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MEMORANDUM

DATE: July 10, 2017

TO: Joanne LaBaw, Task Monitor, EPA, Seattle, WA, Mail Stop ECL-122

FROM: Linda Ader, START-IV Team Leader, E & E, Seattle, WA

SUBJECT: Proposed Sampling and Assessment Approach
Seaport Landing
Aberdeen, Washington.

REF: Contract Number EP-S7-13-07
Technical Direction Document Number: 17-01-0004

1 Introduction

A proposed Targeted Brownfields Assessment (TBA) sampling and assessment approach has been designed for the Seaport Landing Site (Seaport), which is located in Aberdeen, Washington. This memorandum, while outlining the proposed field investigation strategy, is not intended to be a comprehensive field sampling and analytical work plan. The work plan document will be prepared at a later date once project stakeholders have had an opportunity to review and comment on the proposed approach.

Stakeholders for this project include the Grays Harbor Historical Seaport Authority (GHHSA), the Washington Department of Ecology (Ecology), and the U.S. Environmental Protection Agency (EPA). The sampling and assessment approach is based on information contained in multiple due diligence and environmental sampling related documents provided to the Superfund Technical Assessment and Response Team (START), a stakeholder meeting and site visit conducted on February 2, 2017, and best professional judgments. As per the TBA assessment request, this effort is focused exclusively on the upland area of the site, and more specifically is limited to the area generally south of the inner-harbor line. Impacts within the intertidal riverine environment are being separately investigated by GHHSA and their representatives.

2 Site Background

The Seaport site is a former lumber mill located in Sections 9 and 10 of Township 17 North, Range 9 West of the Willamette Base Meridian, in Aberdeen, Washington (Figures 1 and 2). In total, the mill property included approximately 80 acres of land. In 2013, the GHHSA acquired portions of the site, including 24 acres of upland property and assumed a sublease from the Washington Department of Natural Resources to the 14 acres of overwater property leased by Weyerhaeuser from the State of Washington. Weyerhaeuser retained ownership to the balance of the millsite, including the former log storage area east of the Seaport site. Surrounding properties include that former log storage area to the east; a former commercial boatyard to the west; and residential and commercial land use to the south. The Chehalis River is situated north

of the site. West Curtis Street is located along the southern property boundary, and provides roadway access to the site.

In its earliest iteration, many of the mill structures were constructed on overwater piers that extended several hundred feet from the original Chehalis River shoreline. These structures were accessed by planked, piling-supported drives and foot bridges. From the time of construction forward, land beneath the pier/plank supported developments was brought to its current surface grade using fill material. Sawdust and other wood wastes were apparently included in this fill. The source for the balance of this fill is unknown.

The oldest and northern-most of the overwater mills was the "Big Mill" (see "Former Mill Area", Figure 2). In 1972, the "Pee Wee Mill" was added to filled tidelands east-southeast of the Big Mill. With subsequent building modifications the "Small Log Mill" was also added to the southeast portion of the property, adjacent to the Pee Wee Mill. The Big Mill was closed in 2006, and dismantled from 2006 to 2008. By 2009, all remaining milling operations had ended onsite.

The mills were originally configured to produce shingles and slats for housing construction. Mill tooling and capabilities were modified during World War II to facilitate onsite ship keel manufacturing (PES 2010). By 1948 a log debarker and planer was added to the site and production of dimensional lumber began (Emcon 1997). When milling operations began, lumber was rafted to the site on the Chehalis River, and stored adjacent to the site using the pilings along the mill shoreline to secure the raw materials. In the mid-1960's, as the tideland areas were filled, over-land transport became the predominant delivery method, with timber delivered to the site by truck (PES 2010).

The property has been owned/occupied by a variety of sawmills and companies. Based on an 1890 site map, the earliest of these was Aberdeen Lumber. Later owners/occupants included the Schafer Brothers Lumber and Door Co. Mill #4, Simpson Timber Company, and most recently, Weyerhaeuser. GHHSA acquired the site in 2013 with plans to convert the site to a mixed-use, working waterfront that included docks, education centers, and a various tourism related developments (GHSSA N.D.).

As discussed in greater detail in the following sections of this memorandum, the site has been the subject of numerous environmental investigations which have identified multiple areas of contamination. This includes tideland sediments impacted by mercury, polychlorinated biphenyls (PCBs), phenol, benzoic acid, semivolatile organic compounds (SVOCs), and total petroleum hydrocarbons (TPH); soil and ground water impacts by pentachlorophenol (PCP), TPH, chromium, lead, and semivolatile organic compounds (SVOCs) (including polycyclic aromatic hydrocarbons [PAHs]).

3 Previous Investigations/Cleanup Activities:

A brief recap of reports prepared discussing environmental characterization efforts for the site is chronologically provided below. Given the lengthy history of work done at the site, the following summaries do not provide an exhaustive review of all reports created for the site. Only those reports that were both available to the START, and cover areas directly under study

during this investigation are presented below.

3.1 ***Independent Remedial Action Report*, Emcon (1997):**

On January 17, 1997, EMCON presented an Independent Remedial Action (IRA) for the Weyerhaeuser Aberdeen Sawmill to the Weyerhaeuser Company. This report summarized environmental characterization and remedial efforts that had occurred at the site from 1989 through 1993, all focused on the planer building and immediately adjacent land area.

The first sampling at the site took place on October 15, 1989 to investigate potential releases of PCP and NP-1 anti-sapstain compounds. By that time, use of PCP as an anti-sapstain agent had been discontinued at the site. Surface soil samples collected during this 1989 investigation confirmed the release of PCP to surface soils. Following these efforts, additional sampling and testing was performed, beginning on May 24, 1990. These efforts documented impacts across a greater area, with PCP impacted soils and sawdust in the grader building. Five ground water wells (D-01 through D-05) were installed on May 24 and 25, 1990 (See Figure 3). According to Emcon's report, samples of soil collected during well installation confirmed the presence of PCP impacts in subsurface soils, extending up to 16 feet below ground surface (bgs) at one location (D-05). PCP was also identified in ground water at three locations (D-02, D-04e, and D-05), with the highest PCP concentration in ground water at D-05. Further surface and subsurface soil sampling was undertaken in July 1990, which confirmed the presence of PCP contaminated soil between 2 and 6 feet bgs, with the highest concentration again near well D-05. Four additional ground water monitoring wells (D-06 through D-09, Figure 3) were installed at greater distance from the planer/grader building on August 30, 1990. While several SVOCs were detected in both soils and ground water samples collected from these locations, including naphthalene at low concentrations in D-09, PCP was not detected at these locations. The sampling report(s) that included this SVOC and PCP analytical data was/were not available to further substantiate the statements included in Emcon's report.

After review of subsurface sampling data generated to date, and consultation with Ecology, PCP was identified as the only contaminant of concern for remediation, with eight separate areas identified for remediation within the northern portion of the grader building. Work was staged to coincide with an upgrade to the anti-sap stain spray booth, and various process modifications made to minimize the chance for similar future releases. Remediation included the removal of impacted soil using a small backhoe, a vacuum truck, or when access was severely constrained, by hand.

A total of 522 tons of PCP contaminated soil were removed from the site during three separate removal events; however due to the relatively shallow water table, physical access constraints, and concerns about undermining building foundations, soils contaminated with PCP were left in place at some locations. PCP concentrations in soils at three of the eight cleanup areas exceeded the Washington State Model Toxics Control Act Method C (MTCA C) cleanup level in effect at that time (1,090 milligrams per kilogram [mg/kg]). It should be noted that since that work was completed, MTCA cleanup levels for PCP have become more stringent, with the current MTCA C cleanup level for PCP set at 328 mg/kg. As a result, PCP concentrations in soils from six of the eight cleanup areas would exceed current cleanup levels.

With respect to ground water, although PCP was detected in ground water, this detection was a regular occurrence in only one well (D-05), with infrequent PCP detections at other well locations. Surveys of the ground water elevations indicate a north/northwesterly flow direction, towards the Chehalis River. That said, through statistical analysis of ground water analytical data, Emcon determined that PCP impacts did not appear to be migrating to or effecting the Chehalis River's water quality.

3.2 *IRAP Report Addendum*, Emcon (1998):

Following completion of the IRA as discussed in Section 3.1, Emcon presented the results of work done at the site to Ecology, with a request that a No Further Action (NFA) status be granted for the site. As outlined in Emcon's April 13, 1998 dated memorandum, after review of the IRA report, Ecology requested that one additional ground water sample be collected to further corroborate that PCP was not migrating towards the Chehalis River. Ecology also requested the site's Restrictive Covenant be revised to incorporate changes to the standard language that was in use in by Ecology in 1998. The additional sample was collected from temporary well point GP-1 installed near the northwest corner of the planer building, between wells D-06 and D-07 (Figure 3). No PCP was present above the analytical method reporting limit in this sample.

3.3 *No Further Action Letter for Remedial Actions*, Ecology (1999):

After obtaining this ground water data and revising the Restrictive Covenant for the site (see Section 3.2), Ecology granted an NFA status for this PCP release. In light of the PCP contaminated that had been left in place, maintenance of site's NFA status required property owners to comply certain limitation on use, redevelopment, and conveyance, as memorialized in the restrictive covenant filed for the property.

3.4 *Level I Environmental Site Assessment*, PES Environmental (2010):

On August 13, 2010, PES Environmental, Inc. (PES) provided the Weyerhaeuser NR Company with the results of their Level I Environmental Site Assessment (ESA) of the Aberdeen Sawmill property (i.e., Seaport Site). The goal of the report was to identify recognized environmental conditions (RECs) associated with the site. In doing this, PES reviewed various Federal, State, and local data sources; environmental regulatory agency files for the site and vicinity; available permits, plans, and reports for the property; conducted historic research regarding property use and development; performed a site walk; and interviewed site knowledgeable individuals.

Given the data dense nature of this report, and that details on site use and development history have been previously summarized, this recap focusses on the RECs identified in the ESA, providing additional background context for these RECs as relevant to the scope of this TBA. The RECs identified in the report included the following bullets, with features described in the text depicted on Figure 2.

1. A documented release of PCP to soil and ground water in the vicinity of the planer building (this release and associated characterization and remedial efforts were discussed in greater detail in previous Sections 3.1, 3.2, and 3.3 of this memorandum.
2. A release of petroleum hydrocarbons from an underground storage tank (UST) that had

been located near the southeast corner of the maintenance shop. Interviews conducted during the ESA also revealed that additional USTs may have been present near the maintenance shop, including one near the southwest and four near the northeast corner of the maintenance shop. Available reports only documented the removal of the one UST southwest of the maintenance shop, with subsurface soil and ground water impacted by petroleum products at concentrations in excess of current day MTCA A cleanup levels; free-product was observed in the removal excavation at the time of UST removal.

As a means to assess whether additional USTs and subsurface environmental impacts may remain near the maintenance shop, Maul Foster & Alongi, Inc. (MFA) performed subsurface characterization work, including a geophysical survey; MFA's efforts are discussed in greater detail in Section 3.7 of this memo.

3. For a period of nine years ending in June of 1989, paint wastes were released from the property to Shannon Slough. As a result, in 1990 Weyerhaeuser was convicted for illegal discharge under the Clean Water Act (Seattle Times 1990). This waste had been generated while cleaning stencils near the southeast corner of the planer building. Contaminants found in the slough at/near the discharge point included 1,1,1-trichloroethane (TCA), naphthalene, and other petroleum products. Although the exact waste handling process was not well defined in available reports, the waste appears to have been stored in various tanks, including what has been referred to as the "paint waste UST." Waste water from this process were also discharged to Shannon Slough by way of a trench in the stencil cleaning area that led to the stormwater management system, and an outfall on the Shannon Slough. Sediment sampling along the slough undertaken to characterize the extent of these and other releases from the site identified TPH, PAHs, VOCs, and metals in sediments.

   While the associated cleanup reports did not appear to be available to PES, in 1993, a letter from EPA noted that conditions leading to the 1990 conviction had been corrected, and the site was removed from the EPA's list of "violating facilities." Although the exact relationship between a 1992 RCRA Preliminary Assessment (PA) of the site and this statement by EPA are not spelled out in PES' Level I ESA, analytical data for samples collected during the RCRA PA documented sediment conditions to be compliant with Washington Sediment Quality Standards (SQS) or when a related SQS value was not available, the MTCA A cleanup levels in effect at that time.

   The RCRA PA also noted that the building located west of the maintenance shop had functioned as both a hazardous waste storage area and a vehicle wash stand. As releases had reportedly occurred in that area, the RCRA PA recommended follow-on sampling and testing near this building. This recommendation for follow on sampling does not appear to have been called out in the PES Level I report,

4. At some point, apparently after the illegal discharge activities, the paint waste UST served as an intermediary holding tank before the paint waste was transferred to a second storage tank and then disposed offsite (WEST 1992). This UST was removed from a location nearly adjacent to the southeast corner of the planer building, and owing to this location, impacted soils were left in place to minimize the risk of undermining the building's foundation. During removal of the paint waste UST, TCA and petroleum impacts were noted in soil and ground water. While TCA was not detected in soil

samples collected from the sidewalls and bottom at the limits of the removal/remedial excavation, TPH in the form of either hydraulic oil or lube oil remained in soils at concentrations in excess of current day MTCA A cleanup standards.

In addition, it appears that the well network installed to assess ground water quality in relation to PCP releases (see Section 3.1, 3.2, and 3.3) (Emcon 1997), may in fact have been originally installed to assess impacts related to the paint waste UST release (DOF 1990). While available information does not define the separation distance between the paint waste UST removal excavation and the nearest well(s), several volatile organic compounds were occasionally detected in these wells, including the TCA breakdown product 1,1-Dichloroethane (DCA) (Cho et. al. N.D.). Vinyl chloride was also apparently detected in one of the 36 samples collected from the well network (PES 2010, WEST 1992).

5. The Level 1 ESA also detailed multiple releases of petroleum products to the Chehalis River along the site shoreline. Information on these spills/releases appear to have been found during review of the facility's Storm Water Pollution and Prevention Plan, and other Weyerhaeuser maintained files, as wells as detailed during interviews with site knowledgeable individuals.
6. The past presence of an additional sawmill facility on property east of Shannon Slough, at the current day location of the chip truck lift and chip piles was also noted as a REC. While that property was also owned by Weyerhaeuser, only a small portion that land area was conveyed to the GHSSA. Potential contaminants of concern in this area included hydraulic oils, petroleum products, and other potentially hazardous materials.

In their review of the site's general history PES identified the following potential sources of environmental impact:

7. Given that the site had been used for industrial purposes for more than 100 years, unknown/unassessed areas of environmental impact may be present on the site;
8. As previously discussed, the mill had originally been constructed on an over-water, piling-supported pier. Over time, this area was filled. The source, content, and/or environmental quality of this fill material is unknown.
9. Wood fired boilers and refuse burners were historically used on the site. Where or how the ash was disposed of is not known.

The ESA also identified the following data gaps regarding potential environmental issues at the site:

10. An oil storage tank and chemical storage building was located on the northwest corner of the storage shed. Other than its presence on a historic facility map, no information was available regarding these features.
11. As per responses provided by Weyerhaeuser on a March 22, 2000 dated questionnaire, multiple USTs were reportedly removed from site between 1977 and 1979. In addition, PES' review of UST databases maintained by Ecology revealed that three USTs were removed from the site; two of these tanks (10,000 gallon diesel UST and 600 gallon gasoline UST) were listed as removed in December 1988. Although there is conflicting

data on whether the third UST stored used oil or leaded gasoline, as was discussed in Item #2 of this section, its removal occurred in 1993. Interviews with site knowledgeable individuals, again as discussed in Item #2 of this section, also provide anecdotal accounts of additional USTs potentially removed from the site.

No information was available regarding the location of the remaining USTs or the potential presence of related environmental impacts. The relationship (if any) between these tanks and the tanks listed in the March 22, 2000 dated questionnaire and ecology files, or those described by site knowledgeable individuals is not clear.

12. The March 22, 2000 dated questionnaire also stated that although the fill pipe was left in place, the UST formerly located adjacent to the Guard Shack had been removed. Further documentation on this UST removal and/or related sampling and testing work was not available. This fill pipe was noted onsite during the START site visit and the area of this tank was included in the MFA study discussed in Section 3.7.
13. Finally, during document review, PES noted multiple references to an independent cleanup action report that had been submitted to Ecology in 1991. This/these reports appeared to have been related to characterization and cleanup efforts taken in response to releases of paint waste discussed in items #3 and #4 of this section. Although references to the paint waste UST removal efforts were noted in a draft ground water characterization report that provided the background for discussion in item #4 of this section, PES was unable to obtain copies of the cleanup action report(s) from either Ecology or Weyerhaeuser.

3.5 Sediment Sampling Report, Maul Foster & Alongi, Inc. (2014):

On February 5, 2014, MFA presented GHHSA with the results of "bookend" sediment sampling work performed in connection with the former mill site (i.e., comparison of sediment conditions prior to and at the end of the lease period). This sampling event appears to have been undertaken to document sediment conditions in the intertidal lease land at the end of Weyerhaeuser's occupancy of the site. Sampling locations include near-shore surface and subsurface sediments along the "pocket beach" north of the maintenance shop, and surface sediments further offshore from the site, within the Chehalis River. The near shore samples (CR-04, CR-05, and CR-06) were located both beneath old "big mill" building footprint, and hydrologically downgradient of the maintenance shop.

Findings from that study potentially relevant to sampling efforts proposed for the upland area under this TBA includes the presence of significant quantities of wood waste in surface and subsurface sediment sample locations; sheens, petroleum-like odors, and dark-colored water being noted in both surface and subsurface sediment samples; and the presence of diesel to heavy oil range TPH and PCBs in both surface and subsurface sediments. The report did not conclude what the source of those impacts were; however, given the development history of the site and that these sample locations are downgradient of the maintenance area it appears likely that spills/leaks/releases from the big mill or downgradient migration from other upland sources may have caused this contamination.

3.6 ***Draft Disproportionate-Cost Analysis*, Maul Foster & Alongi, Inc. (2016a):**

On April 12, 2016, MFA presented GHSSA with a Draft Disproportionate Cost Analysis focused on the contamination left in place beneath the planer building. The cost analysis was undertaken to compare overall cost, protectiveness, permanence, long term effectiveness, short term risk management, implementability, and the anticipated public concern for use of two different remedial approaches to address contamination near and beneath the Planer Building. Given the proposed change in use, MFA compared contaminant levels to either MTCA A or MTCA B cleanup levels for unrestricted land use when determining the amount of material requiring remediation. The first approach proposed removal and offsite disposal of an estimated 10,640 cubic yards of contaminated material; the second approach was to leave contamination in place and control potential exposure using an engineered cap and institutional controls. Ultimately, while differences were noted in many metrics, given offsite disposal was estimated to cost approximately four times that of an engineered cap construction, this second option (i.e., engineered cap) was the recommended remedial approach.

In addition, this cost analysis included a brief discussion and summary of analytical data for ground water sampled from temporary wells along the current shoreline, north of the planer building and maintenance shop. While no PCP was detected in ground water sampled from these locations, TPH was detected at concentrations above the MTCA A cleanup level. Additional discussion on soil, sediment, and ground water sampling data from these locations is included in Section 3.9.

3.7 Focused Investigation Report, Maul Foster & Alongi, Inc. (2016b):

On July 14, 2016, MFA presented the GHSSA with their Focused Investigation Report summarizing and discussing subsurface characterization work performed in the uplands area of the site. Prior to conducting their investigation, MFA reviewed PES' Level I ESA and identified areas of potential concern on the site, prioritizing those that were perceived as having the greatest risk of impacting the northern adjacent tidal lease lands. Sampling locations were selected and overall project scope was informed by a review of this Level I ESA, and the results of geophysical survey conducted at the site in 2015.

The geophysical survey was performed in light of the uncertainty regarding the number, location, and status of USTs reportedly located on the property. The geophysical survey targeted the area of the maintenance shop and guard shack (see Figure 3). The geophysical survey identified numerous subsurface anomalies that may have been USTs, however based on review of the data and discussions with site knowledgeable individuals, MFA opined that these anomalies were likely cement vaults associated with the facilities electrical and fire systems. MFA also noted two additional anomalies southeast and southwest of the maintenance shop that based on their size, burial depth, and location, may have been UST locations. While the geophysical survey identified disturbed soil near the guard shack, no evidence that a UST remained at this location was encountered.

Three borings (B01, B02, and B03, Figure 3) were advanced surrounding the maintenance shop. Soils were recovered to the full depth of exploration (10 feet bgs) for screening and/or sampling, and the borings were completed as temporary ground water monitoring points. Soils were observed upon recovery and field screened with a photo-ionization detector. Field screening

revealed soils with petroleum odors and elevated PID readings at approximately 5 feet bgs in borings B02 and B03. Soil sample were then collected from both of these borings at 5 feet bgs, and 4.5 feet bgs in B01. While diesel and/or heavy oil range TPH were present in soils from both B02 and B03, only the concentrations of TPH in B02 exceeded MTCA A cleanup levels. TPH concentrations in ground water from both B02 and B03 were also above MTCA A cleanup levels, with concentrations of TPH in B02 significantly above cleanup levels.

Additionally, while ground water sampled from B02 also contained total chromium and lead above MTCA A cleanup levels, as the sample had relatively high turbidity and the dissolved concentrations of those metals were below cleanup levels, these detections were not interpreted to indicate ground water posed an elevated exposure risk to human health or the environment. Total carcinogenic PAH (cPAH) concentrations in ground water from B02 also exceeded MTCA A action levels, however based on the high detection limits associated with this sample and method used to calculate cPAH toxicity, this data was interpreted as inconclusive.

3.8 Study Area Investigation – Aquatic Lands Lease, Maul Foster & Alongi, Inc. (2017):

On April 11, 2017, MFA completed and presented the Agency review draft of their Study Area Investigation (SAI) report. The report was undertaken to characterize the nature and extent of environmental impact in the approximately 16.9 acre leased tidelands at the Seaport Landing site (i.e., areas generally north of the inner harbor line). In addition to summarizing sampling and review performed on other portions of the Seaport site, this report discussed the results of sediment and limited upland area sampling. Characterization efforts included collecting soil and ground water samples from four upland borings, and numerous surface and subsurface sediment samples.

Similar to the findings of the 2014 limited sediment investigation, this study further characterized the extent of wood waste in surface and subsurface soil and sediment sample locations. Soil sampled from the two closest borings to the site (CR-20 and CR-21) contained heavy-oil range TPH at concentrations above the screening level. Benzo(a)pyrene and the cPAHs TEQ value exceeded applicable screening levels in borings CR-20 and CR-21 while PCB concentrations in CR-20 also exceeded the cleanup value. Diesel and/or lube oil range TPH concentrations in ground water were above screening levels at CR-20 and CR-21, as well as at CR-22 and CR-23. Sheens and non-aqueous phase liquids (i.e., free product) were also noted on the ground water at sediment boring location CR-11, and although the deep sediment sample collected from this boring did not contain TPH concentrations above cleanup levels, the sample was collected approximately 23 feet beneath the ground (or mudline) surface.

4 Select Site Visit Observations:

During the START file review and site visit, the following items of potential environmental concern were noted.

- A chemical waste and fuel storage building is, and has been located east of the maintenance shop (Figure 2). During the START site visit, numerous 55-gallon drums and a blind sump containing oil were noted in this building. Above ground fuel tanks had also been located in this building. As discussed under item#2 of Section 3.4, the RCRA

PA report indicated that releases had reportedly occurred in this area, and follow-on sampling and testing was recommended.

- The former planer/grader building and grader building was generally devoid of equipment with much of the building interior accessible by vehicle. Several below-ground concrete lined pits/trenches were noted in the northern portion of the building that appeared to have been used as conveyor line routings to feed sawn lumber into the building. Some sludge/soil was noted in these pits/trenches. The historic spray booth, chemical storage, and control rooms were noted to be smaller individual spaces within the northern portion of the building, where vehicular access would be more limited. Adjacent exterior areas of the building were generally open, paved, and accessible by vehicle.
- A second vehicle maintenance area had been located in the northwest corner of the main shipping shed (Figure 2). Pictures in the PES Level I depict below ground maintenance pits with inclusive oil storage tanks. None of these features were observed during the START site visit.
- An additional oil storage area was located in the southeast corner of the shipping shed (Figure 2). During the START site visit, this was noted to consist of an aboveground vault, with liquids present in the vault.
- The western margins of the site include a large asphalt paved, open area that had been and is currently used for storage and staging. A large, open storage building abuts the eastern side of this storage area. At the time of the site visit, discreet portions of the area were used to store nets, rope/line, and what appeared to be other pieces of fishing related equipment. Additional line, netting, various wood pallets, and drop-in truck campers were stored adjacent to the west side of this building. Based on historic maps, an oil tank and chemical storage shed had been located near the northwest corner of the storage building. No evidence of this historic structure was noted.
- While in operation, the Weyerhaeuser operated sawmill had numerous tanks dispersed across the property to store hydraulic oil. In total, these tanks included an aggregate capacity for approximately 15,000 gallons of liquid.
- The southern portion of the maintenance shop also includes a steam cleaning facility and inclusive water capture and treatment system (Figure 2). The system was designed to recycle wash water used by the system. Staining and discoloration was observed on the walls and floors within this building, though given that the area was in use for equipment storage during the START site visit, the integrity of the floor could not be visually assessed.
- An additional tank was used to store sodium hydroxide was also the reported location of a spill (Figure 2). This tank was located near the southwest corner of the Main Shipping Shed.
- During the site walk, a ground water monitoring well was also observed on the northeast side of the shipping shed/small log mill building (Figure 2). As no other record of this well could be found, its purpose is unknown.

5 Recognized Environmental Conditions and Remedial Action Units:

Given the length of time the site has been industrially utilized, stakeholders have attempted to divide the site into Remedial Action Units (RAUs) to best leverage resources to catalyze the productive reuse of the site. These RAUs are presented below in order of priority and are graphically depicted on Figure 4; RECs associated with each of these areas are included as a subheading. As discussed in Section 1 of this memo, while sediment impacts have been documented and those impacts would represent a REC, the area north of the inner-harbor line, including a limited amount of upland area and the sediment/riverine environment, is not included in the scope of this TBA; as such further discussions of contamination in that area of the site have been omitted.

- ***Remedial Action Unit 1:*** GHHSA plans to convert the former Maintenance Shop for use as an educational/interpretive center. Given the relatively low capital requirements for this conversion, and its potential to benefit and engage the community, further investigation of subsurface impacts in this area and potential related exposure routes were identified as the highest priority for study.
    - **Contaminated Subsurface Soil and Ground Water near the Maintenance Shop:** Impacts to subsurface soil and ground water around the maintenance shop have been confirmed. The source(s) of these impacts does not appear to be fully characterized. At least one UST has been removed from this area. Available records and interviews with site knowledgeable individuals attest to numerous additional USTs having been present on the site, some of which may have been located near this building. That said, geophysical survey work discussed in Section 3.7 has not identified suspect USTs in this area.

      In addition to tanks, other potential sources of subsurface impact in this area include the chemical waste/fuel storage building east of this building; a vehicle maintenance area previously located in the northwest corner of the shipping shed; steam cleaning work performed in the southern portion of the maintenance shop; and operations within the maintenance shop itself. Potential contaminants include: metals, SVOCs, diesel to heavy oil range TPH (TPH-Dx), and volatile organic compounds (VOCs).
- ***Remedial Action Unit 2:*** To help generate income from tourism for the site and community, plans for the western portion of the site include construction of a hotel, restaurant, brewery, or other similar attractions. Such tourist-centric developments are likely to abut and/or overly portions of the planer building footprint where subsurface soil and ground water are impacted by PCP. The former location of a UST used to store paint waste is also included in RAU2. The extent of RAU2 generally conforms to the former planer/grader building footprint.
    - **Contaminated Subsurface Soil and Ground Water near the Former Planer/Grader Building:** Subsurface soil and ground water has been impacted by PCP beneath the northern portion of the planer/grader building. Hydraulic equipment and transformers had also been located adjacent to the exterior of this building. While remediation has occurred in this area, soil and ground water with PCP concentrations in excess of current day MTCA cleanup standards remain. The full extent of soil impacted by PCP at concentrations above current day MTCA cleanup standards is not currently known.

Soils/sludges from unknown sources are also present in concrete pits/trenches located within the building. Potential contaminants in this area include metals, PCBs, SVOCs, VOCs, and TPH-Dx.

- **Contaminated Subsurface Soil and Ground Water near the Former Paint Waste UST:** Areas beneath/adjacent to the southern portion of the planer building have been impacted by releases associated with a removed paint waste UST and former onsite painting activity. The area near the paint waste UST has been impacted by TCA, other VOCs, and TPH reportedly as either hydraulic oil or lube oil. While TCA concentrations were compliant with MTCA A cleanup levels, other contaminants remained above these action levels at the end of the cleanup work. Potential contaminants of concern in this area include TPH-Dx, VOCs, and SVOCs.

- ***Remedial Action Unit 3:*** Potential impacts on the western part of the site but further from the planned tourism development encompass the third RAU. Referencing Figure 4, RAU3 includes the area of the property west and south of both RAU1 and RAU2.
  - **Unknown/Unassessed Condition of Soil and Ground Water Near the Former Oil Tank and Chemical Storage Shed:** A historic property map from 1951 depicted an oil storage tank and chemical storage shed near the northwest corner of the storage shed. No sampling and testing has apparently been performed in this portion of the site. Potential contaminants include metals, SVOCs, TPH-Dx, and VOCs.
- ***Remedial Action Unit 4:*** The fourth RAU includes other RECs identified on the GHSSA property, but that appear to be generally outside of the areas targeted for the most immediate redevelopment efforts. These RECs include the following:
  - **Unknown/Unassessed Conditions of Soil and Ground Water near former Vehicle Maintenance Area:** Vehicle maintenance had historically occurred in the northwest corner of shipping shed. Several maintenance pits that included storage tanks were reportedly located in this area. The pits could not be located at the time of the site visit, nor is soil and/or ground water sampling data available for this area.
  - **Unknown/Unassessed Condition of Soil and Ground Water near a Former NaOH AST:** Two ASTs were formerly located near the southwest corner of the shipping shed that stored NaOH used for parts cleaning work. Liquids from these tanks were reportedly discharged to the sewer system until 1990. In 1990, due to the liquid's corrosiveness and high concentration of lead and zinc, spent solution was disposed offsite. At the time of decommissioning a leak was found in the sewer discharge pipe. No information is available on actions taken to address or characterize potentially associated impacts. Potential contaminants of concern appear to be limited to metals.

Although the following RECs were also identified for RAU4, investigation of these is not proposed for this TBA:

- Releases of TPH to the Chehalis River;
- Unknown/unassessed conditions from the former sawmill located on the eastern adjacent property, near the chip lift.
- Unknown/Unassessed condition of soil and ground water near an oil storage area near the southeast corner of the shipping shed.

- ***Remedial Action Unit 5:*** This area includes areas of potential impacts on the south central portion of the site where redevelopment is not expected in the near term, and that are also interpreted as having a relatively low risk of impact relative to other RAUs more immediately targeted for redevelopment or reuse. Referencing Figure 4, RAU5 includes the area of an aboveground storage tank (AST) associated with an onsite backup generator; and a UST that had been located on the northern side of the Guard Shed. Sampling is not proposed in this area under the scope of TBA.

6 Sampling and Analytical Strategy:

To begin to address the above summarized RECs and potential environmental concerns, the following investigatory steps are proposed (see Figure 4 for sample locations).

- **Geophysical Survey:** In an attempt to identify USTs or other infrastructure that may interfere with sampling locations in other areas of concern a geophysical survey will be conducted. The survey will be conducted using both electromagnetic and ground-penetrating radar equipment. Should this work identify subsurface anomalies (i.e., potential UST(s)) on the site, additional steps will be taken to discern the size and orientation of any such items, such that investigatory borings can be safely advance along the margins of the tank. Given that geophysical survey work has already taken place in the areas immediately adjacent to the maintenance shop and guard shack, these efforts will target the area of the Fuel and Chemical Storage Building east of the maintenance shop, and the former oil tank and chemical storage shed west of the storage building.
- **Subsurface Soil and Ground Water Sampling:** The START proposes sampling and testing of subsurface soil and ground water by placing temporary borings using a direct-push drill rig. For boring locations that are placed in the vicinity of currently existing ground water monitoring wells, the START will attempt to collect the ground water sample from the nearby well rather than from a temporary well screen advanced by the geoprobe. As outlined below, sampling from a total of 18 borings and three monitoring wells is proposed:
    - Six borings in RAU1 to further assess potential impacts proximal to the maintenance shop and assess whether surrounding historic legacy land uses, including the Fuel and Chemical Storage Building, are contributing to impacts in this area;
    - A total of eight borings in RAU2 including three borings near transformer pads or hydraulic equipment locations around the west side of the planer building; two borings on the west and one boring north of the planer building soil remediation area; and two borings at locations expected to be within and downgradient of the former paint waste UST. Monitoring well D-02, D-03, and D-05 will also be targeted for sampling;
    - A total of two borings in RAU3 targeting the area of the former oil tank and chemical storage shed; and
    - Two borings in RAU4 including one boring north of the former vehicle maintenance area within the shipping shed, and one at the location where NaOH had reportedly been released.

All borings will be advanced as continuous cores in 4-foot sections. Borings will be advanced to a maximum exploration depth of 12 feet below ground surface, or until ground water is encountered, whichever is first. As per information previously provided, ground water is expected to be within 10 feet of the ground surface. Small portions of soil collected from each boring interval will be placed in plastic bags for VOC headspace analysis using a photo-ionization detector (PID) and/or flame-ionization detector (FID). Up to two subsurface soil samples will be collected from each boring. Assuming ground water is encountered and recoverable, one sample of ground water will be collected from each boring using a temporary sampling screen or existing monitoring well. All ground water samples will be collected using low-flow techniques, with samples collected after ground water monitoring parameters have stabilized. All samples will be submitted to a fixed laboratory for a mix of metals, SVOCs (including PAHs), PCBs, TPH-Dx, and VOCs analyses as follows:.

- **RAU1:** Samples will be analyzed for metals, SVOCs, TPH-Dx, and VOCs
- **RAU2:** Samples will be analyzed for metals, SVOCs, and PCBs near transformer pads or hydraulic equipment; and metals, SVOCs, TPH-Dx, and VOCs near the planer/grader building and former paint waste tank;
- **RAU3:** Samples will be analyzed for metals, SVOCs, TPH-Dx, and VOCs near the former oil tank and chemical storage shed;
- **RAU4:** Samples will be analyzed for SVOCs, TPH-Dx, and VOCs near the former vehicle maintenance area and, and metals at the NaOH release area.

- **Surface Soil Sampling:** Given the presence of soil/sludge in concrete pits/trenches within the planer/grader building and the uncertainty regarding their source, two surface soil samples will be collected from material within this pit. Samples will be collected by hand using dedicated sampling equipment and analyzed for metals, SVOCs, TPH-Dx, and VOCs.

- **Subslab Soil Vapor Sampling:** Given the proposed reuse of the maintenance shop for educational purposes and the documented presence of subsurface soil and ground water impacts by petroleum compounds in surrounding areas, up to four samples of subslab soil vapor will be collected. These samples will be collected from the north, central, and southern rooms within the building. The fourth sample will be collected from one of the two office spaces on the west-central side of the building. Soil vapor samples will be collected from the airspace immediately beneath the floor slab to assess the potential for vapor intrusion to impact indoor air quality within the building.

  Prior to sample collection, a shut-in test will be performed, the sample train will be tested for leaks using a helium tracer gas and isolating shroud, and at least three casing volumes of air will be purged from the sample train. Samples will then be collected and submitted for a select list of VOCs, volatile TPH constituents, and TPH fractionation analysis.

  Alternatively, during discussions with project stakeholders on June 12, 2017, the potential for GHHSA's consultant (MFA) to collect these subslab soil vapor samples was

discussed. This idea was introduced in response to Ecology's review comments requesting that vapor intrusion assessment conform to a "Level II" type assessment as defined by Ecology's Draft "*Guidance for Evaluating Soil Vapor Intrusion in Washington State*." Such a Level II type investigation would include sampling subslab vapor, indoor air, outdoor/background air, measuring the pressure differential between the building interior and subslab environment, and an assessment/review of chemicals within the building that may be impacting indoor air quality. In the event that MFA is authorized to complete subslab sampling, that data is available prior to sampling under this TBA, and subslab vapor sampling data indicates the need for further air sampling, the START may undertake steps associated with a "Level II" type investigation. If such Level II sampling occurs, the actual tasking and sampling methodology will be described within Sampling and Quality Assurance Plan.

- **Samples of Opportunity:** Due to the uncertainty of site conditions, additional samples may be collected based on observations made during the field sampling event in order to better assess environmental conditions at the site. Up to six additional subsurface borings may also be advanced depending on the results of the PID/FID and other field screening conducted during drilling. For estimating purposes, it is assumed that up to two soil samples and one ground water sample would be collected from each additional boring location (i.e., up to twelve soil and six ground water samples). Depending on the findings obtained during investigation of other areas of the site, opportunity borings may be used to target areas of concern in RAU4. Decisions regarding the need and placement of these samples and/or borings will be made in consultation with the EPA Task Monitor as will selection of the analytical suite to be applied.

If you have any questions or comments regarding this sampling approach, please contact me at 206-406-3411

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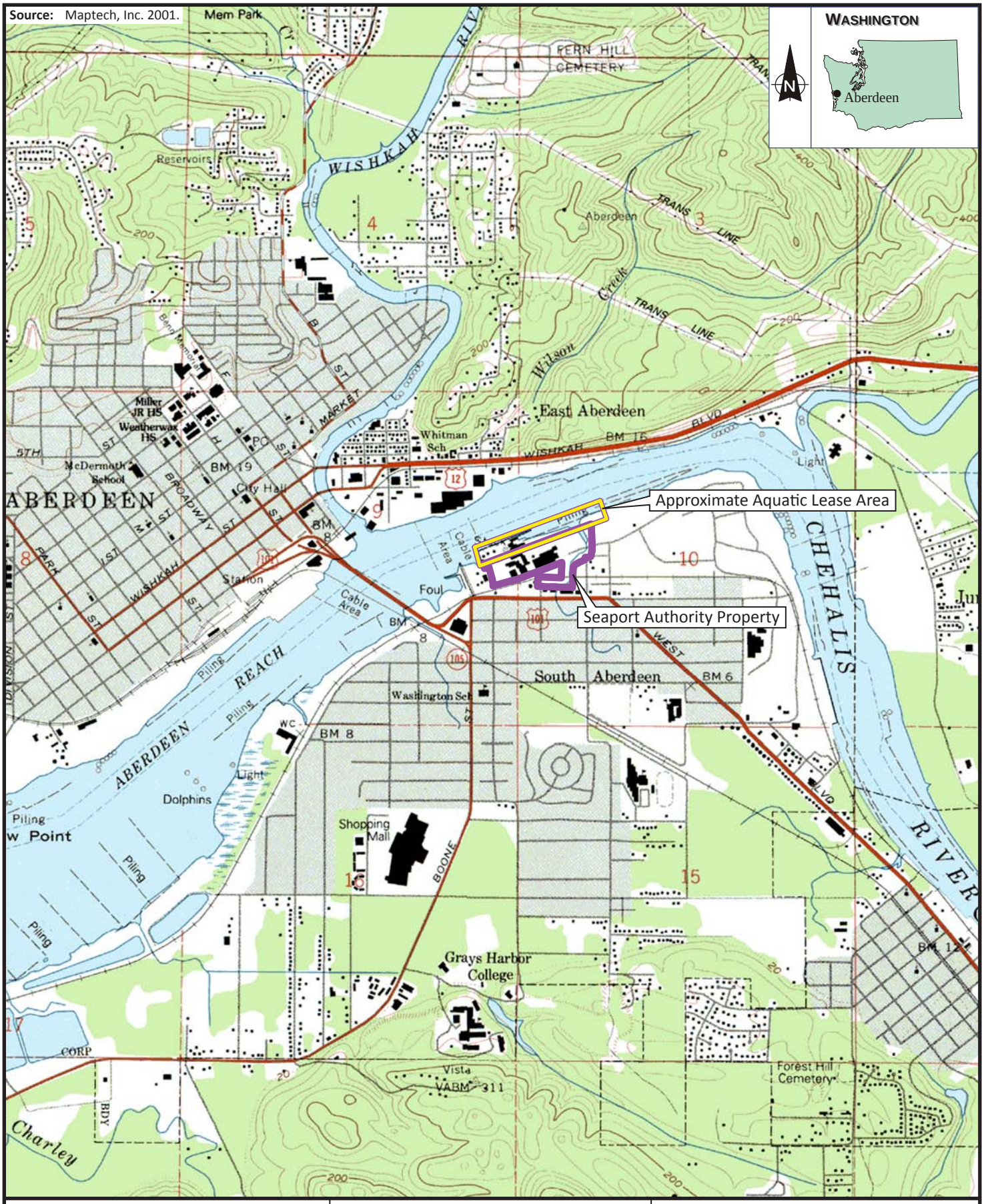
.

FIGURES



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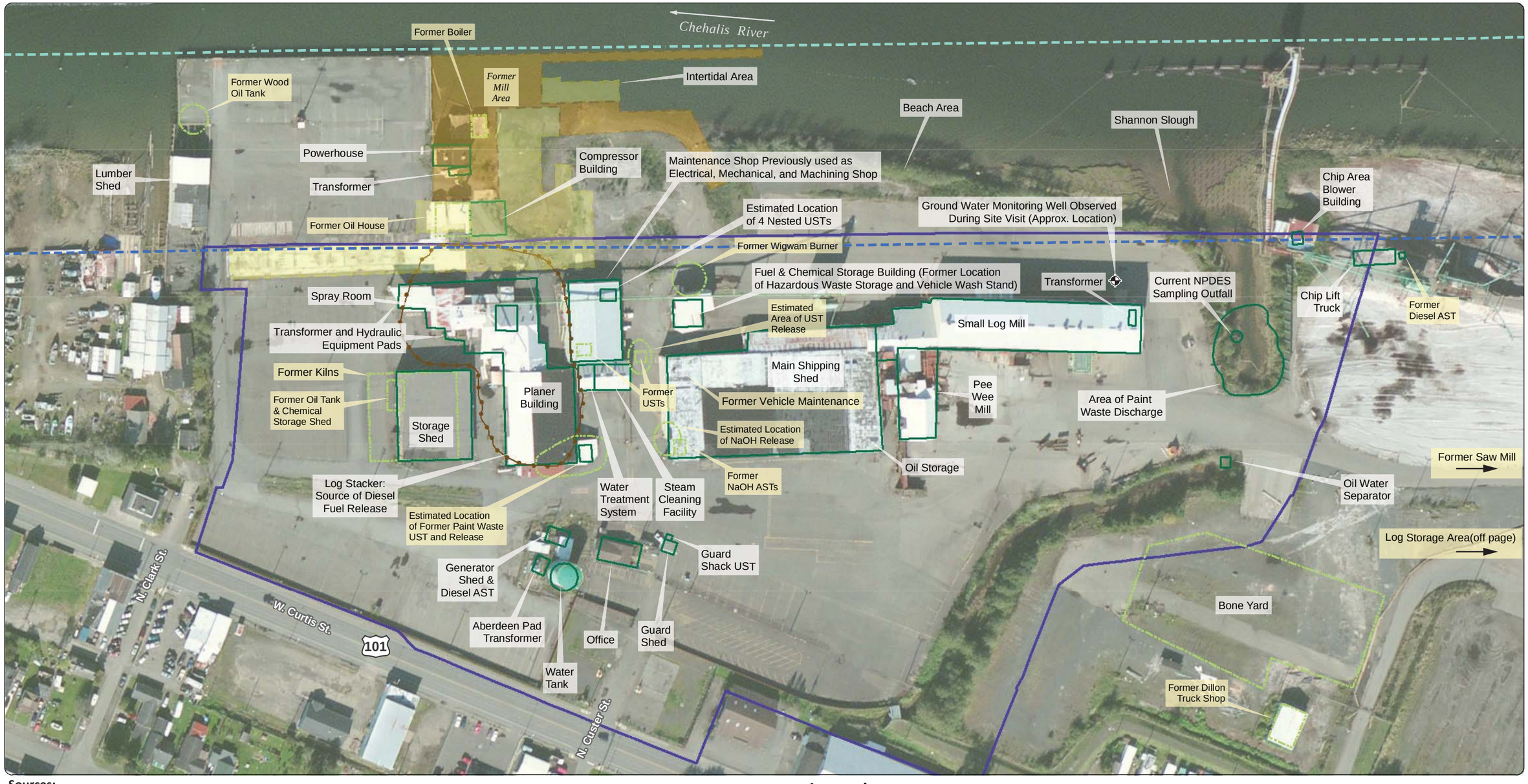
Seattle, Washington

SEAPORT LANDING
Aberdeen, Washington

Figure 1
SITE LOCATION MAP

0 1000 2000
Approximate Scale in Feet

Date:	Drawn by:	
4/14/17	AES	10:START-IV\17010004\fig 1



Sources:

Aerial photograph obtained from Esri ArcGIS Online.
Parcels and roads obtained from Grays Harbor County.
Harbor lines obtained from Washington Dept. of Natural Resources.
Former features from Level I Environmental Site Assessment, PES Environmental; August 13, 2010.

MAUL FOSTER ALONGI

Date: 1/22/2016

Legend

- Former Mill
- Former Wharf Extension
- Existing Buildings/Features
- Former Buildings/Features
- Former PCP Release
- Inner Harbor Line
- Outer Harbor Line
- Seaport Authority Property

0 100 200
Feet

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Figure 2
SITE LAYOUT MAP

Date:	Drawn by:	
5/11/17		10:START IV\17010004\fig 2

Sources: ©2016 Microsoft Corporation (Bing); Emcon 1997; MFA 2014, 2016a, 2016b.

Key:
- Boring Location (MFA)
- Sediment Sample Location (MFA)
- Monitoring Well Location (Emcon)
- Boring Location (Emcon)

N

Chehalis River

CR-05
Compressor Building
CR-04
CR-22
Former Oil House
CR-06
CR-11
CR-23
CR-21
GP-1
D-06
CR-20
Inferred Ground Water Flow Direction (Emcon)
B02
D-04E
Planer
Fuel and Chemical Storage Building
Former Mixing Room
Maintenance Shop
D-09
D-07
D-05
B03
B01
Grader Building
Former Vehicle Maintenance Area
D-08
D-01
Steam Cleaning Facility
Planer
D-02
Approximate Extent of Geophysical Survey
Sticker/Stacker
D-03
Approximate Extent of Geophysical Survey

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0 40 80 160
Approximate Scale in Feet

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Figure 3
SELECT SAMPLE LOCATIONS (MFA)

Date:	Drawn by:	
6/14/17	AES	10:START IV\17010004\fig 3

Sources: ©2016 Microsoft Corporation (Bing); Emcon 1997; MFA 2014, 2016a, 2016b.

Key:
- Boring Location
- Subslab Soil Vapor Sample
- Monitoring Well Location
- Surface Soil Sample Location
- Approximate Remedial Action Unit (RAU) Area
- RAU1
- RAU2
- RAU3
- RAU4
- RAU5

N

Chehalis River

Planer Building

Maintenance Shop

Proposed Geophysical Survey Area

Fuel and Chemical Storage Building

Proposed Geophysical Survey Area

Former Oil Tank and Chemical Storage Shed

D-05

Former Vehicle Maintenance Area

RAU1

RAU4

D-02

D-03

Former NaoH Release Area

RAU2

RAU3

RAU5

Former Paint Waste AST

Guard House

Generator Building

bing™

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0 50 100 200
Approximate Scale in Feet

SEAPORT LANDING
Aberdeen, Washington

Figure 4
PROPOSED SAMPLE LOCATION MAP

Date:	Drawn by:	
6/14/17	AES	10:START IV\17010004\fig 4