Remedial Investigation Work Plan

Remedial Action Area of the Former DuPont Works Site
DuPont, Washington

Prepared for:

Mr. Andrew Smith
Department of Ecology
SWRO Toxics Cleanup Program
PO Box 47775
Olympia, WA 98504

Prepared by:

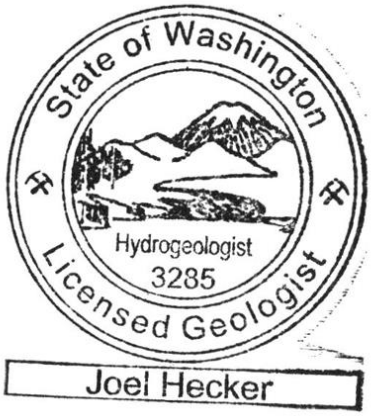
PIONEER TECHNOLOGIES CORPORATION

5205 Corporate Center Ct. SE, Suite A
Olympia, Washington 98503
Phone: 360.570.1700
Fax: 360.570.1777
www.uspioneer.com

June 2023

Professional Certification

This document was prepared under my direction. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I hereby certify that I was in responsible charge of the work performed for this document.



Joel Hecker
Senior Scientist/Hydrogeologist
PIONEER Technologies Corporation
Washington L.G. and L.HG. Registration No. 3285

June 27, 2023
Date

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List of Acronyms

Acronym	Explanation
Albatross	Albatross Estates, LLC
bgs	Below Ground Surface
CAP	Cleanup Action Plan
CFR	Code of Federal Regulations
COPCs	Constituents of Potential Concern
CSM	Conceptual Site Model
DuPont	E.I. DuPont de Nemours and Company
Ecology	Washington State Department of Ecology
ESM	ESM Consulting Engineers
FS	Feasibility Study
mg/kg	Milligrams per Kilogram
MMAN	Monomethylamine nitrate
MTCA	Model Toxics Control Act
MSU	Miscellaneous Small Unit
PCE	Tetrachloroethylene
PERC	Pacific Environmental Remediation Corporation
PERCCON	PERC Construction
PIONEER	PIONEER Technologies Corporation
QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	Risk Assessment
RAA	Remedial Action Area
RfD	Reference Dose
RI	Remedial Investigation
RL	Reporting Limit
SAP	Sampling and Analysis Plan
Site	Former DuPont Works Site
SL	Screening Level
TPH	Total Petroleum Hydrocarbons
TPH-D	TPH in the Diesel Range
TPH-HO	TPH in the Heavy Oil Range
WAC	Washington Administrative Code
Weyerhaeuser	Weyerhaeuser Company
Work Plan	RI Work Plan

SECTION 1: INTRODUCTION

1.1 Purpose

The purpose of this Remedial Investigation (RI) Work Plan (Work Plan) is to present the plan for implementing investigation activities that will characterize data gaps in the Remedial Action Area (RAA) of the former DuPont Works Site (Site), which is the portion of the Site currently owned by Albatross Estates, LLC (Albatross). This Work Plan is being prepared to meet the obligations associated with the Agreed Order (DE 21135) between Albatross and the Washington Department of Ecology (Ecology), effective October 6, 2022.

The Site was previously remediated under a consent decree between Weyerhaeuser Company (Weyerhaeuser)/E.I. DuPont de Nemours and Company (DuPont) and Ecology (No. 03-2-10484-7). To meet cleanup standards, restrictive covenants were filed with Pierce County to prohibit certain types of development (e.g., residential land use). The Site is currently in compliance with the consent decree and restrictive covenants and remains protective of human health and the environment under the current land uses. In fact, the Site was removed from the Hazardous Sites List in 2016. However, Albatross desires to develop the portions of the Site it owns (the RAA) for unrestricted (residential) land use. Albatross and Ecology entered into the Agreed Order referenced above for additional cleanup of the RAA to enable future residential use.

This Work Plan outlines specific investigation activities for the RI occurring within the RAA. Based on results obtained during the RI, subsequent phases of investigation activities may be conducted pursuant to the procedures described in this Work Plan. Following completion of all necessary phases of the RI, an RI/Feasibility Study (FS) Report will be prepared for the RAA.

1.2 Site and RAA Background

A brief overview of Site and RAA background information is presented in this section to provide context for the proposed RI activities. The information presented in this section is based on information previously presented in the RI (URS and PIONEER Technologies Corporation [PIONEER] 2003) and Closure Report (Pacific Environmental Remediation Corporation [PERC] and PIONEER 2007) developed for the Site under the DuPont Consent Decree, which includes the RAA, unless otherwise noted (see Figure 1).

1.2.1 General Facility Information

The RAA is located in southwestern Pierce County, within the City of DuPont, covering approximately 262 acres of the Site. The RAA is bordered by open space to the north and west, and residences to the east and south. The Home Course golf course separates the various parcels that comprise the RAA (see Figure 1). Burlington Northern Railroad is adjacent to the western open space and the Puget Sound is located to the west of the Burlington Northern Railroad.

1.2.2 Site and RAA History and Conditions

Native Americans originally inhabited the Site and surrounding areas including the RAA. European settlement began in 1832, when the Hudson's Bay Company established a cabin/storehouse adjacent to Puget Sound at the mouth of Sequalitchew Creek, northwest of the Site. In 1833, the Hudson's Bay Company built Fort Nisqually, which was located in the northern portion of the Site. Ten years later, a new Fort Nisqually was built at a location adjacent to, but outside the eastern edge of the Site.

DuPont acquired the Site and adjacent areas in 1906 and constructed an explosives-manufacturing plant and the Historical Village of DuPont as a company town for plant workers. The Historical Village of DuPont is approximately one mile southeast of the Site (see Figure 1). DuPont manufactured explosives until the mid-1970s, when it sold the Site and adjacent areas, including the RAA, to Weyerhaeuser. Historical Site features are shown on Figure 2. Weyerhaeuser purchased the Site to establish a deep-water export facility. After evaluating the Site, the goal was revised to the development of a master planned community (Northwest Landing). Weyerhaeuser and DuPont initiated clean-up discussions of the Site with Ecology and agreed to a consent decree in 1991 (revised in 2003). Under the consent decree, Weyerhaeuser and DuPont agreed to clean up remnants of the former manufacturing plant consistent with future area-specific uses including commercial, industrial, open space, and recreational (i.e., golf course).

Weyerhaeuser and its subsidiaries WRECO and Quadrant, developed approximately 2,500 acres in the area that they named Northwest Landing. The Home Course golf course was developed as part of the remediation of the Site and was completed in 2007. No other development has occurred within the RAA since 2007. The Site was divided into multiple tax parcels in 2007 and the parcels that include the RAA were sold by Quadrant to FR/CAL NW Landing LLC in 2007 who later sold the property to Albatross in 2018. Albatross is the current owner of the RAA. Land conditions within the RAA have remained unchanged since 2007.

1.2.3 RAA Current and Future Land Use

The RAA is currently vacant unused land. The anticipated future land uses of the RAA are single- and multi-family residential, as well as light industrial and mixed commercial use.

1.2.4 Environmental Setting

The Site is located in Western Washington, which is typified by relatively mild temperatures and a marine-influenced climate (Western Regional Climate Center 2023). The average annual precipitation for DuPont is approximately 48 inches, with most precipitation falling between October and April (Western Regional Climate Center 2023).

The regional geology is dominated by the Steilacoom Gravel, which constitutes the surficial soils of the Site extending to a depth of about 300 feet below ground surface (bgs). The Steilacoom Gravel consists of brown and gray stratified sands and gravels, with cobbles and occasional zones of siltier sand. Below the Steilacoom Gravel is the Vashon Till, which consists of a high-density, high-silt-content till that makes it a weak aquitard. The Vashon Till is underlain by the Vashon Advance Outwash, deposited by

glacial rivers or streams during the advance of the Vashon glaciation. The Advance Outwash becomes finer grained with depth, typical of advance outwash deposition. Below the Advance Outwash is the Olympia Beds/Possession Drift/Whidbey Formation/Double Bluff Drift sequence (the DBD-OB sequence), which is a fine-grained, interglacial deposit, approximately 70 to 100 feet thick, and very heterogeneous regionally. Below the DBD-OB sequence is the Salmon Springs Glaciation, which was deposited in the glacial period preceding the DBD-OB sequence interglacial. Regional information indicates that the formation is 70 to 120 feet thick and contains zones of organic silt and till (URS and PIONEER 2003).

Two aquifers occur beneath the Site; the shallow Water Table Aquifer extends from 20 to 105 feet bgs and the deeper Sea Level Aquifer is located between 160 and 215 feet bgs. Across most of the Site, the relatively impermeable aquitard restricts vertical flow of groundwater and separates the Water Table Aquifer from the deeper Sea Level Aquifer. This aquitard is absent west of the "Cutoff", which is located 500 to 2,500 feet east of Puget Sound and roughly parallel to the shoreline. The "Cutoff" is the western extent of the Water Table Aquifer and the point at which the Sea Level Aquifer becomes unconfined. Groundwater in the Water Table Aquifer flows west-northwest, with local discharge via springs to upper Sequalitchew Creek. Groundwater in the Sea Level Aquifer flows west-northwest and discharges west of the "Cutoff" as seeps to the Puget Sound (URS and PIONEER 2003).

Old Fort Lake and Sequalitchew Creek are located on the Site, but neither is located within the RAA. No surface water bodies are present in the RAA (see Figure 1).

1.2.5 Investigation and Remediation Chronology

A brief summary of the investigation and remediation actions that have taken place on the Site to date are presented below.[1] Full details on the investigations and remediation completed to date can be found in the RI (URS and PIONEER 2003), Cleanup Action Plan (CAP; West Shore Corporation NW and PIONEER), and Closure Report (PERC and PIONEER 2007) for the Site.

- In 1985, studies were conducted to determine whether hazardous substances were present.
- In 1986, a Phase I Site Survey and Review was performed to identify areas of environmental concern on Site.
- In 1986, soil contamination was documented and reported to Ecology.
- In 1987, a Phase II Site Characterization study was performed.
- In 1989, a Baseline Human Health Risk Assessment (RA) was conducted.
- In 1991, Weyerhaeuser and DuPont signed a consent decree with Ecology, in which they agreed to study the Site and complete an RI, RA, and FS.
- In 1994 and 1995, draft RI, RA, and FS reports were submitted to Ecology.
- Between 1990 and 2002, while studies and negotiations were ongoing, Weyerhaeuser and DuPont undertook interim source removal actions to cleanup soil and/or debris at the Site, in accordance with the Model Toxics Control Act (MTCA) and the consent decree.

[1] Investigations and cleanup actions on the Site include the area covered by the RAA.

- In 2003, to fulfill the provisions of the consent decree, final RI, RA, and FS reports were prepared and submitted to Ecology for approval.
- In 2003, Weyerhaeuser and DuPont completed the detailed design and implementation of the remedial measures selected by Ecology in the CAP. This decision was captured in a new consent decree, which was agreed to by Weyerhaeuser and DuPont and Ecology.
- In 2006, Weyerhaeuser filed restrictive covenants on all property parcels within the Site prohibiting residential uses, and the covenants were recorded by the Pierce County Assessor's Office.
- In 2007, Weyerhaeuser and DuPont completed the remedial measures selected by Ecology in the CAP. Ecology confirmed completion of all active cleanup elements under the 2003 consent decree.
- In 2016, Ecology removed the Site from the Hazardous Sites List. The Site, a portion of which includes the RAA, remains subject to a restrictive covenant, and the Site will be reviewed every 5 years by Ecology in periodic reviews. Ecology also reported that groundwater monitoring requirements have been met.

1.3 Regulatory Context

This RI is currently being conducted as part of the Agreed Order (DE 21135) between Albatross and Ecology, with the goal of remediating the RAA to allow unrestricted land uses. The Agreed Order covers the full extent of the RAA and no other portions of the former DuPont Works site.

1.4 Work Plan Organization

This Work Plan is organized as follows:

- Section 2: Conceptual Site Model (CSM) and Screening Levels (SLs)
- Section 3: Nature and Extent of Contamination
- Section 4: Existing RI Data Gaps
- Section 5: Sampling and Analysis Plan (SAP)
- Section 6: Quality Assurance Project Plan (QAPP)
- Section 7: References

SECTION 2: CONCEPTUAL SITE MODEL AND SCREENING LEVELS

A CSM was developed for the Site, including the RAA, prior to the initial remediation and is presented in the Human Health and Ecological RA (PIONEER Technologies Corporation [PIONEER] 2003). The 2003 CSM with updates, is summarized below.

2.1 Potentially Affected Media

The 2003 CSM determined that potentially affected media at the Site included surface and subsurface soil, surface water (Old Fort Lake and Sequalitchew Creek), sediment (Old Fort Lake and Sequalitchew Creek), and groundwater.

It was determined that the concentrations of constituents of potential concern (COPCs) in surface water and sediment were not of concern for protection of human and ecological receptors. Therefore, Ecology determined that no further action was warranted for these media (Ecology 1996 and PIONEER 2003). Ecology later verified that No Further Action was required for sediment and surface water at the Site (Ecology 2016a).

Groundwater was eliminated in the 2003 RA as potentially affected media due to the limited leachability of the remaining contaminants (PIONEER 2003). Periodic groundwater monitoring occurred at the Site until 2014 (PIONEER 2014), at which time Ecology deemed it no longer necessary (Ecology 2016a). All groundwater concentrations were less than the MTCA Method A surface water cleanup levels (PIONEER 2014). In addition, all potential groundwater exposure pathways are considered incomplete. Based on review of the Washington State Water Wells Reports, there are no water supply wells located within a half-mile radius from the Site. One of the City of DuPont's municipal wells is located approximately 0.62 miles southwest of the RAA.

Vapors were eliminated as potentially affected media as well, based on historical cleanup actions and the relative lack of volatiles and semi-volatiles in soil (of the 213 constituents evaluated in the 2003 RA for the Site, only tetrachloroethylene PCE was identified for a remedy in the FS and it was focused on a portion of the now golf course, outside of the RAA).

As such, the only potentially affected media on the Site is surface and subsurface soil.

2.2 Pathways and Receptors

Potential receptor scenarios and exposure through direct and indirect contact were identified in the initial CSM (PIONEER 2003). Potential exposure scenarios includes residential, occupational, construction, and excavation workers being exposed to constituents in soil via inhalation, ingestion, and dermal contact.

The CSM will be revised during the RI/FS consistent with future unrestricted land use. As the CSM is refined, receptor scenarios and exposure pathways will be reassessed to determine if they are complete

or incomplete. When a pathway is determined to be potentially complete, it will be retained for further evaluation. When a pathway is found to be incomplete, risk does not exist and that pathway will be eliminated from the revised CSM.

2.2.1 Potential Human Receptors

Based on zoning, current Site use, and likely future residential land use, potential human receptors include:

- Adults and children in a residential setting;
- Adult construction-workers during remediation; and
- Adult excavation-workers during remediation.

2.2.2 Ecological Receptors

The previous remediation activities in the RAA included removing all trees and the top 1 foot of soil. This eliminated the entirety of natural potential ecological habitat. Currently, the RAA area is covered by scotch broom which is an invasive species.

2.3 Screening Levels

As discussed in Section 1 and above, the Site was previously remediated to comply with site-specific cleanup levels, which are generally higher than those SLs appropriate for unrestricted land use. The most appropriate SLs to evaluate the current conditions of the Site based on planned unrestricted land use are described below for those constituents requiring additional evaluation:[2]

- The arsenic SL defaults to the natural Puget Sound background concentration of 20 mg/kg, per WAC 173-340-740(5)(c) (Ecology 2023).
- The lead SL is the terrestrial ecological SL of 118 mg/kg, per WAC 173-340-7493, previously agreed to by Ecology and discussed in the Risk Assessment (RA) (PIONEER 2003).
- The total petroleum hydrocarbon (TPH) soil direct contact SLs were calculated by Ecology for default TPH compositions when developing Method A soil cleanup levels (Ecology 2001a and 2001b).[3]
- The nitrobenzene SL defaults to the MTCA Method B soil-to-groundwater SL of 0.064 milligrams per kilogram (mg/kg), per Washington Administrative Code (WAC) 173-340-740 (Ecology 2023).[4]
- A Site-specific unrestricted land use SL of 1,904 mg/kg was calculated for monomethylamine nitrate (MMAN). The United States Environmental Protection Agency (EPA) has not published toxicity information or toxicity values (e.g., reference dose [RfD]) for MMAN; therefore, published SLs do not exist for this constituent. However, PIONEER developed an RfD and calculated site-specific SLs, approved by Ecology, as part of the Final RA (PIONEER 2003). Using

[2] A full evaluation and derivation of SLs for all analyzed constituents on the Site, including the RAA, was completed in the Current Conditions Report (PIONEER 2023). The constituents specifically referenced in this section are those that exceeded the SLs at one or more sample locations within the RAA.

[3] A SL of 7,600 mg/kg for TPH as Bunker C fuel was previously approved by Ecology in the RA (PIONEER 2003).

[4] During a meeting with Ecology on May 11,2023, it was agreed that nitrobenzene concentrations in soil would be compared to the MTCA Method B soil-to-groundwater SL, even though the soil-to-groundwater pathway is considered incomplete. During the RI/FS, the nitrobenzene soil-to-groundwater pathway will be further evaluated.

the same exposure factors but adjusting the exposure frequency to 365 days to match the MTCA residential exposure frequency, a site-specific residential SL for MMAN was calculated.

SECTION 3: NATURE AND EXTENT OF CONTAMINATION

The nature and extent of constituent concentrations within the RAA was extensively characterized prior to remediation. Thousands of additional confirmation samples were collected after remedial activities were completed. In total, over 10,900 soil samples have been collected from the Site, including approximately 2,790 representing in-place soil samples considered representative of current soil conditions in the RAA (see Figure 3). This section summarizes the nature and extent of contamination in soil within the RAA.

3.1.1 Unrestricted Land Use Screening Level Exceedances

Soil sample results were compared to the SLs for unrestricted land use as documented in the Current Conditions Report (PIONEER 2023), prepared for the City of DuPont, and Data Summary Report (PERC 2023). SL exceedances are shown on Figure 4 and summarized below by constituent.

3.1.1.1 Arsenic

Prior to remediation, elevated arsenic concentrations were located throughout the RAA and especially correlated with narrow gauge railroad track locations. Arsenic was sprayed along the rail lines and building foundations to inhibit weed growth in order to prevent potential fires. The Tacoma Smelter Plume was also responsible for generating Sitewide arsenic concentrations generally between 40 and 100 mg/kg (Ecology 2022b).

After remedial activities were completed (Sitewide removal of one foot of soil, interim remedial actions (IRAs), and miscellaneous small unit [MSU] remediation), arsenic remains in soil at concentrations greater than 20 mg/kg (Puget Sound natural background). A total of 271 arsenic samples representing in-place soil exceed 20 mg/kg (see Figure 4). The SL exceedances are generally focused:

- On the eastern edge of the RAA (within CM-08) where surface soil was not removed and compliance with the commercial cleanup level was obtained through selective soil remediation, and
- Along the southeastern RAA perimeter.

The highest in-place arsenic concentrations are located in CM-08.

3.1.1.2 TPH Compounds

Soil in the RAA has historically been analyzed for many different petroleum compounds including Bunker C fuel, diesel fuel, Fuel Oil #6, gasoline, Kensol, kerosene, motor oil, oil & gas, Stoddard solvent, and generic TPH via Method 418.1 (generally to represent Bunker C fuel). Based on samples representative of in-place soil, there are currently only four locations in the RAA with exceedances of unrestricted SLs associated with motor oil, oil & grease, or generic Method 418.1 (for Bunker C fuel). The remaining petroleum compounds were either not detected or did not exceed SLs in samples representative of in-place soil.

One soil sample representative of in-place soil contains **motor oil** at a concentration of 3,000 mg/kg, greater than 2,000 mg/kg SL for TPH in the diesel range (TPH-D) and TPH in the heavy oil range (TPH-HO). The sample was collected in 1992 from the northern portion of the RAA, at a depth of 14.5 to 15 feet bgs, which is the MTCA point of compliance for unrestricted land use (see Figure 4). All confirmation samples collected in 2003 and 2004 and representing in-place soil were less than half of the motor oil SL.

Two samples representative of in-place soil contain **oil & grease** at concentrations greater than the SL (2,000 mg/kg for TPH-D and HO), collocated at different depths in the southeast portion of the RAA (see Figure 4). The samples were collected at depths of 0 to 3 feet bgs (20,000 mg/kg) and 3 to 6 feet bgs (4,700 mg/kg). The remainder of samples representative of in-place soil are either non-detect for oil & grease or contain concentrations significantly less than the SL. All oil & grease samples were collected in 1986 and 1987; oil & grease was not analyzed in soil after remediation was completed.

One sample representative of in-place soil contains TPH via Method 418.1 (associated with **Bunker C fuel**) at a concentration of 36,000 mg/kg, greater than the 2,000 mg/kg SL for TPH-D and HO. The sample was collected at a depth of 3 to 5.5 feet bgs in 1992 in the southeast portion of the RAA (see Figure 4). A second collocated (and possibly duplicate) sample contained TPH at a concentration of 3,600 mg/kg, lower but still exceeding the 2,000 mg/kg SL. The remaining soil samples analyzed using TPH Method 418.1 and representing in-place soil are less than the 2,000 mg/kg SL. All TPH via Method 418 soil samples were collected in 1992 and 1993.

3.1.1.3 Nitrobenzene

A total of 91 samples analyzed for nitrobenzene within the RAA are considered representative of current conditions. The samples were collected between 1992 and 2004. Although nitrobenzene was not detected above the laboratory reporting limit (RL) in any of the samples, the laboratory RL was elevated above the SL in 65 of the 91 samples. As a result, it is possible that nitrobenzene is present at concentrations exceeding the SL (although below the RL at the time of sampling) in 65 locations within the RAA (see Figure 4).

3.1.1.4 MMAN

Only two samples representative of in-place soil contain MMAN at concentrations greater than the SL (1,904 mg/kg), collocated at different depths within in the southeast portion of the RAA (see Figure 4). The samples were collected in 1987 at depths of 0 to 3 feet bgs (3,600 mg/kg) and 3 to 6 feet bgs (30,000 mg/kg) from test pits advanced in a former works magazine landfill area. The remainder of samples representative of in-place soil are either non-detect for MMAN or contain concentrations significantly less than the SL.

SECTION 4: EXISTING RAA RI DATA GAPS

Approximately 2,790 representative samples characterize the current soil conditions within the RAA. As such, the need for additional data collection and the focus of the RI is limited to filling in the identified data gaps discussed below. The laboratory analytical results of the previously collected samples were reported in the Closure Report for the Site, which includes the data for the RAA (PERC and PIONEER 2007).

RI data gaps were identified by evaluating the former sampling locations and reported exceedances compared to SLs to identify areas with 1) no sampling results, 2) isolated exceedances based on 1980s to early 2000s data, or 3) laboratory RLs greater than the SL. The following RI data gaps were identified:

- The concentrations of arsenic and lead in shallow soil at locations not sampled as part of the post-remediation confirmation sampling.
- The validity of isolated SL exceedances of TPH-related constituents and MMAN in soil. Based on the time elapsed since analyses were completed and the improved laboratory methods currently available to analyze these constituents, the reported SL exceedances may not be accurate. Specifically, for MMAN, the wet climate, very high MMAN solubility, presence of gravel-rich soil, and propensity for MMAN break down via ultraviolet rays has likely drastically reduced MMAN concentrations in soil in the 35 years since sampled.[5]
- The presence of nitrobenzene in soil at locations where historical data contained elevated laboratory RLs greater than SLs. The historical nitrobenzene samples with elevated laboratory RLs cannot be relied upon to make remediation decisions.

Additional RI data gaps may be identified in the future based on the RI results. The locations to be investigated during the RI will occur only within the boundaries of the RAA.

[5] No Ecology- or USEPA-approved analytical method for MMAN in soil exists. Multiple laboratories have been contacted and are unable/unwilling to develop a laboratory method for evaluating MMAN in soil (e.g., Eurofins, Specialty Analytical, APPL, Apex, Libby Environmental, and Southwest Research Institute). Since laboratory confirmation sampling is not available, the soils potentially containing the MMAN exceedances will not be re-evaluated but rather remediation methodology will be evaluated in the FS. Due to MMAN's fragility and nature to breakdown when exposed to ultraviolet rays, landfarming/rototilling the soil may be an option.

Section 5: SAMPLING AND ANALYSIS PLAN

The purpose of this sampling and analysis plan (SAP) is to present the methodology for collecting and analyzing soil samples pursuant to this Work Plan in accordance with WAC 173-340-820 and applicable components of Ecology guidance (Ecology 1995). Typical background contents of a stand-alone SAP are not repeated if included elsewhere in this Work Plan.

5.1 Sampling Design for RAA RI

A comprehensive sampling program was developed in order to address the RI data gaps summarized in Section 4. The objectives, sampling details, anticipated number of samples, and the constituents to be analyzed for the RI sampling activities are presented in Table 1. The specific coordinates and depths of each proposed sample are shown in Table 2. The proposed sampling locations are shown on Figure 5.[6,] In summary, the four sampling activities for RI Phase 1 include:

1. Collecting a total of 93 composite samples for arsenic and lead analysis to fill data gaps in the 2007 confirmation sampling grid. These samples will be collected from previously remediated areas of the Site. Five-point composite samples will be collected on a 75 foot-grid, identical to the grid used to collect confirmation samples as part of the previous Site-wide remediation.
2. Collecting a total of 4 discrete samples for TPH-D/HO analysis to confirm bunker C fuel, motor oil, and oil & grease exceedances reported in late 1980s and early 1990s data.
3. Collecting a total of 62 discrete samples for nitrobenzene analysis to confirm samples reported as 'non-detect' in the historical dataset are less than the 0.064 mg/kg SL.

5.2 Sampling Design for Additional RI Phases

It is expected that additional RI activities may be conducted following completion of the specific investigation activities identified in Section 5.1. For instance, based on results of the TPH-D/HO analysis, it may be necessary to advance additional soil borings to delineate SL exceedances. It is expected that all additional RI activities will be conducted using the procedures described in this Work Plan. If necessary, the planning of additional RI activities will be documented with a brief addendum to this Work Plan (e.g., a sampling design table, a sampling design figure, and any modifications to procedures in the Work Plan).

5.3 Investigation Roles and Responsibilities

The project team for implementing this SAP includes representatives from PIONEER, PERC, Coastline Law Group, PERC Construction (PERCCON), Holocene Drilling, ESM Consulting Engineers (ESM), and Libby Environmental. The specific roles and responsibilities that are anticipated for key personnel involved in this investigation project are summarized in Table 4.

[6] Actual locations will be adjusted as necessary in the field based on utilities, obstructions, access, or other field considerations.

5.4 Pre-Mobilization Tasks

Before the commencement of field work, PIONEER will:

- Subcontract and coordinate work with ESM, Holocene Drilling, and Libby Environmental.
- Coordinate with PERC and Coastline Law Group about the proposed fieldwork schedule.
- Coordinate with Albatross personnel regarding proposed sampling locations and access.
- Perform utility locates for proposed drilling locations by calling the Washington Call Before You Dig phone number.
- Complete health and safety preparation tasks.
- Coordinate with the laboratories regarding key elements of the SAP / Quality Assurance Project Plan (QAPP).
- Obtain all necessary equipment and supplies.

In addition, prior to drilling or advancing test pits to collect soil samples, PERC will coordinate brush-hogging and clearing of the RAA to provide access to each proposed sampling location. PERC will also coordinate with PERCCON to contract with a mini-excavator for advancing shallow test pits (see below).

5.5 Field Investigation Procedures

5.5.1 Surveying Sample Points

Prior to the field team collecting samples, licensed surveyors with ESM will determine and stake the horizontal location of each proposed sample location using a Trimble GeoXH global positioning system unit or similar unit. The horizontal accuracy will be approximately one foot.

5.5.2 Test Pit Advancement and Soil Sampling

Due to gravel-rich soils, PERCCON will use a mini-excavator (e.g., Bobcat E85) to advance test pits and facilitate collection of soil samples from the uppermost five feet of soil. No personnel will enter excavations greater than two feet deep. The bucket of the excavator will be used to collect soil samples and all excavations will be backfilled.

5.5.3 Drilling and Soil Sampling

A driller licensed in Washington State per WAC 173-162 will complete all drilling activities to collect samples at depths greater than five feet bgs. Due to gravel-rich soils, soil borings will be advanced using a hollow stem auger rig. Sample cores will be collected from each boring using a split-spoon sampler, dual tube sampler, or similar. Once all soil samples have been collected from a given soil boring, the driller will decommission the soil boring in accordance with WAC 173-160.

PIONEER will examine and classify sample cores according to the Unified Soil Classification System, and will note any visual or olfactory observations associated with potential contamination. Soil sample interval expectations and constituents to be analyzed are presented in Table 1. Key details about the laboratory analyses and sample containers are included in Section 5.6. PIONEER field personnel will log borehole lithology, and record drilling and soil sampling activities using the forms included in Appendix A.

5.5.4 Equipment Decontamination Procedures

Non-dedicated sampling equipment (e.g., excavator bucket, split-spoons, and augers) will be decontaminated in accordance with the following procedures:

- All non-dedicated equipment will be cleaned before use.
- The excavator bucket will be dry-brushed with a stiff-bristled broom to remove caked and loose soil after the collection of each soil sample.
- Following use at each sampling location, the affected portions of non-dedicated drilling and sampling equipment will be scrubbed with potable water containing diluted detergent (e.g., Liquinox) before being sufficiently rinsed with potable water.
- All water generated during decontamination will be managed as investigation-derived waste.

5.5.5 Field Recordkeeping

PIONEER will complete the following forms to document each sampling event (see Appendix A):

- Field Checklist, which is used to assist with planning and coordination prior to a field event, and to document completion of field activities.
- Daily Field Report, which is used to document miscellaneous field activities on a daily basis (e.g., miscellaneous field notes, miscellaneous sampling notes).
- Subsurface Sampling Field Log, which is used to record drilling, lithologic (e.g., color, grain size, moisture, detail), and associated sampling details.

In addition, representative photographs should be taken as necessary to support documentation of the field investigation procedures and each sample location will be GPS surveyed as discussed in Section 5.5.1.

5.6 Laboratory Analyses and Sample Containers

The constituents to be analyzed during the RI are presented in Table 1 and include:

- Arsenic (via EPA Method 7010)
- Lead (via EPA Method 7010)
- TPH-D and TPH-HO (via Ecology Method NWTPH-Dx)
- Nitrobenzene (via EPA Method 8270E)

Laboratory analyses will be performed for soil samples collected pursuant to this Work Plan. The analytical methods, sample container expectations, preservation requirements, and holding times relevant to the constituents being analyzed are presented in Table 4.

Requirements associated with filling soil sample containers include:

- Sample containers will be provided by the laboratories.
- Unless otherwise noted below, sample containers will be filled until almost full in order to provide the laboratory with sufficient sample volume.
- Particles larger than approximately 1/4-inch should not be included in soil sample containers.

5.7 Sample Labeling and Shipment

5.7.1 Sample Labeling

Sample labels will clearly indicate the Site location, sample number identification, date, time, sampler's initials, parameters to be analyzed, and added preservative (if any). Each sample will be individually labeled. Each sample number identification will be unique and will adhere to the PIONEER sample number schema included in Appendix B.

5.7.2 Chain-of-Custody Documentation

Chain-of-custody procedures will be followed to maintain and document sample possession. A sample is considered under a person's custody if it is in that person's physical possession, within visual sight of that person after taking physical possession, secured by that person so that the sample cannot be tampered with, or secured by that person in an area that is restricted to unauthorized personnel.

The originator (the sampler) will complete requested information on the custody record, including signature and date. Original signed custody records listing the samples in the cooler will accompany sample shipments.[7] The originator of the custody record will retain a copy of the custody record.

5.7.3 Sample Shipment

Sample packaging and shipping procedures are based on USEPA specifications and United States Department of Transportation regulations as specified in 49 Code of Federal Regulations (CFR) 173.6 and 49 CFR 173.24. Samples will be delivered on ice to Libby Environmental by the field team. Libby will ensure any subcontracted analysis samples will be packed in coolers with bubble wrap, bags, and ice in a manner to achieve preservation requirements while also preventing breakage of sample containers and leakage of melting ice during transport to the subcontracted lab.

5.8 Investigation-Derived Waste

The following types of investigation-derived waste will be generated during sampling activities and will be handled as follows:

- Cuttings from soil borings will be placed in sealed and labeled drums, and temporarily stored in a secure area of the Site.
- Decontamination water will be placed in sealed and labeled drums, and temporarily stored in a secure area of the Site.
- Personal protective equipment (e.g., nitrile gloves) and other disposable sampling equipment will be disposed of as solid waste in the standard municipal solid waste stream.

All drummed investigation-derived waste will be characterized and if exceeding SLs, removed by a licensed waste transporter for off-Site treatment and/or disposal at a facility permitted to accept the waste. Cuttings from soil borings may be reused as backfill if constituent concentrations do not exceed SLs.

[7] More than one custody form may be needed per cooler to list all the samples contained in the cooler.

5.9 Inadvertent Discovery Plan

An Inadvertent Discovery Plan detailing plans and procedures for the discovery of cultural resources and human skeletal remains is included as Appendix C. Prior to the start of the field investigation the Nisqually Tribe will be consulted to develop clear line of communication related to any inadvertent discoveries.

5.10 Schedule

The following schedule is anticipated for the completion of this investigation. The work will begin once Ecology approves this work plan. All days listed are work days, i.e., NOT calendar days.

Schedule for Field Investigation	Duration in Work Days
Surveying Locations and Clearing of Locations	10
Sampling of newly-identified arsenic and lead locations	5
Resampling of TPH-D/HO locations	1
Resampling of nitrobenzene locations	5
Laboratory Analyses of confirmation samples	20
Evaluation of data	5
Creation of RI Report	45
TOTAL	**91**

Section 6: QUALITY ASSURANCE PROJECT PLAN

The purpose of this QAPP is to summarize the methodology for ensuring usable sampling and analysis data of acceptable quality are generated. This QAPP was prepared in general accordance with WAC 173-340-820 and Ecology guidance (Ecology 2016b).

Typical contents of a stand-alone QAPP are not repeated if included elsewhere in this Work Plan. For instance, requirements for laboratory analytical methods, sample containers, preservation, and holding times are already described in the SAP. Likewise, field procedures associated with quality assurance (e.g., equipment decontamination, field recordkeeping, sample identification schema, sample handling and shipment) are already described in the SAP.

6.1 Field Quality Control Samples

Field quality control (QC) samples will include field duplicates, a matrix spike/matrix spike duplicate[8], and cooler temperature blanks. Unless otherwise noted, field QC samples will be handled, preserved, and documented in the same manner as primary samples. The frequency expectation for each type of field QC sample is listed below:

- Field duplicates: One field duplicate per 20 soil samples
- Matrix spike/matrix spike duplicate: one soil sample
- Cooler temperature blanks: One per cooler of soil samples

Field duplicates and the matrix spike/matrix spike duplicate will be collected at random locations selected by the field sampling team. Field duplicate and matrix spike/matrix spike samples will be collected simultaneously with the primary sample using the same sample collection and preparation techniques. Blind duplicates will not be collected; rather, the duplicate sample will be identified with the same Site ID as the primary sample. Field duplicates and the matrix spike/matrix spike duplicate will be analyzed for the same constituents as the primary sample.

6.2 Laboratory Quality Control Samples

Libby Environmental will be responsible for conducting laboratory QC procedures and reporting laboratory QC results in accordance with the analytical methods and their standard operating procedures. Laboratory QC samples provide important qualitative results used to evaluate the laboratory QC procedures. Laboratory QC samples for applicable analyses will include method blanks, laboratory control samples (also known as blank spikes), matrix spikes, and matrix spike duplicates once per batch of analyses. Expectations for laboratory control limits for laboratory control samples, matrix spikes, and matrix spike duplicates are presented in Table 5. In addition, it is also expected that Libby

[8] Matrix spikes and matrix spike duplicates are lab QC samples, but are also included with the field QC samples since the field sampling team is responsible for ensuring that appropriate sample volumes are collected for analysis of matrix spikes and matrix spike duplicates.

Environmental will perform and report results of surrogate recovery for every sample, when applicable. Expectations for laboratory control limits for surrogate recoveries are shown in Table 5.

6.3 Laboratory Target Reporting Limits

Analytical methods and laboratories have been selected to achieve low target RLs. The constituents being analyzed in each medium and a comparison of target RLs with the corresponding SLs for unrestricted use are presented in Table 6. All the target RLs are less than the corresponding SLs for unrestricted land use. Therefore, the target RLs are considered appropriate for the purposes of this investigation.

6.4 Data Quality Review and Validation

An evaluation of data quality will be performed for all field and lab data. Specifically, field records will be reviewed by PIONEER for completeness, accuracy, and legibility. The laboratories will review their results relative to method criteria and laboratory QC procedures as the data are generated. The laboratories will report their QC results and qualify data as necessary in a report suitable for a Level II data validation. PIONEER will evaluate precision, accuracy, representativeness, comparability, completeness, and sensitivity by reviewing the following items relative to analytical method criteria, laboratory control limits, and national functional guidelines (USEPA 2016a, 2016b) as necessary:

- Comparison of actual analyses versus requested analyses
- Comparison of consistency between laboratory reports and associated electronic data deliverables
- Holding times
- Field QC sample results
- Lab QC sample results
- Actual laboratory RLs

This may result in the rejection or data or addition of other qualifications in addition to the laboratory qualifications. The data quality review documentation will be included with the applicable laboratory reports for reporting purposes.

6.5 Corrective Action

The need for corrective action will be evaluated as appropriate for deviations from the SAP/QAPP and other potential data quality issues that arise in the field or the laboratory. Relatively minor field issues will be discussed, resolved, and documented by the PIONEER Project Manager, PIONEER Field Team Lead, and/or laboratories. Corrective action decisions will be situation-dependent. Potential corrective action decisions may include one or more of the following:

- Revising the sampling and analysis methodology
- Collecting a new sample
- Reanalyzing an existing sample
- Accepting the data with a recognized level of uncertainty
- Revising the sampling design

SECTION 7: REFERENCES

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Figures

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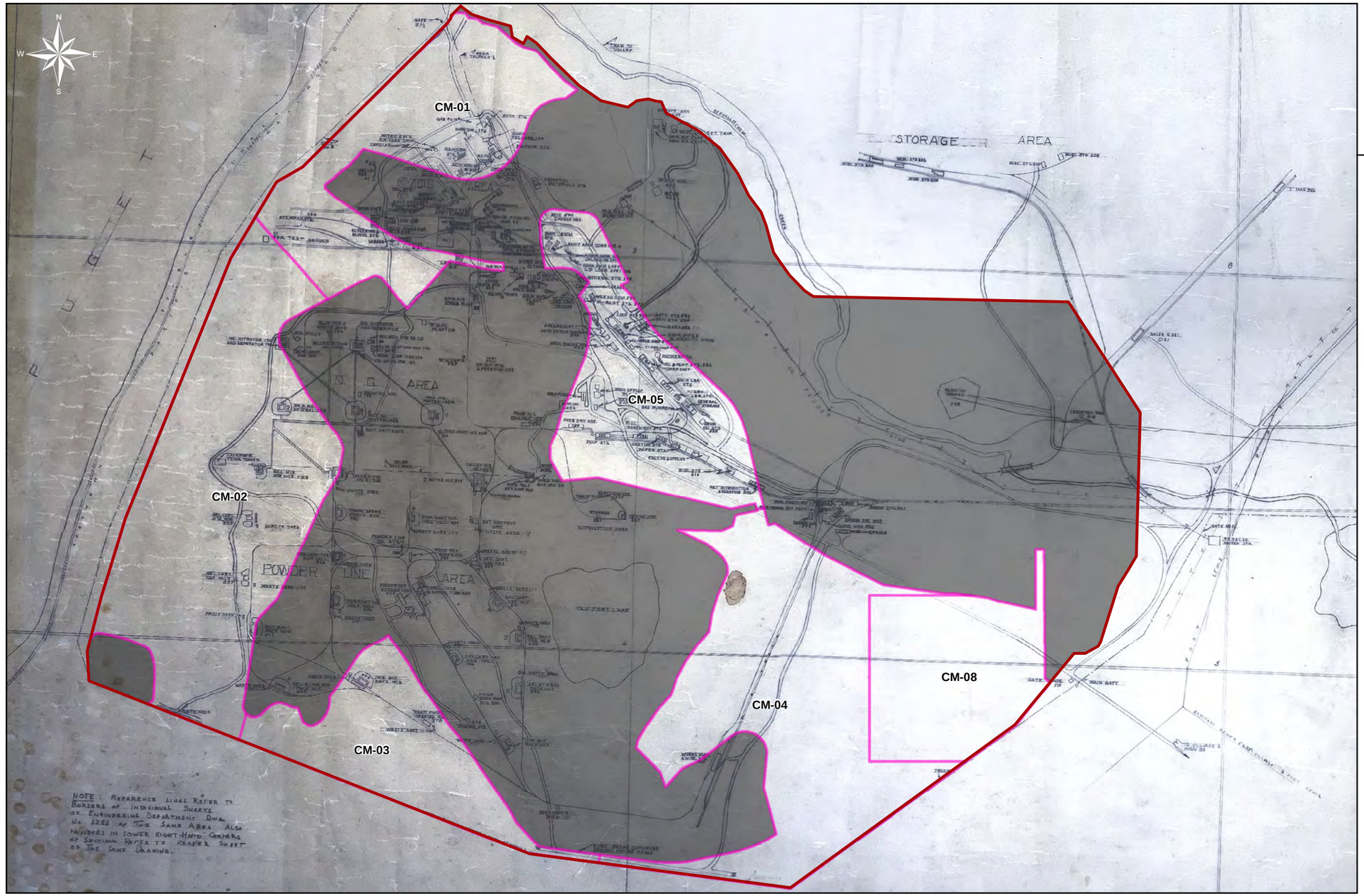
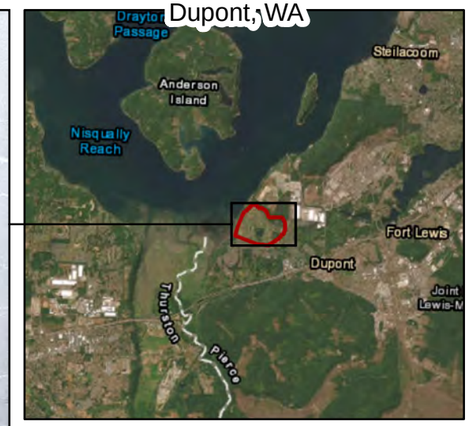
Former DuPont Works Site Vicinity Map
Ri Work Plan
Remedial Action Area of the Former DuPont Works Site

Figure 1

Document Path: G:\Projects\City of DuPont\Maps\2023\RI Work Plan\Figure 1_FormerDuPontWorksSiteVicinityMap_2023.mxd; Author: MCK; Date Saved: 6/21/2023





Legend

- Remedial Action Area (Albatross-owned Property)
- Former DuPont Works Consent Decree Boundary
- Property Owned by Others

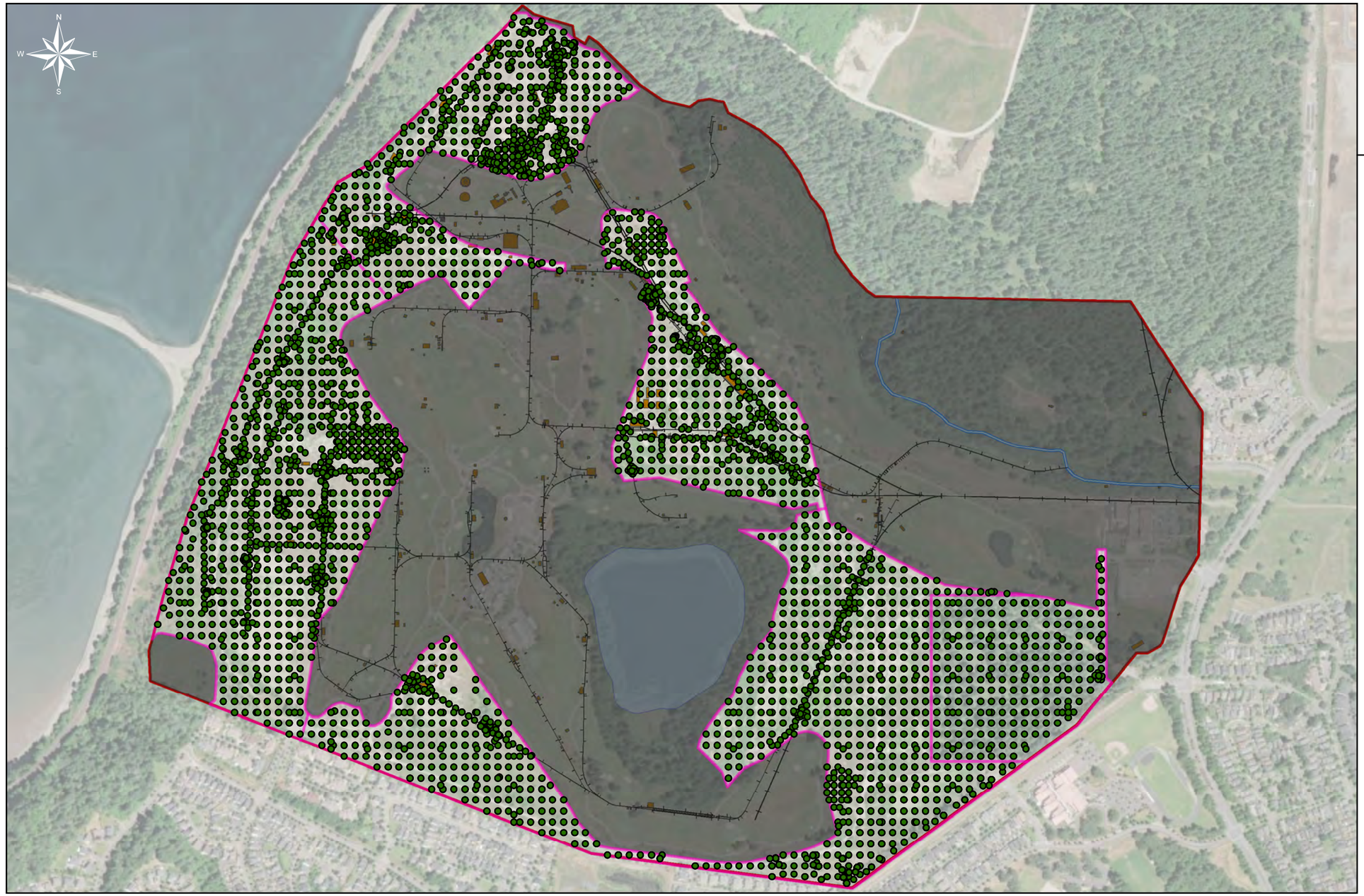
0 300 600 900 1,200 1,500 Feet

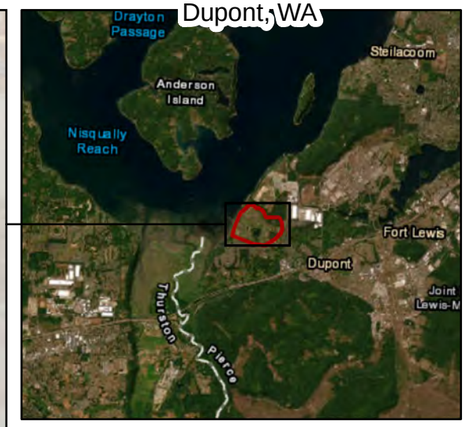
PIONEER TECHNOLOGIES CORPORATION

Historical Site Features
RI Work Plan
Remedial Action Area of the Former DuPont Works Site

Figure 2

Document Path: G:\Projects\City of DuPont\Maps\2023\RI Work Plan\Figure 2_HistoricalSiteFeaturesandLandUses_2023.mxd; Author: MCK; Date Saved: 6/19/2023





Legend

- Soil Sample
- Former Narrow Gauge Railroad
- Former Standard Gauge Railroad
- Old Fort Lake
- Sequalitchew Creek
- Remedial Action Area (Albatross-owned Property)
- Property Owned by Others
- Former DuPont Works Consent Decree Boundary
- Historical Buildings

Notes:
-All soil samples collected on the Site to date are shown, regardless of whether they are still representative of in-place soil conditions. Soil was collected from multiple intervals at many locations.

0 300 600 900 1,200 1,500
Feet

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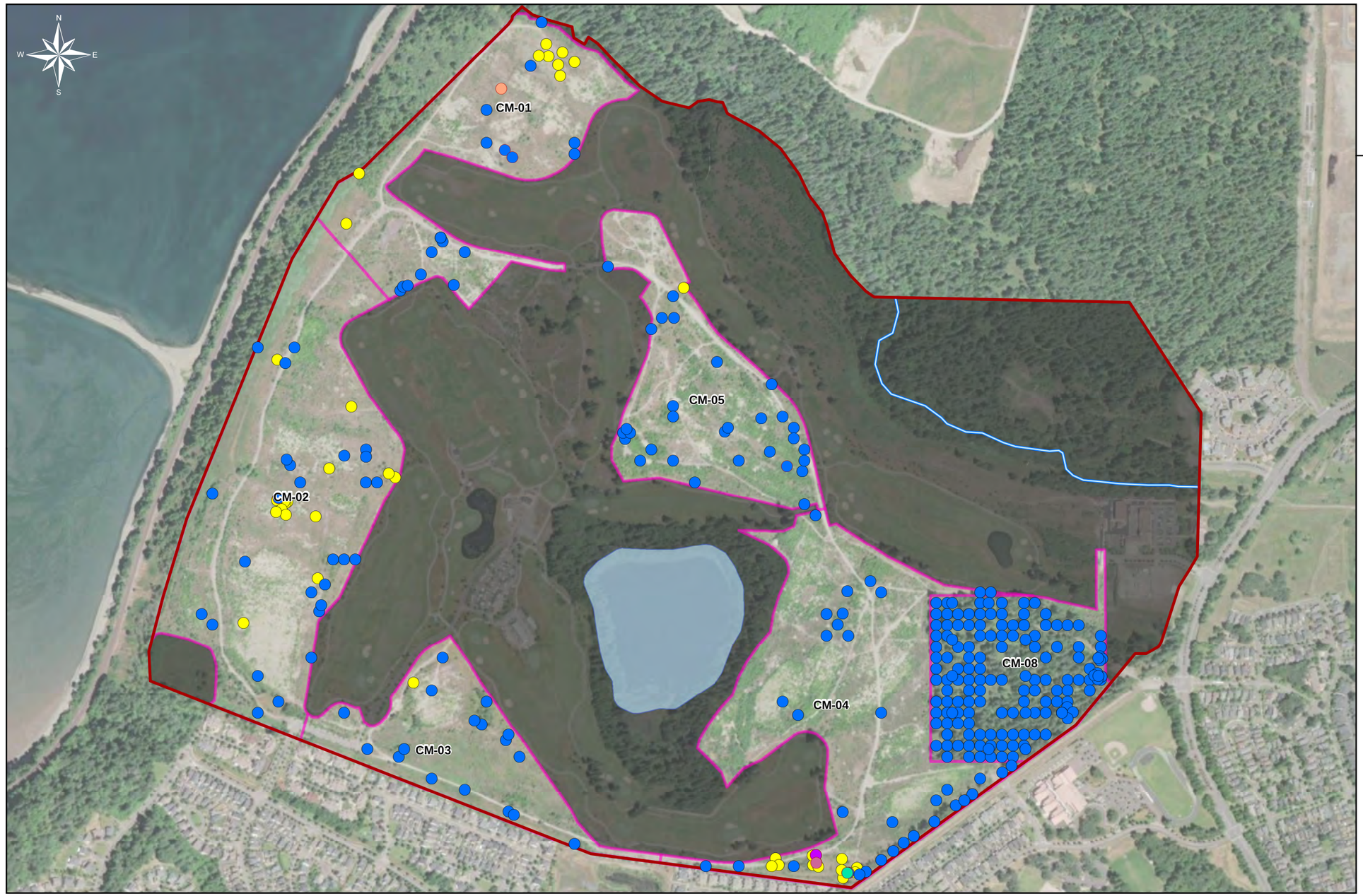
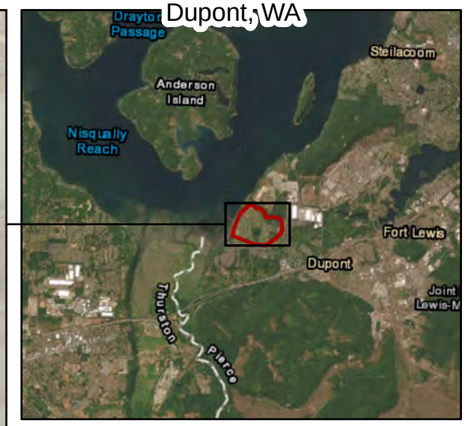
Historical and In-Place Soil Sample Locations
RI Work Plan
Remedial Action Area of the Former DuPont Works Site

Figure 3

Document Path: G:\Projects\City of DuPont\Maps\2023\RI Work Plan\Figure 3_HistoricalAndInPlaceSoilSampleLocations_2023.mxd; Author: MCK; Date Saved: 6/21/2023





Legend

Exceedance Areas by Constituent

- Arsenic
- MMAN
- Nitrobenzene(1)
- Motor Oil
- Oil and Grease
- Bunker C Fuel (via Method 418.1)

Other Site Features

- Sequalitchew Creek
- Old Fort Lake
- Remedial Action Area (Albatross-owned Property)
- Property Owned by Others
- Former DuPont Works Consent Decree Boundary

Notes
1. Although nitrobenzene was not detected above the laboratory reporting limit in any of the shown locations, the laboratory RL was elevated above the SL. As a result, it is possible that nitrobenzene is present at concentrations exceeding the SL.

0 300 600 900 1,200 1,500 Feet

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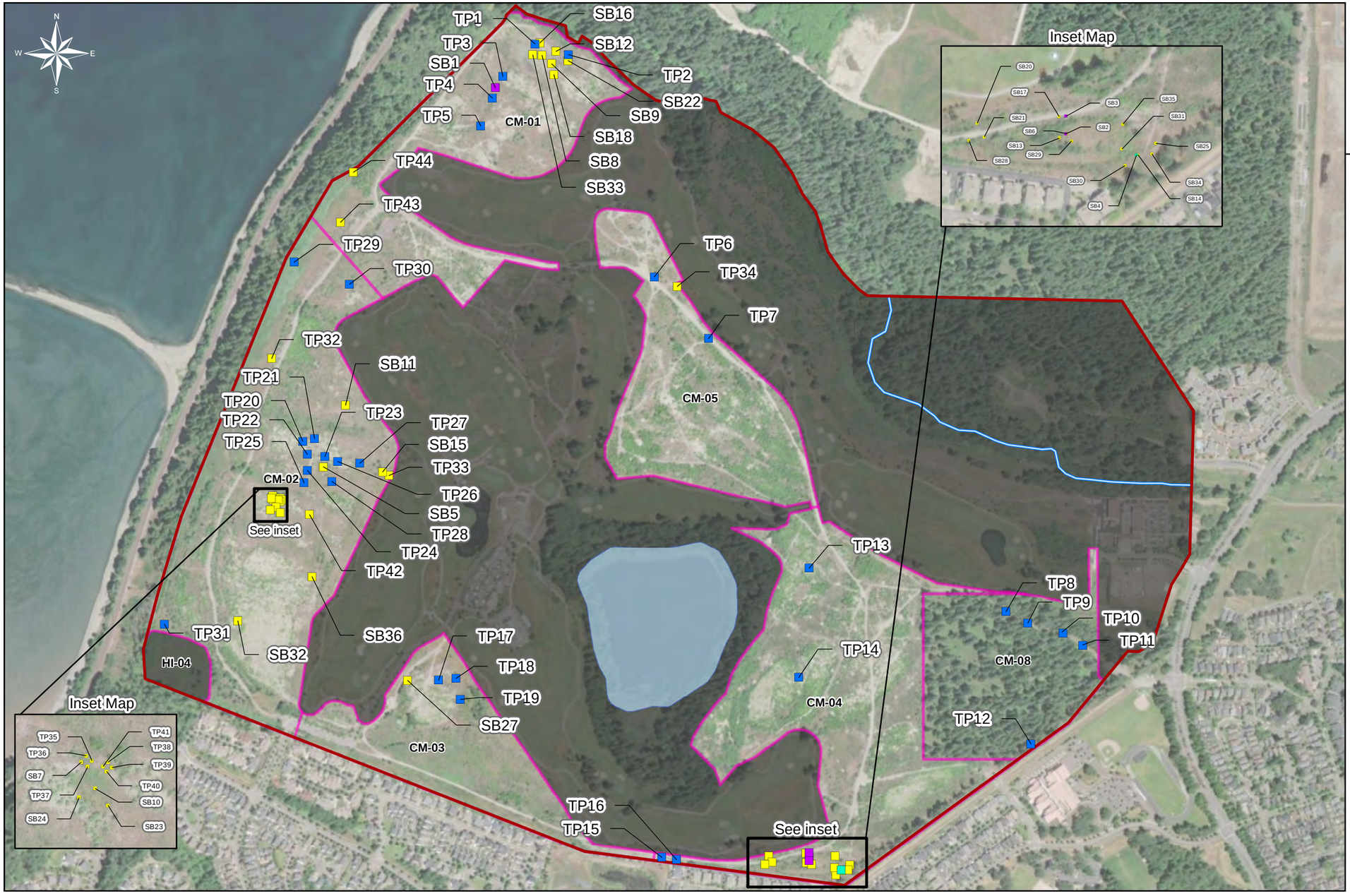
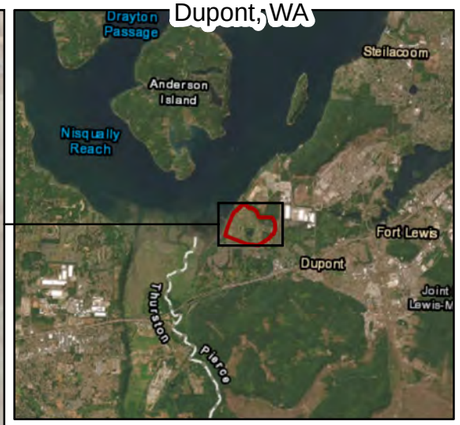
Summary of In-Place Unrestricted Soil Screening Level Exceedances
RI Work Plan
Remedial Action Area of the Former DuPont Works Site

Figure 4

Document Path: G:\Projects\City of DuPont\Maps\2023\RI Work Plan\Figure 4_SummaryOfInPlaceUnrestrictedSoilScreeningLevelExceedances_2023.mxd; Author: MCK; Date Saved: 6/21/2023





Legend

Analytes
- Arsenic/Lead
- MMAN
- Nitrobenzene
- TPH-D/HO

Other Site Features
- Sequalitchew Creek
- Old Fort Lake
- Remedial Action Area (Albatross-owned Property)
- Property Owned by Others
- Former DuPont Works Consent Decree Boundary

Notes:
1. Soil samples may be collected from multiple depth intervals at the shown locations.
2. Soil samples collected from the uppermost five feet of the soil column will be collected with a mini-excavator.
3. Soil samples collected from below five feet in the soil column will be collected using hollow-stem auger drilling methodology.

0 300 600 900 1,200 1,500 Feet

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Proposed Sample Locations
RI Work Plan
Remedial Action Area of the Former DuPont Works Site

Figure 5

Tables

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Table 1: Sampling Design for RI

Sampling Activity #	Objective and General Description of Sampling Activity [1]	Media	Sample IDs	# of Primary Samples	Description of Sample Interval/Location	TPH-D and TPH-HO (via Ecology Method NWTPH-Dx)	Arsenic and Lead (via EPA Method 7010)	Nitrobenzene (via EPA Method 8270)
1	Collect composite samples for arsenic and lead analysis to fill identified data gaps in the 2007 confirmation sampling grid, collected from previously remediated areas of the Site.	Soil	TP1 - TP31	93	Collect samples from 0-0.5 feet, 0.5-1.5 feet, and 1.5-3 feet bgs at each location to fill gaps in previous confirmation sampling completed as part of historical remedial activities.		93	
2	Collect discrete samples for TPH-D/HO analysis to confirm bunker C fuel, motor oil, and oil & grease exceedances reported in late 1980s and early 1990s data using outdated laboratory methods.	Soil	SB1 - SB3	4	Collect sample from 14.5-15 feet bgs to confirm sample collected in 1992 exceeds motor oil cleanup level. Collect sample from 3-6 feet bgs to confirm sample collected in 1992 exceeds Bunker C fuel cleanup level. Collect samples from 0-3 feet and 3-6 feet bgs to confirm samples collected in 1986 exceed 'oil & grease' cleanup level.	4		
3	Collect discrete samples for nitrobenzene analysis to confirm samples reported as 'non-detect' in historical dataset are less than 0.064 mg/kg screening level.	Soil	TP32-TP44 SB4 - SB33	62	Collect samples from 43 test pits and soil borings as detailed on Table 2.			62
Waste characterization and field QC samples [3]		Soil		N/A	Waste characterization composite [2]	1	1	1
		Soil		N/A	Equipment blank	1	5	4
		Soil		N/A	Field duplicate	1	5	4
					Total soil samples	7	104	71

Notes:

QC: quality control

[1] Boring/test pit locations will be adjusted as necessary in the field based on access, existing operations, overhead power lines, underground utilities, etc. The maximum depth for each text pit will be 5 feet bgs and the maximum depth of each soil boring will be 15 feet bgs. Field screening of each boring/test pit will include visual and olfactory observations.

[2] The waste characterization soil sample may be also analyzed for toxicity characteristic leaching procedure metals, depending on landfill requirements.

[3] Frequency expectations for field QC samples will be one sample per 20 samples (except trip blanks will be one sample per cooler).

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Table 2: Proposed Sampling Locations, Depths, and Analytes

Sample ID	Depth Interval(s)	Analyte(s)	Northing [1]	Easting [2]
TP1	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	657014	1101560
TP2	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	656942	1101790
TP3	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	656793	1101340
TP4	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	656644	1101270
TP5	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	656452	1101190
TP6	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	655419	1102380
TP7	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	654997	1102750
TP8	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	653124	1104790
TP9	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	653045	1104940
TP10	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	652974	1105181
TP11	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	652895	1105315
TP12	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	652217	1104960
TP13	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	653421	1103440
TP14	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	652674	1103370
TP15	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	651440	1102430
TP16	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	651424	1102530
TP17	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	652653	1100900
TP18	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	652667	1101020
TP19	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	652522	1101050
TP20	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	654291	1099970
TP21	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	654309	1100050
TP22	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	654201	1100000
TP23	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	654187	1100120
TP24	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	654092	1100000
TP25	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	654005	1099980
TP26	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	654152	1100210
TP27	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	654141	1100360
TP28	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	654016	1100170
TP29	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	655520	1099910
TP30	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	655368	1100290
TP31	0-0.5, 0.5-1.5, 1.5-3	Arsenic/Lead	653039	1099020
TP32	0-0.5	Nitrobenzene	654860	1099756
TP33	0-1	Nitrobenzene	654058	1100562
TP34	0-1, 3-5	Nitrobenzene	655352	1102536
TP35	0-1	Nitrobenzene	653905	1099778
TP36	0-1	Nitrobenzene	653916	1099765
TP37	0-1	Nitrobenzene	653890	1099768
TP38	0-1	Nitrobenzene	653901	1099815
TP39	0-1	Nitrobenzene	653889	1099824
TP40	0-1	Nitrobenzene	653880	1099812
TP41	0-1	Nitrobenzene	653892	1099804
TP42	0-1	Nitrobenzene	653788	1100017
TP43	0-1, 3-5	Nitrobenzene	655792	1100228
TP44	0-1, 3-5	Nitrobenzene	656135	1100317
SB1	14.5-15	TPH-D/HO	656714	1101290
SB2	3-6	TPH-D/HO	651416	1103440
SB3	0-3, 3-6	TPH-D/HO	651470	1103440
SB4	3-6, 8-10	Nitrobenzene	654117	1100111
SB5	3-5.5, 8-10	Nitrobenzene	651416	1103442
SB6	0-11	Nitrobenzene	653902	1099753
SB7	10-13	Nitrobenzene	656938	1101610
SB8	10-13	Nitrobenzene	656878	1101677
SB9	8-11.5	Nitrobenzene	653840	1099786
SB10	3-6, 8-10	Nitrobenzene	654538	1100263

Table 2: Proposed Sampling Locations, Depths, and Analytes

Sample ID	Depth Interval(s)	Analyte(s)	Northing [1]	Easting [2]
SB11	7.5-8	Nitrobenzene	656964	1101705
SB12	0-1, 3-6	Nitrobenzene	651402	1103420
SB13	3-6, 8-10	Nitrobenzene	651350	1103665
SB14	3-6	Nitrobenzene	654081	1100518
SB15	3-6	Nitrobenzene	657021	1101596
SB16	3-6	Nitrobenzene	651469	1103419
SB17	3-6	Nitrobenzene	656805	1101690
SB18	3-6, 8-10	Nitrobenzene	654883	1101712
SB19	3-6	Nitrobenzene	651406	1103186
SB20	3-6	Nitrobenzene	656901	1101788
SB21	8-10	Nitrobenzene	653801	1099816
SB22	0-1, 3-6, 8-10	Nitrobenzene	653819	1099748
SB23	5-8, 10-13	Nitrobenzene	651386	1103720
SB24	3-6, 8-10	Nitrobenzene	655137	1101261
SB25	3-6	Nitrobenzene	651394	1103138
SB26	2-4, 4-6, 8-10	Nitrobenzene	651393	1103458
SB27	5-8, 10-13	Nitrobenzene	651317	1103625
SB28	3-6, 8-10	Nitrobenzene	651368	1103615
SB29	3-6	Nitrobenzene	653059	1099524
SB30	3-6	Nitrobenzene	656940	1101545
SB31	3-6, 8-10	Nitrobenzene	651353	1103708
SB32	0-1, 3-6	Nitrobenzene	651446	1103618
SB33	3-6	Nitrobenzene	653363	1100032

Notes:

[1] The coordinate system used is NAD 1983 2011 StatePlane Washington South FIPS 4602 in US feet.

Table 3: Anticipated Investigation Roles and Responsibilities

Project Role	Name and Contact Information	Key Responsibilities
PIONEER Project Manager	Joel Hecker, L.G., L.HG. heckerj@uspioneer.com (360) 570-1700	• Manage overall completion of the investigation • Communicate and coordinate with client and Ecology • Oversee preparation of planning and reporting documents • Oversee completion of fieldwork • Support implementation of site-specific health and safety plan
PERC Project Manager AO Coordinator	Jeff King (PERC) jking@percnw.com (425) 238-2212 Kim Seeley kseely@coastlinelaw.com (253) 203-6820	• Communicate and coordinate with client, PERC, the AO Coordinator and Ecology
PIONEER Health and Safety Manager	Kevin Gallagher, ASP gallagherk@uspioneer.com (360) 570-1700	• Develop site-specific health and safety plan • Oversee implementation of site-specific health and safety plan
PIONEER Field Team Lead and Site Safety Officer	Melisa Kegans kegans@uspioneer.com (360) 570-1700	• Support project manager with preparation of planning and reporting documents • Implement site-specific health and safety plan • Coordinate and oversee completion of all field work • Collect all samples
PIONEER Field Staff	To be determined	• Support Field Team Lead with collection of soil samples
Brush Clearing	To be determined by PERC	• Clear trees and brush to facilitate access to sampling locations by vehicles and drilling equipment
Excavator	PERCCON (425) 238-2212	• Excavate shallow test pits to aid in collection of soil samples
Licensed Driller	Holocene Drilling (253) 848-6500	• Advance soil borings with hollow stem augers
Licensed Surveyor	ESM Consulting Engineers (253) 838-6113	• Determine the horizontal coordinates of the sampling locations
Analytical Laboratory	Libby Environmental (360) 352-2110	• Analyze soil samples for TPH, As, Pb, and nitrobenzene • Perform laboratory quality control activities

Table 4: Analytical Methods, Sample Containers, Preservation, and Holding Times

Constituent(s)	Media	Analytical Method	Sample Containers [(1)]	Preservation	Extraction Holding Times (days)	Analysis Holding Time (days)
Arsenic and Lead	Soil	USEPA Method SW846-7010 Series	One 8 oz amber glass jar	Place on ice to cool to 4°C +/- 2°C	--	180
TPH-D and TPH-HO	Soil	Ecology Method NWTPH-Dx	One 8 oz amber glass jar	Place on ice to cool to 4°C +/- 2°C	14	40
Nitrobenzene	Soil	USEPA Method SW846-8270E	One 8 oz amber glass jar	Place on ice to cool to 4°C +/- 2°C	14	40

Notes:

--: not applicable; °C: degree Celsius; oz: ounce

[(1)] Depending on analysis volume needs, the laboratory may decide to use one container to perform multiple analyses (e.g., one 8 ounce amber glass jar may provide sufficient volume to perform the TPH-D, TPH-HO, metals, and nitrobenzene soil analyses).

Table 5: Laboratory Control Limits

Constituent(s)	Media	Analytical Method	LCS	MS/MSD		Surrogates
			% Recovery	% Recovery	RPD	% Recovery
Arsenic and Lead	Soil	USEPA Method SW846-7010	80 - 120	75 - 125	< 20	N/A
TPH-D and TPH-HO	Soil	Ecology Method NWTPH-Dx	70-130	N/A	≤ 35	65-135
Nitrobenzene	Soil	USEPA Method SW846-8270E	51-107	51-107	< 35	See Below
2-Fuorobiphenyl	Soil	USEPA Method SW846-8270E	N/A	N/A	N/A	49.6-111
Nitrobenzene-d5	Soil	USEPA Method SW846-8270E	N/A	N/A	N/A	45-7-127
p-Terphenyl-d14	Soil	USEPA Method SW846-8270E	N/A	N/A	N/A	45.4-110

Notes:

LCS: Laboratory control sample; MS/MSD: Matrix spike/matrix spike duplicate; N/A: Not applicable; RPD: Relative percent difference

Table 6: Target Reporting Limits

Constituent	Soil		
	Analytical Method	Target Reporting Limit [1] (mg/kg)	Most Stringent Soil SL [2] (mg/kg)
Arsenic	SW846-7010	5.00	20
Lead	SW846-7010	5.00	118
TPH-D	NWTPH-Dx	50	2,000
TPH-HO	NWTPH-Dx	250	2,000
Nitrobenzene	SW846-8270E	0.050	0.064

Notes:

[1] It may not be possible to achieve these reporting limits in all samples (e.g., samples requiring extra dilution to achieve laboratory control limits, interferences).

[2] Screening Level derivations are further discussed in the Work Plan.

Appendix A

PIONEER TECHNOLOGIES CORPORATION (PTC)
FIELD CHECKLIST

Project/Task Name: _____ Site Location: _____

Requested By / Date: _____ Work Deadline: _____

SERVICES REQUESTED	COMPLETED
_____	☐ YES ☐ NO
_____	☐ YES ☐ NO
_____	☐ YES ☐ NO
_____	☐ YES ☐ NO
_____	☐ YES ☐ NO
_____	☐ YES ☐ NO
_____	☐ YES ☐ NO
_____	☐ YES ☐ NO
_____	☐ YES ☐ NO
_____	☐ YES ☐ NO
_____	☐ YES ☐ NO
_____	☐ YES ☐ NO

ADDITIONAL STANDARD INSTRUCTIONS	COMPLETED		COMPLETED
☐ Review Docs: _____	☐ YES ☐ NO	☐ Health & Safety Meeting	☐ YES ☐ NO
☐ Agency NOI / Utility Locate / Concrete Coring	☐ YES ☐ NO	☐ Call PM from Site	☐ YES ☐ NO
☐ Coordinate Access: _____	☐ YES ☐ NO	☐ Draw Site Map _____	☐ YES ☐ NO
☐ Coordinate Sub / Equip: _____	☐ YES ☐ NO	☐ Cuttings / Purge Water Characterization & Disposal	
☐ Purchase / Rent Equip: _____	☐ YES ☐ NO	☐ Potential HW _____	☐ YES ☐ NO
☐ Client/Agency Coordination: _____	☐ YES ☐ NO	☐ Non-Haz _____	☐ YES ☐ NO
☐ Calibrate Equipment: _____	☐ YES ☐ NO	☐ Background _____	☐ YES ☐ NO

_____

_____

SAMPLING REQUIREMENTS

☐ Field Testing: _____

☐ Lab Testing: _____ Laboratory: _____

☐ Lab Testing: _____ Laboratory: _____

☐ Lab Testing: _____ Laboratory: _____

FIELD SUPPLIES NEEDED

☐ Site Map ☐ Camera ☐ Survey Equip / GPS ☐ Vehicle

☐ Std Field Equip (keys, forms, SAP, HASP, PPE, decon, tools)

☐ Drilling Equip (PID, references, knife, baggies, tape)

☐ Soil Equip (SS bowls, spoon/shovel, hand auger, pick, sieves)

☐ GWM (pump, tubing, gen., compres., bailers, rope/string, PDB)

☐ Pump / Slug Test Equip (GWM Equip, slug, stopwatch)

☐ Water Level Indicator / Interface Probe

☐ Water Quality Meter _____ ☐ Field Test Kits _____

☐ Sample Kit / Cooler / COC / Ice _____

☐ IDW: ☐ Drums _____ ☐ 5-gal buckets _____

☐ Other: _____

☐ Other: _____

PIONEER TECHNOLOGIES CORPORATION (PTC)
DAILY FIELD REPORT

Date:_____ Site Location: _____ Site Arrival Time: _____ Site Departure Time :_____

WEATHER
TEMPERATURE
WIND

Clear Sun	Overcast	Drizzle	Rain	Snow
To 32	32-50	50-70	70-85	85 Up
Calm	Med.	Strong	Severe	

PEOPLE PRESENT ON-SITE

NAME	ASSOCIATION	TIME ON-SITE AND OFF-SITE

NOTES ON WORK COMPLETED

SIGNATURE:_____ DATE:_____

PIONEER TECHNOLOGIES CORPORATION

Project No.: _____
Project Name: _____
Location: _____

Subsurface Sampling Field Log

(applicable for direct-push Geoprobes, hand augers, and test pits)

Drilling Date(s): _____ Client: _____
Drilling Company: _____ Field rep: _____
Sampling Method/Equipment: ____ Geoprobe Rig No. _____ Driller(s): _Casey_____

Sampling Location ID: _____

Soil Collection and Recovery

Sampler No.	Tool Length (ft.)	Actual Advanced Interval (ft. - ft.)	Recovery (in.)
1			
2			
3			
4			
5			
6			

PID Screening

Depth (ft.)	Result (ppm)
1	
3	
5	
7	
9	
11	
13	
15	

Soil Profile/Lithology (include thickness of surfacing material)

Interval (ft. - ft.)	Description (draw horizontal line breaks between units!) (Indicate all depths in feet, e.g. instead of 11 inches, write 0.92 ft.) (For fill, qualify the description with the prefix "FILL-")	Symbol (e.g. SP, CL, SM, etc)	Remarks (include specific depth of observation; note staining, odors, etc. in this column)

END OF BORING DEPTH: _____
GROUNDWATER DEPTH DURING DRILLING:_____ AFTER:_____

SOIL Analytical Sample(s)

Sample Interval	Basic Soil Type	Time	Weight for Meth (g)	Dup #

GROUNDWATER Analytical Sample(s)

Screen Interval (ft. - ft.)	Time	Dup #	Remarks (e.g. odors, sheen, silty, filtered metals/PAHs, etc)

Borehole Backfill:

General Notes: (e.g. notes about location, site conditions, etc):

Appendix B

Memo

PIONEER TECHNOLOGIES CORPORATION
5205 Corporate Ctr. Ct. SE, Ste. A
Olympia, WA 98503-5901
Phone: 360.570.1700
Fax: 360.570.1777
www.uspioneer.com

To: File

From: PIONEER

Date: July 13, 2016

Subject: PIONEER Technologies Corporation Sample Number Schema

All:

The following sample number schema should be used on all PIONEER Technologies Corporation (PTC) projects:

MediaCode-SiteID-DateCode-TopDepth-BotDepth-(PTCTypeCode) – Be sure to use Dashes and Not Underscores

- Media Code = 2 Letter Code for Media Sampled At Location (see Table 1)
- Site ID = 1 to 10 Letter/Number Code for Site ID (with Dash between Site ID and Site ID # (e.g., MW-01)
- DateCode = 6 Number Code for Date (no slashes between monthdayyear)
- TopDepth = Optional but must have 1 decimal point max.
- BotDepth = Optional but must have 1 decimal point max.
- PTCSampTypeCode = Optional (see below)
    - (01) – For Field Duplicate/Replicate #1/Test Case #1
    - (02) – Replicate #2 or Test Case #2
    - (03) – Replicate #3 or Test Case #3
    - (04) – Replicate #4 or Test Case #4
    - (05) – Replicate #5 or Test Case #5
    - (06) – Replicate #6 or Test Case #6
    - (07) – Replicate #7 or Test Case #7
    - (08) – Replicate #8 or Test Case #8
    - (09) – Replicate #9 or Test Case #9
    - (10) – Leachate Sample
    - (20) – Dissolved Sample (i.e., filtered in the field or by the lab)

Note: PTCSampTypeCodes can be combined. For example, a PTCSampTypeCode of "(11)" indicates that the sample is a field duplicate of a leachate sample and a PTCSampTypeCode of "(21)" indicates that the sample is a field duplicate of a dissolved/filtered sample.

Examples:

- EF-EF-01-100112 – No Depth Interval
- EF-EF-01-100112-(01) – No Depth Interval & Field Duplicate Sample of EF-EF01-100112
- GW-MW-01-100112-10.5-20.5 – With Depth Intervals (10.5 to 20.5 feet)

- SO-SS-01-100112-0-0.5 – With Depth Intervals (0 to 0.5 feet)

Note: Examples of leachate and dissolved samples that require field duplicates or replicates:

- SO-SS-01-100112-0-0.5-(11) – Field Duplicate of Leachate sample with depth Intervals (0 to 0.5 feet).
- SO-SS-01-100112-0-0.5-(14) – Replicate #4 of Leachate sample with depth Intervals (0 to 0.5 feet).
- GW-MW-01-100112-10.5-20.5-(21) – Field Duplicate of Dissolved/Filtered groundwater sample with depth intervals (10.5 to 20.5 feet)
- GW-MW-01-100112-10.5-20.5-(23) – Replicate #3 Triplicate of Dissolved/Filtered groundwater sample with depth Intervals (10.5 to 20.5 feet).

Table 1 – PTC Media Codes for Sample Numbers

Media	Media Code for Sample Number	Description
Ambient Air	AA	Ambient Air
Asphalt	AS	Asphalt
Bituminous Coating	BC	Bituminous Coating
Brick	BR	Brick
Concrete	CO	Concrete
Dust	DT	Dust
Equipment Blank	EB	Equipment Blank
Effluent	EF	Effluent
Field Blank	FB	Field Blank
Field Spike	FS	Field Spike Sample
Groundwater	GW	Groundwater
Indoor Air	IA	Indoor Air
Influent	IN	Influent
Midpoint Between IN and EF	MD	Midpoint Between Influent and Effluent Samples
Other Liquid	OL	Non-specified Liquid
Other Solid	OS	Non-specified Solid
Performance Evaluation	PE	Performance Evaluation Sample
Perched Water	PP	Perched Water
Paint	PT	Paint, Paint Chips, Paint Flakes
Pore Water	PW	Sediment Pore Water
Sierra-Crete	SC	Sierra-Crete
Sediment	SD	Sediment
Stack Sample (Emissions)	SE	Stack Sample (Emissions)
Soil Gas	SG	Soil Gas, Soil Vapors, Sub-Slab Soil Gas
Sludge	SL	Sludge
Soil	SO	Soil
Seep Water	SP	Seep Water from Bank Samples
Surfacewater	SW	Surfacewater

Table 1 – PTC Media Codes for Sample Numbers		
Media	**Media Code for Sample Number**	**Description**
Trip Blank	TB	Trip Blank
Tap Water	TW	Tap Water, Drinking Water
Wood	WD	Wood Debris, Wood Waste
Waste Solid	WS	Investigation Derived Waste Solid
Waste Water	WW	Investigation Derived Waste Liquid
Treated Water	XW	Treated Water from Pilot Test, Treatability Study

Sincerely,

Chris Waldron

Appendix C

INADVERTENT DISCOVERY PLAN

PLAN AND PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS

To request ADA accommodation, including materials in a format for the visually impaired, call Ecology at 360-407-6000 or visit https://ecology.wa.gov/accessibility. People with impaired hearing may call Washington Relay Service at 711. People with a speech disability may call TTY at 877-833-6341.

Site Name(s): Remedial Action Area Location: Former DuPont Works Site, DuPont, WA

Project Lead/Organization: PIONEER Technologies Corp. County: Pierce

If this Inadvertent Discovery Plan (IDP) is for multiple (batched) projects, ensure the location information covers all project areas.

1. INTRODUCTION

The IDP outlines procedures to perform in the event of a discovery of archaeological materials or human remains, in accordance with applicable state and federal laws. An IDP is required, as part of Agency Terms and Conditions for all grants and loans, for any project that creates disturbance above or below the ground. An IDP is not a substitute for a formal cultural resource review (Executive 21-02 or Section 106).

Once completed, **the IDP should always be kept at the project site** during all project activities. All staff, contractors, and volunteers should be familiar with its contents and know where to find it.

2. CULTURAL RESOURCE DISCOVERIES

A cultural resource discovery could be prehistoric or historic. Examples include (see images for further examples):

- An accumulation of shell, burned rocks, or other food related materials.
- Bones, intact or in small pieces.
- An area of charcoal or very dark stained soil with artifacts.
- Stone tools or waste flakes (for example, an arrowhead or stone chips).
- Modified or stripped trees, often cedar or aspen, or other modified natural features, such as rock drawings.
- Agricultural or logging materials that appear older than 50 years. These could include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, and many other items.
- Clusters of tin cans or bottles, or other debris that appear older than 50 years.
- Old munitions casings. ***Always assume these are live and never touch or move.***
- Buried railroad tracks, decking, foundations, or other industrial materials.
- Remnants of homesteading. These could include bricks, nails, household items, toys, food containers, and other items associated with homes or farming sites.

The above list does not cover every possible cultural resource. When in doubt, assume the material is a cultural resource.

3. ON-SITE RESPONSIBILITIES

If any employee, contractor, or subcontractor believes that they have uncovered cultural resources or human remains at any point in the project, take the following steps to ***Stop-Protect-Notify***. **If you suspect that the discovery includes human remains, also follow Sections 5 and 6.**

STEP A: Stop Work.

All work must stop immediately in the vicinity of the discovery.

STEP B: Protect the Discovery.

Leave the discovery and the surrounding area untouched and create a clear, identifiable, and wide boundary (30 feet or larger) with temporary fencing, flagging, stakes, or other clear markings. Provide protection and ensure integrity of the discovery until cleared by the Department of Archaeological and Historical Preservation (DAHP) or a licensed, professional archaeologist.

Do not permit vehicles, equipment, or unauthorized personnel to traverse the discovery site. Do not allow work to resume within the boundary until the requirements of this IDP are met.

STEP C: Notify Project Archaeologist (if applicable).

If the project has an archaeologist, notify that person. If there is a monitoring plan in place, the archaeologist will follow the outlined procedure.

STEP D: Notify Project and Washington Department of Ecology (Ecology) contacts.

Project Lead Contacts

Primary Contact		Alternate Contact	
Name:	Joel Hecker	Name:	Jeff King
Organization:	PIONEER	Organization:	PERC
Phone:	(360) 828-3739	Phone:	(425) 238-2212
Email:	HeckerJ@uspioneer.com	Email:	jking@percnw.com

Ecology Contacts (completed by Ecology Project Manager)

Ecology Project Manager		Alternate or Cultural Resource Contact	
Name:	Andrew Smith	Name:	
Program:	Toxic Cleanup Program Site Manager	Program:	
Phone:	(360) 485-3987	Phone:	
Email:	ansm461@ECY.WA.GOV	Email:	

STEP E: Ecology will notify DAHP.

Once notified, the Ecology Cultural Resource Contact or the Ecology Project Manager will contact DAHP to report and confirm the discovery. To avoid delay, the Project Lead/Organization will contact DAHP if they are not able to reach Ecology.

DAHP will provide the steps to assist with identification. DAHP, Ecology, and Tribal representatives may coordinate a site visit following any necessary safety protocols. DAHP may also inform the Project Lead/Organization and Ecology of additional steps to further protect the site.

Do not continue work until DAHP has issued an approval for work to proceed in the area of, or near, the discovery.

DAHP Contacts:

Name: Rob Whitlam, PhD
Title: State Archaeologist
Cell: 360-890-2615
Email: Rob.Whitlam@dahp.wa.gov
Main Office: 360-586-3065

Human Remains/Bones:

Name: Guy Tasa, PhD
Title: State Anthropologist
Cell: 360-790-1633 (24/7)
Email: Guy.Tasa@dahp.wa.gov

4. TRIBAL CONTACTS

In the event cultural resources are discovered, the following tribes will be contacted. See Section 10 for Additional Resources.

Tribe:	Nisqually Tribe	Tribe:	
Name:	Netsy Bullchild	Name:	
Title:	Nisqually Tribe Archives/THPO Director	Title:	
Phone:	(360) 456-5221 Ext. 1106	Phone:	
Email:	bullchild.annette@nisqually-nsn.gov	Email:	
Tribe:		Tribe:	
Name:		Name:	
Title:		Title:	
Phone:		Phone:	
Email:		Email:	

Please provide contact information for additional tribes within your project area, if needed, in Section 11.

5. FURTHER CONTACTS (if applicable)

If the discovery is confirmed by DAHP as a cultural or archaeological resource, or as human remains, and there is a partnering federal or state agency, Ecology or the Project Lead/Organization will ensure the partnering agency is immediately notified.

Federal Agency:		State Agency:	
Agency:		Agency:	
Name:		Name:	
Title:		Title:	
Phone:		Phone:	
Email:		Email:	

6. SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL MATERIAL

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect. Follow the steps under ***Stop-Protect-Notify.*** For specific instructions on how to handle a human remains discovery, see: *RCW 68.50.645: Skeletal human remains—Duty to notify—Ground disturbing activities—Coroner determination—Definitions*.

Suggestion: If you are unsure whether the discovery is human bone or not, contact Guy Tasa with DAHP, for identification and next steps. Do not pick up the discovery.

Guy Tasa, PhD State Physical Anthropologist
Guy.Tasa@dahp.wa.gov
(360) 790-1633 (Cell/Office)

For discoveries that are confirmed or suspected human remains, follow these steps:

1. Notify law enforcement and the Medical Examiner/Coroner using the contacts below. **Do not call 911** unless it is the only number available to you.

   Enter contact information below (required):
   - Local Medical Examiner or Coroner name and phone: Pierece County Medical Examiner - (253) 798-6494
   - Local Law Enforcement main name and phone: DuPont City Police Dept - (253) 964-7060
   - Local Non-Emergency phone number (911 if without a non-emergency number): 911
2. The Medical Examiner/Coroner (with assistance of law enforcement personnel) will determine if the remains are human or if the discovery site constitutes a crime scene and will notify DAHP.
3. **DO NOT speak with the media, allow photography or disturbance of the remains, or release any information about the discovery on social media.**
4. If the remains are determined to be non-forensic, Cover the remains with a tarp or other materials (not soil or rocks) for temporary protection and to shield them from being photographed by others or disturbed.

Further activities:

- Per RCW 27.44.055, RCW 68.50, and RCW 68.60, DAHP will have jurisdiction over non-forensic human remains. Ecology staff will participate in consultation. Organizations may also participate in consultation.
- Documentation of human skeletal remains and funerary objects will be agreed upon through the consultation process described in RCW 27.44.055, RCW 68.50, and RCW 68.60.
- When consultation and documentation activities are complete, work in the discovery area may resume as described in Section 8.

If the project occurs on federal lands (such as a national forest or park or a military reservation) the provisions of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) apply and the responsible federal agency will follow its provisions. Note that state highways that cross federal lands are on an easement and are not owned by the state.

If the project occurs on non-federal lands, the Project Lead/Organization will comply with applicable state and federal laws, and the above protocol.

7. DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological resources discovered during construction are protected by state law RCW 27.53 and assumed eligible for inclusion in the National Register of Historic Places under Criterion D until a formal Determination of Eligibility is made.

The Project Lead/Organization must ensure that proper documentation and field assessment are made of all discovered cultural resources in cooperation with all parties: the federal agencies (if any), DAHP, Ecology, affected tribes, and the archaeologist.

The archaeologist will record all prehistoric and historic cultural material discovered during project construction on a standard DAHP archaeological site or isolate inventory form. They will photograph site overviews, features, and artifacts and prepare stratigraphic profiles and soil/sediment descriptions for minimal subsurface exposures. They will document discovery locations on scaled site plans and site location maps.

Cultural features, horizons, and artifacts detected in buried sediments may require the archaeologist to conduct further evaluation using hand-dug test units. They will excavate units in a controlled fashion to expose features, collect samples from undisturbed contexts, or to interpret complex stratigraphy. They may also use a test unit or trench excavation to determine if an intact occupation surface is present. They will only use test units when necessary to gather information on the nature, extent, and integrity of subsurface cultural deposits to evaluate the site's significance. They will conduct excavations using standard archaeological techniques to precisely document the location of cultural deposits, artifacts, and features.

The archaeologist will record spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of cultural material, and depth to sterile soil, regolith, or bedrock for each unit on a standard form. They will complete test excavation unit level forms, which will include plan maps for each excavation level and artifact counts and material types, number, and vertical provenience (depth below

surface and stratum association where applicable) for all recovered artifacts. They will draw a stratigraphic profile for at least one wall of each test excavation unit.

The archaeologist will screen sediments excavated for purposes of cultural resources investigation through 1/8-inch mesh, unless soil conditions warrant 1/4-inch mesh.

The archaeologist will analyze, catalogue, and temporarily curate all prehistoric and historic artifacts collected from the surface and from probes and excavation units. The ultimate disposition of cultural materials will be determined in consultation with the federal agencies (if any), DAHP, Ecology, and the affected tribe(s).

Within 90 days of concluding fieldwork, the archaeologist will provide a technical report describing any and all monitoring and resultant archaeological excavations to the Project Lead/Organization, who will forward the report to Ecology, the federal agencies (if any), DAHP, and the affected tribe(s) for review and comment.

If assessment activities expose human remains (burials, isolated teeth, or bones), the archaeologist and Project Lead/Organization will follow the process described in **Section 6**.

8. PROCEEDING WITH WORK

The Project Lead/Organization shall work with the archaeologist, DAHP, and affected tribe(s) to determine the appropriate discovery boundary and where work can continue.

Work may continue at the discovery location only after the process outlined in this plan is followed and the Project Lead/Organization, DAHP, any affected tribe(s), Ecology, and the federal agencies (if any) determine that compliance with state and federal laws is complete.

9. ORGANIZATION RESPONSIBILITY

The Project Lead/Organization is responsible for ensuring:

- This IDP has complete and accurate information.
- This IDP is immediately available to all field staff at the sites and available by request to any party.
- This IDP is implemented to address any discovery at the site.
- That all field staff, contractors, and volunteers are instructed on how to implement this IDP.

10. ADDITIONAL RESOURCES

Informative Video

Ecology recommends that all project staff, contractors, and volunteers view this informative video explaining the value of IDP protocol and what to do in the event of a discovery. The target audience is anyone working on the project who could unexpectedly find cultural resources or human remains while excavating or digging. The video is also posted on DAHP's inadvertent discovery language website.

Ecology's IDP Video (https://www.youtube.com/watch?v=ioX-4cXfbDY)

Informational Resources

DAHP (https://dahp.wa.gov)

Washington State Archeology (DAHP 2003)
(https://dahp.wa.gov/sites/default/files/Field%20Guide%20to%20WA%20Arch_0.pdf)

Association of Washington Archaeologists (https://www.archaeologyinwashington.com)

Potentially Interested Tribes

Interactive Map of Tribes by Area
(https://dahp.wa.gov/archaeology/tribal-consultation-information)

WSDOT Tribal Contact Website
(https://wsdot.wa.gov/tribal/TribalContacts.htm)

11. ADDITIONAL INFORMATION

Please add any additional contact information or other information needed within this IDP.

Implement the IDP if you see…

Chipped stone artifacts.

Examples are:

- Glass-like material.
- Angular material.
- “Unusual” material or shape for the area.
- Regularity of flaking.
- Variability of size.

Stone artifacts from Oregon.

Stone artifacts from Washington.

Biface-knife, scraper, or pre-form found in NE Washington. Thought to be a well knapped object of great antiquity. Courtesy of Methow Salmon Rec. Foundation.

Implement the IDP if you see…

Ground stone artifacts.

Examples are:

- Unusual or unnatural shapes or unusual stone.
- Striations or scratching.
- Etching, perforations, or pecking.
- Regularity in modifications.
- Variability of size, function, or complexity.

Above: Fishing Weight - credit CRITFC Treaty Fishing Rights website.

Artifacts from unknown locations (left and right images).

Implement the IDP if you see…

Bone or shell artifacts, tools, or beads.

Examples are:

- Smooth or carved materials.
- Unusual shape.
- Pointed as if used as a tool.
- Wedge shaped like a “shoehorn”.
- Variability of size.
- Beads from shell (dentalium) or tusk.

Upper Left:*Bone Awls from Oregon.*

Upper Center: *Bone Wedge from California.*

Upper Right: *Plateau dentalium choker and bracelet, from Nez Perce National Historical Park, 19th century, made using Antalis pretiosa shells Credit: Nez Perce - Nez Perce National Historical Park, NEPE 8762, Public Domain.*

Above: *Tooth Pendants. Right: Bone Pendants. Both from Oregon and Washington.*

Implement the IDP if you see…

Culturally modified trees, fiber, or wood artifacts.

Examples are:

- Trees with bark stripped or peeled, carvings, axe cuts, de-limbing, wood removal, and other human modifications.
- Fiber or wood artifacts in a wet environment.
- Variability of size, function, and complexity.

Left and Below: *Culturally modified tree and an old carving on an aspen (Courtesy of DAHP).*

Right, Top to Bottom: *Artifacts from Mud Bay, Olympia: Toy war club, two strand cedar rope, wet basketry*.

Implement the IDP if you see…

Strange, different, or interesting looking dirt, rocks, or shells.

Human activities leave traces in the ground that may or may not have artifacts associated with them. Examples are:

- "Unusual" accumulations of rock (especially fire-cracked rock).
- "Unusual" shaped accumulations of rock (such as a shape similar to a fire ring).
- Charcoal or charcoal-stained soils, burnt-looking soils, or soil that has a "layer cake" appearance.
- Accumulations of shell, bones, or artifacts. Shells may be crushed.
- Look for the "unusual" or out of place (for example, rock piles in areas with otherwise few rocks).

Shell Midden pocket in modern fill discovered in sewer trench.

Underground oven. Courtesy of DAHP.

Shell midden with fire cracked rock.

Hearth excavated near Hamilton, WA.

Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Agricultural or logging equipment. May include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, etc.
- Domestic items including square or wire nails, amethyst colored glass, or painted stoneware.

Left: Top to Bottom: *Willow pattern serving bowl and slip joint pocket knife discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

Right: *Collections of historic artifacts discovered during excavations in eastern Washington cities.*

Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Railway tokens, coins, and buttons.
- Spectacles, toys, clothing, and personal items.
- Items helping to understand a culture or identity.
- Food containers and dishware.

Main Image: *Dishes, bottles, workboot found at the North Shore Japanese bath house (ofuro) site, Courtesy Bob Muckle, Archaeologist, Capilano University, B.C. This is an example of an above ground resource.*

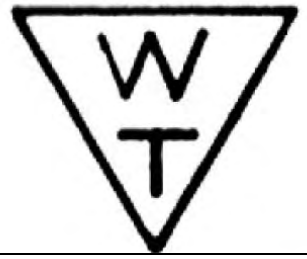
Right, from Top to Bottom: *Coins, token, spectacles and Montgomery Ward pitchfork toy discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

Implement the IDP if you see…

- Old munition casings – if you see ammunition of any type – ***always assume they are live and never touch or move!***
- Tin cans or glass bottles with an older manufacturer's technique – maker's mark, distinct colors such as turquoise, or an older method of opening the container.

Far Left: .303 British cartridge found by a WCC planting crew on Skagit River. Don't ever touch something like this!
Left: Maker's mark on bottom of old bottle.

Right: *Old beer can found in Oregon. ACME was owned by Olympia Brewery. Courtesy of Heather Simmons.*



Logo employed by Whithall Tatum & Co. between 1924 to 1938 (Lockhart et al. 2016).

Can opening dates, courtesy of W.M. Schroeder.

Implement the IDP if you see…

You see historic foundations or buried structures.

Examples are:

- Foundations.
- Railroad and trolley tracks.
- Remnants of structures.

Counter Clockwise, Left to Right: *Historic structure 45KI924, in WSDOT right of way for SR99 tunnel. Remnants of Smith Cove shantytown (45-KI-1200) discovered during Ecology CSO excavation, City of Spokane historic trolley tracks uncovered during stormwater project, intact foundation of historic home that survived the Great Ellensburg Fire of July 4, 1889, uncovered beneath parking lot in Ellensburg.*

Implement the IDP if you see...

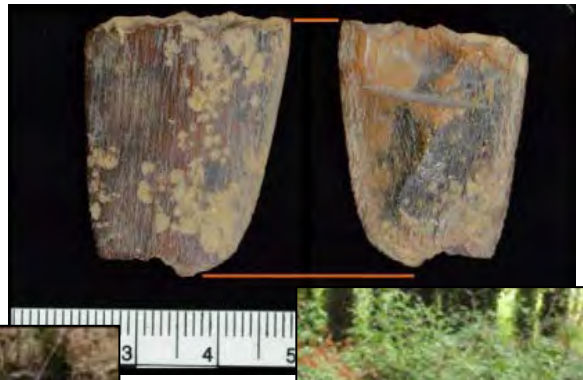
Potential human remains.

Examples are:

- Grave headstones that appear to be older than 50 years.
- Bones or bone tools--intact or in small pieces. It can be difficult to differentiate animal from human so they must be identified by an expert.
- These are all examples of animal bones and are not human.

Center: *Bone wedge tool, courtesy of Smith Cove Shantytown excavation (45KI1200).*

Other images (Top Right, Bottom Left, and Bottom) Center: Courtesy of DAHP.



Directly Above: This is a real discovery at an Ecology sewer project site.

What would you do if you found these items at a site? Who would be the first person you would call?

Hint: *Read the plan!*