Report

Site Investigation and Remedial Action Report

Prepared for

Boise Cascade
Vancouver, Washington

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Prepared by

CH2MHILL

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1.0 Introduction

This report presents the findings and results of the Phase I Environmental Site Assessment, Phase II and supplemental site characterizations investigations, and remedial actions conducted at the Boise White Paper LLC ("Boise") converting paper facility in Vancouver, Washington. The remedial action included soil sampling, excavation, and backfilling with clean soil of an area at the Boise Vancouver Mill site.

1.1 Site History

The site has been occupied and developed since at least 1911. By 1928, the Columbia River Paper Company was present at the site. Boise Cascade Corporation assumed ownership of the facility in the 1960's. Pulp mill operations at the site were discontinued in 1970. Paper mill operations were discontinued in 1996. From 1996 to 2006, the operations have included paper converting (cutting and coating of paper for specific end user use), limited printing services, packaging and storage of roll paper for distribution. No other operations are currently performed at the site. In October 2004, Boise Cascade Corporation sold the Vancouver facility to Boise White Paper, LLC. Additional site history is included in Appendix A.

2.0 Project Background

2.1 Site Location

The Boise Vancouver Mill Site is located in Vancouver Washington, and occupies approximately 35 acres of land, including 28.74 acres owned by Boise and approximately 7 acres of tidelands which is leased from the Washington Department of Natural Resources. In addition, Boise leases 5 acres from the Port of Vancouver. The site is an irregularly shaped parcel bounded roughly on the south by the Columbia River, on the north by West 7th Street, on the east by railroad tracks and on the west by a marine terminal. A Site location map is provided in Figure 1.

2.2 Topography/Geology

The site is located on the north shore of the Columbia River within the Vancouver, Washington, city limits. The site is relatively flat with a slight grade towards the Columbia River, and lies approximately 25 to 35 feet above the National Geodetic Vertical Datum.

The subsurface profile encountered at the site consists of medium to fine-grained sand and silt to a depth of at least 50 feet below ground surface, the maximum depth encountered during this site investigation. This material is likely Columbia River alluvium and dredge spoils placed to facilitate site development. This sand and silt is underlain by coarse-grained Pleistocene alluvial flood plain deposits which may extend down to a depth of 300 feet (Washington Division of Geology and Earth Resource 1987). The Troutdale Formation (partially to fully consolidated sand, gravel, and cobbles) underlies the Pleistocene flood deposits (LSE 1990).

A soil boring log from a production well near the shipping warehouses on the east end of the site indicates that sand, gravel, and cobbles extend to a depth of 49 feet, sand and gravel

with intermixed boulders down to 102 feet, and cemented gravel and cobbles down to 170 feet with a water bearing gravel zone occurring between 140 to 165 feet below ground surface.

During the investigation work, groundwater was encountered at depths of ranging from 27 to 33 feet, depending on location. It is assumed that shallow groundwater beneath the site flows in a southerly direction toward, and eventually discharging to, the Columbia River. This assumption is based on observations and groundwater monitoring at other nearby sites including the Frontier Hard Chrome Superfund Site located approximately 1 mile east of the Boise property (EPA, 2003).

3.0 Previous Investigations

3.1 2004 Phase I Environmental Site Assessment

A Phase I Environmental Site Assessment (ESA) was completed in July of 2004 by URS Corporation for the Vancouver Mill site. The ESA identified five recognized environmental conditions (RECs), two historic RECs, and 12 "*de minimis*" environmental conditions that were not considered to be RECs. URS's review of information gathered during the ESA indicate that two adjacent properties may influence environmental conditions on the Boise Cascade site. A copy of this investigation is included as Appendix A.

The five recognized environmental conditions identified by URS were:

1. Discolored soil related to fire in 1983 at Vancouver Ice and Fuel
2. A chemical warehouse fire in 1981 at the port warehouse location
3. A former above-ground storage tank (AST) and piping to the outfall station
4. A former parts washing grate
5. An above-ground storage vessel that may have leaked

The two historic RECs identified by URS were:

1. Removal of an 8,000 gallon No. 6 fuel oil tank
2. Removal of a 1,000 gallon gasoline tank

The twelve "*de minimis*" environmental conditions are as follows:

1. Historic drum storage
2. Rail spur
3. Fill material south of railroad tracks
4. Potential leaking sumps
5. Sulfite plant
6. Acid recovery area
7. Paint house
8. Decommissioned methanol tank
9. Hot water tank
10. Damaged trenches
11. Potential buried material
12. Upgradient/adjacent properties

3.2 2005 Phase II Site Investigation

The Phase II site investigation was completed in May 2005. The work plan prepared for the Phase II comprehensive investigation identified fifteen areas of interest (AOI) for initial investigation. AOI's are shown on Figure 2 and consist of the following:

- AOI 1—Chemical Warehouse Fire
- AOI 2—Fuel Tank Area
- AOI 3—Former Gasoline Storage
- AOI 4—Parts Washing and Former Fuel Tank
- AOI 5—Paper Storage Area
- AOI 6—Secondary Fiber
- AOI 7—Former Pulp Mill
- AOI 8—Vancouver Fuel and Ice Fire
- AOI 9—Former Drum and Sludge Storage Area
- AOI 10—Boneyard
- AOI 11—Fill Area
- AOI 12—Paint House
- AOI 13—Coater and Chemical Room
- AOI 14—Historical Transformer Locations
- AOI 15—Background/Upgradient Sources

Eleven of the fifteen AOIs investigated did not exceed preliminary screening to Model Toxics Control Act (MTCA) Method A or B cleanup levels. Four AOI's (chemical warehouse fire [AOI 1], parts washing and former fuel tank [AOI 4], paper storage area [AOI 5], and background/upgradient sources [AOI 15]) had soil and/or groundwater detections that exceed screening against MTCA Method A or B cleanup values.

Naturally occurring metal compounds in groundwater exceeded MTCA Method B screening values, likely from the presence of organic material in the subsurface, or elevated background concentrations in the native soils of the area. Findings of the site investigation in the three areas that exceeded screening criteria are described below.

AOI 1—Chemical Warehouse Fire

Lead was detected in shallow soil at a boring location south of the Port Warehouse at a concentration exceeding the MTCA Method A cleanup value. Elevated lead concentrations were limited to the single soil sample at SB-104. Based on this result, additional shallow soil sampling was conducted near SB-104 as described in Section 3.5 and remedial action taken as described in Section 6.4. A groundwater sample was collected at SB-104, no constituents were detected in groundwater.

AOI 4—Parts Washing and Former Fuel Tank

Heavy oil range hydrocarbons in soil and groundwater and TPH-Dx in groundwater exceeded Method A cleanup levels. Given the nature of the constituents detected (long chain hydrocarbons) it is reasonable to assume that these detections are attributable to the former underground fuel oil tank at this location. Based on these results, additional investigation was conducted for AOI 4 as discussed in Section 3.3.

AOI 5—Paper Storage Area

Diesel and heavy oil range hydrocarbon concentrations exceeded Method A cleanup levels in two of three shallow soil samples collected in this area. Samples were collected directly below existing asphalt which may have biased the heavy range TPH-Dx samples high. Based on these results, additional investigation was conducted for AOI 5 as discussed in Section 3.3.

AOI 15—Background/Upgradient Sources

Diesel and heavy oil range hydrocarbon concentrations exceeded Method A cleanup levels in both soil and groundwater at one location (SB-127). Affected soils are located greater than 25 feet below ground surface therefore a complete exposure pathway is not present. Samples collected and visual observations indicate that the hydrocarbons observed are localized and have likely migrated to this location from an upgradient source located on an adjacent property. No known current or historical sources of hydrocarbon are present in this area of the facility. Subsequent discussions with Albina Fuels personnel indicated the presence of petroleum underground storage tanks on the adjacent property.

Manganese concentrations were detected at elevated levels at several locations onsite. These elevated levels may be related to reduced geochemical conditions associated with biological activity near or immediately downgradient of the former pulp mill processes. Over time as the carbon source supporting the biological activity is depleted, the geochemical equilibrium will eventually shift back to normal, and manganese will again be in its stable, essentially insoluble state.

A copy of this investigation report is included in Appendix B.

On May 11, 2005, representatives from Boise, CH2M HILL and Washington State Department of Ecology met to review the findings of the Phase II investigation. It was agreed that additional investigation in the AOI 4 and AOI 5 was warranted and that based on these findings appropriate remedial actions (if necessary) would be initiated.

3.3 Areas of Interest (AOI) 4 and 5 Investigation

AOI 4 (parts washing and fuel tank) and AOI 5 (paper storage area) were identified during Phase II investigation as areas with soil concentrations exceeding Method A and B cleanup values for soil. A supplemental sampling event was conducted on June 22, 2005 to further investigate the extent of petroleum affected soil in these two AOI's.

AOI 4—Parts Washing and Former Fuel Tank

During the Phase II investigations, petroleum hydrocarbons were detected at soil boring SB-108 near the location of a former leaking fuel oil UST (AOI 4). Heavy range TPH-Dx was detected at a depth of 12 to 15 feet below ground surface at concentrations greater than conservative preliminary cleanup levels.

In order to investigate the extent of petroleum affected soils in AOI 4, a supplemental investigation was completed on June 22, 2005. This investigation consisted of advancing 6 Geoprobes with in the AOI 4 area. Geoprobes were advanced to a depth of approximately 15 feet below ground surface at most locations. Soil was logged and monitored as detailed in the Sample and Analysis Plan (SAP) prepared for the Phase II investigation and included

in Appendix B. Soil samples were collected at each Geoprobe location for laboratory analysis based on field observations described in the Phase II investigation SAP.

Geoprobe locations (SB-206 through SB-211) are shown in Figure 3 and soil analytical results are summarized in Table 1. Laboratory analytical data is presented in Appendix C. Total petroleum hydrocarbons (TPH) were identified during the Phase II investigation as the single chemical of concern in this area therefore, soil samples were only analyzed for TPH in the diesel (TPH-dx) and heavy oil (TPH-o) range. TPH-dx analytical results in AOI 4 ranged from below detection limits to 47,400 mg/kg. TPH-o analytical results ranged from below detection limits to 64,100 mg/kg. Based on the results of this investigation, remedial action alternatives were evaluated to address petroleum affected soils. A remedial action was completed in AOI 4 during the fall of 2005 as more fully described in Section 6.2.

AOI 5—Former Paper Storage Area

Petroleum hydrocarbons were detected at concentrations above preliminary cleanup levels at two of three shallow soil sample locations in the former paper storage area (AOI 5) during the Phase II investigation. Samples were collected directly below existing asphalt which may have biased the heavy range TPH-Dx samples high.

In order to quantify the extent of petroleum affected soil in AOI 5, five Geoprobes were advanced within the area. Soil was logged and monitored as detailed in the Sample and Analysis Plan (SAP) prepared for the Phase II investigation included in Appendix B. Soil samples were collected at each Geoprobe location for laboratory analysis from the interval directly below the asphalt base (approximately 0.5 feet bgs) and from 2-4 feet bgs.

Geoprobe locations (SB-201 through SB-205) are shown in Figure 3 and soil analytical results are summarized in Table 1. Laboratory analytical data is presented in Appendix C. Soil samples were analyzed for TPH based on the findings of the Phase II investigation. Analytical results of all soil samples collected were less than the MTCA Method A and B cleanup level for TPH. Based on these findings, no additional investigation or actions are warranted for AOI 5.

3.4 Northeast Property Boundary Sample

A limited Geoprobe investigation was conducted at the Vancouver Mill in August 2005 to evaluate soil and groundwater on land proposed for a boundary line adjustment withthe Port of Vancouver. The proposed transfer parcel is located east of the shipping warehouse near the former No. 11 well. Following clearance of the area by a private utility locate service; a single Geoprobe was advanced near the northeast corner of the Port Warehouse building at the eastern edge of Boise property. The location of the Geoprobe is shown in Figure 4. The Geoprobe was advanced to a depth of 30 feet below ground surface. Soil samples were collected at two depths (0-3 and 12-15 feet below ground surface) and a groundwater sample was collected from a temporary well point. Soil was logged and monitored as detailed in the SAP prepared for the Phase II investigation and included in Appendix B.

Soil samples were analyzed for metals, TPH-Dx, TPH-Gx, and VOCs. The groundwater sample was analyzed for metals (dissolved and total), TPH-Dx, TPH-Gx and VOCs. Laboratory results are presented in Table 2.

Soil analytical results were compared to the Washington Department of Ecology Model Toxics Control Act (MTCA) Method A and Method B cleanup levels, Environmental Protection Agency (EPA) Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil and Natural Background Soil Metals Concentrations for Clark County. All samples analyzed were below Method A and B cleanup levels, PRGs or natural background screening values.

The groundwater analytical results were compared to EPA Maximum Contaminant Levels (MCLs). All constituents analyzed were below MCLs.

3.5 Port Property Warehouse Investigation

In March 2005, a single Geoprobe (SB-104) was advanced on Port of Vancouver property (lease by Boise) directly south of the Port Warehouse building. The Geoprobe was advanced to a depth of 45 feet below ground surface. Soil samples were collected at two depths (0-3 and 12-15 feet below ground surface) and a groundwater sample was collected from a temporary well point.

Soil samples were analyzed for metals, TPH-Dx, PAHs, and VOCs. Lead was detected in the shallow (0-3 feet) soil sample at a concentration of 468 milligrams per kilogram (mg/kg). In order to define the extent of shallow lead affected soil, two samples were collected from six locations near SB-104. Sample locations are shown in Figure 5. Prior to collecting samples, asphalt was cut to obtain access to shallow soils. Using a hand auger, two shallow soil samples were collected at each location at a depth of 0-1 foot below ground surface (bgs) and 2-3 feet bgs. Analytical results are presented in Table 3. Results indicated a limited area of lead impacted soil near SB-104 and SS-504. Based on these results, soil removal action was implemented as described in Section 6.4.

4.0 Site Characterization

4.1 Soil

Fifteen areas of interest (AOIs) were identified for investigation during field planning and subsequent implementation of the Phase II investigation at the Boise Vancouver Mill. In general, results of the soil investigation indicate that the majority of AOI's are not affected above conservative preliminary cleanup levels.

AOI 4 and AOI 5 had soil detections greater than preliminary cleanup values. Additionally, one area (AOI 1) had soil concentrations greater than residential cleanup levels. Additional investigation was conducted at in each of these areas to define the extent of affected soil and potential for remediation. Further investigation at AOI 5 showed that no additional action was necessary in that area. Further investigation at both AOI 4 and AOI 1 provided information to develop a remedial action approach to clean up the area to MTCA cleanup levels. The remedial action and sampling are further explained in Section 6.

A single soil sample in AOI 15, location SB-127, had soil concentrations at the groundwater interface that exceeded diesel and heavy oil range hydrocarbons Method A cleanup levels. The PAHs detected exceed the Method A unrestricted land use cleanup levels but do not exceed the Method A industrial land use cleanup levels. Shallow and medium depth soil

samples were not collected at this boring location. PID reading and visual observation of the soil at shallow depths did not indicate the presence of petroleum hydrocarbons. Due to the depth of these detected constituents (34 feet below ground surface), a complete exposure pathway is not present.

4.2 Groundwater

In addition to screening for soils, a site-wide review of general groundwater condition was conducted during the Phase II investigation.

Separate phase petroleum hydrocarbons were identified at the water table in AOI 15 at Geoprobe location SB-127, which is located near the northwest property boundary adjacent to Albina Fuels. Approximately 0.2 feet of separate phase petroleum hydrocarbon was observed on the water table in a temporary well installed at this location. No known sources are present on-site in this area and observations of the soil column did not indicate the visual presence of hydrocarbons above the water table, suggesting that the petroleum hydrocarbons observed on the water table likely have migrated to this location from an adjacent property.

Total and dissolved metal concentrations of certain metals analyzed during this site investigation, in particular manganese, have been detected at concentrations greater than would be expected as background concentrations. The presence of arsenic in groundwater is consistent with naturally occurring arsenic in soil and therefore is not discussed further. Comparing dissolved to total manganese concentrations in groundwater sample locations with elevated dissolved manganese shows a strong correlation that much of the manganese is in a dissolved phase. Furthermore, a correlation of dissolved manganese concentrations and specific conductance, as measured in the field during groundwater sampling, is present.

Elevated manganese concentrations were detected in groundwater at several locations during the Phase II investigation. These concentrations may be related to reduced geochemical conditions associated with biological activity near and immediately downgradient of the former pulp mill processes. This is likely a natural condition that has been exacerbated by a shift in subsurface geochemistry associated with past site activities. Over time as the carbon source supporting the biological activity is depleted, the geochemical equilibrium will eventually shift back to normal, and manganese will again be in its stable, essentially insoluble state. Boise and the Department of Ecology discussed and agreed at the May 11, 2005 meeting that further groundwater investigation or remediation was not warranted or feasible for the site.

5.0 Selection of Cleanup Standards

One of the requirements of the MTCA cleanup regulation (WAC 173-340) is to establish cleanup standards for sites. The two components of cleanup standards are cleanup levels (CULs) and points of compliance (POCs). A cleanup level represents a concentration at which a particular hazardous substance does not threaten human health or the environment. Risk levels for individual carcinogens are established to not exceed one in one million. For noncarcinogens, the risk should not cause acute or chronic effects in humans.

Acceptable risk for noncarcinogens is represented by a hazard index of less than one. The goal of MTCA is to address substances that are present in site media at concentrations exceeding a cleanup level.

As with most cleanup programs, MTCA cleanup requirements are affected by property use, applicable regulations, environmental features, and technology limitations. These factors are important considerations when determining appropriate cleanup levels. Once cleanup levels are determined, POCs are designated at onsite locations where cleanup levels should be met.

MTCA provides three options for establishing cleanup levels (Ecology, February 2001).

Method A: Method A is designed for cleanups that are relatively straightforward or involve only a few hazardous substances.

Method B: Method B may be used at any site and is the most common method for setting up cleanup levels when sites are affected by contaminants not listed under Method A. Sites that are addressed using Method B cleanup levels generally do not need use restrictions on the property due to small amounts of residual contamination that may remain in place.

Method C: Method C cleanup levels may be used for soil cleanup levels at industrial sites. Method C cleanup levels may also be used for groundwater, surface water and air cleanup levels when Method B cleanup levels are lower than technically possible provided all practicable treatment methods have been used and institutional controls are in place. Unlike Method A or B, Method C levels are calculated for site specific conditions using risk calculations provided in MTCA and EPA guidance.

For the purpose of screening soil and groundwater analytical results collected during the Phase II and subsequent investigations, both Method A and Method B default values were used as preliminary cleanup levels.

6.0 Remedial Actions

6.1 Basis for Selection of Remedial Action

Following completion of the Phase II investigation and subsequent investigation in AOI 4 and AOI 5, a remedial action for petroleum affected soil in AOI 4 was evaluated. Following Ecology guidance for cleanup, alternatives were evaluated against standard screening criteria such as protectiveness, long-term effectiveness, implementability, reliability, and cost. Based on the qualitative and quantitative remedial alternative evaluation, the recommended remedial alternative for AOI 4 consisted of soil removal and offsite disposal. This alternative met the protectiveness standard for remedial actions and has a high long-term reliability factor.

6.2 AOI 4 Remedial Action

Based on the findings of the Phase II investigation, AOI 4 additional investigation and review of remedial alternatives discussed above a soil removal plan was developed to address petroleum affected soil in AOI 4. CH2M HILL Constructors, Inc served as the

general contractor for Boise Cascade during the implementation the remedial action in AOI 4.

The initial scope of work for the remedial action consisted of the demolition of an existing concrete foundation and containment area, removal of AC paving overlying the excavation area and excavation and disposal of petroleum affected soil in an area approximately 40 feet by 135 feet and 8 feet deep as shown on Figure 6???. Based on previous soil investigations, soil between zero and three feet in depth were stockpiled on site and reused for backfill. Soil between three feet and eight feet in depth required removal and disposal off site at a Subtitle D designated landfill. Following soil removal and verification sampling in the excavated area, the area was to be backfilled with soil stockpiled on the site from the excavation and with clean granular material imported from offsite.

Significant modification to the original scope of the remedial action was necessary in order to meet MCTA cleanup values and is described in further detail below. Remedial action activities were initiated on September 6, 2005 and completed on November 15, 2005. In total 5,650 tons of petroleum contaminated soil were removed and disposed of offsite at an approved solid waste management facility. Average final confirmation sample TPH-dx concentrations were 361 mg/kg in the diesel range and 727 mg/kg in the heavy oil range, well below the MTCA Method A/B TPH soil cleanup values of 2000 mg/kg.

Excavation for Petroleum Contaminated Soil

Prior to beginning excavation activities on site, subsurface utilities were located using a private utility locate contractor and by reviewing current and historical drawings of the project area. The project area was cleared and staging area for clean material (soil, asphalt and concrete) was established approximately 500 feet south of the project location in a paved, unused portion of the facility.

Before commencing soil excavation, the above ground former concrete secondary containment area was demolished and stockpiled in the staging area adjacent to the site. Concrete from this structure was crushed and hauled off site for disposal. Following removal of the concrete containment area, asphalt in the project area was cut, removed and stockpiled in the staging area. Photographs documenting these activities are included in Appendix F. Concrete and asphalt removal in the initial excavation area was completed on September 7, 2005.

Several existing utilities, including the fire water line within the proposed excavation area and former wash pad sump required isolation prior to beginning shallow soil removal and stockpiling. Excavation to three feet below ground surface (bgs) began on September 9, 2005. Clean soil located from 0-3 feet bgs were excavated, hauled and stockpiled in the staging area. All stockpiled soil was covered with Visqueen to prevent erosion from the site in the event of precipitation. Initial removal of the upper 3 feet of soil from the excavation area was completed on September 9.

Excavation of petroleum affected soil to approximately 8 feet bgs on the west side of the excavation began on September 12, 2005. To the extent practicable, soils were loaded directly to trucks for hauling to the Wasco County Landfill in The Dalles, OR. A copy of the weight ticket summary for the project is located in Appendix I. In the event that trucks were not available for immediate loading, soils were stockpiled within the excavation. Excavation

of the initial project area to 8 feet bgs continued through September 15, 2005. As discussed below additional soil removal in the western portion of the remedial action area was required in this area.

The first confirmation soil samples were collected from the western portion of the excavation on September 13, 2005. Confirmation soil samples were collected in accordance with the Sampling and Analysis Plan developed for the removal action and included in Appendix G. Results of all confirmation soil samples are shown in Table 4. All confirmation soil samples were analyzed for TPH-dx. Over excavation was required in areas where confirmation samples exceeded MTCA cleanup levels of 2000 mg/kg TPH. Final confirmation soil samples (samples representative of site conditions prior to backfill) are shown in Table 5.

Concrete Vault Removal

During excavation on September 12, 2005 a concrete vault and associated piping was uncovered during excavation. It was determined by CH2M HILL and Boise staff that the vault be removed and samples taken of the materials contained within the vault for waste profiling and offsite disposal. Excavation around the vault revealed that its dimensions were approximately 13 feet wide by 13 feet long by 13 feet deep. It is unclear exactly how the vault functioned, however, it appeared to be associated with the historical process waste system. A sample of the vault material was collected on September 14, 2005 and analyzed for metals (arsenic, barium, cadmium, chromium, lead, mercury, and selenium) and semi-volatile organic compounds (SVOC's). On September 22, 2005 an additional sample was collected and analyzed for volatile organic compounds as requested by the landfill. Analytical results were non-detect for all constituents. Laboratory data was submitted to the landfill for waste profiling. On October 5 and 6, 2005,material was removed from vault for disposal as a solid waste. Following removal of the vault, additional petroleum contaminated soils were removed from areas to the north and east of the vault, and underneath the vault, until confirmation samples demonstrated that all petroleum affected soil had been removed. At that time, the area was backfilled with clean soil.

Underground Heating Oil Tanks

On September 14, 2005 a 20,000 gallon steel underground heating oil tank was uncovered during excavation in the west portion of the remedial action area adjacent to the former boiler. Upon discovery of this tank, Ecology was notified of the finding on September 15, 2005. The tank was approximately 9.5 feet in diameter and 35 feet in length. Boise had no prior knowledge of the presence of the heating oil tank. On September 26 and 27, 2005 approximately 18,000 gallons of residual oil and water from heating oil tank was pumped out by vacuum truck and transported off site for disposal at Pacific Power Vac located in Portland, Oregon. Absorbent was added to clean out the remainder of residual material in the bottom of the tank. The tank was removed and sent to Schnitzer Steel for recycling. Prior to backfilling the tank pit, confirmation samples were taken between 16 and 18 feet bgs (SS-413, SS-414, SS-415 and SS-416). Results of these soil samples slightly exceeded cleanup values and further excavation continued to a total depth of 20 feet bgs.

While removing soil at the top of the 20,000 gallon underground heating oil tank, a sluff in the north wall exposed a second tank on September 28, 2005 also adjacent to the former

boiler. Although not required, Ecology was notified on September 29, 2005 of this new finding. The new tank was determined to be another heating oil tank, approximately 5000 gallons in size. The water and residual petroleum material (likely Bunker C Fuel) were pumped out by vacuum truck on October 3 and October 6, 2005. Approximately 4990 gallons of water and oil were removed from the tank. The heating oil tank was removed on October 5 and sent to Schnitzer Steel for recycling. Additional soil removal was conducted below the 5,000 gallon heating oil tank based on visually affected soil. Four additional confirmation samples were collected on October 6; 2 from the sidewall and 2 at the bottom of the excavation (SS-419, SS-420 SS-421 and SS-422). Results of these final confirmation soil samples are included in Table 5. Confirmation samples showed remaining soil was on average, less than the MTCA Method A/B cleanup value of 2000 mg/kg. Following excavation to approximately 20 feet in the area of the underground heating oil tanks and receipt of the confirmation sampling results the area was backfilled using clean stockpiled soil.

Oil Pipeline

Following completion of the underground heating oil tank removal and concrete vault removal, excavation to the proposed east boundary (40 feet east of SB-210) was initiated on October 11, 2005. During eastward excavation a 4" oil pipeline was discovered traveling in an east to west direction. Soils near the pipeline had visible petroleum impacts, generally to a depth of approximately 10 to 12 feet below ground surface. Upon reaching the extent of the initial remedial action area, Boise and CH2M HILL staff determined that excavation should continue east of the original remedial action area in an attempt to complete the remedial action and meet MTCA cleanup levels. Confirmation samples were collected from the advancing face of the excavation periodically to determine if cleanup levels were being met. Excavation of petroleum affected soil was completed on November 8, 2005. Final confirmation soil were collected in the eastern portion of the excavation and are shown on presented in Table 5 and shown on Figure 6. In total, 5650 tons of petroleum affected soil were removed during this remedial action.

Asbestos Pipe Removal

Two Asbestos Containing (ACM) pipes were discovered during excavation on October 21, 2005. A Boise subcontract asbestos mitigation firm was contacted to obtain samples from the subject ACM pipe. The asbestos containing pipe was prepared for offsite disposal on October 26. A Notice of Intent to Remove or Encapsulate Asbestos was submitted by the contractor to the Southwest Clean Air Agency on October 25, 2005. A copy of this submittal is provided in Appendix I. The ACM material was disposed on October 26, 2005 at Hillsboro Landfill in Hillsboro, OR.

Import Fill and Compaction

Following removal of petroleum affected soil, stockpiled clean material removed from 0-3 feet bgs and import fill was used to return the excavated area to the existing grade. Backfill and compaction began on October 11, 2005 and continued periodically through November 15, 2005. Import fill was brought in by Rinker. Compaction tests were performed to meet 90 percent of the maximum dry density as determined by ASTM D1557, Modified Proctor

Compaction Effort. Backfill was tested to meet minimum compaction. Minimum testing occurred per lift or one test per day while backfill was being placed.

6.3 Confirmation Sampling and Analysis

Field screening (visual observation and PID) and confirmation soil samples were collected from the bottom depth and side walls of all the excavation areasto confirm removal of petroleum affected soil. Concentrations in the soil samples were compared to MTCA Method A and B cleanup values (CULs). To the extent practicable, if field screening indicated presence of petroleum affected soil or confirmation soil samples exceeded MTCA Method A (2,000ppm) CULs, further excavation was conducted. A total of 63 confirmation samples were collected during the remedial action. Analytical data for confirmation samples are provided in Appendix H. A summary of all confirmation soil samples is presented in Table 4. Final confirmation samples, those representative of site conditions following completion of the remedial action are presented in Table 5. Final average confirmation sample TPH concentrations were 361 mg/kg TPH-dx and 727 mg/kg TPH-HO.

6.4 Port Property Warehouse Lead Soil Removal

As described in Section 3.5 shallow soils located on the Port of Vancouver owned parcel leased by Boise had lead concentrations above the MTCA Method A cleanup value. In order to address this soil, removal action was completed in this area as shown in Figure 5. After sampling to confirm the lead contaminated soil was removed, the remaining asphalt was cut and hauled off for disposal. Approximately 38.7 tons of material was disposed of atEnglish Pit Sand & Gravel. Import rock was then brought in to fill the excavated site.

7.0 Conclusions

The following conclusions describe the completion of the Phase II investigation, supplemental site investigation and soil remedial action completed at the Boise Cascade site in Vancouver, Washington:

- A Phase II investigation was conducted to characterize the existing environmental condition of the Boise Vancouver site.
- Three areas of investigation (AOI 1, AOI 4 and AOI 5) were identified during the Phase II investigation that had soil sample concentrations that exceeded conservative preliminary screening values.
- Separate phase petroleum hydrocarbons were identified at the water table in AOI 15 at Geoprobe location SB-127, which is located near the northwest property boundary adjacent to Albina Fuels. Approximately 0.2 feet of separate phase petroleum hydrocarbon was observed on the water table in a temporary well installed at this location. No known sources are present on-site in this area and observations of the soil column did not indicate the visual presence of hydrocarbons above the water table, suggesting that the petroleum hydrocarbons observed on the water table likely have migrated to this location from an adjacent property.

- Additional investigation confirmed elevated TPH concentrations at two of the investigation areas (AOI 1 and AOI 4).
- Excavation and offsite disposal was selected as the remedial action.
- Remedial actions were implemented at the site between September 6 and November 22, 2005.
- Activities that were modified or changed in the remedial action scope of work were communicated to Ecology and documented throughout the project.
- Laboratory results of samples collected in accordance with the approved work plan indicate that the remaining average site hydrocarbon concentrations are significantly less than the MCTA Method A and B cleanup level of 2,000 ppm. The objectives of the remedial action have been met.

8.0 References

CH2M HILL, 2005, Vancouver Mill Site Investigation Work Plan, prepared for Boise Cascade Corporation, February 25, 2005.

CH2M HILL, 2005, Vancouver Mill Site Remedial Action Sampling and Analysis Plan, prepared for Boise Cascade Corporation, September 2005

URS Corporation, 2004, Phase I Environmental Site Assessment, prepared for Boise Cascade Corporation, July 9, 2004.

CH2M HILL, 2005, Sampling and Analysis Plan, prepared for Boise Cascade Corporation, September 9, 2005.

APPENDIX A
2004 Phase I ESA

APPENDIX B

2005 Phase II Site Investigation Report

APPENDIX C

AOI 4/AOI 5 Investigation Analytical Data

APPENDIX D
Port of Vancouver Land Transfer Geoprobe Analytical Data

APPENDIX E
Port Warehouse Lead Analytical Data

APPENDIX F

Remedial Action Photo Documentation

APPENDIX G
Confirmation Soil Sampling SAP

APPENDIX H
Remedial Action Confirmation Sampling Analytical Data

APPENDIX I
Remedial Action Documentation

Table 1
AOI 4 AOI 5 Additional Investigation Analytical Results
Boise Cascade - Vancouver, WA Site

Station ID	Sample ID	Sample Depth (bgs)	Diesel Range Organics (mg/Kg)		Heavy Oil Range Hydrocarbons (mg/Kg)	
SB-201	SB-201-0.5-1.5	.5 - 1.5	**54**		**360**	
	SB-201-2-4	2 - 4	125	U	**292**	
	SB-201-8-10	8 - 10	25	U	50	U
SB-202	SB-202-0.5-1.5	.5 - 1.5	25	U	**81**	
	SB-202-2-4	2 - 4	25	U	**123**	
SB-203	SB-203-0.5-1.5	.5 - 1.5	25	U	**142**	
	SB-203-2-4	2 - 4	25	U	50	U
SB-204	SB-204-0.5-1.5	.5 - 1.5	**167**		**301**	
	SB-204-02-4	2 - 4	25	U	50	U
SB-205	SB-205-0.5-1.5	.5 - 1.5	**196**		50	U
	SB-205-2-4	2 - 4	**1,980**		**524**	
SB-206	SB-206-7-8	7 - 8	**2,720**		**1,890**	
SB-207	SB-207-8-10	8 - 10	**978**		**436**	
	SB-207-12-15	12 - 15	**7,940**		**7,030**	
SB-208	SB-208-8-10	8 - 10	**56**		**94**	
	SB-208-12-15	12 - 15	25	U	50	U
SB-209	SB-209-7-8	7 - 8	**47,400**		**64,100**	
	SB-209-12-15	12 - 15	**128**		**343**	
SB-210	SB-210-9-10	9 - 10	**2,160**		**4,080**	
	SB-210-12-15	12 - 15	**2,060**		**2,790**	
SB-211	SB-211-7-8.5	7 - 8.5	**13,300**		**15,700**	

Notes:
U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the MRL.
Cell Bolded - Analyte Detected
Blank cell indicates the chemical was no analyzed.
bgs = below ground surface

Table 2
Northeast Property Boundary Investigation Analytical Results
Boise Cascade - Vancouver, WA Site

Sample ID Depth Soil/Groundwater Unit	SB301-03-81105 0-3 bgs Soil (mg/kg)		SB301-1215-81105 12-15 bgs Soil (mg/kg)		SB301-GW-81105 - Groundwater (mg/L)	
Dissolved Metals:						
Arsenic					0.0010	U
Barium					**0.012**	
Cadmium					0.0010	U
Chromium					0.0020	U
Lead					0.0010	U
Manganese					**0.061**	
Mercury					0.0002	U
Selenium					0.0020	U
Silver					0.0010	U
Total Metals:						
Arsenic	**4.1**		**0.84**		**0.0037**	
Barium	**150**		**89**		**0.23**	
Cadmium	0.50	U	0.50	U	0.0010	U
Chromium	**14**		**5.5**		**0.095**	
Lead	**10**		**3.4**		**0.0080**	
Manganese	**490**		**260**		**0.69**	
Mercury	0.076	UD	0.063	UD	**0.000665**	
Selenium	1.0	U	1.0	U	0.0020	U
Silver	0.50	U	0.50	U	0.0010	U
Total Petroleum Hydrocarbons:						
NWTPH-Dx:						
Diesel Range Organics	25	U	25	U	0.25	U
Heavy Oil Range Hydrocarbons	50	U	50	U	0.50	U
NWTPH-Gx:						
Gasoline by Gx	6.3	UD	5.8	UD	0.080	U
Volatile Organic Compounds:						
1,1,1,2-Tetrachloroethane	0.0014	UD	0.0016	UD	0.0010	U
1,1,1-Trichloroethane	0.0014	UD	0.0016	UD	0.0010	U
1,1,2,2-Tetrachloroethane	0.0014	UD	0.0016	UD	0.0010	U
1,1,2-Trichloroethane	0.0014	UD	0.0016	UD	0.0010	U
1,1-Dichloroethane	0.0014	UD	0.0016	UD	0.0010	U
1,1-Dichloroethene	0.0014	UD	0.0016	UD	0.0010	U
1,1-Dichloropropene	0.0014	UD	0.0016	UD	0.0010	U
1,2,3-Trichlorobenzene	0.0014	UD	0.0016	UD	0.0010	U
1,2,3-Trichloropropane	0.0014	UD	0.0016	UD	0.0010	U
1,2,4-Trichlorobenzene	0.0014	UD	0.0016	UD	0.0010	U
1,2,4-Trimethylbenzene	0.0014	UD	0.0016	UD	0.0010	U
1,2-Dibromo-3-Chloropropane	0.0068	UD	0.0081	UD	0.0050	U
1,2-Dibromoethane	0.0014	UD	0.0016	UD	0.0010	U
1,2-Dichlorobenzene	0.0014	UD	0.0016	UD	0.0010	U
1,2-Dichloroethane	0.0014	UD	0.0016	UD	0.0010	U
1,2-Dichloropropane	0.0014	UD	0.0016	UD	0.0010	U
1,3,5-Trimethylbenzene	0.0014	UD	0.0016	UD	0.0010	U
1,3-Dichlorobenzene	0.0014	UD	0.0016	UD	0.0010	U
1,3-Dichloropropane	0.0014	UD	0.0016	UD	0.0010	U

Table 2
Northeast Property Boundary Investigation Analytical Results
Boise Cascade - Vancouver, WA Site

Sample ID Depth Soil/Groundwater Unit	SB301-03-81105 0-3 bgs Soil (mg/kg)		SB301-1215-81105 12-15 bgs Soil (mg/kg)		SB301-GW-81105 - Groundwater (mg/L)	
1,4-Dichlorobenzene	0.0014	UD	0.0016	UD	0.0010	U
2,2-Dichloropropane	0.0014	UD	0.0016	UD	0.0010	U
2-Butanone	0.014	UD	0.016	UD	0.010	U
2-Chlorotoluene	0.0014	UD	0.0016	UD	0.0010	U
2-Hexanone	0.0068	UD	0.0081	UD	0.010	U
4-Chlorotoluene	0.0014	UD	0.0016	UD	0.0010	U
4-Methyl-2-Pentanone	0.0068	UD	0.0081	UD	0.0050	U
Acetone	0.017	UD	0.020	UD	0.025	U
Benzene	0.0014	UD	0.0016	UD	0.0010	U
Bromobenzene	0.0014	UD	0.0016	UD	0.0010	U
Bromochloromethane	0.0014	UD	0.0016	UD	0.0010	U
Bromodichloromethane	0.0014	UD	0.0016	UD	0.0010	U
Bromoform	0.0014	UD	0.0016	UD	0.0010	U
Bromomethane	0.0068	UD	0.0081	UD	0.0050	U
Carbon Disulfide	0.014	UD	0.016	UD	0.010	U
Carbon Tetrachloride	0.0014	UD	0.0016	UD	0.0010	U
Chlorobenzene	0.0014	UD	0.0016	UD	0.0010	U
Chlorodibromomethane	0.0014	UD	0.0016	UD	0.0010	U
Chloroethane	0.0068	UD	0.0081	UD	0.0010	U
Chloroform	0.0014	UD	0.0016	UD	0.0010	U
Chloromethane	0.0068	UD	0.0081	UD	0.0050	U
Cis-1,2-Dichloroethene	0.0014	UD	0.0016	UD	0.0010	U
Cis-1,3-Dichloropropene	0.0014	UD	0.0016	UD	0.0010	U
Dibromomethane	0.0014	UD	0.0016	UD	0.0010	U
Dichlorodifluoromethane	0.0014	UD	0.0016	UD	0.0050	U
Ethylbenzene	0.0034	UD	0.0041	UD	0.0010	U
Hexachlorobutadiene	0.0034	UD	0.0041	UD	0.0040	U
Isopropylbenzene	0.0014	UD	0.0016	UD	0.0020	U
m+p-Xylenes	0.0027	UD	0.0032	UD	0.0020	U
Methylene Chloride	0.0068	UD	0.0081	UD	0.0050	U
Methyl-tert-butyl Ether					0.0010	U
Naphthalene	0.0027	UD	0.0032	UD	0.0020	U
n-Butylbenzene	0.0034	UD	0.0041	UD	0.0050	U
n-Propylbenzene	0.0014	UD	0.0016	UD	0.0010	U
o-Xylene	0.0014	UD	0.0016	UD	0.0010	U
p-Isopropyltoluene	0.0014	UD	0.0016	UD	0.0020	U
Sec-Butylbenzene	0.0014	UD	0.0016	UD	0.0010	U
Styrene	0.0014	UD	0.0016	UD	0.0010	U
Tert-Butylbenzene	0.0014	UD	0.0016	UD	0.0010	U
Tetrachloroethene	0.0014	UD	0.0016	UD	0.0010	U
Toluene	0.0014	UD	0.0016	UD	0.0010	U
Trans-1,2-Dichloroethene	0.0014	UD	0.0016	UD	0.0010	U
Trans-1,3-Dichloropropene	0.0014	UD	0.0016	UD	0.0010	U
Trichloroethene	0.0014	UD	0.0016	UD	0.0010	U
Trichlorofluoromethane	0.0014	UD	0.0016	UD	0.0010	U
Vinyl Chloride	0.0014	UD	0.0016	UD	0.0010	U

Table 2
Northeast Property Boundary Investigation Analytical Results
Boise Cascade - Vancouver, WA Site

Sample ID Depth Soil/Groundwater Unit	SB301-03-81105 0-3 bgs Soil (mg/kg)	SB301-1215-81105 12-15 bgs Soil (mg/kg)	SB301-GW-81105 - Groundwater (mg/L)

Notes:

Units are reported in mg/Kg for soil samples and mg/L for groundwater sample.
D = The result is from a dilution.
U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the MRL.
Cell Bolded - Analyte Detected
Blank cell indicates the chemical was not analyzed.
bgs = below ground surface

Table 3
Port Property Warehouse Investigation Analytical Results
Boise Cascade - Vancouver, WA Site

Station ID	Sample ID	Sample Depth (bgs)	Lead (mg/Kg)
SS-501	SS-501-06	0.6	**47**
	SS-501-30	3.0	**4.8**
SS-502	SS-502-06	0.6	**32**
	SS-502-30	3.0	**4.9**
SS-503	SS-503-06	0.6	**34**
	SS-503-30	3.0	**54**
SS-504	SS-504-06	0.6	**360**
	SS-504-30	3.0	**68**
SS-505	SS-505-06	0.6	**11**
	SS-505-30	3.0	**16**
SS-506	SS-506-06	0.6	**41**
	SS-506-30	3.0	**37**

Notes:
U = The analyte was analyzed for, but not detected.
The associated numerical value is at or below the MRL.
Cell Bolded - Analyte Detected
bgs = below ground surface

Table 4
Remedial Action Confirmation Soil Sampling Analytical Results
Boise Cascade - Vancouver, WA Site

Station ID	Sample ID	Date Sampled	Sample Depth (bgs)	Diesel Range Organics (mg/Kg)		Heavy Oil Range Hydrocarbons (mg/Kg)	
SS-401	SS-401-08	09/13/05	**8**	**1,820**	**D**	**3,130**	**D**
SS-402	SS-402-04	09/13/05	**4**	**328**	**D**	**627**	**D**
SS-403	SS-403-04	09/13/05	**4**	**25**	U	50	U
SS-404	SS-404-08	09/13/05	**8**	**2,140**	**D**	**3,340**	**D**
SS-405	SS-405-04	09/13/05	**4**	**25**	U	50	U
SS-406	SS-406-08	09/13/05	**8**	**562**	**D**	**1,700**	**D**
SS-407	SS-407-04	09/14/05	**4**	**270**		**743**	
SS-408	SS-408-06	09/14/05	**6**	**116**		**292**	
SS-409	SS-409-12	09/14/05	**12**	**1,030**		**877**	
SS-410	SS-410-11	09/14/05	**11**	**126**		**124**	
SS-411	SS-411-06	09/14/05	**6**	**2,500**	U	**4,590**	
SS-412	SS-412-06	09/22/05	**6**	**15,300**		**18,400**	
SS-413	SS-413-20	09/29/05	**2**	**6,660**	**D**	**9,000**	**D**
SS-414	SS-414-16	09/29/05	**16**	**193**	**D**	**366**	**D**
SS-415	SS-415-20	09/29/05	**20**	**1,150**	**D**	**3,720**	**D**
SS-416	SS-416-18	09/29/05	**18**	**1,540**	**D**	**3,900**	**D**
SS-417	SS-417-06	10/05/05	**6**	**11,400**	**D**	**10,700**	**D**
SS-418	SS-418-09	10/06/05	**9**	**17**	U	34	U
SS-419	SS-419-20	10/06/05	**20**	**2,680**		**3,520**	
SS-420	SS-420-20	10/06/05	**20**	**14**	U	28	U
SS-421	SS-421-20	10/06/05	**20**	**780**		**2,000**	
SS-422	SS-422-20	10/06/05	**20**	**373**		**1,270**	
SS-423	SS-423-10	10/10/05	**10**	**16**	U	33	U
SS-424	SS-424-10	10/10/05	**10**	**45**		**55**	
SS-424	SS-425-12	10/10/05	**12**	**17**	U	34	U
SS-426	SS-426-06	10/10/05	**6**	**10,300**		**17,400**	
SS-427	SS-427-06	10/13/05	**6**	**112**	**D**	**324**	**D**
SS-428	SS428-6	10/17/05	**6**	**276**	U	**4,190**	**D**
SS-429	SS429-12	10/17/05	**12**	**1,960**	**D**	**2,850**	**D**
SS-430	SS-430-06	10/18/05	**6**	**83**	**D**	**298**	**D**
SS-431	SS-431-07	10/18/05	**7**	**550**	**D**	**2,430**	**D**
SS-432	SS-432-09	10/18/05	**9**	**4,880**	**D**	**5,430**	**D**
SS-435B	SS435B	10/25/05	**10**	**773**	**D**	**1,770**	**D**
SS-436B	SS436B	10/25/05	**10**	**4,960**	**D**	**6,480**	**D**
SS-437B	SS437B	10/25/05	**10**	**6,570**	**D**	**9,500**	**D**
SS-438	SS438-6	10/25/05	**6**	**434**	**D**	**2,070**	**D**
SS-439	SS439-12	10/25/05	**12**	**6,550**	**D**	**9,420**	**D**
SS-440	SS440-6	10/25/05	**6**	**1,230**	**D**	**5,170**	**D**
SS-441	SS441-12	10/25/05	**12**	**16,300**	**D**	**18,000**	**D**
SS-442	SS442-6	10/25/05	**6**	**2,750**	**D**	**11,100**	**D**
SS-443	SS443-10	10/25/05	**10**	**1,450**	**D**	**4,460**	**D**
SS-444	SS444-6	10/25/05	**6**	**1,840**	**D**	**7,500**	**D**
SS-445	SS445-12	10/25/05	**12**	**1,130**	**D**	**2,300**	**D**
SS-446	SS446-6	10/25/05	**6**	**42,300**	**D**	**52,200**	**D**
SS-447	SS447-10	10/25/05	**10**	**259**	**D**	**402**	**D**
SS-448	SS448-6	10/25/05	**6**	**7,260**	**D**	**16,700**	**D**
SS-449	SS449-12	10/25/05	**12**	**17,000**	**D**	**19,500**	**D**
SS-450	SS450-6	10/25/05	**6**	**17,300**	**D**	**19,900**	**D**

Table 4
Remedial Action Confirmation Soil Sampling Analytical Results
Boise Cascade - Vancouver, WA Site

Station ID	Sample ID	Date Sampled	Sample Depth (bgs)	Diesel Range Organics (mg/Kg)		Heavy Oil Range Hydrocarbons (mg/Kg)	
SS-451	SS451-10	10/25/05	**10**	**31,400**	**D**	**33,200**	**D**
SS-452	SS 452-6-180	11/01/05	**6**	**1,450**	**D**	**2,590**	**D**
SS-453	SS 453-12-180	11/01/05	**12**	**11,200**	**D**	**15,200**	**D**
SS-454	SS 454-B-180	11/01/05	12	17	UD	33	U
SS-455	SS 455-8N175	11/02/05	**8**	**32**	**D**	**103**	**D**
SS-457	SS457-6N-230	11/03/05	**6**	**16**	UD	**110**	
SS-458	SS458-10N-230	11/03/05	**10**	**17**	U	34	U
SS-459	SS459-10N-180	11/03/05	**10**	**17**	UD	**56**	**D**
SS-460	SS460-6N-180	11/03/05	**6**	**512**	**D**	**1,890**	**D**
SS-461	SS461-6-S-220	11/04/05	**6**	**32**		**85**	
SS-462	SS462-10-S-220	11/04/05	**10**	**13**	U	27	U
SS-463	SS463-10-S-175	11/04/05	**10**	**13**	U	27	U
SS-464	SS464-6-S-175	11/04/05	**6**	**61**		**180**	

Notes:
U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the MRL.
Cell Bolded - Analyte Detected
bgs = below ground surface

Table 5

Summary of Final Remedial Action Confirmation Samples

Boise Cascade- Vancouver, WA Site

Station ID	Sample ID	Date Sampled	Sample Depth (bgs)	Diesel Range Organics (mg/Kg)		Heavy Oil Range Hydrocarbons (mg/Kg)	
SS-454	SS 454-B-180	11/01/05	**10**	17	UD	33	U
SS-455	SS 455-8N175	11/02/05	**8.0**	**32**	**D**	**103**	**D**
SS-457	SS457-6N-230	11/03/05	**6.0**	**16**	UD	**110**	
SS-458	SS458-10N-230	11/03/05	**10**	**17**	U	34	U
SS-459	SS459-10N-180	11/03/05	**10**	**17**	UD	**56**	**D**
SS-460	SS460-6N-180	11/03/05	**6.0**	**512**	**D**	**1,890**	**D**
SS-461	SS461-6-S-220	11/04/05	**6.0**	**32**		**85**	
SS-462	SS462-10-S-220	11/04/05	**10**	**13**	U	27	U
SS-463	SS463-10-S-175	11/04/05	**10**	**13**	U	27	U
SS-464	SS464-6-S-175	11/04/05	**6.0**	**61**		**180**	
SS-401	SS-401-08	09/13/05	**8.0**	**1,820**	**D**	**3,130**	**D**
SS-402	SS-402-04	09/13/05	**4.0**	**328**	**D**	**627**	**D**
SS-403	SS-403-04	09/13/05	**4.0**	**25**	U	50	U
SS-405	SS-405-04	09/13/05	**4.0**	**25**	U	50	U
SS-406	SS-406-08	09/13/05	**8.0**	**562**	**D**	**1,700**	**D**
SS-407	SS-407-04	09/14/05	**4.0**	**270**		**743**	
SS-408	SS-408-06	09/14/05	**6.0**	**116**		**292**	
SS-409	SS-409-12	09/14/05	**1.2**	**1,030**		**877**	
SS-410	SS-410-11	09/14/05	**1.1**	**126**		**124**	
SS-419	SS-419-20	10/06/05	**20**	**2,680**		**3,520**	
SS-420	SS-420-20	10/06/05	**20**	**14**	U	28	U
SS-421	SS-421-20	10/06/05	**20**	**780**		**2,000**	
SS-422	SS-422-20	10/06/05	**20**	**373**		**1,270**	
SS-423	SS-423-10	10/10/05	**10**	**16**	U	33	U
SS-424	SS-424-10	10/10/05	**10**	**45**		**55**	
SS-425	SS-425-12	10/10/05	**12**	**17**	U	34	U
SS-427	SS-427-06	10/13/05	**6.0**	**112**	**D**	**324**	**D**
SS-430	SS-430-06	10/18/05	**6.0**	**83**	**D**	**298**	**D**
SS-431	SS-431-07	10/18/05	**7.0**	**550**	**D**	**2,430**	**D**
SS-434	SS-434-10		**12.0**	**726**	**D**	**642**	**D**
SS-435B	SS435B	10/25/05	**10**	**773**	**D**	**1,770**	**D**
AVERAGE				**361**		**727**	

Notes:

U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the MRL.

Cell Bolded - Analyte Detected

bgs = below ground surface

Table 6
Remedial Action Vault Waste Characterization Analytical Results
Boise Cascade - Vancouver, WA Site

Class/Analyte	Sample/Date Sampled			
	PROCESS VAULT 9/14/2005		PROCESS VAULT #2 9/22/2005	
General Chemistry:				
Percent Total Solid (%)			**48**	
pH			**8.0**	
Dry Weight (%)	**58**			
No Flash To (^{o}F)			150	U
Metals - TCLP (mg/L):				
Arsenic	0.10	U		
Barium	1.0	U		
Cadmium	0.050	U		
Chromium	0.10	U		
Lead	0.10	U		
Mercury	0.0025	U		
Selenium	0.10	U		
Silver	0.050	U		
Semi-volatile Organic Compounds (mg/Kg):				
1,2,4-Trichlorobenzene	8.3	U		
1,2-Dichlorobenzene	8.3	U		
1,3-Dichlorobenzene	8.3	U		
1,4-Dichlorobenzene	8.3	U		
1-Methylnaphthalene	8.3	U		
2,4,5-Trichlorophenol	8.3	U		
2,4,6-Trichlorophenol	8.3	U		
2,4-Dichlorophenol	8.3	U		
2,4-Dimethylphenol	8.3	U		
2,4-Dinitrophenol	13	U		
2,4-Dinitrotoluene	13	U		
2,6-Dinitrotoluene	13	U		
2-Chloronaphthalene	8.3	U		
2-Chlorophenol	8.3	U		
2-Methylnaphthalene	8.3	U		
2-Methylphenol	8.3	U		
2-Nitroaniline	13	U		
2-Nitrophenol	8.3	U		
3,3-Dichlorobenzidine	125	U		
3-,4-Methylphenol (isomers)	8.3	U		
3-Nitroaniline	13	U		
4,6-Dinitro-2-Methylphenol	13	U		
4-Bromophenyl Phenyl Ether	8.3	U		
4-Chloro-3-Methylphenol	8.3	U		
4-Chloroaniline	13	U		
4-Chlorophenyl Phenyl Ether	8.3	U		
4-Nitroaniline	13	U		
4-Nitrophenol	13	U		
Acenaphthene	8.3	U		
Acenaphthylene	8.3	U		
Aniline	8.3	U		
Anthracene	8.3	U		
Benzo (a) anthracene	8.3	U		

Table 6
Remedial Action Vault Waste Characterization Analytical Results
Boise Cascade - Vancouver, WA Site

Class/Analyte	Sample/Date Sampled			
	PROCESS VAULT 9/14/2005		PROCESS VAULT #2 9/22/2005	
Benzo (a) pyrene	8.3	U		
Benzo (b) fluoranthene	8.3	U		
Benzo (g,h,i) perylene	8.3	U		
Benzo (k) fluoranthene	8.3	U		
Benzoic Acid	25	U		
Benzyl Alcohol	8.3	U		
Bis(2-Chloroethoxy) Methane	8.3	U		
Bis(2-Chloroethyl) Ether	8.3	U		
Bis(2-Chloroisopropyl) Ether	8.3	U		
Bis(2-Ethylhexyl) Phthalate	8.3	U		
Butyl Benzyl Phthalate	8.3	U		
Carbazole	8.3	U		
Chrysene	8.3	U		
Dibenzo (a,h) anthracene	8.3	U		
Dibenzofuran	8.3	U		
Diethyl Phthalate	8.3	U		
Dimethyl Phthalate	8.3	U		
Di-n-Butyl Phthalate	8.3	U		
Di-n-Octyl Phthalate	8.3	U		
Fluoranthene	8.3	U		
Fluorene	8.3	U		
Hexachlorobenzene	8.3	U		
Hexachlorobutadiene	8.3	U		
Hexachlorocyclopentadiene	13	U		
Hexachloroethane	8.3	U		
Indeno (1,2,3-cd) pyrene	8.3	U		
Isophorone	8.3	U		
Naphthalene	8.3	U		
Nitrobenzene	8.3	U		
n-Nitrosodi-n-Propylamine	8.3	U		
n-Nitrosodiphenylamine	8.3	U		
Pentachlorophenol	13	U		
Phenanthrene	8.3	U		
Phenol	8.3	U		
Pyrene	8.3	U		
Volatile Organic Compounds (mg/Kg):				
1,1,1,2-Tetrachloroethane			0.21	U
1,1,1-Trichloroethane			0.21	U
1,1,2,2-Tetrachloroethane			0.21	U
1,1,2-Trichloroethane			0.21	U
1,1-Dichloroethane			0.21	U
1,1-Dichloroethene			0.21	U
1,1-Dichloropropene			0.21	U
1,2,3-Trichlorobenzene			0.21	U
1,2,3-Trichloropropane			0.21	U
1,2,4-Trichlorobenzene			0.21	U
1,2,4-Trimethylbenzene			0.21	U
1,2-Dibromo-3-Chloropropane			1.0	U

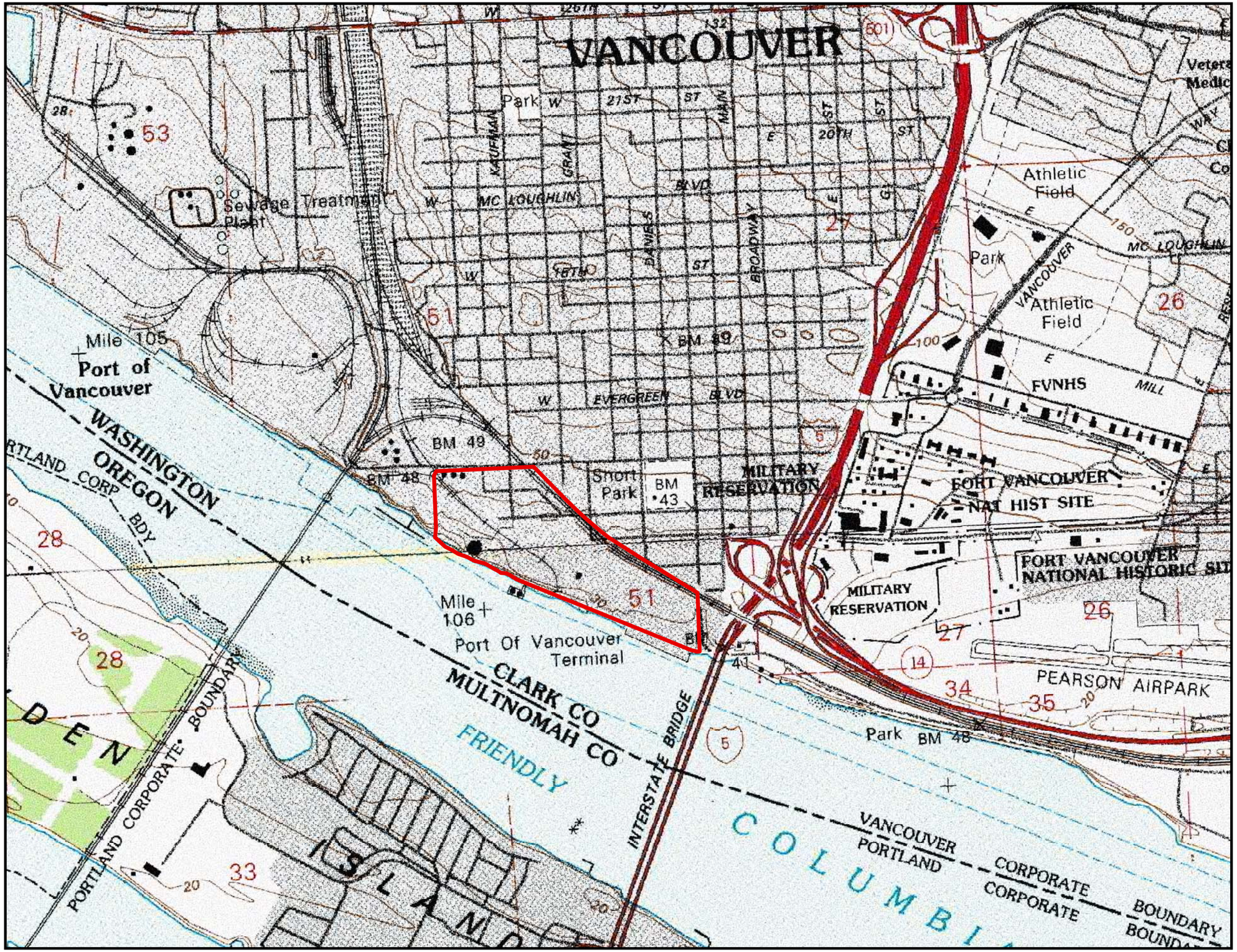
Table 6
Remedial Action Vault Waste Characterization Analytical Results
Boise Cascade - Vancouver, WA Site

Class/Analyte	Sample/Date Sampled		
	PROCESS VAULT 9/14/2005	PROCESS VAULT #2 9/22/2005	
1,2-Dibromoethane		0.21	U
1,2-Dichlorobenzene		0.21	U
1,2-Dichloroethane		0.21	U
1,2-Dichloropropane		0.21	U
1,3,5-Trimethylbenzene		0.21	U
1,3-Dichlorobenzene		0.21	U
1,3-Dichloropropane		0.21	U
1,4-Dichlorobenzene		0.21	U
2,2-Dichloropropane		0.21	U
2-Butanone		2.1	U
2-Chlorotoluene		0.21	U
2-Hexanone		2.1	U
4-Chlorotoluene		0.21	U
4-Methyl-2-Pentanone		1.0	U
Acetone		5.2	U
Benzene		0.21	U
Bromobenzene		0.21	U
Bromochloromethane		0.21	U
Bromodichloromethane		0.21	U
Bromoform		0.21	U
Bromomethane		1.0	U
Carbon Disulfide		2.1	U
Carbon Tetrachloride		0.21	U
Chlorobenzene		0.21	U
Chlorodibromomethane		0.21	U
Chloroethane		0.21	U
Chloroform		0.21	U
Chloromethane		1.0	U
Cis-1,2-Dichloroethene		0.21	U
Cis-1,3-Dichloropropene		0.21	U
Dibromomethane		0.21	U
Dichlorodifluoromethane		1.0	U
Ethylbenzene		0.21	U
Hexachlorobutadiene		0.83	U
Isopropylbenzene		0.42	U
m+p-Xylenes		0.42	U
Methylene Chloride		1.0	U
Methyl-tert-butyl Ether		0.21	U
Naphthalene		0.42	U
n-Butylbenzene		1.0	U
n-Propylbenzene		0.21	U
o-Xylene		0.21	U
p-Isopropyltoluene		0.42	U
Sec-Butylbenzene		0.21	U
Styrene		0.21	U
Tert-Butylbenzene		0.21	U
Tetrachloroethene		0.21	U
Toluene		0.21	U

Table 6
Remedial Action Vault Waste Characterization Analytical Results
Boise Cascade - Vancouver, WA Site

Class/Analyte	Sample/Date Sampled			
	PROCESS VAULT 9/14/2005		PROCESS VAULT #2 9/22/2005	
Trans-1,2-Dichloroethene			0.21	U
Trans-1,3-Dichloropropene			0.21	U
Trichloroethene			0.21	U
Trichlorofluoromethane			0.21	U
Vinyl Chloride			0.21	U

Notes:
U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the MRL.
Cell Bolded - Analyte Detected
Blank cell indicates the analyses was not run for that sample.



Legend

SITE AREA

N

500 0 500 1,000 Feet

Figure 1

Site Map

Boise Cascade Mill
Vancouver, Washington

CH2MHILL

File Path: \\rosa\proj\BoiseCascade\326995\gis\mxds\figure1_vancouver_Site_Map.mxd, Date: May 12, 2005 11:26:40 AM

Legend

- GPS Data (08-12-05)
- GPS Data (06-27-05)
- SOIL AND GROUNDWATER SAMPLE LOCATION
- GROUNDWATER ONLY SAMPLE LOCATION
- SOIL ONLY SAMPLE LOCATION
- TEST PIT LOCATION
- SURFACE SOIL ONLY SAMPLE LOCATION
- APPROXIMATE BOISE PROPERTY BOUNDARY
- AREAS OF INVESTIGATION

NOTE: AOI 14, HISTORIC TRANSFORMER LOCATIONS INCLUDE SS-124, SS-125, AND SS-126

N

0 100 200 300 400

Feet

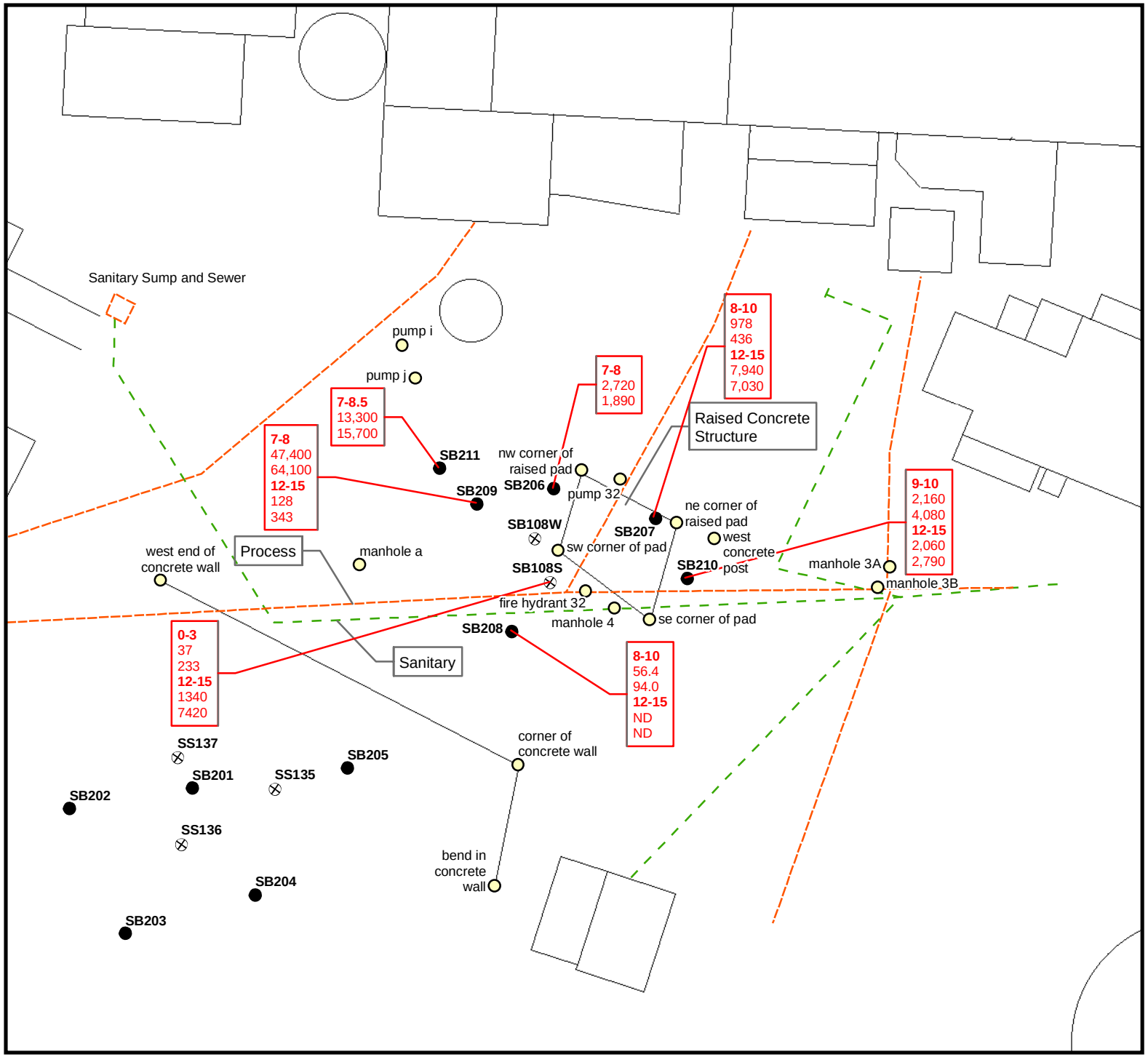
Figure 2

Phase II Investigation
Soil and Groundwater
Sample Locations

Boise Cascade Mill
Vancouver, Washington

CH2MHILL

File Path: \\rosa\proj\BoiseCascade\326995\gis\mxds\figure2_vancouver_Sample_Locations2.mxd, Date: January 17, 2006 10:52:04 AM



Legend

- SUBSURFACE SOIL BORINGS 06/22/05
- FACILITY FEATURES
- PREVIOUS SAMPLING LOCATIONS
- RAILROAD
- BUILDING FOOTPRINT
- 130-1013.dwg Polyline

Pipelines

- Process
- Sanitary

Depth (FT BGS)
Diesel (mg/Kg)
Heavy Oil (mg/Kg)

N

10 0 10 20 Feet

Figure 3

Additional Site Investigation,
AOI 4 & 5
Environmental Data

Boise Cascade Mill
Vancouver, Washington

CH2MHILL

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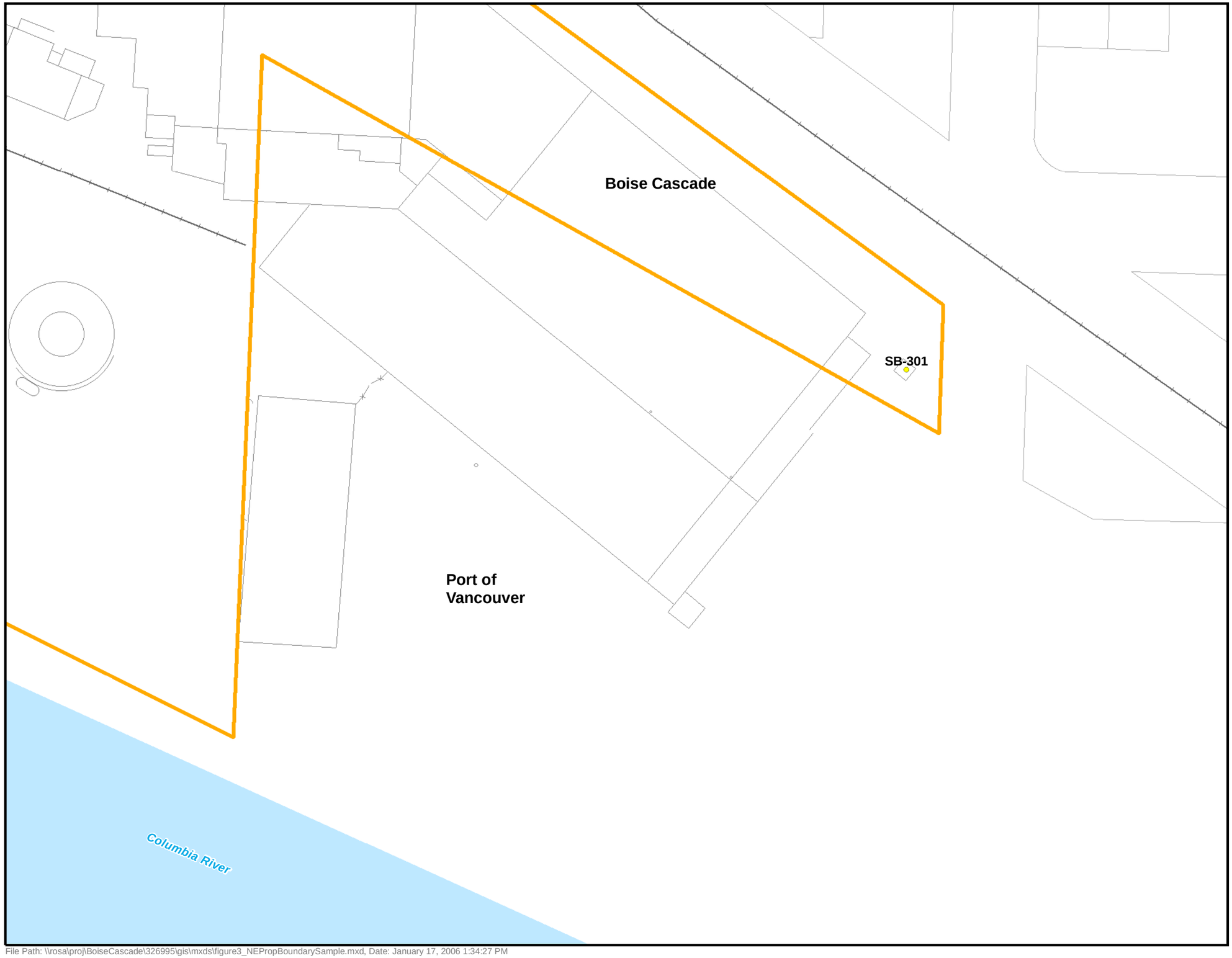


Legend

- GPS Data (08-11-05)
- APPROXIMATE BOISE PROPERTY BOUNDARY

N

0 40 80 120 160

Feet

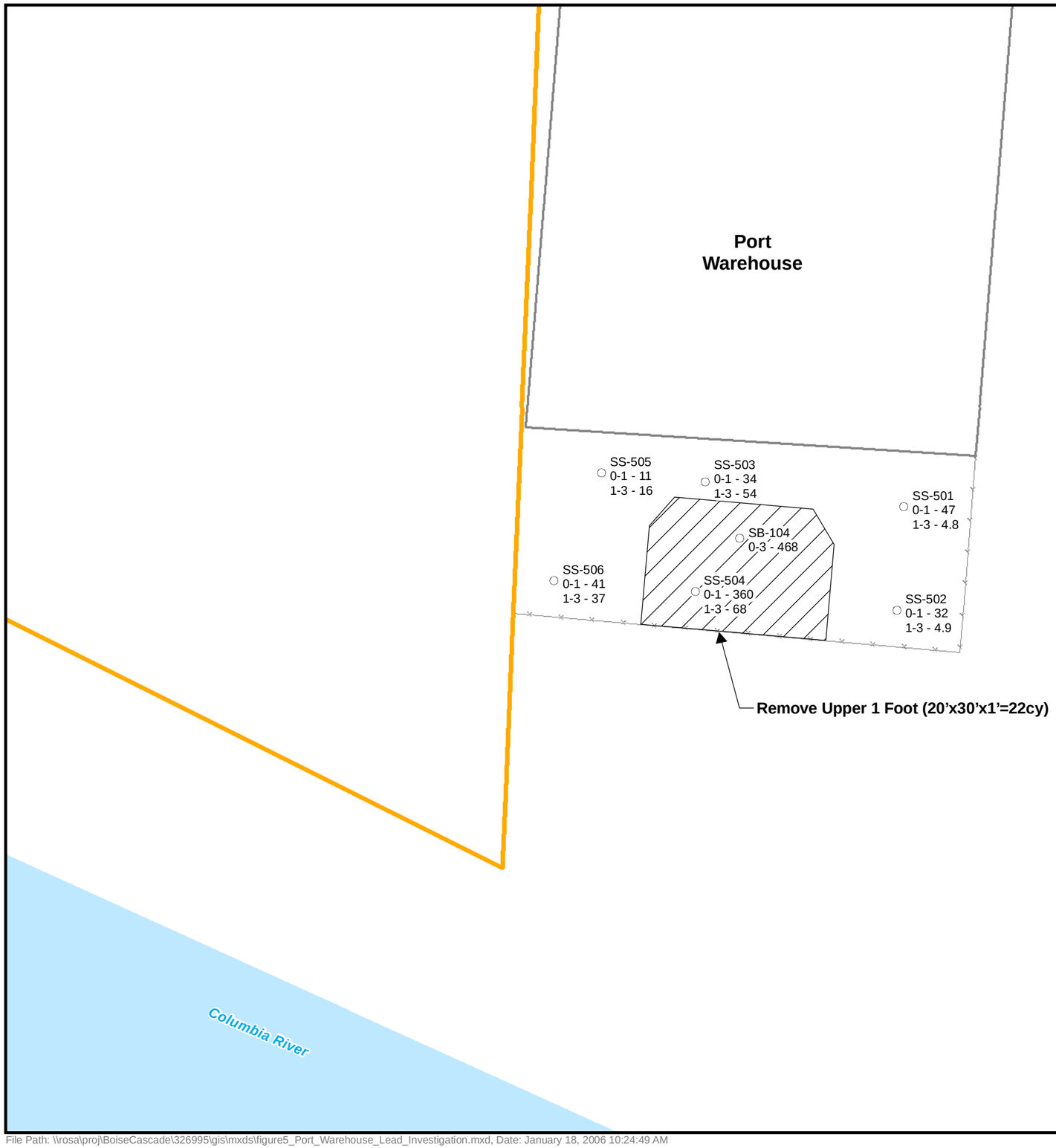
Figure 4

Northeast Property Boundary Sample

Boise Cascade Mill
Vancouver, Washington

CH2MHILL

File Path: \\rosa\proj\BoiseCascade\326995\gis\mxds\figure3_NEPropBoundarySample.mxd, Date: January 17, 2006 1:34:27 PM



Legend

- SAMPLE LOCATION
- PORT WAREHOUSE SOIL REMOVAL AREA
- APPROXIMATE BOISE PROPERTY BOUNDARY

SB-126 = SAMPLE LOCATION
0-3 - 468 = LEAD CONCENTRATION (DEPTH BELOW GROUND SURFACE IN FEET)

N

0 10 20 30 40

Feet

Figure 5

Port Property
Warehouse Investigation

Boise Cascade Mill
Vancouver, Washington

CH2MHILL

File Path: \\rosa\proj\BoiseCascade\326995\gis\mxds\figure5_Port_Warehouse_Lead_Investigation.mxd, Date: January 18, 2006 10:24:49 AM

LEGEND:

- CONFIRMATION SOIL SAMPLE
- FACILITY FEATURES
- SOIL GEOPROBE LOCATIONS
- RAILROAD
- BUILDING FOOTPRINT

NOTE:
SAMPLE LOCATIONS ARE APPROXIMATE.

PUMP I
PUMP J
SS419
5,000 GAL UST
SS422
FIRE WATER VALVE
SS415
SS413
SS421
SS420
SS414
SS416
SS403
SS408
SS402
SB207
SB206
20,000 GAL UST
SS409
SS430
WEST CONCRETE POST
SS431
SS432
MH 3A
(165')
SS459
SS460
8" FIRE WATER LINE
MH 3B
SS442-6
SS443-10
SS440-6
SS441-12
SS446-6
SS447-10
SS448-6
SS449-12
SS457
SS458
SB211
SB209
SS407
SB108W
SB210
SS411
SS412
SS417
SS435B
SS436B
SS437B
SS450-6
SS451-10
~50'
SS455
SS454
SS418
SS406
SS405
SB108S
SS404
FORMER FIRE HYDRANT
MH 4
CONCRETE VAULT
SS410
75'
SS452
SS453
SS444-6
SS445-12
SS438-6
SS439-12
SS463
SS464
SS461
SS462
MH A
SB208
APPROXIMATE EXTENT OF EXCAVATION

N

SCALE IN FEET
0 25 50

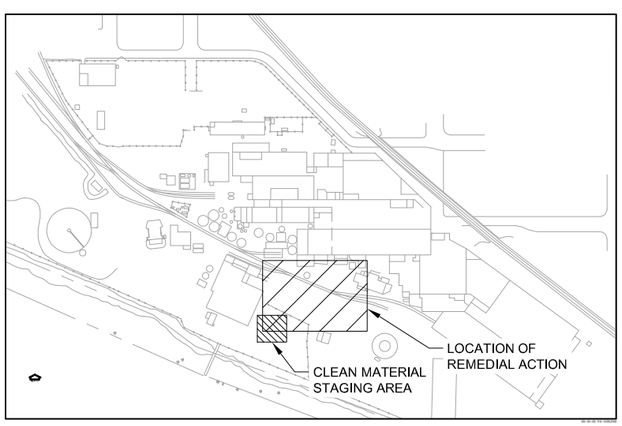


FIGURE 6
EXTENT OF REMEDIAL ACTION AND CONFIRMATION SOIL SAMPLE LOCATIONS

BOISE CASCADE MILL
VANCOUVER, WASHINGTON

CH2MHILL