E-05	1.26E-05	1.87E-05	5.00E-04	1.83E+03	Not Applicable	no	Not Calculated	No	no
Pyrene	12	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	1.10E-01	Not Applicable	no	Not Calculated	No	no
Semi-Volatile Organic Compounds															
2,3,4,5-Tetrachlorophenol	21	1	5%	6.38E-03	6.38E-03	Not Applicable	6.38E-03	5.71E-05	1.41E-03	1.09E+00	Not Applicable	no	Not Calculated	No	no
2,3,4,6-Tetrachlorophenol	22	2	9%	1.60E-02	8.77E-02	Not Applicable	8.77E-02	5.60E-05	1.41E-03	1.09E+00	Not Applicable		Not Calculated	No	no
2,4,5-Trichlorophenol	16	1	6%	9.38E-03	9.38E-03	Not Applicable	9.38E-03	5.60E-05	1.41E-03	3.65E+00	Not Applicable	no	Not Calculated	No	no
2,4,6-Trichlorophenol	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.00E-05	1.61E-03	4.40E-03	Not Applicable	no	Not Calculated	No	no
2,4-Dichlorophenol	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.00E-05	1.61E-03	1.09E-01	Not Applicable	no	Not Calculated	No	no
2,6-Dichlorophenol	14	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.60E-05	5.80E-05	1.09E-01	Not Applicable		Not Calculated	No	no
2-Chlorophenol	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.00E-05	1.61E-03	3.04E-02	Not Applicable	no	Not Calculated	No	no
2-Methylnaphthalene	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	4.20E-03	2.70E-02	Not Applicable	no	Not Calculated	No	no
3,4-Dichlorophenol	21	1	5%	2.74E-03	2.74E-03	Not Applicable	2.74E-03	5.61E-05	1.81E-03	1.09E-01	Not Applicable	no	Not Calculated	No	no
3,4-Methylphenol	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-02	4.20E-02	3.65E+01	Not Applicable	no	Not Calculated	No	no
3+4-chlorphenols	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.90E-04	3.23E-03	3.04E+01	Not Applicable	no	Not Calculated	No	no
Benzoic acid	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.70E-02	8.30E-02	1.46E+02	Not Applicable	no	Not Calculated	No	no
Bis(2-ethylhexyl)phthalate	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	4.20E-03	5.60E-03	Not Applicable	no	Not Calculated	No	no
Butylbenzylphthalate	2	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	1.90E-03	7.30E+00	Not Applicable	no	Not Calculated	No	no
Dibenzofuran	6	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-05	7.00E-05	1.22E-02	Not Applicable	no	Not Calculated	No	no
Diethylphthalate	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	4.20E-03	2.92E+01	Not Applicable	no	Not Calculated	No	no
Dimethylphthalate	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	4.20E-03	3.65E+02	Not Applicable	no	Not Calculated	No	no
Di-n-Butylphthalate	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-03	4.20E-03	3.65E+00	Not Applicable	no	Not Calculated	No	no
iodopropynyl butylcarbamate	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.80E-04	1.61E-03	NO DATA	Not Applicable	no	Not Calculated	No	no
Pentachlorophenol	24	4	17%	1.13E-04	2.56E-01	2.73E-02	2.73E-02	1.87E-04	2.10E-02	4.40E-05	Not Applicable	YES	Not Calculated	Yes	YES
Phenol	3	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.70E-03	8.30E-03	1.09E+01	Not Applicable	no	NA	No	no

APPENDIX B / TABLE 3
RISK-BASED CONCENTRATION SCREENING AND SUMMARY
DIP TANK GROUNDWATER
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/L)	Maximum Detected Concentration (mg/L)	Upper Confidence Limit (mg/L)	Exposure Point Concentration[a] (mg/L)	Minimum Sample Reporting Limit (mg/L)	Maximum Sample Reporting Limit (mg/L)	Minimum Human Health Risk-Based Screening Concentration (mg/L)	Background/ Reference Concentration[b] (mg/L)	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Volatile Organic Compounds															
1,1,1,2-Tetrachloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	4.32E-04	Not Applicable	YES	Not Calculated	No	YES
1,1,1-Trichloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	9.10E+00	Not Applicable	no	Not Calculated	No	no
1,1,2,2-Tetrachloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	5.53E-05	Not Applicable	YES	Not Calculated	No	YES
1,1,2-Trichloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.30E-04	Not Applicable	YES	Not Calculated	No	YES
1,1-Dichloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.80E-03	Not Applicable	no	Not Calculated	No	no
1,1-Dichloroethene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.80E-01	Not Applicable	no	Not Calculated	No	no
1,1-Dichloropropene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	3.95E-04	Not Applicable	YES	Not Calculated	No	YES
1,2,3-Trichlorobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	7.16E-03	Not Applicable	no	Not Calculated	No	no
1,2,3-Trichloropropane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	5.60E-06	Not Applicable	YES	Not Calculated	No	YES
1,2,4-Trichlorobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	7.16E-03	Not Applicable	no	Not Calculated	No	no
1,2,4-Trimethylbenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.50E-02	Not Applicable	no	Not Calculated	No	no
1,2-Dibromo-3-chloropropane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-03	5.00E-03	4.76E-05	Not Applicable	YES	Not Calculated	No	YES
1,2-Dibromoethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	6.30E-06	Not Applicable	YES	Not Calculated	No	YES
1,2-Dichlorobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	3.00E-01	Not Applicable	no	Not Calculated	No	no
1,2-Dichloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.40E-04	Not Applicable	YES	Not Calculated	No	YES
1,2-Dichloroethene, cis-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	3.60E-02	Not Applicable	no	Not Calculated	No	no
1,2-Dichloroethene, trans-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	3.60E-01	Not Applicable	no	Not Calculated	No	no
1,2-Dichloropropane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.65E-04	Not Applicable	YES	Not Calculated	No	YES
1,3,5-Trimethylbenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.10E-01	Not Applicable	no	Not Calculated	No	no
1,3-Dichlorobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.83E-01	Not Applicable	no	Not Calculated	No	no
1,3-Dichloropropane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.22E-01	Not Applicable	no	Not Calculated	No	no
1,3-Dichloropropene, cis-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	3.95E-04	Not Applicable	YES	Not Calculated	No	YES
1,3-Dichloropropene, trans-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	3.95E-04	Not Applicable	YES	Not Calculated	No	YES
1,4-Dichlorobenzene	8	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	4.20E-03	4.80E-04	Not Applicable	YES	Not Calculated	No	YES
2,2-Dichloropropane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.65E-04	Not Applicable	YES	Not Calculated	No	YES
2-Butanone	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	2.50E-01	6.97E+00	Not Applicable	no	Not Calculated	No	no
2-Chlorotoluene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.22E-01	Not Applicable	no	Not Calculated	No	no
2-Hexanone	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	1.00E-02	No Data	Not Applicable	no	Not Calculated	No	no
4-Chlorotoluene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.22E-01	Not Applicable	no	Not Calculated	No	no
4-Isopropyltoluene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	6.80E-01	Not Applicable	no	Not Calculated	No	no
4-Methyl-2-pentanone	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	1.00E-02	No Data	Not Applicable	no	Not Calculated	No	no
Acetone	5	1	20%	3.03E-01	3.03E-01	Not Applicable	3.03E-01	2.00E-02	2.00E-02	5.48E+00	Not Applicable	no	Not Calculated	No	no
Benzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.50E-04	2.50E-04	4.60E-04	Not Applicable	no	Not Calculated	No	no
Bromobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.03E-02	Not Applicable	no	Not Calculated	No	no
Bromochloromethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	No Data	Not Applicable	no	Not Calculated	No	no
Bromoform	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	3.30E-03	Not Applicable	no	Not Calculated	No	no
Bromomethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	7.50E-03	Not Applicable	no	Not Calculated	No	no
Butylbenzene, n-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	2.43E-01	Not Applicable	no	Not Calculated	No	no
Butylbenzene, sec-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	2.43E-01	Not Applicable	no	Not Calculated	No	no
Butylbenzene, tert-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.43E-01	Not Applicable	no	Not Calculated	No	no
Carbon tetrachloride	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	4.60E-04	Not Applicable	YES	Not Calculated	No	YES
Chlorobenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	7.70E-02	Not Applicable	no	Not Calculated	No	no
Chloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	2.10E+00	Not Applicable	no	Not Calculated	No	no
Chloroform	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	2.20E-04	Not Applicable	YES	Not Calculated	No	YES
Chloromethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.90E-01	Not Applicable	no	Not Calculated	No	no
Dibromochloromethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	6.80E-04	Not Applicable	no	Not Calculated	No	no
Dibromomethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	No Data	Not Applicable	no	Not Calculated	No	no
Dichlorodifluoromethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	3.95E-01	Not Applicable	no	Not Calculated	No	no
Ethylbenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.50E-03	Not Applicable	no	Not Calculated	No	no
Hexachlorobutadiene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.00E-03	2.00E-03	8.62E-04	Not Applicable	YES	Not Calculated	No	YES
Isopropylbenzene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	6.80E-01	Not Applicable	no	Not Calculated	No	no
Methyl tert-butyl ether (MTBE)	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.40E-02	Not Applicable	no	Not Calculated	No	no
Methylene chloride	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-03	5.00E-03	4.28E-03	Not Applicable	YES	Not Calculated	No	YES
Propylbenzene, n-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.43E-01	Not Applicable	no	Not Calculated	No	no
Styrene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.20E+00	Not Applicable	no	Not Calculated	No	no

APPENDIX B / TABLE 3
RISK-BASED CONCENTRATION SCREENING AND SUMMARY
DIP TANK GROUNDWATER
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/L)	Maximum Detected Concentration (mg/L)	Upper Confidence Limit (mg/L)	Exposure Point Concentration[a] (mg/L)	Minimum Sample Reporting Limit (mg/L)	Maximum Sample Reporting Limit (mg/L)	Minimum Human Health Risk-Based Screening Concentration (mg/L)	Background/ Reference Concentration[b] (mg/L)	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Volatile Organic Compounds (cont'd)															
Tetrachloroethene	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.20E-02	Not Applicable	no	Not Calculated	No	no
Toluene	3	1	33%	1.10E-03	1.10E-03	Not Applicable	1.10E-03	5.00E-04	5.00E-04	1.10E+00	Not Applicable	no	Not Calculated	No	no
Trichloroethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	NO DATA	Not Applicable		Not Calculated	No	no
Trichlorofluoromethane	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.10E+00	Not Applicable	no	Not Calculated	No	no
Vinyl chloride	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	2.70E-05	Not Applicable	YES	Not Calculated	No	YES
Xylene, m,p-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-03	1.00E-03	1.90E-01	Not Applicable	no	Not Calculated	No	no
Xylene, o-	5	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	5.00E-04	5.00E-04	1.90E-01	Not Applicable	no	Not Calculated	No	no
Petroleum Hydrocarbons															
NWTPH-Gx Gasoline	10	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	9.35E-02	1.00E-01	No Data	Not Applicable	no	Not Calculated	No	no
NWTPH-Dx Diesel	24	13	54%	4.10E-02	1.11E+00	2.92E-01	2.92E-01	7.50E-02	2.50E-01	No Data	Not Applicable	no	Not Calculated	Not Calculated	no
NWTPH-Dx Heavy Oil	24	15	63%	8.20E-02	1.25E+01	4.12E+00	4.12E+00	1.50E-01	5.00E-01	No Data	Not Applicable	no	Not Calculated	Not Calculated	no

Notes:
[a] Upper confidence limit on the mean or median of detected values
[b] Default ODEQ (2010) background concentrations for metals.
mg/L = Milligram per liter

APPENDIX B / TABLE 4
RISK-BASED CONCENTRATION SCREENING AND SUMMARY
BEAR CREEK SEDIMENTS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration[a] (mg/kg)	Minimum Sample Reporting Limit (mg/kg)	Maximum Sample Reporting Limit (mg/kg)	Minimum Human Health Risk-Based Screening Concentration (mg/kg)	Background/ Reference Concentration[b] (mg/kg)	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Metals															
Antimony	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.12E+00	1.08E+01	3.13E+01	1.00E+00	no	YES	No	no
Arsenic, total	21	11	52%	1.80E+00	1.07E+01	4.55E+00	4.55E+00	1.30E+00	1.02E+01	4.30E-01	7.90E+00	YES	YES	Yes	YES
Barium	14	5	36%	1.22E+02	2.08E+02	1.39E+02	1.39E+02	7.89E+01	3.06E+02	1.50E+04	0.00E+00	no	YES	No	no
Beryllium	16	3	19%	1.49E+00	1.91E+00	1.55E+00	1.55E+00	1.26E+00	5.09E+00	1.50E+03	0.00E+00	no	YES	No	no
Cadmium	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.12E+00	5.09E+00	2.10E+03	5.00E-01	no	YES	No	no
Chromium, Total	21	14	67%	1.16E+01	5.75E+01	3.70E+01	3.70E+01	2.83E+01	9.88E+01	2.11E+02	3.00E+01	no	YES	No	no
Copper	16	16	100%	1.78E+01	6.59E+01	4.04E+01	4.04E+01	Not Applicable	Not Applicable	3.10E+03	1.20E+01	YES	YES	No	no
Lead	21	21	100%	3.70E+00	1.10E+02	3.11E+01	3.11E+01	Not Applicable	Not Applicable	4.00E+02	2.00E+00	YES	YES	No	no
Mercury	21	9	43%	7.10E-02	1.30E+00	2.82E-01	2.82E-01	5.30E-02	4.07E-01	2.30E+01	2.00E-01	no	YES	No	no
Nickel	16	16	100%	7.25E+00	3.59E+01	2.22E+01	2.22E+01	Not Applicable	Not Applicable	1.40E+04	2.00E+01	YES	YES	No	no
Selenium	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.23E+00	1.02E+01	3.91E+02	4.00E-01	no	YES	No	no
Silver	21	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	6.58E-01	5.09E+00	3.90E+02	4.00E-01	no	YES	No	no
Thallium	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.12E+00	5.09E+00	5.16E+00	0.00E+00	no	YES	No	no
Zinc	16	7	44%	1.05E+02	4.43E+02	1.73E+02	1.73E+02	2.53E+01	1.69E+02	2.35E+04	5.30E+01	no	Yes	No	no
Pesticides/Polychlorinated Biphenyls (PCBs)/Dioxins															
2,3,7,8-TCDD (dioxin)	38	30	79%	1.27E-07	6.30E-06	1.58E-06	1.58E-06	1.97E-07	1.08E-06	4.70E-06	0.00E+00	no	NA	Yes	no
2,3,7,8-TEQ	38	38	100%	4.40E-06	4.13E-04	1.21E-04	1.21E-04	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	Yes	YES
1,2,3,7,8-PeCDD	38	38	100%	4.00E-07	5.10E-05	1.02E-05	1.02E-05	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	Yes	no
1,2,3,4,7,8-HxCDD	38	36	95%	6.85E-08	6.50E-06	1.73E-06	1.73E-06	6.98E-08	1.67E-06	1.80E-05	Not Applicable	no	Not Calculated	No	no
1,2,3,6,7,8-HxCDD	38	37	97%	1.56E-07	1.80E-05	5.03E-06	5.03E-06	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	No	no
1,2,3,7,8,9-HxCDD	38	38	100%	9.89E-07	1.16E-04	3.40E-05	1.87E-04	3.60E-06	3.60E-06	1.80E-05	Not Applicable	no	Not Calculated	Yes	YES
1,2,3,4,6,7,8-HpCDD	38	38	100%	9.93E-07	1.10E-04	3.02E-05	3.02E-05	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	Yes	YES
OCDD	38	38	100%	1.35E-07	1.40E-05	3.99E-06	3.99E-06	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	No	no
2,3,7,8-TCDF	38	38	100%	7.19E-08	9.56E-07	1.90E-06	1.90E-06	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	No	no
1,2,3,7,8-PeCDF	38	38	100%	1.39E-08	1.30E-06	3.14E-07	3.14E-07	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	No	no
2,3,4,7,8-PeCDF	38	38	100%	1.49E-07	1.70E-05	4.80E-06	4.80E-06	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	No	no
1,2,3,4,7,8-HxCDF	38	38	100%	1.25E-07	2.24E-05	5.09E-06	5.09E-06	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	Yes	no
1,2,3,6,7,8-HxCDF	38	33	87%	1.67E-07	1.70E-05	3.91E-06	3.91E-06	1.10E-07	1.51E-05	1.80E-05	Not Applicable	no	Not Calculated	No	no
1,2,3,7,8,9-HxCDF	38	36	95%	2.44E-08	1.98E-06	4.36E-07	4.36E-07	1.61E-08	6.90E-08	1.80E-05	Not Applicable	no	Not Calculated	No	no
1,2,3,4,6,7,8-HpCDF	38	38	100%	2.65E-07	6.22E-05	1.38E-05	1.38E-05	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	Yes	no
1,2,3,4,7,8,9-Hp-CDF	38	38	100%	1.18E-08	3.17E-06	4.93E-07	4.93E-07	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	No	no
OCDF	38	38	100%	4.26E-09	2.18E-06	3.75E-07	3.75E-07	Not Applicable	Not Applicable	1.80E-05	Not Applicable	Not Calculated	Not Calculated	No	no
Polynuclear Aromatic Hydrocarbons															
Acenaphthene	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	8.80E-02	4.70E+03	Not Applicable	no	Not Calculated	No	no
Acenaphthylene	16	1	6%	4.49E-02	4.49E-02	2.18E-02	4.49E-02	9.50E-03	8.83E-02	4.70E+03	Not Applicable	no	Not Calculated	No	no
Anthracene	16	1	6%	5.27E-02	5.27E-02	2.18E-02	5.27E-02	9.50E-03	8.83E-02	2.30E+04	Not Applicable	no	Not Calculated	No	no
Benz(a)anthracene	16	1	6%	2.87E-01	2.87E-01	2.18E-02	2.87E-01	9.50E-03	8.83E-02	1.50E-01	Not Applicable	no	Not Calculated	Yes	YES
Benzo(a)pyrene	16	1	6%	3.54E-01	3.54E-01	2.67E-02	3.54E-01	1.43E-02	8.83E-02	1.50E-02	Not Applicable	no	Not Calculated	Yes	YES
Benzo(b)fluoranthene	15	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-02	8.80E-02	1.50E-01	Not Applicable	no	Not Calculated	No	no
Benzo(b+k) fluoranthene	1	1	100%	5.17E-01	5.17E-01	Not Applicable	5.17E-01	Not Applicable	Not Applicable	1.50E-01	Not Applicable	Not Calculated	Not Calculated	Yes	YES
Benzo(g,h,i)perylene	16	1	6%	3.27E-01	3.27E-01	Not Applicable	3.27E-01	1.06E-02	8.83E-02	1.80E+03	Not Applicable	no	Not Calculated	No	no
Benzo(k)fluoranthene	15	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-02	8.80E-02	1.50E+00	Not Applicable	no	Not Calculated	No	no
Chrysene	16	1	6%	3.56E-01	3.56E-01	2.18E-02	3.56E-01	1.06E-02	8.83E-02	1.50E+01	Not Applicable	no	Not Calculated	No	no
Dibenz(a,h)anthracene	16	1	6%	4.30E-02	4.30E-02	2.48E-02	4.30E-02	1.06E-02	8.83E-02	1.50E-02	Not Applicable	no	Not Calculated	Yes	YES
Fluoranthene	16	1	6%	6.81E-01	6.81E-01	2.18E-02	6.81E-01	1.06E-02	8.83E-02	2.40E+03	Not Applicable	no	Not Calculated	No	no
Fluorene	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	8.80E-02	3.10E+03	Not Applicable	no	Not Calculated	No	no
Indeno(1,2,3-cd)pyrene	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	3.21E-01	1.50E-01	Not Applicable	no	Not Calculated	No	no
Naphthalene	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.00E-02	1.76E-01	5.30E+00	Not Applicable	no	Not Calculated	No	no
Phenanthrene	16	1	6%	3.03E-01	3.03E-01	2.18E-02	3.03E-01	1.06E-02	8.83E-02	2.30E+04	Not Applicable	no	Not Calculated	No	no
Pyrene	16	1	6%	7.80E-01	7.80E-01	2.18E-02	7.80E-01	1.06E-02	8.83E-02	1.80E+03	Not Applicable	no	Not Calculated	No	no

APPENDIX B / TABLE 4
RISK-BASED CONCENTRATION SCREENING AND SUMMARY
BEAR CREEK SEDIMENTS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Contaminant of Interest (COI)	Number of Analyses	Number of Detections	Frequency of Detection	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Upper Confidence Limit (mg/kg)	Exposure Point Concentration[a] (mg/kg)	Minimum Sample Reporting Limit (mg/kg)	Maximum Sample Reporting Limit (mg/kg)	Minimum Human Health Risk-Based Screening Concentration (mg/kg)	Background/ Reference Concentration[b] (mg/kg)	Reporting Limit Too High for Human Health?	Maximum Concentration Exceeds Background?	Maximum Detected Concentration Exceeds Minimum Human Health Risk-Based Screening Concentration?	Human Health COI?
Semi-Volatile Organic Compounds															
2,3,4,5-Tetrachlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	1.83E+03	Not Applicable	no	Not Calculated	No	no
2,3,4,6-Tetrachlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	1.83E+03	Not Applicable	no	Not Calculated	No	no
2,4,5-Trichlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	6.11E+03	Not Applicable	no	Not Calculated	No	no
2,4,6-Trichlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	4.40E+01	Not Applicable	no	Not Calculated	No	no
2,4-Dichlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	1.83E+02	Not Applicable	no	Not Calculated	No	no
2-Chlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	6.34E+01	Not Applicable	no	Not Calculated	No	no
3,4-Dichlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	4.80E-02	0.598.945	1.83E+02	Not Applicable	no	Not Calculated	No	no
3+4-Chlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.19E-01	5.29E-01	2.36E+02	Not Applicable	no	Not Calculated	No	no
Carbazole	9	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	1.40E-02	3.70E-02	8.62E+01	Not Applicable	no	Not Calculated	No	no
Pentachlorophenol	16	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	7.50E-02	6.18E-01	1.00E+00	Not Applicable	no	Not Calculated	No	no
Petroleum Hydrocarbons															
NWTPH-Gx Gasoline	7	0	0%	Not Detected	Not Detected	Not Applicable	0.00E+00	2.50E+01	9.20E+01	1.20E+03	Not Applicable	no	Not Calculated	No	no
NWTPH-Dx Diesel	7	2	29%	1.18E+02	1.49E+02	1.26E+02	1.26E+02	6.30E+01	2.30E+02	1.10E+03	Not Applicable	no	Not Calculated	No	no
NWTPH-Dx Heavy Oil	7	2	29%	1.05E+03	1.06E+03	7.14E+02	7.14E+02	1.25E+02	4.60E+02	2.80E+03	Not Applicable	no	Not Calculated	No	no

Notes:
[a] Upper confidence limit on the mean or median of detected values
[b] Default ODEQ (2010) background concentrations for metals.
mg/kg = Milligrams per kilogram

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

diesel

General Statistics

Total Number of Observations	29	Number of Distinct Observations	18
Number of Detects	2	Number of Non-Detects	27
Number of Distinct Detects	2	Number of Distinct Non-Detects	16
Minimum Detect	221	Minimum Non-Detect	8.4
Maximum Detect	701	Maximum Non-Detect	390
Variance Detects	115200	Percent Non-Detects	93.1%
Mean Detects	461	SD Detects	339.4
Median Detects	461	CV Detects	0.736
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	5.975	SD of Logged Detects	0.816

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	39.89	Standard Error of Mean	34.47
SD	131	90% KM (BCA) UCL	N/A
90% KM (t) UCL	85.12	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	84.05	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	143.3	95% KM Chebyshev UCL	190.1
97.5% KM Chebyshev UCL	255.1	99% KM Chebyshev UCL	382.8

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	3.321	k star (bias corrected MLE)	N/A
Theta hat (MLE)	138.8	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	13.28	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0927	nu hat (KM)	5.375
		Adjusted Level of Significance (β)	0.0897
Approximate Chi Square Value (5.38, α)	1.831	Adjusted Chi Square Value (5.38, β)	1.737
90% Gamma Approximate KM-UCL (use when n>=50)	117.1	90% Gamma Adjusted KM-UCL (use when n<50)	123.4

Gamma (KM) may not be used when k hat (KM) is < 0.1

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

diesel (cont'd)

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	38.32	Mean in Log Scale	1.679
SD in Original Scale	133.9	SD in Log Scale	1.604
90% t UCL (assumes normality of ROS data)	70.96	90% Percentile Bootstrap UCL	70.51
90% BCA Bootstrap UCL	97.53	90% Bootstrap t UCL	320.4
90% H-UCL (Log ROS)	40.6		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	63.65	Mean in Log Scale	3.106
SD in Original Scale	134.7	SD in Log Scale	1.32
90% t UCL (Assumes normality)	96.48	90% H-Stat UCL	91.02

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

oil

General Statistics

Total Number of Observations	29	Number of Distinct Observations	27
Number of Detects	18	Number of Non-Detects	11
Number of Distinct Detects	18	Number of Distinct Non-Detects	9
Minimum Detect	52	Minimum Non-Detect	17
Maximum Detect	4260	Maximum Non-Detect	71
Variance Detects	2425627	Percent Non-Detects	37.93%
Mean Detects	1458	SD Detects	1557
Median Detects	923.5	CV Detects	1.068
Skewness Detects	0.866	Kurtosis Detects	-0.842
Mean of Logged Detects	6.449	SD of Logged Detects	1.522

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.813	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.217	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.209	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	911.8	Standard Error of Mean	264
SD	1382	90% KM (BCA) UCL	1254
90% KM (t) UCL	1258	90% KM (Percentile Bootstrap) UCL	1233
90% KM (z) UCL	1250	90% KM Bootstrap t UCL	1312
90% KM Chebyshev UCL	1704	95% KM Chebyshev UCL	2063
97.5% KM Chebyshev UCL	2561	99% KM Chebyshev UCL	3539

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.562	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.781	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.17	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.212	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.72	k star (bias corrected MLE)	0.637
Theta hat (MLE)	2023	Theta star (bias corrected MLE)	2287
nu hat (MLE)	25.94	nu star (bias corrected)	22.95
MLE Mean (bias corrected)	1458	MLE Sd (bias corrected)	1826

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.435	nu hat (KM)	25.25
Approximate Chi Square Value (25.25, α)	16.68	Adjusted Chi Square Value (25.25, β)	16.35
90% Gamma Approximate KM-UCL (use when n>=50)	1380	90% Gamma Adjusted KM-UCL (use when n<50)	1408

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

oil (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	904.8
Maximum	4260	Median	110
SD	1411	CV	1.559
k hat (MLE)	0.166	k star (bias corrected MLE)	0.172
Theta hat (MLE)	5440	Theta star (bias corrected MLE)	5257
nu hat (MLE)	9.646	nu star (bias corrected)	9.981
MLE Mean (bias corrected)	904.8	MLE Sd (bias corrected)	2181
		Adjusted Level of Significance (β)	0.0897
Approximate Chi Square Value (9.98, α)	4.853	Adjusted Chi Square Value (9.98, β)	4.687
90% Gamma Approximate UCL (use when n>=50)	1861	90% Gamma Adjusted UCL (use when n<50)	1927

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.912	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.897	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.135	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.209	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	912	Mean in Log Scale	5.096
SD in Original Scale	1406	SD in Log Scale	2.136
90% t UCL (assumes normality of ROS data)	1255	90% Percentile Bootstrap UCL	1258
90% BCA Bootstrap UCL	1285	90% Bootstrap t UCL	1336
90% H-UCL (Log ROS)	5425		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	5.097	90% H-UCL (KM -Log)	4712
KM SD (logged)	2.091	90% Critical H Value (KM-Log)	2.976
KM Standard Error of Mean (logged)	0.401		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	913.5	Mean in Log Scale	5.148
SD in Original Scale	1405	SD in Log Scale	2.093
90% t UCL (Assumes normality)	1256	90% H-Stat UCL	5001

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

pentachlorophenol

General Statistics

Total Number of Observations	35	Number of Distinct Observations	32
Number of Detects	11	Number of Non-Detects	24
Number of Distinct Detects	11	Number of Distinct Non-Detects	21
Minimum Detect	0.017	Minimum Non-Detect	0.014
Maximum Detect	5.1	Maximum Non-Detect	0.598
Variance Detects	3.401	Percent Non-Detects	68.57%
Mean Detects	1.46	SD Detects	1.844
Median Detects	0.193	CV Detects	1.263
Skewness Detects	0.98	Kurtosis Detects	-0.499
Mean of Logged Detects	-1.021	SD of Logged Detects	2.099

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.786	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.299	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.267	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.48	Standard Error of Mean	0.211
SD	1.189	90% KM (BCA) UCL	0.697
90% KM (t) UCL	0.756	90% KM (Percentile Bootstrap) UCL	0.736
90% KM (z) UCL	0.75	90% KM Bootstrap t UCL	0.876
90% KM Chebyshev UCL	1.113	95% KM Chebyshev UCL	1.399
97.5% KM Chebyshev UCL	1.797	99% KM Chebyshev UCL	2.578

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.59	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.789	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.24	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.27	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.46	k star (bias corrected MLE)	0.395
Theta hat (MLE)	3.175	Theta star (bias corrected MLE)	3.696
nu hat (MLE)	10.12	nu star (bias corrected)	8.691
MLE Mean (bias corrected)	1.46	MLE Sd (bias corrected)	2.323

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.163	nu hat (KM)	11.42
Approximate Chi Square Value (11.42, α)	5.885	Adjusted Chi Square Value (11.42, β)	5.738
90% Gamma Approximate KM-UCL (use when n>=50)	0.932	90% Gamma Adjusted KM-UCL (use when n<50)	0.956

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

pentachlorophenol (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.468
Maximum	5.1	Median	0.01
SD	1.21	CV	2.585
k hat (MLE)	0.265	k star (bias corrected MLE)	0.261
Theta hat (MLE)	1.767	Theta star (bias corrected MLE)	1.792
nu hat (MLE)	18.55	nu star (bias corrected)	18.29
MLE Mean (bias corrected)	0.468	MLE Sd (bias corrected)	0.916
		Adjusted Level of Significance (β)	0.0917
Approximate Chi Square Value (18.29, α)	11.09	Adjusted Chi Square Value (18.29, β)	10.88
90% Gamma Approximate UCL (use when n>=50)	0.772	90% Gamma Adjusted UCL (use when n<50)	0.787

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.189	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.267	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.469	Mean in Log Scale	-3.528
SD in Original Scale	1.21	SD in Log Scale	2.193
90% t UCL (assumes normality of ROS data)	0.736	90% Percentile Bootstrap UCL	0.741
90% BCA Bootstrap UCL	0.806	90% Bootstrap t UCL	0.865
90% H-UCL (Log ROS)	1.036		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.938	90% H-UCL (KM -Log)	0.613
KM SD (logged)	1.806	90% Critical H Value (KM-Log)	2.643
KM Standard Error of Mean (logged)	0.35		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.533	Mean in Log Scale	-2.194
SD in Original Scale	1.188	SD in Log Scale	1.682
90% t UCL (Assumes normality)	0.796	90% H-Stat UCL	0.945

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

3,4-dichlorophenol

General Statistics

Total Number of Observations	21	Number of Distinct Observations	21
Number of Detects	2	Number of Non-Detects	19
Number of Distinct Detects	2	Number of Distinct Non-Detects	19
Minimum Detect	0.02	Minimum Non-Detect	0.0231
Maximum Detect	0.466	Maximum Non-Detect	0.598
Variance Detects	0.0995	Percent Non-Detects	90.48%
Mean Detects	0.243	SD Detects	0.315
Median Detects	0.243	CV Detects	1.298
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-2.338	SD of Logged Detects	2.226

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0448	Standard Error of Mean	0.0341
SD	0.102	90% KM (BCA) UCL	N/A
90% KM (t) UCL	0.0899	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	0.0884	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.147	95% KM Chebyshev UCL	0.193
97.5% KM Chebyshev UCL	0.257	99% KM Chebyshev UCL	0.384

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.66	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.368	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.641	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.192	nu hat (KM)	8.069
		Adjusted Level of Significance (β)	0.0869
Approximate Chi Square Value (8.07, α)	3.536	Adjusted Chi Square Value (8.07, β)	3.361
90% Gamma Approximate KM-UCL (use when n>=50)	0.102	90% Gamma Adjusted KM-UCL (use when n<50)	0.108

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

3,4-dichlorophenol (cont'd)

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0416	Mean in Log Scale	-3.746
SD in Original Scale	0.0973	SD in Log Scale	0.685
90% t UCL (assumes normality of ROS data)	0.0697	90% Percentile Bootstrap UCL	N/A
90% BCA Bootstrap UCL	N/A	90% Bootstrap t UCL	N/A
90% H-UCL (Log ROS)	0.0382		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.107	Mean in Log Scale	-2.968
SD in Original Scale	0.13	SD in Log Scale	1.26
90% t UCL (Assumes normality)	0.145	90% H-Stat UCL	0.208

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

2,3,4,5-tetrachlorophenol

General Statistics

Total Number of Observations	21	Number of Distinct Observations	21
Number of Detects	1	Number of Non-Detects	20
Number of Distinct Detects	1	Number of Distinct Non-Detects	20

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 2,3,4,5-tetrachlorophenol was not processed!

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

2,4,5-trichlorophenol

General Statistics

Total Number of Observations	25	Number of Distinct Observations	25
Number of Detects	2	Number of Non-Detects	23
Number of Distinct Detects	2	Number of Distinct Non-Detects	23
Minimum Detect	0.0112	Minimum Non-Detect	0.0231
Maximum Detect	0.0896	Maximum Non-Detect	0.598
Variance Detects	0.00307	Percent Non-Detects	92%
Mean Detects	0.0504	SD Detects	0.0554
Median Detects	0.0504	CV Detects	1.1
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-3.452	SD of Logged Detects	1.47

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0164	Standard Error of Mean	0.00714
SD	0.0196	90% KM (BCA) UCL	N/A
90% KM (t) UCL	0.0258	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	0.0256	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0378	95% KM Chebyshev UCL	0.0476
97.5% KM Chebyshev UCL	0.061	99% KM Chebyshev UCL	0.0875

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.216	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0414	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.866	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.706	nu hat (KM)	35.28
		Adjusted Level of Significance (β)	0.0883
Approximate Chi Square Value (35.28, α)	25.03	Adjusted Chi Square Value (35.28, β)	24.57
90% Gamma Approximate KM-UCL (use when n>=50)	0.0232	90% Gamma Adjusted KM-UCL (use when n<50)	0.0236

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

2,4,5-trichlorophenol (cont'd)

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0148	Mean in Log Scale	-4.372
SD in Original Scale	0.0156	SD in Log Scale	0.411
90% t UCL (assumes normality of ROS data)	0.0189	90% Percentile Bootstrap UCL	N/A
90% BCA Bootstrap UCL	N/A	90% Bootstrap t UCL	N/A
90% H-UCL (Log ROS)	0.0155		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0829	Mean in Log Scale	-3.131
SD in Original Scale	0.0955	SD in Log Scale	1.157
90% t UCL (Assumes normality)	0.108	90% H-Stat UCL	0.137

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

antimony

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Number of Detects	3	Number of Non-Detects	6
Number of Distinct Detects	3	Number of Distinct Non-Detects	6
Minimum Detect	0.174	Minimum Non-Detect	0.246
Maximum Detect	2.29	Maximum Non-Detect	10.8
Variance Detects	1.124	Percent Non-Detects	66.67%
Mean Detects	1.271	SD Detects	1.06
Median Detects	1.35	CV Detects	0.834
Skewness Detects	-0.332	Kurtosis Detects	N/A
Mean of Logged Detects	-0.207	SD of Logged Detects	1.361

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.996	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.196	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.644	Standard Error of Mean	0.351
SD	0.762	90% KM (BCA) UCL	N/A
90% KM (t) UCL	1.135	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	1.094	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.698	95% KM Chebyshev UCL	2.175
97.5% KM Chebyshev UCL	2.838	99% KM Chebyshev UCL	4.139

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.26	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.009	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.559	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

antimony (cont'd)

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.715	nu hat (KM)	12.87
		Adjusted Level of Significance (β)	0.0666
Approximate Chi Square Value (12.87, α)	6.946	Adjusted Chi Square Value (12.87, β)	6.238
90% Gamma Approximate KM-UCL (use when n>=50)	1.194	90% Gamma Adjusted KM-UCL (use when n<50)	1.33

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.896	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.312	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.585	Mean in Log Scale	-1.029
SD in Original Scale	0.74	SD in Log Scale	0.936
90% t UCL (assumes normality of ROS data)	0.93	90% Percentile Bootstrap UCL	0.918
90% BCA Bootstrap UCL	0.945	90% Bootstrap t UCL	4.069
90% H-UCL (Log ROS)	1.125		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-1.068	90% H-UCL (KM -Log)	1.402
KM SD (logged)	1.05	90% Critical H Value (KM-Log)	2.306
KM Standard Error of Mean (logged)	0.501		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.275	Mean in Log Scale	-0.474
SD in Original Scale	1.696	SD in Log Scale	1.305
90% t UCL (Assumes normality)	2.065	90% H-Stat UCL	5.063

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

arsenic

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12
Number of Detects	8	Number of Non-Detects	5
Number of Distinct Detects	8	Number of Distinct Non-Detects	4
Minimum Detect	1.1	Minimum Non-Detect	1.2
Maximum Detect	9.4	Maximum Non-Detect	21.6
Variance Detects	7.184	Percent Non-Detects	38.46%
Mean Detects	3.649	SD Detects	2.68
Median Detects	3.26	CV Detects	0.735
Skewness Detects	1.552	Kurtosis Detects	2.92
Mean of Logged Detects	1.074	SD of Logged Detects	0.713

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.856	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.209	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.313	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	2.834	Standard Error of Mean	0.728
SD	2.354	90% KM (BCA) UCL	3.723
90% KM (t) UCL	3.821	90% KM (Percentile Bootstrap) UCL	3.743
90% KM (z) UCL	3.767	90% KM Bootstrap t UCL	4.397
90% KM Chebyshev UCL	5.017	95% KM Chebyshev UCL	6.006
97.5% KM Chebyshev UCL	7.379	99% KM Chebyshev UCL	10.08

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.223	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.723	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.13	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.297	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.427	k star (bias corrected MLE)	1.6
Theta hat (MLE)	1.504	Theta star (bias corrected MLE)	2.28
nu hat (MLE)	38.83	nu star (bias corrected)	25.6
MLE Mean (bias corrected)	3.649	MLE Sd (bias corrected)	2.885

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	1.45	nu hat (KM)	37.7
Approximate Chi Square Value (37.70, α)	27.08	Adjusted Chi Square Value (37.70, β)	26.08
90% Gamma Approximate KM-UCL (use when n>=50)	3.944	90% Gamma Adjusted KM-UCL (use when n<50)	4.096

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

arsenic (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.531
Maximum	9.4	Median	1.92
SD	2.561	CV	1.012
k hat (MLE)	0.825	k star (bias corrected MLE)	0.686
Theta hat (MLE)	3.069	Theta star (bias corrected MLE)	3.691
nu hat (MLE)	21.44	nu star (bias corrected)	17.83
MLE Mean (bias corrected)	2.531	MLE Sd (bias corrected)	3.057
		Adjusted Level of Significance (β)	0.0767
Approximate Chi Square Value (17.83, α)	10.73	Adjusted Chi Square Value (17.83, β)	10.12
90% Gamma Approximate UCL (use when n>=50)	4.205	90% Gamma Adjusted UCL (use when n<50)	4.458

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.97	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.133	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.313	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.725	Mean in Log Scale	0.723
SD in Original Scale	2.398	SD in Log Scale	0.749
90% t UCL (assumes normality of ROS data)	3.627	90% Percentile Bootstrap UCL	3.54
90% BCA Bootstrap UCL	3.825	90% Bootstrap t UCL	4.231
90% H-UCL (Log ROS)	3.996		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	0.773	90% H-UCL (KM -Log)	3.91
KM SD (logged)	0.699	90% Critical H Value (KM-Log)	1.721
KM Standard Error of Mean (logged)	0.218		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.35	Mean in Log Scale	0.791
SD in Original Scale	3.305	SD in Log Scale	0.953
90% t UCL (Assumes normality)	4.593	90% H-Stat UCL	5.996

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

beryllium

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	4
Number of Distinct Detects	5	Number of Distinct Non-Detects	4
Minimum Detect	0.725	Minimum Non-Detect	1.13
Maximum Detect	1.36	Maximum Non-Detect	10.8
Variance Detects	0.0804	Percent Non-Detects	44.44%
Mean Detects	1.029	SD Detects	0.284
Median Detects	1.08	CV Detects	0.275
Skewness Detects	-0.0953	Kurtosis Detects	-2.574
Mean of Logged Detects	-0.00303	SD of Logged Detects	0.286

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.898	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.236	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.396	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.979	Standard Error of Mean	0.114
SD	0.245	90% KM (BCA) UCL	1.127
90% KM (t) UCL	1.137	90% KM (Percentile Bootstrap) UCL	1.14
90% KM (z) UCL	1.124	90% KM Bootstrap t UCL	1.13
90% KM Chebyshev UCL	1.319	95% KM Chebyshev UCL	1.474
97.5% KM Chebyshev UCL	1.688	99% KM Chebyshev UCL	2.109

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.407	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.264	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	15.79	k star (bias corrected MLE)	6.448
Theta hat (MLE)	0.0652	Theta star (bias corrected MLE)	0.16
nu hat (MLE)	157.9	nu star (bias corrected)	64.48
MLE Mean (bias corrected)	1.029	MLE Sd (bias corrected)	0.405

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

beryllium (cont'd)

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	16.02	nu hat (KM)	288.4
Approximate Chi Square Value (288.40, α)	258.1	Adjusted Chi Square Value (288.40, β)	253.2
90% Gamma Approximate KM-UCL (use when n>=50)	1.094	90% Gamma Adjusted KM-UCL (use when n<50)	1.115

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.725	Mean	0.973
Maximum	1.36	Median	0.954
SD	0.215	CV	0.22
k hat (MLE)	24.4	k star (bias corrected MLE)	16.34
Theta hat (MLE)	0.0399	Theta star (bias corrected MLE)	0.0595
nu hat (MLE)	439.2	nu star (bias corrected)	294.1
MLE Mean (bias corrected)	0.973	MLE Sd (bias corrected)	0.241
		Adjusted Level of Significance (β)	0.0666
Approximate Chi Square Value (294.12, α)	263.5	Adjusted Chi Square Value (294.12, β)	258.6
90% Gamma Approximate UCL (use when n>=50)	1.086	90% Gamma Adjusted UCL (use when n<50)	1.107

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.879	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.238	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.396	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.967	Mean in Log Scale	-0.0544
SD in Original Scale	0.216	SD in Log Scale	0.215
90% t UCL (assumes normality of ROS data)	1.068	90% Percentile Bootstrap UCL	1.052
90% BCA Bootstrap UCL	1.063	90% Bootstrap t UCL	1.101
90% H-UCL (Log ROS)	1.079		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-0.0526	90% H-UCL (KM -Log)	1.111
KM SD (logged)	0.249	90% Critical H Value (KM-Log)	1.436
KM Standard Error of Mean (logged)	0.118		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.406	Mean in Log Scale	0.0596
SD in Original Scale	1.523	SD in Log Scale	0.681
90% t UCL (Assumes normality)	2.115	90% H-Stat UCL	2.074

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

cadmium

General Statistics

Total Number of Observations	13	Number of Distinct Observations	11
Number of Detects	6	Number of Non-Detects	7
Number of Distinct Detects	6	Number of Distinct Non-Detects	5
Minimum Detect	0.211	Minimum Non-Detect	0.22
Maximum Detect	3.84	Maximum Non-Detect	10.8
Variance Detects	2.028	Percent Non-Detects	53.85%
Mean Detects	0.937	SD Detects	1.424
Median Detects	0.394	CV Detects	1.519
Skewness Detects	2.434	Kurtosis Detects	5.942
Mean of Logged Detects	-0.658	SD of Logged Detects	1.014

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.546	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.474	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.362	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.588	Standard Error of Mean	0.312
SD	0.985	90% KM (BCA) UCL	0.974
90% KM (t) UCL	1.01	90% KM (Percentile Bootstrap) UCL	0.963
90% KM (z) UCL	0.987	90% KM Bootstrap t UCL	3.772
90% KM Chebyshev UCL	1.523	95% KM Chebyshev UCL	1.946
97.5% KM Chebyshev UCL	2.534	99% KM Chebyshev UCL	3.688

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.232	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.716	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.465	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.341	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.975	k star (bias corrected MLE)	0.599
Theta hat (MLE)	0.961	Theta star (bias corrected MLE)	1.566
nu hat (MLE)	11.7	nu star (bias corrected)	7.184
MLE Mean (bias corrected)	0.937	MLE Sd (bias corrected)	1.211

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.356	nu hat (KM)	9.263
Approximate Chi Square Value (9.26, α)	4.351	Adjusted Chi Square Value (9.26, β)	3.986
90% Gamma Approximate KM-UCL (use when n>=50)	1.251	90% Gamma Adjusted KM-UCL (use when n<50)	1.366

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

cadmium (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.438
Maximum	3.84	Median	0.01
SD	1.038	CV	2.369
k hat (MLE)	0.344	k star (bias corrected MLE)	0.316
Theta hat (MLE)	1.272	Theta star (bias corrected MLE)	1.385
nu hat (MLE)	8.953	nu star (bias corrected)	8.22
MLE Mean (bias corrected)	0.438	MLE Sd (bias corrected)	0.779
		Adjusted Level of Significance (β)	0.0767
Approximate Chi Square Value (8.22, α)	3.638	Adjusted Chi Square Value (8.22, β)	3.31
90% Gamma Approximate UCL (use when n>=50)	0.99	90% Gamma Adjusted UCL (use when n<50)	1.088

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.712	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.412	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.362	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.534	Mean in Log Scale	-1.243
SD in Original Scale	0.999	SD in Log Scale	0.917
90% t UCL (assumes normality of ROS data)	0.91	90% Percentile Bootstrap UCL	0.842
90% BCA Bootstrap UCL	1.108	90% Bootstrap t UCL	3.308
90% H-UCL (Log ROS)	0.735		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.973	Mean in Log Scale	-0.928
SD in Original Scale	1.658	SD in Log Scale	1.26
90% t UCL (Assumes normality)	1.597	90% H-Stat UCL	2.062

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

chromium

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12
		Number of Missing Observations	0
Minimum	18	Mean	34.78
Maximum	68.5	Median	28.2
SD	16.64	Std. Error of Mean	4.615
Coefficient of Variation	0.479	Skewness	0.775

Normal GOF Test

Shapiro Wilk Test Statistic	0.893	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.866	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.192	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.246	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

90% Normal UCL		**90% UCLs (Adjusted for Skewness)**	
90% Student's-t UCL	41.04	90% Adjusted-CLT UCL (Chen-1995)	41.4
		90% Modified-t UCL (Johnson-1978)	41.2

Gamma GOF Test

A-D Test Statistic	0.45	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.158	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.237	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.047	k star (bias corrected MLE)	3.933
Theta hat (MLE)	6.891	Theta star (bias corrected MLE)	8.841
nu hat (MLE)	131.2	nu star (bias corrected)	102.3
MLE Mean (bias corrected)	34.78	MLE Sd (bias corrected)	17.54
		Approximate Chi Square Value (0.1)	84.42
Adjusted Level of Significance	0.0767	Adjusted Chi Square Value	82.59

Assuming Gamma Distribution

90% Approximate Gamma UCL (use when n>=50))	42.13	90% Adjusted Gamma UCL (use when n<50)	43.06

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.866	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.143	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.246	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

chromium (cont'd)

Lognormal Statistics

Minimum of Logged Data	2.89	Mean of logged Data	3.447
Maximum of Logged Data	4.227	SD of logged Data	0.468

Assuming Lognormal Distribution

90% H-UCL	43.07	90% Chebyshev (MVUE) UCL	48.54
95% Chebyshev (MVUE) UCL	54.81	97.5% Chebyshev (MVUE) UCL	63.5
99% Chebyshev (MVUE) UCL	80.58		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

90% CLT UCL	40.69	90% Jackknife UCL	41.04
90% Standard Bootstrap UCL	40.42	90% Bootstrap-t UCL	42.06
90% Hall's Bootstrap UCL	41.24	90% Percentile Bootstrap UCL	40.39
90% BCA Bootstrap UCL	41.38		
90% Chebyshev(Mean, Sd) UCL	48.62	95% Chebyshev(Mean, Sd) UCL	54.9
97.5% Chebyshev(Mean, Sd) UCL	63.6	99% Chebyshev(Mean, Sd) UCL	80.7

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

copper

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	13.8	Mean	68.39
Maximum	263	Median	34.2
SD	78.6	Std. Error of Mean	26.2
Coefficient of Variation	1.149	Skewness	2.315

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0

Normal GOF Test

Shapiro Wilk Test Statistic	0.693	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.294	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.295	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

90% Normal UCL		**90% UCLs (Adjusted for Skewness)**	
90% Student's-t UCL	105	90% Adjusted-CLT UCL (Chen-1995)	116.4
		90% Modified-t UCL (Johnson-1978)	108.4

Gamma GOF Test

A-D Test Statistic	0.516	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.737	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.217	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.285	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.344	k star (bias corrected MLE)	0.97
Theta hat (MLE)	50.9	Theta star (bias corrected MLE)	70.52
nu hat (MLE)	24.18	nu star (bias corrected)	17.46
MLE Mean (bias corrected)	68.39	MLE Sd (bias corrected)	69.45
		Approximate Chi Square Value (0.1)	10.44
Adjusted Level of Significance	0.0666	Adjusted Chi Square Value	9.548

Assuming Gamma Distribution

90% Approximate Gamma UCL (use when n>=50))	114.3	90% Adjusted Gamma UCL (use when n<50)	125

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

copper (cont'd)

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.176	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.295	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.625	Mean of logged Data	3.809
Maximum of Logged Data	5.572	SD of logged Data	0.906

Assuming Lognormal Distribution

90% H-UCL	133.4	90% Chebyshev (MVUE) UCL	124.3
95% Chebyshev (MVUE) UCL	151.5	97.5% Chebyshev (MVUE) UCL	189.3
99% Chebyshev (MVUE) UCL	263.5		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

90% CLT UCL	102	90% Jackknife UCL	105
90% Standard Bootstrap UCL	100.2	90% Bootstrap-t UCL	159.7
90% Hall's Bootstrap UCL	245.1	90% Percentile Bootstrap UCL	100.7
90% BCA Bootstrap UCL	117		
90% Chebyshev(Mean, Sd) UCL	147	95% Chebyshev(Mean, Sd) UCL	182.6
97.5% Chebyshev(Mean, Sd) UCL	232	99% Chebyshev(Mean, Sd) UCL	329.1

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

lead

General Statistics

Total Number of Observations	13	Number of Distinct Observations	13
		Number of Missing Observations	0
Minimum	2.8	Mean	20.5
Maximum	100	Median	8.39
SD	29.72	Std. Error of Mean	8.242
Coefficient of Variation	1.45	Skewness	2.222

Normal GOF Test

Shapiro Wilk Test Statistic	0.616	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.866	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.379	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.246	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

90% Normal UCL		**90% UCLs (Adjusted for Skewness)**	
90% Student's-t UCL	31.68	90% Adjusted-CLT UCL (Chen-1995)	34.69
		90% Modified-t UCL (Johnson-1978)	32.52

Gamma GOF Test

A-D Test Statistic	1.151	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.763	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.302	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.244	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.893	k star (bias corrected MLE)	0.738
Theta hat (MLE)	22.96	Theta star (bias corrected MLE)	27.77
nu hat (MLE)	23.21	nu star (bias corrected)	19.19
MLE Mean (bias corrected)	20.5	MLE Sd (bias corrected)	23.86
		Approximate Chi Square Value (0.1)	11.8
Adjusted Level of Significance	0.0767	Adjusted Chi Square Value	11.16

Assuming Gamma Distribution

90% Approximate Gamma UCL (use when n>=50))	33.33	90% Adjusted Gamma UCL (use when n<50)	35.25

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.898	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.866	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.219	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.246	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

lead (cont'd)

Lognormal Statistics

Minimum of Logged Data	1.03	Mean of logged Data	2.365
Maximum of Logged Data	4.605	SD of logged Data	1.081

Assuming Lognormal Distribution

90% H-UCL	37.16	90% Chebyshev (MVUE) UCL	35.4
95% Chebyshev (MVUE) UCL	43.32	97.5% Chebyshev (MVUE) UCL	54.32
99% Chebyshev (MVUE) UCL	75.92		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

90% CLT UCL	31.06	90% Jackknife UCL	31.68
90% Standard Bootstrap UCL	30.81	90% Bootstrap-t UCL	54.21
90% Hall's Bootstrap UCL	83.89	90% Percentile Bootstrap UCL	31.06
90% BCA Bootstrap UCL	33.55		
90% Chebyshev(Mean, Sd) UCL	45.22	95% Chebyshev(Mean, Sd) UCL	56.43
97.5% Chebyshev(Mean, Sd) UCL	71.97	99% Chebyshev(Mean, Sd) UCL	102.5

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

mercury

General Statistics

Total Number of Observations	13	Number of Distinct Observations	11
Number of Detects	3	Number of Non-Detects	10
Number of Distinct Detects	3	Number of Distinct Non-Detects	8
Minimum Detect	0.061	Minimum Non-Detect	0.057
Maximum Detect	0.973	Maximum Non-Detect	0.117
Variance Detects	0.241	Percent Non-Detects	76.92%
Mean Detects	0.412	SD Detects	0.491
Median Detects	0.203	CV Detects	1.19
Skewness Detects	1.57	Kurtosis Detects	N/A
Mean of Logged Detects	-1.473	SD of Logged Detects	1.389

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.864	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.332	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.14	Standard Error of Mean	0.0827
SD	0.243	90% KM (BCA) UCL	N/A
90% KM (t) UCL	0.253	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	0.246	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.388	95% KM Chebyshev UCL	0.501
97.5% KM Chebyshev UCL	0.657	99% KM Chebyshev UCL	0.963

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.985	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.419	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.91	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.333	nu hat (KM)	8.65
		Adjusted Level of Significance (β)	0.0767
Approximate Chi Square Value (8.65, α)	3.929	Adjusted Chi Square Value (8.65, β)	3.586
90% Gamma Approximate KM-UCL (use when n>=50)	0.309	90% Gamma Adjusted KM-UCL (use when n<50)	0.339

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

mercury (cont'd)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.994	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.202	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.11	Mean in Log Scale	-3.521
SD in Original Scale	0.265	SD in Log Scale	1.404
90% t UCL (assumes normality of ROS data)	0.209	90% Percentile Bootstrap UCL	0.196
90% BCA Bootstrap UCL	0.301	90% Bootstrap t UCL	1.27
90% H-UCL (Log ROS)	0.222		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.52	90% H-UCL (KM -Log)	0.166
KM SD (logged)	0.792	90% Critical H Value (KM-Log)	1.811
KM Standard Error of Mean (logged)	0.27		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.131	Mean in Log Scale	-2.715
SD in Original Scale	0.257	SD in Log Scale	0.922
90% t UCL (Assumes normality)	0.227	90% H-Stat UCL	0.17

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

nickel

General Statistics

Total Number of Observations	13	Number of Distinct Observations	11
Number of Detects	9	Number of Non-Detects	4
Number of Distinct Detects	9	Number of Distinct Non-Detects	2
Minimum Detect	10.4	Minimum Non-Detect	2.2
Maximum Detect	32.8	Maximum Non-Detect	2.3
Variance Detects	61.92	Percent Non-Detects	30.77%
Mean Detects	20.5	SD Detects	7.869
Median Detects	22.4	CV Detects	0.384
Skewness Detects	0.156	Kurtosis Detects	-0.986
Mean of Logged Detects	2.948	SD of Logged Detects	0.415

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.942	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.151	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.295	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	14.87	Standard Error of Mean	3.077
SD	10.46	90% KM (BCA) UCL	18.4
90% KM (t) UCL	19.04	90% KM (Percentile Bootstrap) UCL	18.54
90% KM (z) UCL	18.81	90% KM Bootstrap t UCL	18.91
90% KM Chebyshev UCL	24.1	95% KM Chebyshev UCL	28.28
97.5% KM Chebyshev UCL	34.09	99% KM Chebyshev UCL	45.49

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.31	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.722	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.198	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.28	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	7.086	k star (bias corrected MLE)	4.798
Theta hat (MLE)	2.893	Theta star (bias corrected MLE)	4.272
nu hat (MLE)	127.6	nu star (bias corrected)	86.37
MLE Mean (bias corrected)	20.5	MLE Sd (bias corrected)	9.359

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	2.02	nu hat (KM)	52.53
Approximate Chi Square Value (52.53, α)	39.89	Adjusted Chi Square Value (52.53, β)	38.66
90% Gamma Approximate KM-UCL (use when n>=50)	19.58	90% Gamma Adjusted KM-UCL (use when n<50)	20.2

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

nickel (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	2.379	Mean	15.5
Maximum	32.8	Median	14.8
SD	10.17	CV	0.656
k hat (MLE)	1.888	k star (bias corrected MLE)	1.503
Theta hat (MLE)	8.212	Theta star (bias corrected MLE)	10.31
nu hat (MLE)	49.08	nu star (bias corrected)	39.08
MLE Mean (bias corrected)	15.5	MLE Sd (bias corrected)	12.64
		Adjusted Level of Significance (β)	0.0767
Approximate Chi Square Value (39.08, α)	28.27	Adjusted Chi Square Value (39.08, β)	27.24
90% Gamma Approximate UCL (use when n>=50)	21.43	90% Gamma Adjusted UCL (use when n<50)	22.24

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.206	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.295	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	16.34	Mean in Log Scale	2.636
SD in Original Scale	9.151	SD in Log Scale	0.6
90% t UCL (assumes normality of ROS data)	19.79	90% Percentile Bootstrap UCL	19.62
90% BCA Bootstrap UCL	19.66	90% Bootstrap t UCL	20.05
90% H-UCL (Log ROS)	22.16		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	2.284	90% H-UCL (KM -Log)	32.05
KM SD (logged)	1.049	90% Critical H Value (KM-Log)	2.095
KM Standard Error of Mean (logged)	0.308		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	14.54	Mean in Log Scale	2.077
SD in Original Scale	11.31	SD in Log Scale	1.401
90% t UCL (Assumes normality)	18.79	90% H-Stat UCL	59.57

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

selenium

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Number of Detects	2	Number of Non-Detects	7
Number of Distinct Detects	2	Number of Distinct Non-Detects	7
Minimum Detect	0.724	Minimum Non-Detect	1.23
Maximum Detect	1.18	Maximum Non-Detect	21.6
Variance Detects	0.104	Percent Non-Detects	77.78%
Mean Detects	0.952	SD Detects	0.322
Median Detects	0.952	CV Detects	0.339
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.0787	SD of Logged Detects	0.345

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.952	Standard Error of Mean	0.228
SD	0.228	90% KM (BCA) UCL	N/A
90% KM (t) UCL	1.27	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	1.244	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.636	95% KM Chebyshev UCL	1.946
97.5% KM Chebyshev UCL	2.376	99% KM Chebyshev UCL	3.221

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	17.09	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0557	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	68.38	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	17.43	nu hat (KM)	313.8
		Adjusted Level of Significance (β)	0.0666
Approximate Chi Square Value (313.82, α)	282.2	Adjusted Chi Square Value (313.82, β)	277.1
90% Gamma Approximate KM-UCL (use when n>=50)	1.059	90% Gamma Adjusted KM-UCL (use when n<50)	1.078

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

selenium (cont'd)

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.93	Mean in Log Scale	-0.0787
SD in Original Scale	0.115	SD in Log Scale	0.122
90% t UCL (assumes normality of ROS data)	0.984	90% Percentile Bootstrap UCL	N/A
90% BCA Bootstrap UCL	N/A	90% Bootstrap t UCL	N/A
90% H-UCL (Log ROS)	0.988		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.179	Mean in Log Scale	0.292
SD in Original Scale	3.257	SD in Log Scale	0.865
90% t UCL (Assumes normality)	3.696	90% H-Stat UCL	3.637

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

thallium

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Number of Detects	1	Number of Non-Detects	8
Number of Distinct Detects	1	Number of Distinct Non-Detects	8

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable thallium was not processed!

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

zinc

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	19	Mean	530.5
Maximum	3680	Median	45.3
SD	1201	Std. Error of Mean	400.3
Coefficient of Variation	2.264	Skewness	2.828

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0

Normal GOF Test

Shapiro Wilk Test Statistic	0.497	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.409	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.295	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

90% Normal UCL		**90% UCLs (Adjusted for Skewness)**	
90% Student's-t UCL	1090	90% Adjusted-CLT UCL (Chen-1995)	1313
		90% Modified-t UCL (Johnson-1978)	1153

Gamma GOF Test

A-D Test Statistic	1.263	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.789	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.349	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.298	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.4	k star (bias corrected MLE)	0.341
Theta hat (MLE)	1326	Theta star (bias corrected MLE)	1556
nu hat (MLE)	7.204	nu star (bias corrected)	6.136
MLE Mean (bias corrected)	530.5	MLE Sd (bias corrected)	908.7
		Approximate Chi Square Value (0.1)	2.29
Adjusted Level of Significance	0.0666	Adjusted Chi Square Value	1.923

Assuming Gamma Distribution

90% Approximate Gamma UCL (use when n>=50))	1422	90% Adjusted Gamma UCL (use when n<50)	1693

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

zinc (cont'd)

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.835	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.24	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.295	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.944	Mean of logged Data	4.63
Maximum of Logged Data	8.211	SD of logged Data	1.704

Assuming Lognormal Distribution

90% H-UCL	3294	90% Chebyshev (MVUE) UCL	895.4
95% Chebyshev (MVUE) UCL	1153	97.5% Chebyshev (MVUE) UCL	1510
99% Chebyshev (MVUE) UCL	2213		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

90% CLT UCL	1044	90% Jackknife UCL	1090
90% Standard Bootstrap UCL	1016	90% Bootstrap-t UCL	11617
90% Hall's Bootstrap UCL	3033	90% Percentile Bootstrap UCL	1002
90% BCA Bootstrap UCL	1332		
90% Chebyshev(Mean, Sd) UCL	1732	95% Chebyshev(Mean, Sd) UCL	2276
97.5% Chebyshev(Mean, Sd) UCL	3031	99% Chebyshev(Mean, Sd) UCL	4514

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

b(a)p

General Statistics

Total Number of Observations	14	Number of Distinct Observations	11
Number of Detects	1	Number of Non-Detects	13
Number of Distinct Detects	1	Number of Distinct Non-Detects	10

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable b(a)p was not processed!

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

chrysene

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Number of Detects	1	Number of Non-Detects	9
Number of Distinct Detects	1	Number of Distinct Non-Detects	9

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable chrysene was not processed!

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

fluoranthene

General Statistics

Total Number of Observations	14	Number of Distinct Observations	10
Number of Detects	1	Number of Non-Detects	13
Number of Distinct Detects	1	Number of Distinct Non-Detects	9

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable fluoranthene was not processed!

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

naphthalene

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Number of Detects	3	Number of Non-Detects	7
Number of Distinct Detects	3	Number of Distinct Non-Detects	7
Minimum Detect	0.0058	Minimum Non-Detect	0.0114
Maximum Detect	0.0483	Maximum Non-Detect	0.398
Variance Detects	5.8825E-4	Percent Non-Detects	70%
Mean Detects	0.0203	SD Detects	0.0243
Median Detects	0.0068	CV Detects	1.195
Skewness Detects	1.729	Kurtosis Detects	N/A
Mean of Logged Detects	-4.39	SD of Logged Detects	1.181

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.768	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.378	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0133	Standard Error of Mean	0.00783
SD	0.0157	90% KM (BCA) UCL	N/A
90% KM (t) UCL	0.0241	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	0.0233	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0368	95% KM Chebyshev UCL	0.0475
97.5% KM Chebyshev UCL	0.0622	99% KM Chebyshev UCL	0.0913

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.152	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0176	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.911	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.721	nu hat (KM)	14.43
		Adjusted Level of Significance (β)	0.0724
Approximate Chi Square Value (14.43, α)	8.113	Adjusted Chi Square Value (14.43, β)	7.488
90% Gamma Approximate KM-UCL (use when n>=50)	0.0237	90% Gamma Adjusted KM-UCL (use when n<50)	0.0256

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

naphthalene (cont'd)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.806	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.361	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0116	Mean in Log Scale	-4.707
SD in Original Scale	0.0129	SD in Log Scale	0.607
90% t UCL (assumes normality of ROS data)	0.0173	90% Percentile Bootstrap UCL	0.0161
90% BCA Bootstrap UCL	0.0199	90% Bootstrap t UCL	0.0627
90% H-UCL (Log ROS)	0.0153		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-4.73	90% H-UCL (KM -Log)	0.019
KM SD (logged)	0.764	90% Critical H Value (KM-Log)	1.872
KM Standard Error of Mean (logged)	0.384		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0589	Mean in Log Scale	-3.599
SD in Original Scale	0.075	SD in Log Scale	1.346
90% t UCL (Assumes normality)	0.0917	90% H-Stat UCL	0.223

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

phenanthrene

General Statistics

Total Number of Observations	14	Number of Distinct Observations	10
Number of Detects	2	Number of Non-Detects	12
Number of Distinct Detects	2	Number of Distinct Non-Detects	8
Minimum Detect	0.0019	Minimum Non-Detect	0.0057
Maximum Detect	0.0031	Maximum Non-Detect	0.2
Variance Detects	7.2000E-7	Percent Non-Detects	85.71%
Mean Detects	0.0025	SD Detects	8.4853E-4
Median Detects	0.0025	CV Detects	0.339
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-6.021	SD of Logged Detects	0.346

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0025	Standard Error of Mean	6.0000E-4
SD	6.0000E-4	90% KM (BCA) UCL	N/A
90% KM (t) UCL	0.00331	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	0.00327	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0043	95% KM Chebyshev UCL	0.00512
97.5% KM Chebyshev UCL	0.00625	99% KM Chebyshev UCL	0.00847

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	17.02	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.4688E-4	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	68.08	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	17.36	nu hat (KM)	486.1
		Adjusted Level of Significance (β)	0.0781
Approximate Chi Square Value (486.11, α)	446.6	Adjusted Chi Square Value (486.11, β)	442.6
90% Gamma Approximate KM-UCL (use when n>=50)	0.00272	90% Gamma Adjusted KM-UCL (use when n<50)	0.00275

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

phenanthrene (cont'd)

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00249	Mean in Log Scale	-6.021
SD in Original Scale	6.0231E-4	SD in Log Scale	0.238
90% t UCL (assumes normality of ROS data)	0.00271	90% Percentile Bootstrap UCL	0.0027
90% BCA Bootstrap UCL	0.0027	90% Bootstrap t UCL	0.00275
90% H-UCL (Log ROS)	0.00274		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0295	Mean in Log Scale	-4.147
SD in Original Scale	0.032	SD in Log Scale	1.269
90% t UCL (Assumes normality)	0.041	90% H-Stat UCL	0.0802

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

pyrene

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
Number of Detects	1	Number of Non-Detects	9
Number of Distinct Detects	1	Number of Distinct Non-Detects	8

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable pyrene was not processed!

APPENDIX B / TABLE 5
ProUCL STATISTICS
DIP TANK SOILS
FLORAGON PROPERTY
MOLALLA, OREGON

BEHP

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	0
Minimum	0.131	Mean	0.131
Maximum	0.131	Median	0.131

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable BEHP was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

diesel

General Statistics

Total Number of Observations	24	Number of Distinct Observations	18
Number of Detects	13	Number of Non-Detects	11
Number of Distinct Detects	13	Number of Distinct Non-Detects	6
Minimum Detect	41	Minimum Non-Detect	75
Maximum Detect	1110	Maximum Non-Detect	250
Variance Detects	113184	Percent Non-Detects	45.83%
Mean Detects	344.5	SD Detects	336.4
Median Detects	239	CV Detects	0.976
Skewness Detects	1.296	Kurtosis Detects	0.989
Mean of Logged Detects	5.355	SD of Logged Detects	1.08

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.835	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.866	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.232	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.246	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	214.1	Standard Error of Mean	59.3
SD	277.9	90% KM (BCA) UCL	288.7
90% KM (t) UCL	292.4	90% KM (Percentile Bootstrap) UCL	292.8
90% KM (z) UCL	290.1	90% KM Bootstrap t UCL	320.6
90% KM Chebyshev UCL	392	95% KM Chebyshev UCL	472.6
97.5% KM Chebyshev UCL	584.5	99% KM Chebyshev UCL	804.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.339	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.755	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.157	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.242	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.166	k star (bias corrected MLE)	0.948
Theta hat (MLE)	295.6	Theta star (bias corrected MLE)	363.4
nu hat (MLE)	30.31	nu star (bias corrected)	24.65
MLE Mean (bias corrected)	344.5	MLE Sd (bias corrected)	353.9

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.594	nu hat (KM)	28.5
Approximate Chi Square Value (28.50, α)	19.35	Adjusted Chi Square Value (28.50, β)	18.94
90% Gamma Approximate KM-UCL (use when n>=50)	315.3	90% Gamma Adjusted KM-UCL (use when n<50)	322.3

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

diesel (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	194.1
Maximum	1110	Median	64
SD	296.1	CV	1.525
k hat (MLE)	0.212	k star (bias corrected MLE)	0.213
Theta hat (MLE)	916.1	Theta star (bias corrected MLE)	910.5
nu hat (MLE)	10.17	nu star (bias corrected)	10.23
MLE Mean (bias corrected)	194.1	MLE Sd (bias corrected)	420.4
		Adjusted Level of Significance (β)	0.088
Approximate Chi Square Value (10.23, α)	5.03	Adjusted Chi Square Value (10.23, β)	4.832
90% Gamma Approximate UCL (use when n>=50)	394.8	90% Gamma Adjusted UCL (use when n<50)	411

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.95	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.866	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.154	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.246	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	211.9	Mean in Log Scale	4.685
SD in Original Scale	284.9	SD in Log Scale	1.128
90% t UCL (assumes normality of ROS data)	288.6	90% Percentile Bootstrap UCL	293.5
90% BCA Bootstrap UCL	314.9	90% Bootstrap t UCL	325.4
90% H-UCL (Log ROS)	327.4		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	4.735	90% H-UCL (KM -Log)	301.4
KM SD (logged)	1.05	90% Critical H Value (KM-Log)	1.924
KM Standard Error of Mean (logged)	0.233		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	221.1	Mean in Log Scale	4.808
SD in Original Scale	280.4	SD in Log Scale	1.064
90% t UCL (Assumes normality)	296.6	90% H-Stat UCL	331.6

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

oil

General Statistics

Total Number of Observations	24	Number of Distinct Observations	20
Number of Detects	15	Number of Non-Detects	9
Number of Distinct Detects	15	Number of Distinct Non-Detects	5
Minimum Detect	82	Minimum Non-Detect	150
Maximum Detect	12500	Maximum Non-Detect	500
Variance Detects	9906528	Percent Non-Detects	37.5%
Mean Detects	1302	SD Detects	3147
Median Detects	164	CV Detects	2.417
Skewness Detects	3.671	Kurtosis Detects	13.85
Mean of Logged Detects	5.868	SD of Logged Detects	1.458

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.418	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.378	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.229	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	864.6	Standard Error of Mean	521.9
SD	2470	90% KM (BCA) UCL	1421
90% KM (t) UCL	1553	90% KM (Percentile Bootstrap) UCL	1482
90% KM (z) UCL	1533	90% KM Bootstrap t UCL	4204
90% KM Chebyshev UCL	2430	95% KM Chebyshev UCL	3140
97.5% KM Chebyshev UCL	4124	99% KM Chebyshev UCL	6058

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.627	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.795	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.272	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.234	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.489	k star (bias corrected MLE)	0.435
Theta hat (MLE)	2665	Theta star (bias corrected MLE)	2991
nu hat (MLE)	14.66	nu star (bias corrected)	13.06
MLE Mean (bias corrected)	1302	MLE Sd (bias corrected)	1974

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.123	nu hat (KM)	5.883
Approximate Chi Square Value (5.88, α)	2.135	Adjusted Chi Square Value (5.88, β)	2.015
90% Gamma Approximate KM-UCL (use when n>=50)	2383	90% Gamma Adjusted KM-UCL (use when n<50)	2524

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

oil (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	832.6
Maximum	12500	Median	128.5
SD	2534	CV	3.043
k hat (MLE)	0.173	k star (bias corrected MLE)	0.18
Theta hat (MLE)	4802	Theta star (bias corrected MLE)	4639
nu hat (MLE)	8.323	nu star (bias corrected)	8.616
MLE Mean (bias corrected)	832.6	MLE Sd (bias corrected)	1965
		Adjusted Level of Significance (β)	0.088
Approximate Chi Square Value (8.62, α)	3.906	Adjusted Chi Square Value (8.62, β)	3.735
90% Gamma Approximate UCL (use when n>=50)	1837	90% Gamma Adjusted UCL (use when n<50)	1921

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.854	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.234	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.229	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	873.9	Mean in Log Scale	5.518
SD in Original Scale	2520	SD in Log Scale	1.27
90% t UCL (assumes normality of ROS data)	1553	90% Percentile Bootstrap UCL	1519
90% BCA Bootstrap UCL	2001	90% Bootstrap t UCL	4450
90% H-UCL (Log ROS)	985		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	876.4	Mean in Log Scale	5.529
SD in Original Scale	2520	SD in Log Scale	1.273
90% t UCL (Assumes normality)	1555	90% H-Stat UCL	1003

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

pentachlorophenol

General Statistics

Total Number of Observations	24	Number of Distinct Observations	14
Number of Detects	4	Number of Non-Detects	20
Number of Distinct Detects	4	Number of Distinct Non-Detects	10
Minimum Detect	0.113	Minimum Non-Detect	0.187
Maximum Detect	256	Maximum Non-Detect	21
Variance Detects	15816	Percent Non-Detects	83.33%
Mean Detects	67.52	SD Detects	125.8
Median Detects	6.985	CV Detects	1.863
Skewness Detects	1.99	Kurtosis Detects	3.965
Mean of Logged Detects	1.632	SD of Logged Detects	3.24

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.664	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.421	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.443	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	11.38	Standard Error of Mean	12.04
SD	51.07	90% KM (BCA) UCL	N/A
90% KM (t) UCL	27.26	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	26.8	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	47.49	95% KM Chebyshev UCL	63.85
97.5% KM Chebyshev UCL	86.55	99% KM Chebyshev UCL	131.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.301	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.712	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.268	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.42	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.272	k star (bias corrected MLE)	0.235
Theta hat (MLE)	248.6	Theta star (bias corrected MLE)	287.9
nu hat (MLE)	2.173	nu star (bias corrected)	1.877
MLE Mean (bias corrected)	67.52	MLE Sd (bias corrected)	139.4

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0496	nu hat (KM)	2.383
Approximate Chi Square Value (2.38, α)	0.355	Adjusted Chi Square Value (2.38, β)	0.321
90% Gamma Approximate KM-UCL (use when n>=50)	76.4	90% Gamma Adjusted KM-UCL (use when n<50)	84.47

Gamma (KM) may not be used when k hat (KM) is < 0.1

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

pentachlorophenol (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	11.26
Maximum	256	Median	0.01
SD	52.19	CV	4.634
k hat (MLE)	0.131	k star (bias corrected MLE)	0.142
Theta hat (MLE)	86.04	Theta star (bias corrected MLE)	79.14
nu hat (MLE)	6.283	nu star (bias corrected)	6.831
MLE Mean (bias corrected)	11.26	MLE Sd (bias corrected)	29.85
		Adjusted Level of Significance (β)	0.088
Approximate Chi Square Value (6.83, α)	2.726	Adjusted Chi Square Value (6.83, β)	2.587
90% Gamma Approximate UCL (use when n>=50)	28.22	90% Gamma Adjusted UCL (use when n<50)	N/A

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.146	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.443	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	11.39	Mean in Log Scale	-2.006
SD in Original Scale	52.16	SD in Log Scale	2.442
90% t UCL (assumes normality of ROS data)	25.43	90% Percentile Bootstrap UCL	22.51
90% BCA Bootstrap UCL	33.14	90% Bootstrap t UCL	1044
90% H-UCL (Log ROS)	15.91		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-1.525	90% H-UCL (KM -Log)	3.426
KM SD (logged)	1.838	90% Critical H Value (KM-Log)	2.783
KM Standard Error of Mean (logged)	0.438		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	11.99	Mean in Log Scale	-1.171
SD in Original Scale	52.07	SD in Log Scale	2.116
90% t UCL (Assumes normality)	26.01	90% H-Stat UCL	11.48

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

3,4-dichlorophenol

General Statistics

Total Number of Observations	21	Number of Distinct Observations	10
Number of Detects	1	Number of Non-Detects	20
Number of Distinct Detects	1	Number of Distinct Non-Detects	9

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 3,4-dichlorophenol was not processed!

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

2,3,4,5-tetrachlorophenol

General Statistics

Total Number of Observations	21	Number of Distinct Observations	10
Number of Detects	1	Number of Non-Detects	20
Number of Distinct Detects	1	Number of Distinct Non-Detects	9

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 2,3,4,5-tetrachlorophenol was not processed!

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

2,3,4,6-tetrachlorophenol

General Statistics

Total Number of Observations	22	Number of Distinct Observations	11
Number of Detects	2	Number of Non-Detects	20
Number of Distinct Detects	2	Number of Distinct Non-Detects	9
Minimum Detect	16	Minimum Non-Detect	0.056
Maximum Detect	87.7	Maximum Non-Detect	1.41
Variance Detects	2570	Percent Non-Detects	90.91%
Mean Detects	51.85	SD Detects	50.7
Median Detects	51.85	CV Detects	0.978
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	3.623	SD of Logged Detects	1.203

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	4.765	Standard Error of Mean	5.548
SD	18.4	90% KM (BCA) UCL	N/A
90% KM (t) UCL	12.11	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	11.87	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	21.41	95% KM Chebyshev UCL	28.95
97.5% KM Chebyshev UCL	39.41	99% KM Chebyshev UCL	59.96

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.685	k star (bias corrected MLE)	N/A
Theta hat (MLE)	30.76	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.742	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0671	nu hat (KM)	2.95
		Adjusted Level of Significance (β)	0.0873
Approximate Chi Square Value (2.95, α)	0.573	Adjusted Chi Square Value (2.95, β)	0.52
90% Gamma Approximate KM-UCL (use when n>=50)	24.52	90% Gamma Adjusted KM-UCL (use when n<50)	27.02

Gamma (KM) may not be used when k hat (KM) is < 0.1

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

2,3,4,6-tetrachlorophenol (cont'd)

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	4.736	Mean in Log Scale	-5.099
SD in Original Scale	18.84	SD in Log Scale	3.728
90% t UCL (assumes normality of ROS data)	10.05	90% Percentile Bootstrap UCL	9.448
90% BCA Bootstrap UCL	14.15	90% Bootstrap t UCL	1222
90% H-UCL (Log ROS)	462.9		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	4.796	Mean in Log Scale	-2.383
SD in Original Scale	18.82	SD in Log Scale	2.154
90% t UCL (Assumes normality)	10.11	90% H-Stat UCL	4.265

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

2,4,5-trichlorophenol

General Statistics

Total Number of Observations	16	Number of Distinct Observations	8
Number of Detects	1	Number of Non-Detects	15
Number of Distinct Detects	1	Number of Distinct Non-Detects	7

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 2,4,5-trichlorophenol was not processed!

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

nickel

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
Number of Detects	2	Number of Non-Detects	2
Number of Distinct Detects	2	Number of Distinct Non-Detects	2
Minimum Detect	2.5	Minimum Non-Detect	2
Maximum Detect	3.2	Maximum Non-Detect	4
Variance Detects	0.245	Percent Non-Detects	50%
Mean Detects	2.85	SD Detects	0.495
Median Detects	2.85	CV Detects	0.174
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	1.04	SD of Logged Detects	0.175

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	2.567	Standard Error of Mean	0.402
SD	0.492	90% KM (BCA) UCL	N/A
90% KM (t) UCL	3.225	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	3.082	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	3.772	95% KM Chebyshev UCL	4.318
97.5% KM Chebyshev UCL	5.076	99% KM Chebyshev UCL	6.565

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	65.97	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0432	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	263.9	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	27.2	nu hat (KM)	217.6
		Adjusted Level of Significance (β)	0.0374
Approximate Chi Square Value (217.58, α)	191.3	Adjusted Chi Square Value (217.58, β)	181.9
90% Gamma Approximate KM-UCL (use when n>=50)	2.919	90% Gamma Adjusted KM-UCL (use when n<50)	3.07

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

nickel (cont'd)

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.42	Mean in Log Scale	0.855
SD in Original Scale	0.65	SD in Log Scale	0.283
90% t UCL (assumes normality of ROS data)	2.952	90% Percentile Bootstrap UCL	N/A
90% BCA Bootstrap UCL	N/A	90% Bootstrap t UCL	N/A
90% H-UCL (Log ROS)	3.25		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2.175	Mean in Log Scale	0.693
SD in Original Scale	0.925	SD in Log Scale	0.5
90% t UCL (Assumes normality)	2.933	90% H-Stat UCL	4.231

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

zinc

General Statistics

Total Number of Observations	5	Number of Distinct Observations	4
Number of Detects	1	Number of Non-Detects	4
Number of Distinct Detects	1	Number of Distinct Non-Detects	3

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable zinc was not processed!

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

fluoranthene

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10
Number of Detects	3	Number of Non-Detects	9
Number of Distinct Detects	3	Number of Distinct Non-Detects	7
Minimum Detect	0.0101	Minimum Non-Detect	0.0187
Maximum Detect	0.0119	Maximum Non-Detect	0.0748
Variance Detects	1.0233E-6	Percent Non-Detects	75%
Mean Detects	0.0107	SD Detects	0.00101
Median Detects	0.0102	CV Detects	0.0942
Skewness Detects	1.713	Kurtosis Detects	N/A
Mean of Logged Detects	-4.537	SD of Logged Detects	0.092

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.792	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.368	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0107	Standard Error of Mean	5.8405E-4
SD	8.2597E-4	90% KM (BCA) UCL	N/A
90% KM (t) UCL	0.0115	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	0.0115	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0125	95% KM Chebyshev UCL	0.0133
97.5% KM Chebyshev UCL	0.0144	99% KM Chebyshev UCL	0.0165

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	174.6	k star (bias corrected MLE)	N/A
Theta hat (MLE)	6.1486E-5	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	1047	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	168.9	nu hat (KM)	4053
		Adjusted Level of Significance (β)	0.0752
Approximate Chi Square Value (N/A, α)	3938	Adjusted Chi Square Value (N/A, β)	3924
90% Gamma Approximate KM-UCL (use when n>=50)	0.011	90% Gamma Adjusted KM-UCL (use when n<50)	0.0111

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

fluoranthene (cont'd)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.795	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.366	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0107	Mean in Log Scale	-4.537
SD in Original Scale	5.4822E-4	SD in Log Scale	0.0504
90% t UCL (assumes normality of ROS data)	0.0109	90% Percentile Bootstrap UCL	0.0109
90% BCA Bootstrap UCL	0.0109	90% Bootstrap t UCL	0.011
90% H-UCL (Log ROS)	N/A		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-4.537	90% H-UCL (KM -Log)	N/A
KM SD (logged)	0.0751	90% Critical H Value (KM-Log)	N/A
KM Standard Error of Mean (logged)	0.0531		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0155	Mean in Log Scale	-4.315
SD in Original Scale	0.0105	SD in Log Scale	0.52
90% t UCL (Assumes normality)	0.0197	90% H-Stat UCL	0.0196

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

naphthalene

General Statistics

Total Number of Observations	15	Number of Distinct Observations	14
Number of Detects	8	Number of Non-Detects	7
Number of Distinct Detects	8	Number of Distinct Non-Detects	6
Minimum Detect	0.0192	Minimum Non-Detect	0.0374
Maximum Detect	0.0449	Maximum Non-Detect	4.2
Variance Detects	7.8557E-5	Percent Non-Detects	46.67%
Mean Detects	0.0292	SD Detects	0.00886
Median Detects	0.0266	CV Detects	0.303
Skewness Detects	0.663	Kurtosis Detects	-0.281
Mean of Logged Detects	-3.572	SD of Logged Detects	0.298

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.229	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.313	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0288	Standard Error of Mean	0.0029
SD	0.00797	90% KM (BCA) UCL	0.032
90% KM (t) UCL	0.0327	90% KM (Percentile Bootstrap) UCL	0.0324
90% KM (z) UCL	0.0325	90% KM Bootstrap t UCL	0.0333
90% KM Chebyshev UCL	0.0375	95% KM Chebyshev UCL	0.0414
97.5% KM Chebyshev UCL	0.0469	99% KM Chebyshev UCL	0.0576

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.311	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.715	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.205	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.294	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	12.91	k star (bias corrected MLE)	8.152
Theta hat (MLE)	0.00226	Theta star (bias corrected MLE)	0.00359
nu hat (MLE)	206.6	nu star (bias corrected)	130.4
MLE Mean (bias corrected)	0.0292	MLE Sd (bias corrected)	0.0102

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	13.05	nu hat (KM)	391.6
Approximate Chi Square Value (391.64, α)	356.2	Adjusted Chi Square Value (391.64, β)	352.9
90% Gamma Approximate KM-UCL (use when n>=50)	0.0317	90% Gamma Adjusted KM-UCL (use when n<50)	0.0319

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

naphthalene (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0192	Mean	0.0285
Maximum	0.0449	Median	0.0269
SD	0.0065	CV	0.228
k hat (MLE)	22.2	k star (bias corrected MLE)	17.8
Theta hat (MLE)	0.00129	Theta star (bias corrected MLE)	0.0016
nu hat (MLE)	665.9	nu star (bias corrected)	534
MLE Mean (bias corrected)	0.0285	MLE Sd (bias corrected)	0.00676
		Adjusted Level of Significance (β)	0.0795
Approximate Chi Square Value (534.03, α)	492.6	Adjusted Chi Square Value (534.03, β)	488.7
90% Gamma Approximate UCL (use when n>=50)	0.0309	90% Gamma Adjusted UCL (use when n<50)	0.0312

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.184	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.313	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0283	Mean in Log Scale	-3.587
SD in Original Scale	0.00652	SD in Log Scale	0.218
90% t UCL (assumes normality of ROS data)	0.0306	90% Percentile Bootstrap UCL	0.0304
90% BCA Bootstrap UCL	0.0309	90% Bootstrap t UCL	0.0313
90% H-UCL (Log ROS)	0.0307		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-3.585	90% H-UCL (KM -Log)	0.0318
KM SD (logged)	0.271	90% Critical H Value (KM-Log)	1.397
KM Standard Error of Mean (logged)	0.0999		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.278	Mean in Log Scale	-2.757
SD in Original Scale	0.577	SD in Log Scale	1.564
90% t UCL (Assumes normality)	0.479	90% H-Stat UCL	0.657

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

phenanthrene

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10
Number of Detects	3	Number of Non-Detects	9
Number of Distinct Detects	3	Number of Distinct Non-Detects	7
Minimum Detect	0.00999	Minimum Non-Detect	0.0187
Maximum Detect	0.0125	Maximum Non-Detect	0.5
Variance Detects	1.8790E-6	Percent Non-Detects	75%
Mean Detects	0.0116	SD Detects	0.00137
Median Detects	0.0122	CV Detects	0.119
Skewness Detects	-1.639	Kurtosis Detects	N/A
Mean of Logged Detects	-4.465	SD of Logged Detects	0.123

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.838	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.346	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0116	Standard Error of Mean	7.9142E-4
SD	0.00112	90% KM (BCA) UCL	N/A
90% KM (t) UCL	0.0126	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	0.0126	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0139	95% KM Chebyshev UCL	0.015
97.5% KM Chebyshev UCL	0.0165	99% KM Chebyshev UCL	0.0194

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	101.7	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.1366E-4	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	610.4	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	106.7	nu hat (KM)	2562
		Adjusted Level of Significance (β)	0.0752
Approximate Chi Square Value (N/A, α)	2470	Adjusted Chi Square Value (N/A, β)	2460
90% Gamma Approximate KM-UCL (use when n>=50)	0.012	90% Gamma Adjusted KM-UCL (use when n<50)	0.012

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

phenanthrene (cont'd)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.83	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.35	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0115	Mean in Log Scale	-4.465
SD in Original Scale	7.6762E-4	SD in Log Scale	0.0679
90% t UCL (assumes normality of ROS data)	0.0118	90% Percentile Bootstrap UCL	0.0118
90% BCA Bootstrap UCL	0.0118	90% Bootstrap t UCL	0.0118
90% H-UCL (Log ROS)	N/A		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-4.465	90% H-UCL (KM -Log)	0.012
KM SD (logged)	0.1	90% Critical H Value (KM-Log)	1.338
KM Standard Error of Mean (logged)	0.071		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0555	Mean in Log Scale	-3.777
SD in Original Scale	0.0914	SD in Log Scale	1.224
90% t UCL (Assumes normality)	0.0915	90% H-Stat UCL	0.115

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

acetone

General Statistics

Total Number of Observations	5	Number of Distinct Observations	2
Number of Detects	1	Number of Non-Detects	4
Number of Distinct Detects	1	Number of Distinct Non-Detects	1

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable acetone was not processed!

APPENDIX B / TABLE 6
ProUCL STATISTICS
DIP TANK GROUNDWATER
FLORAGON PROPERTY
MOLALLA, OREGON

toluene

General Statistics

Total Number of Observations	3	Number of Distinct Observations	2
Number of Detects	1	Number of Non-Detects	2
Number of Distinct Detects	1	Number of Distinct Non-Detects	1

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable toluene was not processed!

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

diesel

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	5
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	118	Minimum Non-Detect	63
Maximum Detect	149	Maximum Non-Detect	230
Variance Detects	480.5	Percent Non-Detects	71.43%
Mean Detects	133.5	SD Detects	21.92
Median Detects	133.5	CV Detects	0.164
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	4.887	SD of Logged Detects	0.165

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	92.61	Standard Error of Mean	22.87
SD	34.59	90% KM (BCA) UCL	N/A
90% KM (t) UCL	125.5	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	121.9	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	161.2	95% KM Chebyshev UCL	192.3
97.5% KM Chebyshev UCL	235.5	99% KM Chebyshev UCL	320.2

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	73.85	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.808	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	295.4	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	7.17	nu hat (KM)	100.4
		Adjusted Level of Significance (β)	0.0549
Approximate Chi Square Value (100.39, α)	82.71	Adjusted Chi Square Value (100.39, β)	78.82
90% Gamma Approximate KM-UCL (use when n>=50)	112.4	90% Gamma Adjusted KM-UCL (use when n<50)	118

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

diesel (cont'd)

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	105.8	Mean in Log Scale	4.646
SD in Original Scale	21.58	SD in Log Scale	0.187
90% t UCL (assumes normality of ROS data)	117.6	90% Percentile Bootstrap UCL	116.3
90% BCA Bootstrap UCL	118	90% Bootstrap t UCL	127
90% H-UCL (Log ROS)	118.3		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	82.57	Mean in Log Scale	4.278
SD in Original Scale	44.44	SD in Log Scale	0.577
90% t UCL (Assumes normality)	106.8	90% H-Stat UCL	130.3

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

oil

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
Number of Detects	2	Number of Non-Detects	5
Number of Distinct Detects	2	Number of Distinct Non-Detects	5
Minimum Detect	1050	Minimum Non-Detect	125
Maximum Detect	1060	Maximum Non-Detect	460
Variance Detects	50	Percent Non-Detects	71.43%
Mean Detects	1055	SD Detects	7.071
Median Detects	1055	CV Detects	0.0067
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	6.961	SD of Logged Detects	0.0067

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	390.7	Standard Error of Mean	224.6
SD	420.1	90% KM (BCA) UCL	N/A
90% KM (t) UCL	714	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	678.5	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1064	95% KM Chebyshev UCL	1370
97.5% KM Chebyshev UCL	1793	99% KM Chebyshev UCL	2625

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	44521	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0237	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	178083	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.865	nu hat (KM)	12.11
		Adjusted Level of Significance (β)	0.0549
Approximate Chi Square Value (12.11, α)	6.383	Adjusted Chi Square Value (12.11, β)	5.426
90% Gamma Approximate KM-UCL (use when n>=50)	741.1	90% Gamma Adjusted KM-UCL (use when n<50)	871.8

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

oil (cont'd)

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1031	Mean in Log Scale	6.938
SD in Original Scale	16.44	SD in Log Scale	0.0158
90% t UCL (assumes normality of ROS data)	1040	90% Percentile Bootstrap UCL	N/A
90% BCA Bootstrap UCL	N/A	90% Bootstrap t UCL	N/A
90% H-UCL (Log ROS)	N/A		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	390.2	Mean in Log Scale	5.364
SD in Original Scale	457.2	SD in Log Scale	1.161
90% t UCL (Assumes normality)	639	90% H-Stat UCL	1533

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

arsenic

General Statistics

Total Number of Observations	21	Number of Distinct Observations	21
Number of Detects	11	Number of Non-Detects	10
Number of Distinct Detects	11	Number of Distinct Non-Detects	10
Minimum Detect	1.8	Minimum Non-Detect	1.3
Maximum Detect	10.7	Maximum Non-Detect	10.2
Variance Detects	6.245	Percent Non-Detects	47.62%
Mean Detects	4.989	SD Detects	2.499
Median Detects	4.75	CV Detects	0.501
Skewness Detects	1.041	Kurtosis Detects	1.728
Mean of Logged Detects	1.492	SD of Logged Detects	0.515

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.151	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.267	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	3.755	Standard Error of Mean	0.6
SD	2.407	90% KM (BCA) UCL	4.547
90% KM (t) UCL	4.55	90% KM (Percentile Bootstrap) UCL	4.536
90% KM (z) UCL	4.523	90% KM Bootstrap t UCL	4.557
90% KM Chebyshev UCL	5.554	95% KM Chebyshev UCL	6.369
97.5% KM Chebyshev UCL	7.5	99% KM Chebyshev UCL	9.721

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.206	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.732	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.118	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.256	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	4.493	k star (bias corrected MLE)	3.328
Theta hat (MLE)	1.11	Theta star (bias corrected MLE)	1.499
nu hat (MLE)	98.85	nu star (bias corrected)	73.22
MLE Mean (bias corrected)	4.989	MLE Sd (bias corrected)	2.735

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	2.434	nu hat (KM)	102.2
Approximate Chi Square Value (102.21, α)	84.37	Adjusted Chi Square Value (102.21, β)	83.39
90% Gamma Approximate KM-UCL (use when n>=50)	4.549	90% Gamma Adjusted KM-UCL (use when n<50)	4.602

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

arsenic (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.642	Mean	3.589
Maximum	10.7	Median	3.057
SD	2.413	CV	0.672
k hat (MLE)	2.398	k star (bias corrected MLE)	2.087
Theta hat (MLE)	1.497	Theta star (bias corrected MLE)	1.72
nu hat (MLE)	100.7	nu star (bias corrected)	87.65
MLE Mean (bias corrected)	3.589	MLE Sd (bias corrected)	2.484
		Adjusted Level of Significance (β)	0.0869
Approximate Chi Square Value (87.65, α)	71.17	Adjusted Chi Square Value (87.65, β)	70.27
90% Gamma Approximate UCL (use when n>=50)	4.42	90% Gamma Adjusted UCL (use when n<50)	4.476

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.97	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.132	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.267	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.705	Mean in Log Scale	1.157
SD in Original Scale	2.285	SD in Log Scale	0.552
90% t UCL (assumes normality of ROS data)	4.366	90% Percentile Bootstrap UCL	4.364
90% BCA Bootstrap UCL	4.497	90% Bootstrap t UCL	4.589
90% H-UCL (Log ROS)	4.473		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	1.12	90% H-UCL (KM -Log)	4.744
KM SD (logged)	0.644	90% Critical H Value (KM-Log)	1.589
KM Standard Error of Mean (logged)	0.169		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.841	Mean in Log Scale	1.133
SD in Original Scale	2.404	SD in Log Scale	0.719
90% t UCL (Assumes normality)	4.537	90% H-Stat UCL	5.237

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

barium

General Statistics

Total Number of Observations	14	Number of Distinct Observations	14
Number of Detects	5	Number of Non-Detects	9
Number of Distinct Detects	5	Number of Distinct Non-Detects	9
Minimum Detect	122	Minimum Non-Detect	78.9
Maximum Detect	208	Maximum Non-Detect	306
Variance Detects	1384	Percent Non-Detects	64.29%
Mean Detects	159.2	SD Detects	37.2
Median Detects	150	CV Detects	0.234
Skewness Detects	0.469	Kurtosis Detects	-2.109
Mean of Logged Detects	5.049	SD of Logged Detects	0.231

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.198	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.396	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	118.1	Standard Error of Mean	15.66
SD	45.15	90% KM (BCA) UCL	151.5
90% KM (t) UCL	139.3	90% KM (Percentile Bootstrap) UCL	142.4
90% KM (z) UCL	138.2	90% KM Bootstrap t UCL	128.9
90% KM Chebyshev UCL	165.1	95% KM Chebyshev UCL	186.4
97.5% KM Chebyshev UCL	215.9	99% KM Chebyshev UCL	273.9

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.321	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.219	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	23.38	k star (bias corrected MLE)	9.485
Theta hat (MLE)	6.809	Theta star (bias corrected MLE)	16.78
nu hat (MLE)	233.8	nu star (bias corrected)	94.85
MLE Mean (bias corrected)	159.2	MLE Sd (bias corrected)	51.69

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	6.847	nu hat (KM)	191.7
Approximate Chi Square Value (191.71, α)	167.1	Adjusted Chi Square Value (191.71, β)	164.7
90% Gamma Approximate KM-UCL (use when n>=50)	135.6	90% Gamma Adjusted KM-UCL (use when n<50)	137.6

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

barium (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	70.72	Mean	113
Maximum	208	Median	108.9
SD	43.64	CV	0.386
k hat (MLE)	8.096	k star (bias corrected MLE)	6.408
Theta hat (MLE)	13.96	Theta star (bias corrected MLE)	17.63
nu hat (MLE)	226.7	nu star (bias corrected)	179.4
MLE Mean (bias corrected)	113	MLE Sd (bias corrected)	44.64
		Adjusted Level of Significance (β)	0.0781
Approximate Chi Square Value (179.44, α)	155.6	Adjusted Chi Square Value (179.44, β)	153.3
90% Gamma Approximate UCL (use when n>=50)	130.3	90% Gamma Adjusted UCL (use when n<50)	132.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.193	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.396	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	119.2	Mean in Log Scale	4.739
SD in Original Scale	38.53	SD in Log Scale	0.291
90% t UCL (assumes normality of ROS data)	133.1	90% Percentile Bootstrap UCL	132.1
90% BCA Bootstrap UCL	135.2	90% Bootstrap t UCL	136.1
90% H-UCL (Log ROS)	133.7		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	4.704	90% H-UCL (KM -Log)	136.3
KM SD (logged)	0.361	90% Critical H Value (KM-Log)	1.451
KM Standard Error of Mean (logged)	0.127		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	109.9	Mean in Log Scale	4.58
SD in Original Scale	53.06	SD in Log Scale	0.524
90% t UCL (Assumes normality)	129.1	90% H-Stat UCL	140.3

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

beryllium

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
Number of Detects	3	Number of Non-Detects	13
Number of Distinct Detects	3	Number of Distinct Non-Detects	13
Minimum Detect	1.49	Minimum Non-Detect	1.26
Maximum Detect	1.91	Maximum Non-Detect	5.09
Variance Detects	0.0497	Percent Non-Detects	81.25%
Mean Detects	1.743	SD Detects	0.223
Median Detects	1.83	CV Detects	0.128
Skewness Detects	-1.485	Kurtosis Detects	N/A
Mean of Logged Detects	0.55	SD of Logged Detects	0.133

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.887	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.318	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	1.419	Standard Error of Mean	0.0965
SD	0.241	90% KM (BCA) UCL	N/A
90% KM (t) UCL	1.548	90% KM (Percentile Bootstrap) UCL	N/A
90% KM (z) UCL	1.542	90% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.708	95% KM Chebyshev UCL	1.839
97.5% KM Chebyshev UCL	2.021	99% KM Chebyshev UCL	2.379

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	87.37	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.02	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	524.2	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	34.71	nu hat (KM)	1111
		Adjusted Level of Significance (β)	0.0809
Approximate Chi Square Value (N/A, α)	1051	Adjusted Chi Square Value (N/A, β)	1046
90% Gamma Approximate KM-UCL (use when n>=50)	1.5	90% Gamma Adjusted KM-UCL (use when n<50)	1.507

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

beryllium (cont'd)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.875	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.325	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.512	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.32	Mean in Log Scale	0.265
SD in Original Scale	0.234	SD in Log Scale	0.159
90% t UCL (assumes normality of ROS data)	1.398	90% Percentile Bootstrap UCL	1.396
90% BCA Bootstrap UCL	1.419	90% Bootstrap t UCL	1.43
90% H-UCL (Log ROS)	1.394		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	0.337	90% H-UCL (KM -Log)	1.497
KM SD (logged)	0.157	90% Critical H Value (KM-Log)	1.344
KM Standard Error of Mean (logged)	0.0633		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.336	Mean in Log Scale	0.181
SD in Original Scale	0.632	SD in Log Scale	0.488
90% t UCL (Assumes normality)	1.548	90% H-Stat UCL	1.633

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

chromium

General Statistics

Total Number of Observations	21	Number of Distinct Observations	20
Number of Detects	14	Number of Non-Detects	7
Number of Distinct Detects	14	Number of Distinct Non-Detects	7
Minimum Detect	11.6	Minimum Non-Detect	28.3
Maximum Detect	57.5	Maximum Non-Detect	98.8
Variance Detects	165.5	Percent Non-Detects	33.33%
Mean Detects	35.67	SD Detects	12.86
Median Detects	36.9	CV Detects	0.361
Skewness Detects	-0.216	Kurtosis Detects	-0.677
Mean of Logged Detects	3.499	SD of Logged Detects	0.43

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.963	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.18	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.237	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	32.72	Standard Error of Mean	3.205
SD	12.6	90% KM (BCA) UCL	36.61
90% KM (t) UCL	36.97	90% KM (Percentile Bootstrap) UCL	36.77
90% KM (z) UCL	36.83	90% KM Bootstrap t UCL	37.16
90% KM Chebyshev UCL	42.33	95% KM Chebyshev UCL	46.69
97.5% KM Chebyshev UCL	52.73	99% KM Chebyshev UCL	64.61

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.42	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.737	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.192	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.229	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	6.82	k star (bias corrected MLE)	5.406
Theta hat (MLE)	5.231	Theta star (bias corrected MLE)	6.598
nu hat (MLE)	191	nu star (bias corrected)	151.4
MLE Mean (bias corrected)	35.67	MLE Sd (bias corrected)	15.34

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	6.739	nu hat (KM)	283
Approximate Chi Square Value (283.04, α)	253	Adjusted Chi Square Value (283.04, β)	251.3
90% Gamma Approximate KM-UCL (use when n>=50)	36.6	90% Gamma Adjusted KM-UCL (use when n<50)	36.85

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

chromium (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	11.6	Mean	32.73
Maximum	57.5	Median	31.39
SD	11.47	CV	0.351
k hat (MLE)	8.137	k star (bias corrected MLE)	7.006
Theta hat (MLE)	4.023	Theta star (bias corrected MLE)	4.672
nu hat (MLE)	341.7	nu star (bias corrected)	294.3
MLE Mean (bias corrected)	32.73	MLE Sd (bias corrected)	12.37
		Adjusted Level of Significance (β)	0.0869
Approximate Chi Square Value (294.26, α)	263.6	Adjusted Chi Square Value (294.26, β)	261.9
90% Gamma Approximate UCL (use when n>=50)	36.53	90% Gamma Adjusted UCL (use when n<50)	36.78

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.908	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.237	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	32.31	Mean in Log Scale	3.409
SD in Original Scale	11.7	SD in Log Scale	0.382
90% t UCL (assumes normality of ROS data)	35.69	90% Percentile Bootstrap UCL	35.43
90% BCA Bootstrap UCL	35.42	90% Bootstrap t UCL	35.98
90% H-UCL (Log ROS)	36.75		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	3.402	90% H-UCL (KM -Log)	38.07
KM SD (logged)	0.437	90% Critical H Value (KM-Log)	1.457
KM Standard Error of Mean (logged)	0.117		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	32.92	Mean in Log Scale	3.397
SD in Original Scale	13.64	SD in Log Scale	0.473
90% t UCL (Assumes normality)	36.87	90% H-Stat UCL	39.07

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

copper

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	17.8	Mean	35.94
Maximum	65.9	Median	36.05
SD	13.39	Std. Error of Mean	3.348
Coefficient of Variation	0.373	Skewness	0.676

Normal GOF Test

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.887	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.192	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.222	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

90% Normal UCL		**90% UCLs (Adjusted for Skewness)**	
90% Student's-t UCL	40.43	90% Adjusted-CLT UCL (Chen-1995)	40.63
		90% Modified-t UCL (Johnson-1978)	40.52

Gamma GOF Test

A-D Test Statistic	0.342	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.188	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.919	k star (bias corrected MLE)	6.476
Theta hat (MLE)	4.538	Theta star (bias corrected MLE)	5.549
nu hat (MLE)	253.4	nu star (bias corrected)	207.2
MLE Mean (bias corrected)	35.94	MLE Sd (bias corrected)	14.12
		Approximate Chi Square Value (0.1)	181.6
Adjusted Level of Significance	0.0809	Adjusted Chi Square Value	179.4

Assuming Gamma Distribution

90% Approximate Gamma UCL (use when n>=50))	41.01	90% Adjusted Gamma UCL (use when n<50)	41.51

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.887	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.172	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.222	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.879	Mean of logged Data	3.517
Maximum of Logged Data	4.188	SD of logged Data	0.372

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

copper (cont'd)

Assuming Lognormal Distribution

90% H-UCL	41.48	90% Chebyshev (MVUE) UCL	46.16
95% Chebyshev (MVUE) UCL	50.79	97.5% Chebyshev (MVUE) UCL	57.21
99% Chebyshev (MVUE) UCL	69.82		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

90% CLT UCL	40.23	90% Jackknife UCL	40.43
90% Standard Bootstrap UCL	40.06	90% Bootstrap-t UCL	40.94
90% Hall's Bootstrap UCL	40.61	90% Percentile Bootstrap UCL	40.28
90% BCA Bootstrap UCL	40.38		
90% Chebyshev(Mean, Sd) UCL	45.98	95% Chebyshev(Mean, Sd) UCL	50.53
97.5% Chebyshev(Mean, Sd) UCL	56.85	99% Chebyshev(Mean, Sd) UCL	69.25

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

lead

General Statistics

Total Number of Observations	21	Number of Distinct Observations	20
		Number of Missing Observations	0
Minimum	3.7	Mean	16.34
Maximum	110	Median	10.5
SD	22.46	Std. Error of Mean	4.901
Coefficient of Variation	1.374	Skewness	3.982

Normal GOF Test

Shapiro Wilk Test Statistic	0.463	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.908	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.317	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.193	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

90% Normal UCL		**90% UCLs (Adjusted for Skewness)**	
90% Student's-t UCL	22.84	90% Adjusted-CLT UCL (Chen-1995)	25.67
		90% Modified-t UCL (Johnson-1978)	23.55

Gamma GOF Test

A-D Test Statistic	1.78	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.758	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.251	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.193	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.547	k star (bias corrected MLE)	1.357
Theta hat (MLE)	10.57	Theta star (bias corrected MLE)	12.04
nu hat (MLE)	64.96	nu star (bias corrected)	57.01
MLE Mean (bias corrected)	16.34	MLE Sd (bias corrected)	14.03
		Approximate Chi Square Value (0.1)	43.83
Adjusted Level of Significance	0.0869	Adjusted Chi Square Value	43.13

Assuming Gamma Distribution

90% Approximate Gamma UCL (use when n>=50))	21.26	90% Adjusted Gamma UCL (use when n<50)	21.61

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.88	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.908	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.204	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.193	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.308	Mean of logged Data	2.437
Maximum of Logged Data	4.7	SD of logged Data	0.721

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

lead (cont'd)

Assuming Lognormal Distribution

90% H-UCL	19.35	90% Chebyshev (MVUE) UCL	22.01
95% Chebyshev (MVUE) UCL	25.36	97.5% Chebyshev (MVUE) UCL	30.01
99% Chebyshev (MVUE) UCL	39.15		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

90% CLT UCL	22.63	90% Jackknife UCL	22.84
90% Standard Bootstrap UCL	22.32	90% Bootstrap-t UCL	38.4
90% Hall's Bootstrap UCL	52.26	90% Percentile Bootstrap UCL	22.44
90% BCA Bootstrap UCL	27.02		
90% Chebyshev(Mean, Sd) UCL	31.05	95% Chebyshev(Mean, Sd) UCL	37.71
97.5% Chebyshev(Mean, Sd) UCL	46.95	99% Chebyshev(Mean, Sd) UCL	65.11

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

mercury

General Statistics

Total Number of Observations	21	Number of Distinct Observations	21
Number of Detects	9	Number of Non-Detects	12
Number of Distinct Detects	9	Number of Distinct Non-Detects	12
Minimum Detect	0.071	Minimum Non-Detect	0.053
Maximum Detect	1.3	Maximum Non-Detect	0.407
Variance Detects	0.165	Percent Non-Detects	57.14%
Mean Detects	0.348	SD Detects	0.406
Median Detects	0.121	CV Detects	1.166
Skewness Detects	1.949	Kurtosis Detects	3.805
Mean of Logged Detects	-1.553	SD of Logged Detects	1.012

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.729	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.268	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.295	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.195	Standard Error of Mean	0.0661
SD	0.284	90% KM (BCA) UCL	0.272
90% KM (t) UCL	0.282	90% KM (Percentile Bootstrap) UCL	0.281
90% KM (z) UCL	0.279	90% KM Bootstrap t UCL	0.388
90% KM Chebyshev UCL	0.393	95% KM Chebyshev UCL	0.483
97.5% KM Chebyshev UCL	0.608	99% KM Chebyshev UCL	0.853

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.664	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.29	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.286	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.143	k star (bias corrected MLE)	0.836
Theta hat (MLE)	0.304	Theta star (bias corrected MLE)	0.416
nu hat (MLE)	20.57	nu star (bias corrected)	15.05
MLE Mean (bias corrected)	0.348	MLE Sd (bias corrected)	0.381

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.469	nu hat (KM)	19.7
Approximate Chi Square Value (19.70, α)	12.2	Adjusted Chi Square Value (19.70, β)	11.85
90% Gamma Approximate KM-UCL (use when n>=50)	0.314	90% Gamma Adjusted KM-UCL (use when n<50)	0.324

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

mercury (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.155
Maximum	1.3	Median	0.01
SD	0.309	CV	1.993
k hat (MLE)	0.451	k star (bias corrected MLE)	0.418
Theta hat (MLE)	0.343	Theta star (bias corrected MLE)	0.37
nu hat (MLE)	18.94	nu star (bias corrected)	17.56
MLE Mean (bias corrected)	0.155	MLE Sd (bias corrected)	0.239
		Adjusted Level of Significance (β)	0.0869
Approximate Chi Square Value (17.56, α)	10.52	Adjusted Chi Square Value (17.56, β)	10.2
90% Gamma Approximate UCL (use when n>=50)	0.258	90% Gamma Adjusted UCL (use when n<50)	0.267

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.887	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.265	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.295	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.182	Mean in Log Scale	-2.34
SD in Original Scale	0.296	SD in Log Scale	0.996
90% t UCL (assumes normality of ROS data)	0.267	90% Percentile Bootstrap UCL	0.266
90% BCA Bootstrap UCL	0.299	90% Bootstrap t UCL	0.379
90% H-UCL (Log ROS)	0.241		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.141	90% H-UCL (KM -Log)	0.232
KM SD (logged)	0.84	90% Critical H Value (KM-Log)	1.744
KM Standard Error of Mean (logged)	0.209		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.197	Mean in Log Scale	-2.179
SD in Original Scale	0.292	SD in Log Scale	0.949
90% t UCL (Assumes normality)	0.281	90% H-Stat UCL	0.262

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

nickel

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	7.25	Mean	19.55
Maximum	35.9	Median	17.15
SD	7.87	Std. Error of Mean	1.968
Coefficient of Variation	0.403	Skewness	0.521

Normal GOF Test

Shapiro Wilk Test Statistic	0.953	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.887	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.196	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.222	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

90% Normal UCL		**90% UCLs (Adjusted for Skewness)**	
90% Student's-t UCL	22.18	90% Adjusted-CLT UCL (Chen-1995)	22.25
		90% Modified-t UCL (Johnson-1978)	22.23

Gamma GOF Test

A-D Test Statistic	0.297	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.167	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.216	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.441	k star (bias corrected MLE)	5.275
Theta hat (MLE)	3.035	Theta star (bias corrected MLE)	3.705
nu hat (MLE)	206.1	nu star (bias corrected)	168.8
MLE Mean (bias corrected)	19.55	MLE Sd (bias corrected)	8.511
		Approximate Chi Square Value (0.1)	145.7
Adjusted Level of Significance	0.0809	Adjusted Chi Square Value	143.8

Assuming Gamma Distribution

90% Approximate Gamma UCL (use when n>=50))	22.64	90% Adjusted Gamma UCL (use when n<50)	22.95

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.966	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.887	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.141	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.222	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.981	Mean of logged Data	2.893
Maximum of Logged Data	3.581	SD of logged Data	0.422

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

nickel (cont'd)

Assuming Lognormal Distribution

90% H-UCL	23.16	90% Chebyshev (MVUE) UCL	25.96
95% Chebyshev (MVUE) UCL	28.83	97.5% Chebyshev (MVUE) UCL	32.82
99% Chebyshev (MVUE) UCL	40.65		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

90% CLT UCL	22.07	90% Jackknife UCL	22.18
90% Standard Bootstrap UCL	22.05	90% Bootstrap-t UCL	22.45
90% Hall's Bootstrap UCL	22.35	90% Percentile Bootstrap UCL	21.85
90% BCA Bootstrap UCL	22.05		
90% Chebyshev(Mean, Sd) UCL	25.45	95% Chebyshev(Mean, Sd) UCL	28.12
97.5% Chebyshev(Mean, Sd) UCL	31.83	99% Chebyshev(Mean, Sd) UCL	39.12

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

zinc

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
Number of Detects	7	Number of Non-Detects	9
Number of Distinct Detects	7	Number of Distinct Non-Detects	9
Minimum Detect	105	Minimum Non-Detect	25.3
Maximum Detect	443	Maximum Non-Detect	169
Variance Detects	15160	Percent Non-Detects	56.25%
Mean Detects	245.4	SD Detects	123.1
Median Detects	272	CV Detects	0.502
Skewness Detects	0.387	Kurtosis Detects	-0.825
Mean of Logged Detects	5.384	SD of Logged Detects	0.543

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.934	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.187	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.335	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	124.9	Standard Error of Mean	35.8
SD	131.4	90% KM (BCA) UCL	192.5
90% KM (t) UCL	172.9	90% KM (Percentile Bootstrap) UCL	181.4
90% KM (z) UCL	170.8	90% KM Bootstrap t UCL	167.4
90% KM Chebyshev UCL	232.3	95% KM Chebyshev UCL	281
97.5% KM Chebyshev UCL	348.5	99% KM Chebyshev UCL	481.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.321	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.218	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.313	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	4.347	k star (bias corrected MLE)	2.58
Theta hat (MLE)	56.45	Theta star (bias corrected MLE)	95.15
nu hat (MLE)	60.86	nu star (bias corrected)	36.11
MLE Mean (bias corrected)	245.4	MLE Sd (bias corrected)	152.8

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.903	nu hat (KM)	28.91
Approximate Chi Square Value (28.91, α)	19.69	Adjusted Chi Square Value (28.91, β)	19.01
90% Gamma Approximate KM-UCL (use when n>=50)	183.4	90% Gamma Adjusted KM-UCL (use when n<50)	190

APPENDIX B / TABLE 7
ProUCL STATISTICS
BEAR CREEK SEDIMENTS
FLORAGON PROPERTY
MOLALLA, OREGON

zinc (cont'd)

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	108.1
Maximum	443	Median	5.522
SD	147.4	CV	1.364
k hat (MLE)	0.169	k star (bias corrected MLE)	0.179
Theta hat (MLE)	640.9	Theta star (bias corrected MLE)	604.9
nu hat (MLE)	5.396	nu star (bias corrected)	5.717
MLE Mean (bias corrected)	108.1	MLE Sd (bias corrected)	255.7
		Adjusted Level of Significance (β)	0.0809
Approximate Chi Square Value (5.72, α)	2.034	Adjusted Chi Square Value (5.72, β)	1.847
90% Gamma Approximate UCL (use when n>=50)	303.7	90% Gamma Adjusted UCL (use when n<50)	334.5

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.23	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.335	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	136.2	Mean in Log Scale	4.567
SD in Original Scale	126.4	SD in Log Scale	0.823
90% t UCL (assumes normality of ROS data)	178.6	90% Percentile Bootstrap UCL	175.9
90% BCA Bootstrap UCL	186.1	90% Bootstrap t UCL	194.1
90% H-UCL (Log ROS)	197.5		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	4.228	90% H-UCL (KM -Log)	229.8
KM SD (logged)	1.108	90% Critical H Value (KM-Log)	2.08
KM Standard Error of Mean (logged)	0.309		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	133.5	Mean in Log Scale	4.459
SD in Original Scale	129.1	SD in Log Scale	0.986
90% t UCL (Assumes normality)	176.8	90% H-Stat UCL	230.5

APPENDIX B / TABLE 8
BEAR CREEK SEDIMENT MEDIAN PAH CALCULATIONS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Chemical	Acenaphthylene		Anthracene		Benz(a) anthracene		Benzo(a) pyrene		Benzo(g,h,i) perylene		Benzo(k) fluoranthene		Chrysene		Dibenz(a,h) anthracene		Fluoranthene		Phenanthrene		Pyrene		Benzo(b+k) fluoranthene(s)	
mg/Kg concentrations with full detection limits for nondetects	0.0302	0	0.0302	0	0.0302	0	0.0302	0	0.0302	0	0.0302	0	0.0302	0	0.0302	0	0.0302	0	0.0302	0	0.0302	0	0.517	1
	0.0249	0	0.0249	0	0.0249	0	0.0249	0	0.0249	0	0.0249	0	0.0249	0	0.0249	0	0.0249	0	0.0249	0	0.0249	0		
	0.0521	0	0.0521	0	0.0521	0	0.0521	0	0.0521	0	0.0521	0	0.0521	0	0.0521	0	0.0521	0	0.0521	0	0.0521	0		
	0.0551	0	0.0551	0	0.0551	0	0.0551	0	0.0551	0	0.0551	0	0.0551	0	0.0551	0	0.0551	0	0.0551	0	0.0551	0		
	0.0883	0	0.0883	0	0.0883	0	0.0883	0	0.0883	0	0.0883	0	0.0883	0	0.0883	0	0.0883	0	0.0883	0	0.0883	0		
	0.0305	0	0.0305	0	0.0305	0	0.0305	0	0.0305	0	0.0305	0	0.0305	0	0.0305	0	0.0305	0	0.0305	0	0.0305	0		
	0.0449	1	0.0527	1	0.287	1	0.354	1	0.327	1	0.0284	0	0.356	1	0.043	1	0.681	1	0.303	1	0.780	1		
	0.0189	0	0.0189	0	0.0189	0	0.0284	0	0.0945	0	0.0371	0	0.0189	0	0.0945	0	0.0189	0	0.0189	0	0.0189	0		
	0.0247	0	0.0247	0	0.0247	0	0.0371	0	0.0495	0	0.0183	0	0.0247	0	0.0247	0	0.0247	0	0.0247	0	0.0247	0		
	0.0122	0	0.0122	0	0.0122	0	0.0183	0	0.0122	0	0.0190	0	0.0122	0	0.0122	0	0.0122	0	0.0122	0	0.0122	0		
	0.0127	0	0.0127	0	0.0127	0	0.0190	0	0.0127	0	0.0162	0	0.0127	0	0.0127	0	0.0127	0	0.0127	0	0.0127	0		
	0.0108	0	0.0108	0	0.0108	0	0.0162	0	0.0108	0	0.0175	0	0.0108	0	0.0108	0	0.0108	0	0.0108	0	0.0108	0		
	0.0117	0	0.0117	0	0.0117	0	0.0175	0	0.0117	0	0.0143	0	0.0117	0	0.0117	0	0.0117	0	0.0117	0	0.0117	0		
	0.0095	0	0.0095	0	0.0095	0	0.0143	0	0.0095	0	0.0159	0	0.0095	0	0.0095	0	0.0095	0	0.0095	0	0.0095	0		
	0.0106	0	0.0106	0	0.0106	0	0.0159	0	0.0106	0	0.0213	0	0.0106	0	0.0106	0	0.0106	0	0.0106	0	0.0106	0		
	0.0142	0	0.0142	0	0.0142	0	0.0213	0	0.0142	0			0.0142	0	0.0142	0	0.0142	0	0.0142	0	0.0142	0		
Median	0.0218		0.0218		0.0218		0.02665		0.02755		0.0249		0.0218		0.0248		0.0218		0.0218		0.0218		0.517	1
mg/Kg concentrations with 1/2 detection limits for nondetects	0.0151	0	0.0151	0	0.0151	0	0.0151	0	0.0151	0	0.0151	0	0.0151	0	0.0151	0	0.0151	0	0.0151	0	0.0151	0	0.517	1
	0.01245	0	0.01245	0	0.01245	0	0.01245	0	0.01245	0	0.01245	0	0.01245	0	0.01245	0	0.01245	0	0.01245	0	0.01245	0		
	0.02605	0	0.02605	0	0.02605	0	0.02605	0	0.02605	0	0.02605	0	0.02605	0	0.02605	0	0.02605	0	0.02605	0	0.02605	0		
	0.02755	0	0.02755	0	0.02755	0	0.02755	0	0.02755	0	0.02755	0	0.02755	0	0.02755	0	0.02755	0	0.02755	0	0.02755	0		
	0.04415	0	0.04415	0	0.04415	0	0.04415	0	0.04415	0	0.04415	0	0.04415	0	0.04415	0	0.04415	0	0.04415	0	0.04415	0		
	0.01525	0	0.01525	0	0.01525	0	0.01525	0	0.01525	0	0.01525	0	0.01525	0	0.01525	0	0.01525	0	0.01525	0	0.01525	0		
	0.0449	1	0.0527	1	0.287	1	0.354	1	0.327	1	0.0142	0	0.356	1	0.043	1	0.681	1	0.303	1	0.78	1		
	0.00945	0	0.00945	0	0.00945	0	0.0142	0	0.04725	0	0.01855	0	0.00945	0	0.04725	0	0.00945	0	0.00945	0	0.00945	0		
	0.01235	0	0.01235	0	0.01235	0	0.01855	0	0.02475	0	0.00915	0	0.01235	0	0.01235	0	0.01235	0	0.01235	0	0.01235	0		
	0.0061	0	0.0061	0	0.0061	0	0.00915	0	0.0061	0	0.0095	0	0.0061	0	0.0061	0	0.0061	0	0.0061	0	0.0061	0		
	0.00635	0	0.00635	0	0.00635	0	0.0095	0	0.00635	0	0.0081	0	0.00635	0	0.00635	0	0.00635	0	0.00635	0	0.00635	0		
	0.0054	0	0.0054	0	0.0054	0	0.0081	0	0.0054	0	0.00875	0	0.0054	0	0.0054	0	0.0054	0	0.0054	0	0.0054	0		
	0.00585	0	0.00585	0	0.00585	0	0.00875	0	0.00585	0	0.00715	0	0.00585	0	0.00585	0	0.00585	0	0.00585	0	0.00585	0		
	0.004765	0	0.004765	0	0.004765	0	0.00715	0	0.004765	0	0.00795	0	0.004765	0	0.004765	0	0.004765	0	0.004765	0	0.004765	0		
	0.0053	0	0.0053	0	0.0053	0	0.00795	0	0.0053	0	0.01065	0	0.0053	0	0.0053	0	0.0053	0	0.0053	0	0.0053	0		
	0.0071	0	0.0071	0	0.0071	0	0.01065	0	0.0071	0			0.0071	0	0.0071	0	0.0071	0	0.0071	0	0.0071	0		
Median	0.0109		0.0109		0.0109		0.013325		0.013775		0.01245		0.0109		0.0124		0.0109		0.0109		0.0109		0.517	1

Notes:

Numbers in blue indicate a non-detect value.

APPENDIX C
RISK-BASED SCREENING TABLES

APPENDIX C / TABLE 1
RISK-BASED SCREENING - CURRENT AND FUTURE OCCUPATIONAL WORKER
DIP TANK SOILS AND GROUNDWATER
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Chemical	Carcinogen	Soil - Ingestion (surface only)							Soil - Outdoor Air							Soil -Indoor Air							Groundwater -Outdoor Air							Groundwater - Indoor Air							Sum C/RBC (nc)
		C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (ug/L)	RBC (ug/L)	C/RBC	>1 (ca)	RBC (ug/L)	C/RBC	>.1 (nc)	C (ug/L)	RBC (ug/L)	C/RBC	>1 (ca)	RBC (ug/L)	C/RBC	>.1 (nc)	
Arsenic, Total	y	3.82	1.9	2	YES	310	0.012	no	3.82	nv	NA	no	nv	NA		3.82	nv	NA	no	nv	NA																2E-06
2,3,7,8-TCDD (dioxin)	y	7.80E-06	9.44E-06	8.26E-01	no	0.00038			7.80E-06	nv	NA	no	nv	NA		7.80E-06	nv	NA	no	nv	NA																	8E-07
2,3,7,8-TCDD TEQ	y	1.55E-05	9.44E-06	1.64E+00	YES	0.00038	4E-02	no	1.55E-05	nv	NA	no	nv	NA		1.55E-05	nv	NA	no	nv	NA																	2E-06
Benzo(a)pyrene																							7.0E-05	nv	NA	NA	nv	NA		7.0E-05	nv	NA	NA	nv	NA		
Pentachlorophenol																							2.7E-02	nv	NA	NA	nv	NA		2.7E-02	nv	NA	NA	nv	NA		
1,1,2-Trichloroethane																							5.0E-04	21000	2.38E-08	no	24000	2.1E-08		5.0E-04	11000	4.55E-08	no	13000	3.8E-08		7E-14
1,4-Dichlorobenzene																							4.2E-03	21000	2E-07	no	>S	NA		4.2E-03	7100	5.92E-07	no	>S	NA		8E-13
Hexachlorobutadiene																							2.0E-03	nv	NA	NA	nv	NA		2.0E-03	nv	NA	NA	nv	NA		
																																					4E-06

APPENDIX C / TABLE 2
RISK-BASED SCREENING - FUTURE CONSTRUCTION WORKER
DIP TANK AREA SOILS AND GROUNDWATER
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Chemical	Carcinogen	Soil - Ingestion (surface only)							Soil - Outdoor Air							Soil -Indoor Air							Groundwater -Outdoor Air							Groundwater - Indoor Air							Sum C/RBC (nc)
		C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (ug/L)	RBC (ug/L)	C/RBC	>1 (ca)	RBC (ug/L)	C/RBC	>.1 (nc)	C (ug/L)	RBC (ug/L)	C/RBC	>1 (ca)	RBC (ug/L)	C/RBC	>.1 (nc)	
Arsenic, Total	y	3.82	15	0	no	97	0.04	no	3.82	nv	NA	no	nv	NA	no	3.82	nv	NA	no	nv	NA	no															3E-07
2,3,7,8-TCDD (dioxin)	y	7.80E-06	9.44E-06	8.26E-01	no	0.00023	0.03	no	7.80E-06	nv	NA	no	nv	NA	no	7.80E-06	nv	NA	no	nv	NA	no															
2,3,7,8-TCDD TEQ	y	1.55E-05	9.44E-06	1.64E+00	YES	0.00023	0.07	no	1.55E-05	nv	NA	no	nv	NA	no	1.55E-05	nv	NA	no	nv	NA	no															2E-06
Benzo(a)pyrene																							7.0E-05	nv	NA	NA	nv	NA									
Pentachlorophenol																							2.7E-02	53	NA	NA	53	NA									5E-10
1,1,2-Trichloroethane																							5.0E-04	1000	5E-07	no	49	1.0E-05		0.0005	1000	0.0000005	no	49	1.02041E-05	no	5E-13
1,4-Dichlorobenzene																							4.2E-03	>S	NA	no	>S	NA	no	4.2E-03	>S	NA	no	>S	NA	no	na
Hexachlorobutadiene																							2.0E-03	nv	NA	NA	nv	NA									
																																					2E-06

APPENDIX C / TABLE 3
RISK-BASED SCREENING - FUTURE TRENCH/EXCAVATION WORKER
DIP TANK SOILS AND GROUNDWATER
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Chemical	Carcinogen	Soil - Ingestion (surface only)							Soil - Outdoor Air							Soil -Indoor Air							Groundwater -Outdoor Air							Groundwater - Indoor Air							Groundwater in the Trench							Sum C/RBC (nc)
		C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (ug/L)	RBC (ug/L)	C/RBC	>1 (ca)	RBC (ug/L)	C/RBC	>.1 (nc)	C (ug/L)	RBC (ug/L)	C/RBC	>1 (ca)	RBC (ug/L)	C/RBC	>.1 (nc)	C (ug/L)	RBC (ug/L)	C/RBC	>1 (ca)	RBC (ug/L)	C/RBC	>.1 (nc)	
Arsenic, Total	y	3.82	420	0.009	no	2700	0.001	no	3.82	nv	NA	no	nv	NA	no	3.82	nv	NA	no	nv	NA	no																						9E-09
2,3,7,8-TCDD (dioxin)	y	7.80E-06	9.44E-06	8.26E-01	no	0.0063	1.24E-03	no	7.80E-06	nv	NA	no	nv	NA	no	7.80E-06	nv	NA	no	nv	NA	no																						8E-07
2,3,7,8-TCDD TEQ	y	1.55E-05	9.44E-06	1.64E+00	YES	0.0063	2.46E-03	no	1.55E-05	nv	NA	no	nv	NA	no	1.55E-05	nv	NA	no	nv	NA	no																						2E-06
Benzo(a)pyrene																							7.0E-05	nv	NA	NA	nv	NA	NA	0.00007	nv	NA	NA	nv	NA	NA	0.00007	nv	NA	NA	nv	NA	NA	
Pentachlorophenol																							2.7E-02	53	NA	NA	53	NA	NA	0.02726	nv	NA	NA	nv	NA	NA	0.02726	nv	NA	NA	nv	NA	NA	5E-10
1,1,2-Trichloroethane																							5.0E-04	1000	5E-07	no	1000	5.0E-07	no	0.0005	11000	4.55E-08	no	11000	4.55E-08	no	0.0005	11000	4.55E-08	no	49	1E-05	no	5E-13
1,4-Dichlorobenzene																							4.2E-03	1500	2.8E-06	no	1500	2.8E-06	no	0.0042	7100	5.92E-07	no	7100	5.92E-07	no	0.0042	7100	5.92E-07	no	7600	6E-07	no	3E-12
Hexachlorobutadiene																							2.0E-03		NA	NA		NA	NA	0.002		NA	NA		NA	NA	0.002	0.9	0.002222	no	0.9	2E-03	no	
																																											2E-06

APPENDIX C / TABLE 4
RISK-BASED SCREENING - CURRENT AND FUTURE OCCUPATIONAL WORKER
BEAR CREEK SEDIMENTS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Chemical	Carcinogen	Soil - Ingestion (surface only)					Soil - Outdoor Air					Total ECR
		C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	>.1 (nc)	
Total Arsenic	c	4.6E+00	3.2	1.421875	YES		4.6E+00	nv	NA	no	below background	1E-06
TCDD-TEQ	c	1.2E-04	7.5E-05	1.613333	YES							2E-06
Benz(a)anthracene	c	2.87E-01	1.2	0.239167	no		2.87E-01	>Csat	NA	no		2E-07
Benzo(a)pyrene	c	3.5E-01	0.12	2.95	YES		3.5E-01	NV	NA	no		3E-06
Dibenz(a,h)anthracene	c	4.3E-02	0.12	0.358333	no		4.3E-02	NV	NA	no		4E-07
												7E-06

Total Arsenic	nc	4.6E+00	310	1.5E-02		no
TCDD-TEQ	nc	1.2E-04	0.00038	3.2E-01		YES

APPENDIX C / TABLE 5
RISK-BASED SCREENING - FUTURE CONSTRUCTION WORKER
BEAR CREEK SEDIMENTS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Chemical	Carcinogen	Soil - Ingestion (surface only)							Soil - Outdoor Air							Sum C/RBC (c)	nc
		C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)		
Total Arsenic	c	4.6E+00	15	3.03E-01	no	97	4.69E-02	no	4.6E+00	NV	NA	NA	NV	NA	NA	3E-07	4.7E-02
2,3,7,8-TEQ	c	1.2E-04	0.00017	7.12E-01	no	0.00023	5.26E-01	YES	1.2E-04	0.13	9.31E-04	no	>Csat	NA	no	7E-07	5.3E-01
Benz(a)anthracene	c	2.87E-01	24	1.20E-02	no	24	1.20E-02	no	2.87E-01	>Csat	NA	NA	>Csat	NA	NA	1E-08	
Benzo(a)pyrene	c	3.5E-01	2.4	1.48E-01	no	NA	NA	no	3.5E-01	NV	NA	NA	NV	NA	NA	1E-07	
Benzo(b+k) fluoranthene	c	5.2E-01	24	2.15E-02	no	NA	NA	no	5.2E-01	NV	NA	NA	NV	NA	NA	2E-08	
Dibenz(a,h)anthracene	c	4.3E-02	2.4	1.79E-02	no	NA	NA	no	4.3E-02	NV	NA	NA	NV	NA	NA	2E-08	
																1E-06	6E-01

APPENDIX C / TABLE 6
RISK-BASED SCREENING - FUTURE TRENCH/EXCAVATION WORKER
BEAR CREEK SEDIMENTS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Chemical	Carcinogen	Soil - Ingestion (surface only)							Soil - Outdoor Air							Sum C/RBC (nc)
		C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	
Total Arsenic	c	4.6E+00	420	0.011	no	2700	0.002	no	4.6E+00	NV	NA	NA	NV	NA	NA	1E-08
2,3,7,8-TEQ	c	1.2E-04	0.0048	0.025	no	0.0063	0.019	no	1.2E-04	0.13	9.31E-04	no	>Csat	NA	NA	3E-08
Benz(a)anthracene	c	2.87E-01	660	0.000	no	NA	NA	NA	2.87E-01	>Csat	NA	NA	>Csat	NA	NA	4E-10
Benzo(a)pyrene	c	3.5E-01	67	0.005	no	NA	NA	NA	3.5E-01	NV	NA	NA	NV	NA	NA	5E-09
Benzo(b+k) fluoranthene	c	5.2E-01	670	0.001	no	NA	NA	NA	5.2E-01	NV	NA	NA	NV	NA	NA	8E-10
Dibenz(a,h)anthracene	c	4.3E-02	67	0.001	no	NA	NA	NA	4.3E-02	NV	NA	NA	NV	NA	NA	6E-10
																4E-08

APPENDIX C / TABLE 7
RISK-BASED SCREENING - FUTURE RESIDENT
BEAR CREEK SEDIMENTS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Chemical	Carcinogen	Soil - Ingestion (surface only)							Soil - Outdoor Air							
		C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	
Total Arsenic	c	4.6E+00	0.43	10.5814	YES	22	2.1E-01	YES	4.6E+00	nv	NA	no	nv	NA	no	1E-05
2,3,7,8-TEQ	c	1.2E-04	0.0000047	25.74468	YES	0.000051	2.4E+00	YES	1.2E-04	0.01	1.2E-02	no	>Csat	NA	no	3E-05
Benz(a)anthracene	c	2.87E-01	0.15	1.913333	YES	NA	NA	no	2.87E-01	>Csat	NA	no	>Csat	NA	no	2E-06
Benzo(a)pyrene	c	3.5E-01	0.015	23.6	YES	NA	NA	no	3.5E-01	NV	NA	no	NV	NA	no	2E-05
Benzo(b+k) fluoranthene	c	5.2E-01	0.15	3.446667	YES	NA	NA	no	5.2E-01	NV	NA	no	NV	NA	no	3E-06
Dibenz(a,h)anthracene	c	4.3E-02	0.015	2.866667	YES	NA	NA	no	4.3E-02	NV	NA	no	NV	NA	no	3E-06

APPENDIX C / TABLE 8
RISK-BASED SCREENING - CURRENT AND FUTURE RECREATIONAL USER OF BEAR CREEK
BEAR CREEK SEDIMENTS
HUMAN HEALTH RISK ASSESSMENT
FLORAGON PROPERTY
MOLALLA, OREGON

Chemical	Carcinogen	Soil - Ingestion (surface only)							Soil - Outdoor Air							
		C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	
Total Arsenic	c	4.6E+00	3.2	1.421875	YES	250	1.8E-02	no	4.6E+00	nv	NA	no	nv	NA	no	below background
TCDD-TEQ	c	1.2E-04	7.5E-05	1.613333	YES	5.9E-04	2.1E-01	YES	1.2E-04	>Csat			>Csat		no	
Benz(a)anthracene	c	2.87E-01	1.2	0.239167	no	NA	NA	no	2.87E-01	>Csat	NA	no	>Csat	NA	no	
Benzo(a)pyrene	c	3.5E-01	0.12	2.95	YES	NA	NA	no	3.5E-01	NV	NA	no	NV	NA	no	
Benzo(b+k) fluoranthene	c	5.2E-01	1.2	0.430833	no	NA	NA	no	5.2E-01	NV	NA	no	NV	NA	no	
Dibenz(a,h)anthracene	c	4.3E-02	0.12	0.358333	no	NA	NA	no	4.3E-02	NV	NA	no	NV	NA	no	

Chemical	Carcinogen	Soil - Ingestion (surface only)							Soil - Outdoor Air						
		C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)	C (mg/kg)	RBC (mg/Kg)	C/RBC	>1 (ca)	RBC (mg/Kg)	C/RBC	>.1 (nc)
Benzo(a)pyrene	c	1.0E-01	0.12	0.833333	no	0.12	8.3E-01	YES	1.0E-01	NV	NA	no	NV	NA	no

APPENDIX D
ECOLOGICAL RISK ASSESSMENT

TECHNICAL MEMORANDUM

To: Dan Hafley, Oregon DEQ - Northwest Region

From: Rone Brewer, Ecological Risk Assessor, Sound Ecological Endeavors, LLC
Paul Ecker, EES Environmental Consulting, Inc.
Brad Berggren, PNG Environmental, Inc.

Date: September 16, 2016

Subject: **Ecological Risk Characterization & Residual Risk Assessment Summary**
Bear Creek Sediment - Floragon Property
Molalla, Oregon
Oregon DEQ VCP Site ID Number 0009

The purpose of this Technical Memorandum is to evaluate site-specific dioxin analytical data collected from Bear Creek sediments in the context of ecological risk considerations developed for the subject site. This evaluation includes an overview of likely receptor scenarios and acknowledges ecologically protective risk-based concentrations (RBCs), preliminary remediation goals (PRGs), and remedial action levels (RALs) established for dioxin and furan congeners ('dioxin' based on 2,3,7,8-TCDD toxic equivalencies) by the Oregon Department of Environmental Quality (DEQ). For comparison to current creek sediment conditions and for use in future remedy planning, a residual risk discussion is also presented for a range of cleanup scenarios.

Other than localized areas in Bear Creek sediments, no unacceptable ecological risks were predicted for other portions of the site. This includes the former Dip Tank Area due to limited areas of contamination, overall poor habitat, few receptors of concern, disturbed and paved upland surfaces, and likely future land use. The site's lengthy history of industrial operations as well as current and anticipated future industrial zoning and land use, represent established and long-term future conditions that are expected to minimize or exclude suitable ecological habitat at this site.

INTRODUCTION

Remedial Investigation (RI) and Ecological Risk Assessment (ERA) findings indicate environmental impacts may be present based on potential ecological exposure to Bear Creek sediments at the Floragon property (site), with dioxin recognized as the only Contaminant of Concern (COC) (PNG 2011, 2012, 2013, 2015a, 2015b, 2016a; EES 2013, 2014, 2015; DEQ 2012, 2013, 2014, 2015a-f, 2016). Bear Creek sediment sampling locations are illustrated in Figures 1 and 2 and the sampling sequence and rationale are outlined below.

Bear Creek sediment sampling and analysis under Phase 1 of the RI was conducted in 2010 at three locations on the Floragon property (composite samples AB-23, AB-25, and AB-28). Based on the 2010 analytical results, additional sediment sampling was conducted during Phase 2 RI work in 2012 to better characterize the extent of dioxin in sediment (composite samples collected from eight locations included SED-1 through SED-8). Ecological risk characterization for creek sediments was conducted using the

2010 and 2012 dioxin concentration data (PNG 2015a), as described below. Based on subsequent discussions with DEQ, follow-up Phase 3 RI work conducted in 2014 and 2015 included supplemental sediment dioxin characterization intended to delineate localized areas of relatively high dioxin concentrations at the site (SED-200 through SED-211) (PNG 2016a).

Bear Creek Ecological Risk Bioaccumulation Modeling (February 2015)

A Screening Level ERA Assessment conducted for the Floragon property identified potential ecological risks for Bear Creek, primarily related to exposures to dioxin in Bear Creek sediment (PNG 2011). Based on the results of the screening level ERA, additional Phase 2 RI sediment samples were collected from Bear Creek and analyzed for dioxin in support of the RI and risk characterization data needs in 2012. The Phase 2B ERA Work Plan was developed based on detailed technical discussions during 2012 and 2013 with DEQ, and summarizes the proposed approach for completing the ERA with regard to dioxin in Bear Creek sediment (PNG 2012 and 2013).

The site-specific ecological receptor functional groups of concern likely to be exposed to dioxin in Bear Creek surface sediment were identified in the Work Plan as:

- Benthic invertebrates exposed to dioxin in Bear Creek sediment.
- Wildlife exposed to dioxin in Bear Creek sediment.

The great blue heron was selected as the indicator species representative of sediment-exposed wildlife. The heron was chosen because it may be present in the site vicinity and would be the species most highly exposed to dioxin in surface sediment primarily via direct contact, ingestion, and chemical bioaccumulation related to ingestion of aquatic/benthic species (e.g., frogs) exposed to site-related Bear Creek surface sediment. Surface sediment was collected from 0 to 12 inches below the sediment surface and recent USEPA Guidance (USEPA 2015) indicates that the biologically active zone of sediments in streams with coarse grained/sand with fines is 25 cm or approximately 0.8 feet. The 0-1 foot sampling depth of surface sediments is a conservative evaluation of the biologically active zone in Bear Creek. The ERA assessment endpoints presented in the Work Plan were:

- Determine whether chemical contamination in Bear Creek surface sediment has the potential to reduce benthic invertebrate population abundance and diversity.
- Determine whether chemical contamination in Bear Creek surface sediment has the potential to reduce the growth, reproduction, and survival of local semi-aquatic/benthic wildlife (i.e. heron) populations.

The Work Plan also presented the approach for calculating Exposure Point Concentrations (EPCs), the species-specific exposure model and exposure parameters for the heron, and chemical/congener-specific bioaccumulation factors for modeling the accumulation of dioxin within the frogs (as part of the heron food chain). The dioxin/furan ecological screening benchmarks for benthic invertebrates and the ecological benchmark doses for the heron also were presented.

In an email dated 9/20/2013, DEQ provided technical comments regarding its review of the Work Plan, with final comments provided on 2/13/2014. Details of the DEQ comments, Avison Team responses, and key ecological receptor scenario considerations are summarized below.

BENTHIC INVERTEBRATES

Benthic invertebrates were initially identified as an ecological receptor for Bear Creek and the uncertainty associated with the use of the invertebrate sediment screening levels for dioxin was summarized in a Technical Brief (Brewer and Fuji 2012). As agreed upon with DEQ in late 2014, a decision was made to focus the Bear Creek risk characterization effort on two representative ecological receptors, specifically the great blue heron and weasel as summarized below and as detailed in site-specific modeling results (PNG 2015a).

BIRDS

The great blue heron was selected as a representative indicator species for the bird bioaccumulation model based on ingestion of frogs in and around the creek. DEQ requested adjustment of the heron site use factor from 0.00035 to 0.01733, resulting in approximately a 50-fold increase in predicted exposure and requested that the dioxin bioaccumulation factors from published bioaccumulation assessment guidance (DEQ 2007) also be incorporated into the heron exposure model.

MAMMALS

DEQ required inclusion of a mammalian bioaccumulation model, citing consistency in assessed species between the Floragon site and an adjacent upstream property (Avison Mill #1). As requested by DEQ, the weasel was used as the indicator species for a mammal bioaccumulation model, eating small mammals that, in turn, are eating invertebrates exposed to dioxin in Bear Creek surface sediment. During development of the site weasel exposure model, chemical- and species-specific exposure factors, bioaccumulation modelling, dose calculation methods, and the toxicity benchmark dose were made consistent with those used for the Avison Mill #1 property risk assessment. An exception was the site use factor for weasels, which was modified based on site-specific considerations regarding potentially available weasel habitat both along and in the bottom of Bear Creek. The weasel was very conservatively assumed to be exposed via the food chain to site-related dioxin in surface sediment along the entire on-site length of Bear Creek and throughout the year, regardless of flow within the creek. This conservative assumption was made even though the presence of surface water in Bear Creek makes it impossible for a mouse or weasel to forage on the creek bottom for most of the year.

BIOACCUMULATION MODEL AND RISK CALCULATIONS

Following DEQ's requested approach, the bioaccumulation of dioxin through the food chain was calculated on a congener specific basis:

- Heron: the bioaccumulation and risks were calculated using both the DEQ biota-sediment accumulation factors (BSAFs; DEQ 2007) and 90UCL BSAFs calculated from non-migratory freshwater fish BSAF data in the U.S. Army Corps of Engineers (Corps) and U.S. Environmental Protection Agency (EPA) BSAF databases.
- Weasel: a partitioning (Kow & Koc) approach was used to first calculate accumulation from sediment to invertebrates, and then food chain multipliers were used to calculate accumulation into invertebrate-eating small mammals, that are then eaten by the weasel. Congener-specific concentrations in prey

items and in sediment were converted to 2.,3,7,8-tetrachlorodibenzodioxin (TCDD) toxicity equivalent (TEQ) values using bird (heron) or mammal (weasel) toxicity equivalency factors (TEFs). Then the congener-specific TEQ values were summed to calculate a total TCDD TEQ value. These values are presented below. As discussed in the next section, this modeling effort was reviewed by DEQ. DEQ subsequently completed an exposure model that used different bioaccumulation factors.

The total TCDD concentrations in tissue and sediment were then incorporated into the exposure model using species-specific exposure parameters. In this manner, a site-specific TCDD exposure dose was calculated for the weasel and heron under the four different EPC scenarios. The exposure dose was then divided by the ecological reference dose to get a total TCDD TEQ risk ratio.

The TCDD TEQ risk ratio was then correlated to a preliminary risk-based cleanup level (i.e., an ecological risk-based concentration [ERBC] or a PRB) in sediment that would be protective of the indicator species. The TCDD TEQ ERBC correlation factor was developed by calculating an average of the ratios of individual dioxin/furan congener TEQ doses to their respective congener TCDD TEQ concentration in sediment. This average ratio became the correlation factor, which was used to calculate the TCDD TEQ concentration in sediment that corresponds to a risk ratio of 1.

MODEL CONCLUSIONS

Heron and weasel risk ratios, calculated using varying EPCs for comparison, are summarized below:

- Heron: No unacceptable risks (i.e., risk ratio greater than 1) were predicted in any of the four heron EPC models.
- Weasel: Lowest Observed Adverse Effects Level (LOAEL) - based risk ratios ranged from 0.35 for the 90UCL scenario, excluding sample AB-25, to 1.9 for the maximum-concentration EPC scenario which includes sample AB-25.
- Weasel: No Observed Adverse Effects Level (NOAEL) - based risk ratios ranged from 1.8 to 9.3, with the exclusion of sample AB-25 resulting in a risk ratio of 3.5.

The weasel 90UCL LOAEL-based model is supported by published DEQ guidance and industry practice and is an appropriate assessment of site-specific weasel risks. As shown on Table D1, neither of the LOAEL-based 90UCL weasel bioaccumulation models indicates unacceptable risks to this receptor (risk ratios range from 0.35 without Sample AB-25 to 0.79 including Sample AB-25). However, the more conservative assessment conducted using the maximum detected concentration as the EPC did indicate potential unacceptable risks when Sample AB-25 was included (risk ratio = 1.9) versus when Sample AB-25 was excluded (risk ratio = 0.69). The risk ratios from the more conservative maximum detected concentration assessment of weasel risks could be used as a very conservative basis for considering a localized sediment remedial action targeting the AB-25 area. The purpose of a focused action would be to reduce potential weasel risks to acceptable levels among Bear Creek sediments.

Preliminary ERBCs also were estimated from the bioaccumulation models and are summarized in Table D1. Heron NOAEL and LOAEL-based ERBCs ranged from avian TCDD-TEQ concentrations of 5,280 to 26,400 picograms per gram (pg/g), which greatly exceed any known or suspected sediment concentrations at the site. Weasel NOAEL and LOAEL based ERBCs ranged from 47 to 236 pg/g mammalian TCDD-TEQ concentrations.

PNG's modeling determined that the most realistic assessment of weasel risks was derived from use of the 90UCL and LOAEL risks, resulting in a 236 pg/g ERBC. Based on the 2010-2012 data set, sediment sample AB-25 was the only location among characterized Floragon Bear Creek surface sediments that contained dioxin mammal TEQ concentrations greater than 236 pg/g. There were no hot spots identified where risk ratios approach or exceed 10 for heron or weasel exposure to Floragon's Bear Creek sediment.

Although supplemental Phase 3 RI sediment data collected in 2014-2015 would slightly alter the statistical details described by the modeling effort, overall bioaccumulation model findings and conclusions would not be significantly different with regard to the significance of Bear Creek Reach 3 or hot spot determination.

DEQ-Established Dioxin Criteria for Bear Creek Sediments

Based on RI findings through 2014, specific exposure model input parameters for the most sensitive ecological receptors, including mammalian toxic equivalency (TEQ) and a conceptual framework for focused remedial action proposed by EES Environmental Consulting (EES) and PNG Environmental, Inc. (PNG) (EES 2014, EES 2015, PNG 2015a, PNG 2015b), DEQ developed ecologically protective risk-based concentrations for mammals exposed to dioxin via the food chain (DEQ 2015a-f) including:

- Preliminary Remediation Goal (PRG) of 20 pg/g.
- Remedial Action Level (RAL) of 120 pg/g.

A calculated soil dioxin PRG of 12 pg/g was initially calculated by DEQ, which was then adjusted to 20 pg/g using dioxin concentration to dose regression (DEQ 2015, PNG 2015b). The 20 pg/g PRG is considered by DEQ to be protective of sediment-exposed ecological receptors. The RAL was established by DEQ through the rationale that eliminating exposure to areas of dioxin concentrations exceeding 120 pg/g will lower the overall ecological receptor exposure among site creek sediments to an undefined reasonably protective level.

The DEQ PRG differed significantly from the ERBC/PRG calculated in the site-specific Ecological Risk Bioaccumulation Model (PNG 2015a). The primary reason for the differences was DEQ's use in their exposure model of bioaccumulation factors developed from the USEPA's Estimation Programs Interface (EPI) suite, which models Kow and Koc values; whereas the Floragon site exposure model used an upper confidence limit (UCL) on the mean of measured values for freshwater aquatic organisms. Because of the use of the EPI suite modeled values, much higher dioxin bioaccumulation was predicted by the DEQ exposure model than by PNG. Hence, the significantly lower remediation goals.

In order to address and delineate site creek sediments in light of the revised DEQ risk-based criteria, additional Phase 3 RI sediment samples were collected in October 2015 (PNG 2015b). All available sediment dioxin analytical data collected during the RI (2010

through 2015) are evaluated in this document for risk assessment purposes and in support of the final RI.

ECOLOGICAL RISK SUMMARY

Dioxin mammalian TEQ concentrations for the 30 RI surface sediment samples used in this ecological risk characterization are summarized in Table D2. Individual sample dioxin congener analytical results and mammalian toxicity equivalency factor (TEF) conversion to TEQs are provided in the PNG RI document as summary Table 1-1 with accompanying details (PNG 2016b). Surface sediment samples are representative of the biologically active zone (0-25 centimeters) below the sediment surface (USEPA 2015). Fish and wildlife exposure to contaminants below this depth are not a concern as it is not a biologically active zone; therefore, direct contact does not occur. Deeper sediment sample analytical data were collected during the RI for dioxin nature and extent delineation purposes.

Surface sediment sample locations with dioxin TEQs greater than the DEQ RAL of 120 pg/g are shown on Figure 2. For the purposes of this risk evaluation, dioxin concentration calculations use the laboratory Estimated Detection Limits (EDLs) for samples with non-detected concentrations. The 90th-percentile upper confidence limits on the mean (90UCLs) were calculated with the U.S. Environmental Protection Agency's (USEPA) Pro UCL Version 5.1 using the ProUCL-recommended 95UCL type, calculated for each data set.

In order to evaluate various residual risk scenarios with regard to dioxin ecological exposure point concentrations, key statistics (minimum, mean, 90th percentile upper confidence limit on the mean [90UCL], and maximum concentrations) were calculated for the dioxin data. The various data sets evaluated are described below, and summary results of these calculations are provided in Table D3. The samples and associated dioxin TEQ concentrations included in each set of calculations are provided in Tables D4 through D10.

Current Data Set (Existing Conditions)

The complete RI surface sediment data set (30 samples collected from the 0-1 foot depth zone) was examined to evaluate the 90UCL exposure point concentrations.

- Incorporating all 30 existing surface sediment samples results in a 90UCL exposure point concentration of 147 pg/g (Table D4). This value exceeds the DEQ RAL of 120 pg/g.

Residual Risk Assessment - Modified Conditions

For comparison to the full data set and to evaluate data distribution trends, the dioxin data were broken out into various generalized alternative residual risk scenarios as follows. The residual risk assessment is based on applying DEQ's recently-established PRG and RAL criteria to site sediment conditions, and will be further evaluated during feasibility study (FS) development and consideration of appropriate and protective remedial options for the site. The findings are summarized in Table D3 and detailed on supplemental tables as noted below.

CONDITIONS ACHIEVING THE RAL (120 PG/G)

Discussions with DEQ indicate that dioxin concentrations exceeding the 120 pg/g RAL are expected to drive ecological risk considerations at the site. Several residual risk scenarios were evaluated, as summarized below.

- Exclude all samples exceeding the RAL: Excluding the nine surface samples with dioxin concentrations greater than the RAL of 120 pg/g results in a residual 90UCL of 73 pg/g (Table D5).
- Exclude Reach 3: Within the site study area, Reach 3 includes a continuous and relatively isolated section of Bear Creek where dioxin concentrations in surface sediments are generally greatest and where there is less uncertainty regarding contribution from other non-site related contaminant sources. This site condition was recognized and addressed in the 2015 risk characterization which was part of a preliminary proposal for focused cleanup of this Reach 3 area (PNG 2015a). Due to the presence of relatively high dioxin concentrations within this reach and their influence on predicted ecological risks, surface sediment dioxin distribution statistics were evaluated excluding all six AB-25 related samples collected at Reach 3.
  - Exclusion of Reach 3 surface sediments results in a residual 90UCL of 115 pg/g, which is below the RAL of 120 pg/g (Table D6).
- Exclude all samples exceeding 400 pg/g: An EPC below the RAL also can be statistically achieved by excluding the two surface sediment samples that exceed 400 pg/g. The two samples driving this scenario (AB-25 and AB-25-3) are both located within Reach 3. This represents the simplest and most efficient approach to achieve a residual EPC below 120 pg/g.
  - Excluding all samples exceeding 400 pg/g results in a residual 90UCL of 108 pg/g, which is below the RAL of 120 pg/g (Table D7).
- Consider and exclude traditional hot spots of contamination: According to DEQ's risk assessment guidance, an ecological hot spot for soil is defined by a toxicity quotient greater than 10 at any given sample location (DEQ 1998). A generic hot spot threshold is not provided for sediment. Since in this assessment, the risk assessment exposure model was developed for a mammal exposed to soil, applying the generic soil hot spot threshold of 10 is considered applicable. Based on the DEQ PRG of 20 pg/g, the traditional hot spot threshold would be 200 pg/g. Four sample locations have surface sediment dioxin concentrations greater than 200 pg/g including AB-25, AB-25-3, SED201ABC, and SED204ABC.
  - Excluding hot spot concentrations exceeding 200 pg/g would result in a residual 90UCL EPC of 93 pg/g, which is below the DEQ RAL of 120 pg/g (Table D8).

CONDITIONS ACHIEVING THE PRG (20 PG/G)

DEQ criteria establish a PRG for site sediments of 20 pg/g. DEQ regards this PRG as a protective value to be considered during FS development; an important consideration for the FS is that the PRG is a remedial goal based on protectiveness, and not a specific action level. The PRG was developed by DEQ with various

uncertainties and layers of conservative assumptions (see discussion below). FS development will establish protective conditions targeting the 20 pg/g PRG but active cleanup is likely to focus on areas of greater contamination.

For this evaluation, the data set was refined to evaluate conditions necessary to achieve the 20 pg/g PRG, which involved iterative elimination of highest concentration surface samples until the 90UCL was 20 pg/g or less.

- 27 of 30 surface samples must be excluded in order to achieve the 20 pg/g PRG, resulting in a 90UCL of 19 pg/g (Table D9).

RESIDUAL RISK ASSESSMENT SUMMARY

Current data indicate that among all Floragon surface sediment samples, the 90UCL EPC for dioxin is 147 pg/g. This 90UCL value exceeds the RAL of 120 pg/g by 23%. Assuming the ecologically acceptable concentration within this portion of Bear Creek is equivalent to DEQ's PRG of 20 pg/g, the current surface sediment 90UCL for the entire RI data set represents a toxicity quotient/risk ratio (RR) of 7.4 (147/20=7.4). For comparison, the 120 pg/g RAL established by DEQ represents a target RR of 6 (120/20=6.0). The existing condition (RR=7.4) closely approximates that of the RAL (RR=6.0), but both conditions exceed the desired RR of 1.0 based on a 20 pg/g PRG. Residual risk scenarios further minimize the risk ratios as follows.

- Excluding Reach 3 (six surface sediment samples) results in a residual 90UCL EPC of 115 pg/g, representing a RR of 5.8 (115/20 = 5.8).
- Excluding the site's two surface sediment samples exceeding 400 pg/g (both located within Reach 3) results in a residual 90UCL EPC of 108 pg/g, corresponding to a RR of 5.4 (108/20 = 5.4).
- Excluding four hot spot locations where concentrations exceed 200 pg/g results in a 90UCL EPC of 93 pg/g and RR of 4.6 (93/20 = 4.6).
- Eliminating exposure to nine surface sediment samples where dioxin concentrations exceed the DEQ RAL of 120 pg/g results in a 90UCL of 73 pg/g and a RR of 3.6 (73/20=3.6).
- In order to achieve a RR of 1 or less, the 90UCL EPC must not exceed the DEQ PRG of 20 pg/g. This would require excluding 27 of 30 surface sample locations, resulting in a 90UCL of 19 pg/g. This leaves only the areas surrounding SED-1, SED-4, and SED-6 (Figure 1).

PNG calculated a PRG of 236 pg/g (PNG 2015a) for the site. DEQ (2015b) acknowledged that the ecological protective concentration likely is between this PRG and the DEQ calculated PRG of 20 pg/g. Not considering other conservative uncertainties (see below), eliminating the four sample locations exceeding 200 pg/g results in an 90UCL EPC of 93 pg/g within Floragon Bear Creek surface sediment, which represents a likely protective residual EPC that less than the midway between 20 and 236 pg/g.

UNCERTAINTY

Uncertainty is inherent in risk assessment. Species-specific exposure parameters are available or often can be reasonably extrapolated based on species similarities and bioenergetics. Conversely, chemical-specific data is poorly characterized across the multitude of environmental and biochemical influences on uptake, accumulation,

biodegradation, toxicity, and by the sheer number of potential receptors that have not been tested for individual chemical effects. It is precisely these uncertainties that lead risk assessors to conservative (i.e., protective) assumptions and exposure model inputs, which are often required by state and federal risk assessment guidance. Concepts of reasonable maximum exposure, ecological population management, acceptable risk level, and site-specific data gathering are often supplanted by maximum or near maximum exposure estimates and individual ecological receptor risk. These are built into various chemical and species-specific models developed with multiple other protective assumptions that then stack upon each other resulting in significant overestimation of potential ecological risks. These are then used to calculate overly protective remedial action goals which are difficult and costly to attain and fail to provide proportionally increased benefits to the environment.

The primary DEQ-examined uncertainty within the Floragon site mammalian dioxin bioaccumulation model was dioxin congener-specific bioaccumulation factors. During the development of the site dioxin bioaccumulation model, dioxin congener bioaccumulation data was calculated from octanol-water (Kow) and organic carbon (Koc) partitioning values. These values are presented in EPA dioxin-specific risk calculation guidance (USEPA 2003) using an upper bound (95UCL) bioaccumulation factor calculated using food chain multipliers where appropriate. The use of these upper bound bioaccumulation factors by PNG (2015a) resulted in a protective PRG range of 47 to 236 pg/g dioxin (mammalian TEQ) using the NOAEL and LOAEL toxicity dose, respectively. However, the DEQ used bioaccumulation factors developed from Kow/Koc values extracted from the USEPA's Estimation Programs Interface for Windows (EPIWIN or EPI Suite) which uses an Atom/Fragment Contribution methodology to estimate Kow and Koc values. Essentially, various atoms or simple combinations of atoms (i.e., fragments) have the Kow or Koc values estimated based on linear regression models with actual Kow/Koc values. For a complete molecular estimate the atom/fragment contributions are added together along with atom/fragment (regressed) correction factors (for some molecular fragments). While Atom/Fragment methods and measured Kow/Koc values have generally been found to be well correlated, large molecules bonded to the chemicals in question make the regression assessment more uncertain, and at least one researcher found that:

> EPA's well-known EPIWIN software seems to use a relatively large chlorine fragment constant of 0.64 for the estimation of log Kow values, presumably based on (Meylan and Howard 1995). Therefore, EPIWIN may overestimate log Kow of nonpolar organochlorine compounds, especially the higher chlorinated ones *(such as dioxins)*. Likewise, Niederer and Goss (2008) recently found that the EPIWIN software failed to correctly predict the influence of the chlorine position in chlorophenols on n-octanol/water and air/water partitioning (Van Noort 2009) (*Emphasis added*).

In addition, the user's guide for EPIWIN plainly directs that values from EPIWIN should not be substituted for measured data, such as what was used for the Floragon site's bioaccumulation factor estimates. No estimates of potential bias were provided by DEQ for their provided dioxin EPIWIN-selected bioaccumulation factors. However, the DEQ-provided bioaccumulation factors result in a dioxin PRG of 3 pg/g, regressed (sediment concentration to dose) to a concentration of 12 pg/g, which was then adjusted by DEQ to 20 pg/g. This puts the final DEQ PRG of 20 pg/g between approximately 4 to 12 times lower than the site-specific protective concentrations calculated by PNG for the Floragon

site (47 and 236 pg/g) using actual dioxin congener Kow and Koc data and site-specific exposure data for relevant receptors.

Given the range of PRGs calculated for Bear Creek sediment by DEQ and the Avison team, the protective individual receptor-specific PRG ranges from 3 to over 236 pg/g (a difference factor of approximately 80). DEQ established that a PRG of 20 pg/g is most appropriate for this site, established as a generalized residual 90UCL EPC that could be approximated through remedial action at sediment areas where dioxin concentrations exceed the RAL of 120 pg/g. Our calculations show that eliminating exposure to all surface sediment sample locations with dioxin TEQ concentrations equal to or greater than 120 pg/g results in a residual 90UCL EPC of 73 pg/g (RR=3.6). This residual 90UCL concentration is 3.6 times greater than the DEQ target PRG of 20 pg/g but appears to be within DEQ's acceptable range of 20 to 120 pg/g (DEQ 2015a-f, 2016).

For terrestrial mammalian receptors, dioxin exposure at the Floragon site was assumed to be via sediment and the related food chain. Since site sediments are inundated all or part of the year, there would be little to no actual terrestrial exposure to these areas. The lack of year-round flow in Bear Creek also limits the semi-aquatic food chain because aquatic receptors/forage items are limited and have limited to no exposure at the site. Thus, realistic exposure of mammals to dioxin in sediment is overestimated using this current approach, which results in an overestimation of risk.

Contaminant distribution in site sediments is also the result of uncertainty with regard to contribution from unspecified offsite sources. There are several areas where dioxin concentrations in sediment are notably higher than other locations. Reach 3 (AB-25 area) is the Bear Creek segment closest to the known Floragon site dioxin source area. Other elevated dioxin concentrations in sediment are also associated with off-site drainages and stormwater. These other dioxin sources confound simple identification of site related dioxin in sediment and may raise concerns with respect to continued or potential recontamination of remediated sediments over time.

Other uncertainties incorporated into this risk assessment as protective elements are likely to contribute to an over-estimate of ecological risk at this site including:

- The use of full EDLs as a biased-high surrogate for dioxin concentrations in cases where the laboratory did not detect congeners at concentrations above EDLs. In most cases among this data set, the use of EDLs does not significantly alter the calculated (TEQ) dioxin concentrations (see Table D2). However, in at least one case (SED-5), the method of quantifying congener non-detects determines whether or not total dioxin concentrations exceed the 120 pg/g RAL at this location, with a TEQ range between 116 pg/g (using 0 for non-detect results) and 122 pg/g (using the full EDL for non-detect results).
- Because the location of sample SED-5 is downstream from potential off-site dioxin sources and the low dioxin concentrations among surface sediments sequentially upstream on the Floragon site, it is likely that the dioxin concentration at the SED-5 location is at least in part attributable to other, non-Floragon related, sources.
- Significant uncertainty regarding non-Floragon related dioxin sources is associated with sediment sample locations near drainage outfalls serving offsite roadway ditches and other offsite areas. Creek surface sediment dioxin concentrations adjacent to two identified offsite outfalls approach or exceed the 120 pg/g RAL at locations SED-201, SED-203, SED-204, and AB-23 near the

South Molalla Forest Road drainage culvert, and at AB-28 located immediately downstream from South Molalla Avenue ditch outfalls.

- A point-by-point comparison of the 20 pg/g protective level to individual sampling location data is inappropriate for evaluating bioaccumulation exposures to mammalian receptors that are exposed to prey throughout their home range (which PNG and DEQ determined is over three acres for the weasel at the Floragon site). The use of 90UCL EPCs is more representative of potential weasel exposures, but this approach still represents a very protective statistical estimate of exposures.
- At most (if not all) of the industrial Floragon property, Bear Creek provides poor-quality ecological habitat, particularly at portions of the creek where dioxin concentrations approach or exceed the RAL. Very conservative assumptions were used by DEQ in developing its 20 pg/g PRG and 120 pg/g RAL. The use of the weasel as a surrogate mammalian receptor compounds this conservativism because no weasels have been observed at the site and because the poor site habitat and use of sediment as a surrogate for soil exposure at the site are unlikely to support any realistic weasel population. There is little or no riparian habitat present in the industrial ditch setting that characterizes Reaches 1 through 4, particularly at the hardscaped and rip-rapped areas upstream of Reach 4. In addition, the wetland and waters determinations recently conducted at this portion of the site confirmed that there are no threatened, endangered, or sensitive species in the Bear Creek study area (SWCA 2015 and 2016), and that no wetlands are present in areas known to be impacted by dioxin at actionable levels.

CONCLUSIONS

Given that PRGs incorporate protective exposure, toxicological, and bioaccumulation factors for non-protected species, the various model-calculated PRGs from 3 to 236 pg/g are all expected to be adequately protective of ecological receptors exposed to Bear Creek surface sediment at and downstream of the Floragon property.

- The DEQ-calculated protective PRG was established at 12 pg/g using selected toxicity and bioaccumulation data, then adjusted to 20 pg/g concentration based on “lines of evidence and the uncertainties associated with the exposure models.” In order to achieve this 20 pg/g PRG, most site sediments would need to be excluded since 27 of 30 sample locations exceed the PRG.
- The 120 pg/g RAL was established by DEQ based on an assumption that exclusion of Bear Creek sediments containing dioxin above this value would result in an ecologically protective condition for this site. Excluding surface sediments with dioxin concentrations exceeding the RAL results in a residual 90 UCL EPC of 73 pg/g, exceeding the DEQ Preliminary Remediation Goal of 20 pg/g by a factor of 3.6, but within DEQ’s stated acceptable risk range (DEQ 2015c).
- Numerous layers of protective assumptions and uncertainties were used to develop site-specific PRG and RAL values, all of which likely contribute to an overestimation of ecological exposures and unacceptable risks at the site. For example, modifying only one of the conservative modeling factors such as the bioaccumulation factor, results in an 80-fold difference in calculated PRG values ranging from 3 to 236 pg/g. The DEQ’s designated RAL of 120 pg/g is near the midpoint of this PRG range, as are various residual risk scenarios presented in this document which result in 90 UCL values between 73 and 115 pg/g. The

residual risk scenarios satisfy the 120 pg/g RAL on a site-wide (90 UCL) basis but result in risk ratios which range up to 5.8, modestly exceeding DEQ's preferred acceptable risk range of 3.6 based on exclusion of all sediment concentrations exceeding the RAL as noted above. However, these residual 90 UCL values represent alternative cleanup conditions which may achieve the 120 pg/g RAL designated by DEQ and should be further considered during FS development.

Attachments: Table D1 – Bear Creek Sediment Bioaccumulation Risk Ratios and Cleanup Levels
Table D2 – Bear Creek Surface Sediment – Dioxin Equivalent Concentrations - Mammalian TEQ
Table D3 – Dioxin Concentrations in Bear Creek Sediment – Current and Residual Scenarios
Table D4 – Dioxin Concentrations in Surface Sediment Samples
Table D5 – Dioxin Concentrations in Surface Samples Excluding TEQs Greater than 120 ppt
Table D6 – Dioxin Concentrations in Surface Samples Excluding AB-25 Reach Samples
Table D7 – Dioxin Concentrations in Surface Samples Excluding TEQs Greater than 400 ppt
Table D8 – Dioxin Concentrations in Surface Samples Excluding TEQs Greater than 200 ppt
Table D9 – Interative Elimination of Highest Concentration Surface Sample Until 90UCL was 20 ppt or Less
Table D10 – Dioxin Concentrations in AB-25 Sediment Samples

Figure 1 – Bear Creek Sediment Sample Locations (2010-2015)
Figure 2 – Dioxin TEQm in pg/g – Bear Creek Sediments

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Table D1
Bear Creek Sediment
Bioaccumulation Risk Ratios and Preliminary Cleanup Levels
Floragon Property
Molalla, Oregon

Exposure Scenario	Risk Ratio		ERBCs Risk Ratio = 1 (pg/g)	Hot Spot ERBCs Risk Ratio = 10 (pg/g)
	90UCL EPC	Maximum EPC		
HERON [a]				
LOAEL all samples	0.0084	0.019	26,400	264,000
LOAEL without sample AB-25	0.0068	0.012	26,400	264,000
NOAEL all samples	0.042	0.097	5,280	52,800
NOAEL without sample AB-25	0.034	0.062	5,280	52,800
WEASEL				
LOAEL all samples	0.79	1.9	236	2,360
LOAEL without sample AB-25	0.35	0.69	236	2,360
NOAEL all samples	3.9	9.3	47	470
NOAEL without sample AB-25	1.8	3.5	47	470

Notes:

[a] Risk results for the heron based on Oregon Department of Environmental Quality (DEQ) biota-seditment accumulation factors (BSAFs; DEQ 2007)

90UCL = 90th Percentile Upper Confidence Limit on the mean

EPC = Exposure Point Concentration

ERBC = Ecological Risk-Based Concentration (aka, preliminary cleanup level)

pg/g = Picograms per gram or parts per trillion

LOAEL = Lowest Observed Adverse Effect Level

NOAEL = No Observed Adverse Effect Level

Table D2
Bear Creek Surface Sediments - Dioxin Equivalent Concentrations - Mammalian TEQ (pg/g)
Floragon Property
Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	2,3,7,8-TCDD TEQ with EDLs	2,3,7,8-TCDD TEQ with 1/2 EDLs	2,3,7,8-TCDD TEQ without non-detects
AB-23	0-1	02/02/2010	182	182	182
AB-25	0-1	02/02/2010	413	413	413
AB-28	0-1	02/02/2010	165	165	165
SED-COMP-1	0-1	04/13/2012	19	19	19
SED-COMP-2	0-1	04/13/2012	46	46	46
SED-COMP-3	0-1	04/12/2012	71	71	71
SED-COMP-3 Dup (SED-COMP-99)	0-1	04/12/2012	45	45	45
SED-COMP-4	0-1	04/11/2012	8.0	8.0	7.9
SED-COMP-5	0-1	04/11/2012	122	119	116
SED-COMP-6	0-1	04/11/2012	4.4	4.2	4.0
SED-COMP-7	0-1	04/11/2012	49	49	49
SED-COMP-8	0-1	04/12/2012	43	43	43
AB-25-0COMP (0-1)	0-1	11/20/2014	71	71	71
AB-25-1COMP (0-1)	0-1	11/19/2014	158	158	158
AB-25-2COMP (0-1)	0-1	11/19/2014	115	115	115
AB-25-3COMP (0-1)	0-1	11/19/2014	485	485	485
AB-25-4COMP (0-1)	0-1	11/19/2014	96	96	96
SED-200ABC (0-1) COMP	0-1	10/15/2015	49	49	49
SED-201ABC (0-1) COMP	0-1	10/15/2015	266	266	266
SED-202ABC (0-1) COMP	0-1	10/15/2015	32	32	32
SED-203ABC (0-1) COMP	0-1	10/16/2015	120	120	120
SED-204ABC (0-1) COMP	0-1	10/16/2015	220	215	210
SED-205ABC (0-1) COMP	0-1	10/16/2015	93	91	88
SED-206ABC (0-1) COMP	0-1	10/16/2015	102	102	102
SED-207ABC (0-1) COMP	0-1	10/16/2015	56	56	56
SED-208ABC (0-1) COMP	0-1	10/19/2015	41	41	41
SED-209ABC (0-1) COMP	0-1	10/19/2015	151	151	151
SED-210ABC (0-1) COMP	0-1	10/19/2015	45	45	45
SED-211ABC (0-1) COMP	0-1	10/19/2015	105	105	105
SED-211ABC (0-1) COMP Dup (SED-250)	0-1	10/19/2015	102	102	102

Notes:

pg/g = picograms per gram

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TCDD = Tetrachlorinated Dibenzo-p-Dioxin(s)

EDL = Estimated Detection Limit

Table D3
Dioxin Concentrations in Bear Creek Sediment - Current and Residual Scenarios
Floragon Property
Molalla, Oregon

Statistic	All Surface Sediment Samples (Table D4)	Surface ≤ 120 ppt (Table D5)	Surface Excluding AB25 Reach/Reach 3 (Table D6)	Surface ≤ 400 ppt (Table D7)	Surface ≤ 200 ppt (Table D8)	Surface & UCL ≤ 20 ppt (Table D9)	AB25 Reach/Reach 3 (Table D10)
Minimum	4.4	4.4	4.4	4.4	4.4	4.4	71
Mean	116	63	89	92	80	10	223
90UCL	147	73	115	108	93	19	331
Maximum	485	120	266	266	182	19	485

Notes:
90UCL = 90th percentile upper confidence limit on the mean
pg/g = picograms per gram
ppt = parts per trillion or ng/kg

Table D4
Dioxin Concentrations in Surface Sediment Samples (pg/g)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	2,3,7,8-TCDD TEQ
AB-23	02/02/2010	182
AB-25	02/02/2010	413
AB-28	02/02/2010	165
SED-COMP-1	04/13/2012	19
SED-COMP-2	04/13/2012	46
SED-COMP-3	12/04/2012	71
SED-COMP-3 Dup	12/04/2012	45
SED-COMP-4	11/04/2012	8.0
SED-COMP-5	11/04/2012	122
SED-COMP-6	11/04/2012	4.4
SED-COMP-7	11/04/2012	49
SED-COMP-8	12/04/2012	43
AB-25-0COMP (0-1)	11/20/2014	71
AB-25-1COMP (0-1)	11/19/2014	158
AB-25-2COMP (0-1)	11/19/2014	115
AB-25-3COMP (0-1)	11/19/2014	485
AB-25-4COMP (0-1)	11/19/2014	96
SED-200ABC (0-1) COMP	10/15/2015	49
SED-201ABC (0-1) COMP	10/15/2015	266
SED-202ABC (0-1) COMP	10/15/2015	32
SED-203ABC (0-1) COMP	10/16/2015	120
SED-204ABC (0-1) COMP	10/16/2015	220
SED-205ABC (0-1) COMP	10/16/2015	93
SED-206ABC (0-1) COMP	10/16/2015	102
SED-207ABC (0-1) COMP	10/16/2015	56
SED-208ABC (0-1) COMP	10/19/2015	41
SED-209ABC (0-1) COMP	10/19/2015	151
SED-210ABC (0-1) COMP	10/19/2015	45
SED-211ABC (0-1) COMP	10/19/2015	105
SED-211ABC (0-1) COMP Dup (SED-250)	10/19/2015	102
	Min	4.4
	Mean	116
	90UCL	147
	Max	485

Notes:

pg/g = picograms per gram

90UCL = 90th percentile upper confidence limit on the mean

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent

TEF = Toxicity equvalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.

Table D5
Dioxin Concentrations in Surface Samples Excluding TEQs Greater Than 120 ppt (pg/g)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	2,3,7,8-TCDD TEQ
SED-COMP-1	04/13/2012	19
SED-COMP-2	04/13/2012	46
SED-COMP-3	12/04/2012	71
SED-COMP-3 Dup	12/04/2012	45
SED-COMP-4	11/04/2012	8.0
SED-COMP-6	11/04/2012	4.4
SED-COMP-7	11/04/2012	49
SED-COMP-8	12/04/2012	43
AB-25-0COMP (0-1)	11/20/2014	71
AB-25-2COMP (0-1)	11/19/2014	115
AB-25-4COMP (0-1)	11/19/2014	96
SED-200ABC (0-1) COMP	10/15/2015	49
SED-202ABC (0-1) COMP	10/15/2015	32
SED-203ABC (0-1) COMP	10/16/2015	120
SED-205ABC (0-1) COMP	10/16/2015	93
SED-206ABC (0-1) COMP	10/16/2015	102
SED-207ABC (0-1) COMP	10/16/2015	56
SED-208ABC (0-1) COMP	10/19/2015	41
SED-210ABC (0-1) COMP	10/19/2015	45
SED-211ABC (0-1) COMP	10/19/2015	105
SED-211ABC (0-1) COMP Dup (SED-250)	10/19/2015	102
	Min	4.4
	Mean	63
	90UCL	73
	Max	120

Notes:

pg/g = picograms per gram

90UCL = 90th percentile upper confidence limit on the mean

ppt = parts per trillion or ng/kg

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent

TEF = Toxicity equvalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.

Table D6
Dioxin Concentrations in Surface Samples Excluding AB-25 Reach Samples (pg/g)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	2,3,7,8-TCDD TEQ
AB-23	02/02/2010	182
AB-28	02/02/2010	165
SED-COMP-1	04/13/2012	19
SED-COMP-2	04/13/2012	46
SED-COMP-3	12/04/2012	71
SED-COMP-3 Dup	12/04/2012	45
SED-COMP-4	11/04/2012	8.0
SED-COMP-5	11/04/2012	122
SED-COMP-6	11/04/2012	4.4
SED-COMP-7	11/04/2012	49
SED-COMP-8	12/04/2012	43
SED-200ABC (0-1) COMP	10/15/2015	49
SED-201ABC (0-1) COMP	10/15/2015	266
SED-202ABC (0-1) COMP	10/15/2015	32
SED-203ABC (0-1) COMP	10/16/2015	120
SED-204ABC (0-1) COMP	10/16/2015	220
SED-205ABC (0-1) COMP	10/16/2015	93
SED-206ABC (0-1) COMP	10/16/2015	102
SED-207ABC (0-1) COMP	10/16/2015	56
SED-208ABC (0-1) COMP	10/19/2015	41
SED-209ABC (0-1) COMP	10/19/2015	151
SED-210ABC (0-1) COMP	10/19/2015	45
SED-211ABC (0-1) COMP	10/19/2015	105
SED-211ABC (0-1) COMP Dup (SED-250)	10/19/2015	102
	Min	4.4
	Mean	89
	90UCL	115
	Max	266

Notes:

pg/g = picograms per gram

90UCL = 90th percentile upper confidence limit on the mean

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent

TEF = Toxicity equvalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.

Table D7
Dioxin Concentrations in Surface Samples Excluding TEQs Greater Than 400 ppt (pg/g)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	2,3,7,8-TCDD TEQ
AB-23	02/02/2010	182
AB-28	02/02/2010	165
SED-COMP-1	04/13/2012	19
SED-COMP-2	04/13/2012	46
SED-COMP-3	12/04/2012	71
SED-COMP-3 Dup	12/04/2012	45
SED-COMP-4	11/04/2012	8.0
SED-COMP-5	11/04/2012	122
SED-COMP-6	11/04/2012	4.4
SED-COMP-7	11/04/2012	49
SED-COMP-8	12/04/2012	43
AB-25-0COMP (0-1)	11/20/2014	71
AB-25-1COMP (0-1)	11/19/2014	158
AB-25-2COMP (0-1)	11/19/2014	115
AB-25-4COMP (0-1)	11/19/2014	96
SED-200ABC (0-1) COMP	10/15/2015	49
SED-201ABC (0-1) COMP	10/15/2015	266
SED-202ABC (0-1) COMP	10/15/2015	32
SED-203ABC (0-1) COMP	10/16/2015	120
SED-204ABC (0-1) COMP	10/16/2015	220
SED-205ABC (0-1) COMP	10/16/2015	93
SED-206ABC (0-1) COMP	10/16/2015	102
SED-207ABC (0-1) COMP	10/16/2015	56
SED-208ABC (0-1) COMP	10/19/2015	41
SED-209ABC (0-1) COMP	10/19/2015	151
SED-210ABC (0-1) COMP	10/19/2015	45
SED-211ABC (0-1) COMP	10/19/2015	105
SED-211ABC (0-1) COMP Dup (SED-250)	10/19/2015	102
	Min	4.4
	Mean	92
	90UCL	108
	Max	266

Notes:

pg/g = picograms per gram

90UCL = 90th percentile upper confidence limit on the mean

ppt = parts per trillion or ng/kg

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent

TEF = Toxicity equvalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.

Table D8
Dioxin Concentrations in Surface Samples Excluding TEQs Greater than 200 ppt (pg/g)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	2,3,7,8-TCDD TEQ
AB-23	02/02/2010	182
AB-28	02/02/2010	165
SED-COMP-1	04/13/2012	19
SED-COMP-2	04/13/2012	46
SED-COMP-3	12/04/2012	71
SED-COMP-3 Dup	12/04/2012	45
SED-COMP-4	11/04/2012	8.0
SED-COMP-5	11/04/2012	122
SED-COMP-6	11/04/2012	4.4
SED-COMP-7	11/04/2012	49
SED-COMP-8	12/04/2012	43
AB-25-0COMP (0-1)	11/20/2014	71
AB-25-1COMP (0-1)	11/19/2014	158
AB-25-2COMP (0-1)	11/19/2014	115
AB-25-4COMP (0-1)	11/19/2014	96
SED-200ABC (0-1) COMP	10/15/2015	49
SED-202ABC (0-1) COMP	10/15/2015	32
SED-203ABC (0-1) COMP	10/16/2015	120
SED-205ABC (0-1) COMP	10/16/2015	93
SED-206ABC (0-1) COMP	10/16/2015	102
SED-207ABC (0-1) COMP	10/16/2015	56
SED-208ABC (0-1) COMP	10/19/2015	41
SED-209ABC (0-1) COMP	10/19/2015	151
SED-210ABC (0-1) COMP	10/19/2015	45
SED-211ABC (0-1) COMP	10/19/2015	105
SED-211ABC (0-1) COMP Dup (SED-250)	10/19/2015	102
	Min	4.4
	Mean	80
	90UCL	93
	Max	182

Notes:

pg/g = picograms per gram

90UCL = 90th percentile upper confidence limit on the mean

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent

TEF = Toxicity equvalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.

Table D9

Interative Elimination of Highest Concentration Surface Sample Until 90UCL was 20 ppt or Less (pg/g)

Floragon Property

Molalla, Oregon

Sample ID	Sample Date	2,3,7,8-TCDD TEQ
SED-COMP-1	04/13/2012	19
SED-COMP-4	11/04/2012	8.0
SED-COMP-6	11/04/2012	4.4
	Min	4.4
	Mean	10
	90UCL	19
	Max	19

Notes:

pg/g = picograms per gram

90UCL = 90th percentile upper confidence limit on the mean

ppt = parts per trillion or ng/kg

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent

TEF = Toxicity equvalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.

Table D10
Dioxin Concentrations in AB-25 Sediment Samples (pg/g)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	2,3,7,8-TCDD TEQ
AB-25	02/02/2010	413
AB-25-0COMP (0-1)	11/20/2014	71
AB-25-1COMP (0-1)	11/19/2014	158
AB-25-2COMP (0-1)	11/19/2014	115
AB-25-3COMP (0-1)	11/19/2014	485
AB-25-4COMP (0-1)	11/19/2014	96
	Min	71
	Mean	223
	90UCL	331
	Max	485

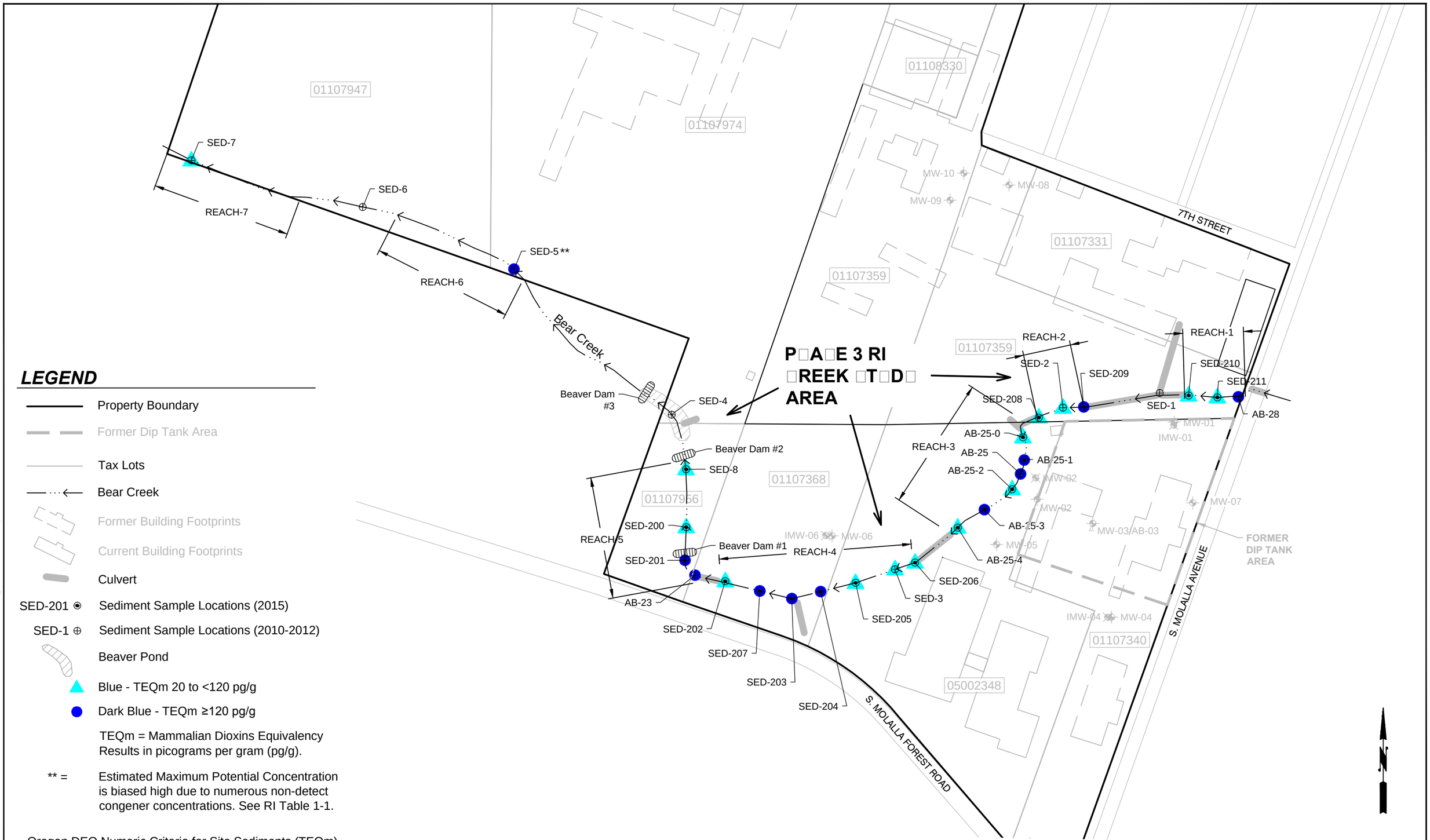
Notes:

pg/g = picograms per gram

90UCL = 90th percentile upper confidence limit on the mean

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD Equivalent

TEF = Toxicity equvalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.



LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Former Building Footprints
- Current Building Footprints
- Culvert
- SED-201 ⊙ Sediment Sample Locations (2015)
- SED-1 ⊕ Sediment Sample Locations (2010-2012)
- Beaver Pond
- Blue - TEQm 20 to <120 pg/g
- Dark Blue - TEQm ≥120 pg/g

TEQm = Mammalian Dioxins Equivalency Results in picograms per gram (pg/g).

** = Estimated Maximum Potential Concentration is biased high due to numerous non-detect congener concentrations. See RI Table 1-1.

Oregon DEQ Numeric Criteria for Site Sediments (TEQm)
Remedial Action Goal = 20 pg/g
Remedial Action Level = 120 pg/g

APPROXIMATE SCALE IN FEET
0 100 200 400

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
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DATE: 9-7-16
FILE NAME: 1177-01
DRAWN BY: JJT
APPROVED BY: CR

FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

BEAR CREEK SEDIMENT
SAMPLING LOCATIONS
(2010-2015)

Project No. 1177-01
Figure No. 1

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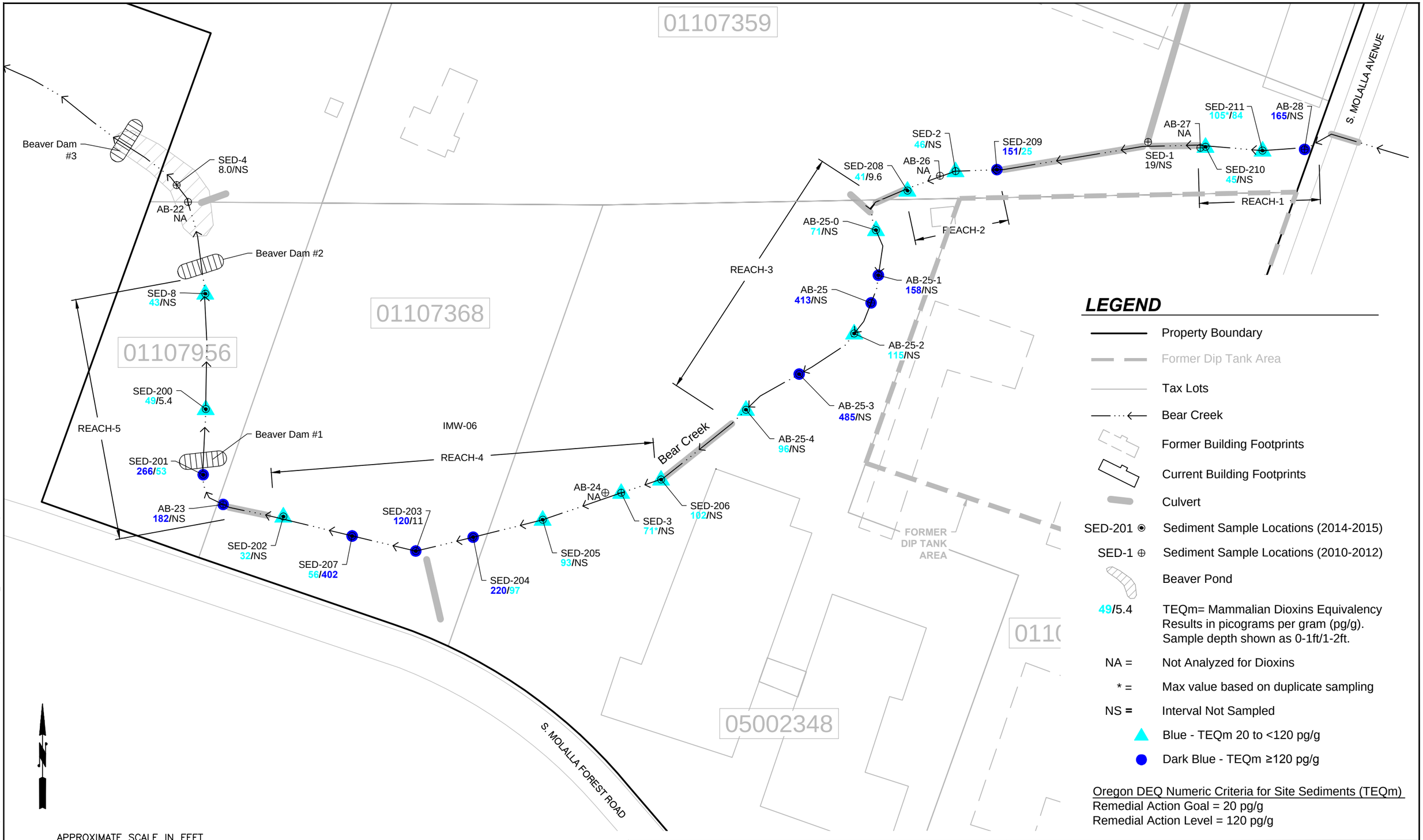

LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Former Building Footprints
- Current Building Footprints
- Culvert
- SED-201 — Sediment Sample Locations (2014-2015)
- SED-1 — Sediment Sample Locations (2010-2012)
- Beaver Pond
- 49/5.4 — TEQm= Mammalian Dioxins Equivalency Results in picograms per gram (pg/g). Sample depth shown as 0-1ft/1-2ft.
- NA = Not Analyzed for Dioxins
- * = Max value based on duplicate sampling
- NS = Interval Not Sampled
- Blue - TEQm 20 to <120 pg/g
- Dark Blue - TEQm ≥120 pg/g

Oregon DEQ Numeric Criteria for Site Sediments (TEQm)
Remedial Action Goal = 20 pg/g
Remedial Action Level = 120 pg/g

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FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

DIOXIN TEQm
BEAR CREEK SEDIMENTS AND
PHASE 3 RI CREEK STUDY AREA

Project No. 1177-01
Figure No. 2

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