INDEPENDENT REMEDIAL ACTION REPORT

WEYERHAEUSER ABERDEEN SAWMILL

ABERDEEN, WASHINGTON

Prepared for

Weyerhaeuser Company

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EXECUTIVE SUMMARY

The Aberdeen Sawmill is a 47-acre site located adjacent to the Chehalis River on Weyerhaeuser property in Aberdeen, Washington. Historical practices at the site using dilute solutions of pentachlorophenol (PCP) for wood treatment in the grader building were thought to have contaminated soil and groundwater at the site. To characterize the nature and extent of the contamination, Weyerhaeuser performed independent investigations in 1990. The compounds analyzed for included PCP, semivolatile organics, metals, PCBs, and pesticides.

Based on the results of those initial investigations, PCP was determined to be the only contaminant of concern (COC) for the site. Semivolatile organics were eliminated as COCs due to their low concentrations and infrequent detections. Metals were eliminated as COC because there were no known on-site sources of the metals and there is no obvious trend or pattern in the data indicating an on-site source impacting groundwater. PCBs and pesticides were eliminated as COCs based on a review of the historical facility operations and analytical results were below detection limits.

Based on the analytical results of the investigations and historical operations at the facility, Weyerhaeuser identified the following eight potential remediation areas in and around the grader and planer buildings:

- Area 1 - Sorting area
- Area 2 - Outside ramp area and inside soil area near spray booth
- Area 3 - Area under wooden decking near old mixing room
- Area 4 - Area adjacent to the spray booth
- Area 5 - Area north of the conveyor belt
- Area 6 - West area beneath grader table
- Area 7 - East area beneath grader table
- Area 8 - Stacker area and former dip tank operation area

At the time remedial action was initiated at the site in 1990, the Washington Model Toxics Control Act (MTCA) did not exist. Initial work was conducted without an established site-specific cleanup level for PCP in soil. Following enactment of MTCA, an evaluation was performed to determine applicable cleanup levels for the site. Based on the industrial use and zoning of the site, Method C cleanup levels for soil were selected. The appropriate cleanup levels for groundwater were determined to be surface water

standards. These standards were selected because groundwater discharges to the nearby Chehalis River and groundwater is not a current source of drinking water. Furthermore, there is no viable future drinking water use at the site for the following reasons:

- Ambient, upgradient water quality is poor
- Municipal water is available at the site from the city of Aberdeen
- A water well installed in the aquifer would not meet Ecology well construction standards
- Saltwater intrusion from Grays Harbor Bay precludes the surface water from being a potential drinking water source

Based on the data from the investigations, remedial action objectives (RAOs) for the site were developed. The RAO for soil was to remove as much of the PCP-contaminated soil and wood waste in the eight areas identified as possible without compromising the structural integrity of the building. For areas where PCP contamination was left in-place, the RAO was to prevent direct contact exposure using engineering and/or institutional controls. The RAO for groundwater was to prevent PCP-contaminated groundwater from migrating to the Chehalis River at concentrations exceeding AWQC.

Based on these RAOs, Weyerhaeuser developed an approach for the site that included the following remedial actions:

- Soil excavation and landfill disposal
- Backfilling and capping excavated areas
- Process modifications and facility improvements
- Institutional controls
- Groundwater monitoring

Weyerhaeuser initiated remedial action in 1990. The soil excavation in the former spray booth and sapstain-control areas was performed in several stages from 1990 and 1993. As part of the process modifications and improvements in 1991 a new spray booth was constructed and excavation was performed during the planned facility shutdown. A total of 522 tons of soil and debris were removed from the site and transported to Chemical Waste Management's hazardous waste landfill in Arlington, Oregon. The excavated areas were backfilled with clean material and capped with a concrete and/or asphalt cover. PCP concentrations in all the confirmation samples collected in Areas 1, 4, 6, and 7 were below the Method C cleanup level. Soil samples collected at the limits of the excavation in Areas 2, 3 and 5 contained concentrations of PCP above the Method C cleanup level. Further excavation could not be performed in these areas due to severe access restraints and concerns regarding the stability of building foundations. A deed restriction has been placed on the property due to the residual PCP-contaminated soil left in place.

As part of the remedial action program, groundwater sampling was performed between 1990 and 1993. Based on a statistical evaluation performed on the groundwater analytical data, only monitoring well D-05 consistently contained PCP concentrations above AWQC. Due to the limited aerial extent of the groundwater contamination and the lack of detection of PCP in downgradient monitoring well D-06, Weyerhaeuser determined that the PCP-contaminated groundwater was not migrating to the Chehalis River, and groundwater monitoring was discontinued.

Based on the detailed information contained in this independent remedial action program (IRAP) report, Weyerhaeuser is requesting that Ecology grant a status of "no further action" to the site.

1 INTRODUCTION

This report presents the results of the independent site investigation and cleanup actions conducted by Weyerhaeuser at its Aberdeen, Washington, sawmill in response to the discovery of pentachlorophenol (PCP) contamination in the vicinity of the planer mill, grader building and adjacent areas. The site investigation and cleanup actions described here were conducted as an independent action under the state of Washington's Model Toxic Control Act (MTCA).

This independent remedial action program (IRAP) report was prepared for Weyerhaeuser by EMCON in accordance with the MTCA requirements for reporting independent remedial actions (WAC 173-340-300[4], WAC 173-340-450 [4] and WAC 173-340-450 [8]). The report is formatted to generally follow the outline suggested in the Department of Ecology's "Guidance on Preparing Remedial Action Reports under MTCA."

2 SITE BACKGROUND

2.1 Site Description

The Aberdeen sawmill is a 47-acre site located at 500 North Custer Street in the south section of Aberdeen, Washington (Figure 1). The site is on the south shore of the Chehalis River, upstream of Grays Harbor. It is in the northeast quarter of the southeast quarter of section 9, township 17 north, range 9 west, Willamette Meridian. The site is further identified by its position at approximately 46° 58' 15" latitude and 123° 48' 00" longitude. Shannon Slough is east of the sawmill facility and the Chehalis River borders the site to the north.

The site has been owned and operated by the Weyerhaeuser Company (corporate headquarters, Tacoma, Washington) since 1955. The mill is managed by Bob Andrews (360 538-1033). Site environmental matters are managed by Helen Bond at Weyerhaeuser's Aberdeen Sawmill, Aberdeen, Washington 98520 (360 538-2610).

This IRAP report was prepared specifically for the area comprising the grading, planing, and sorting buildings (Figure 2). A completed IRAP summary form is provided in Appendix A.

2.2 Site History and Land Use

A shingle and lath mill was built at the Aberdeen property in 1925 by the Schafer Brothers. The mill was modified for lumber production in 1948. Weyerhaeuser purchased the property and operations from the Schafer Brothers in 1955. Under Weyerhaeuser's ownership, the facility has been used for lumber production from 1955 to the present. Additional modifications to the mill's lumber-handling procedures have occurred over the past 40 years. The site is currently zoned industrial (I) by the City of Aberdeen.

2.3 Initial Site Investigations

As noted in Section 1, the initial investigative work at the site (i.e., the sapstain application area in the planer mill, grader building, and adjacent areas) was in response to independent site investigations and cleanup actions by Weyerhauser. Because the site investigation and cleanup actions at the site consist of a series of overlapping phases, there is no clear distinction between the investigative and remedial phases of the project. For purposes of this report, only the soil investigations conducted before the first cleanup action in July 1990 and the first round of groundwater sampling are described in this section. Subsequent soil and groundwater data are described in Section 5 (nature and extent of contamination and affected media), Section 7 (independent remedial actions performed), and Section 8 (compliance monitoring requirements).

Four separate soil and groundwater investigations were conducted in the planer building, in October 1989 and in May through August 1990. The following sections describe the investigations and the findings.

2.3.1 1989 Investigation

The first soil sampling related to potential releases of chemicals (i.e., PCP and NP-1) applied to control sapstain (discoloring wood fungus) was conducted on October 15, 1989, next to the mixing room and spray booth area in the planer building (Figure 2). The purpose of the investigation was to determine if a release had occurred to surface soils. Nine grab and composite surface soil samples were collected and analyzed for semivolatile organics using USEPA Method 8270. Concentrations of PCP were detected from 3 to 750 milligrams per kilogram (mg/kg) near the former spray booth and mixing room. For purposes of potential waste characterization and disposal, several samples were also analyzed using the EP toxicity test and a fish bioassay. The laboratory results indicated that no samples exceeded the EP toxicity metals maximum concentration limit and that seven of the nine samples failed the fish bioassay test. The sampling locations and laboratory results are shown in Figure B-1 (Appendix B). The soil sampling laboratory results are presented in Appendix C.

2.3.2 1990 Investigations

On the basis of the results of the October 1989 sampling, additional surface soil and sawdust sampling was performed on May 24, 1990, in the grader building north of the conveyer belt and in the stacker area. Five samples were collected and analyzed for semivolatile organics. Fish bioassays were also run on five samples. Concentrations of PCP were detected in the soil samples ranging from 3.9 to 120 mg/kg. Four of the five samples failed the fish bioassay test. The sampling locations and laboratory results are shown in Figure B-2 (Appendix B).

On May 24 and 25, 1990, Dalton, Olmsted & Fugelevand, Inc., installed five monitoring wells (D-01 through D-05) at locations around the grading, planing, and sorting buildings (see Figure 2). The wells were installed using a hollow-stem auger. The purpose of the groundwater investigation was to evaluate whether NP 1, PCP, or other wood-treating chemicals had impacted groundwater at the site. Soil samples were collected from the borings during well installation and analyzed for semivolatile organics by USEPA Method 8270. PCP was detected in soil from boring D-05 at 14.5 to 16 feet below the ground surface (bgs) at concentrations ranging from below the method detection limit to 1.9 mg/kg. PCP was not detected in soil samples from borings D-01 through D-04e. Bis(2-ethylhexyl) phthalate was detected in soil samples collected from each boring and in the laboratory blank, at concentrations ranging from nondetect to 540 mg/kg. The concentrations of bis(2-ethylhexyl) phthalate probably represent laboratory contamination. Other semivolatile organic compounds were detected, but at low concentrations, including 4-methylphenol, bis (2-chloroisopropyl) ether, benzoic acid, naphthalene, 2-methylnaphthalene, phenanthrene, anthracene, di-n-butylphthalate, fluoranthene, pyrene, benzo(a)anthracene, and di-n octyl phthatate.

Groundwater samples were collected from the five monitoring wells on May 25 and 28, 1990, and August 15, 1990, and analyzed for semivolatile organics (see Table 1). PCP was detected in monitoring well D-05 at concentrations ranging from 5,800 to 6,900 micrograms per liter (µg/L). PCP was detected in monitoring well D-02 only during the May 1990 sampling, at a concentration of 83 µg/L. PCP was detected at low levels in monitoring well D-04e, with concentrations estimated from 6 to 24 µg/L. PCP was not detected in monitoring wells D-01 or D-03 during either sampling round. Other semivolatile organic compounds including phenol, 2-chlorophenol, 4-methylphenol, 2,4-dimethylphenol, benzoic acid, 2,4-dichlorophenol, 1,2,4-trichlorobenzene, naphthalene, 4-chloro-3-methyphenol, 2-methylnaphthalene, 2,4,6-trichlorophenol, 2,4,5-trichlorophenol, 4-nitrophenol, 4,6-dinitro-2-methylphenol and bis (2-ethylhexyl) phthalate were also detected, but at low concentrations (Table 1). The groundwater sampling field parameters and laboratory results are presented in Appendix D.

An additional soil investigation was performed in July 1990 to further characterize the extent of PCP concentrations in the surface debris and in sawdust and subsurface soils in the grader building area. A total of 23 grab and composite samples was collected and analyzed for semivolatile organics, the EP toxicity test, and a fish bioassay. Concentrations of PCP in the soil ranged from 11 to 25,000 mg/kg from 2 to 6 feet bgs. The highest concentrations of PCP were found in the outside ramp area north of monitoring well D-05 and the inside soil area near the spray booth. Sampling locations and analytical results are shown in Figure B-3 (Appendix B).

On August 30, 1990, four additional monitoring wells (D-06 through D-09) were installed by Dalton, Olmsted & Fugelevand, Inc. (Figure 2). The purpose of the additional wells was to further characterize the direction of groundwater flow and the extent of semivolatiles in groundwater. Soil samples collected from the borings were analyzed for semivolatile organics. PCP was not detected. Other semivolatile organic compounds (2-methylnaphthalene, phenanthrene, bis (2-ethylhexyl) phthalate and di-n octyl phthalate) were detected at low concentrations.

Groundwater samples were collected from wells D-06 through D-09 on September 13, 1990, and analyzed for semivolatile organics. PCP was not detected in the groundwater samples. Phenol and 4-methylphenol were detected in monitoring wells D-07 through D-09 at low concentrations. Naphthalene, benzoic acid, and 2-methylnaphthalene were also detected in monitoring well D-09, but at low concentrations.

3 ENVIRONMENTAL SETTING

3.1 Climate

The Aberdeen area has a temperate marine climate, featuring cool, wet winters and cool, dry summers. The Pacific Ocean moderates the temperature and provides a vast supply of moisture for storms that move inland from the west to east. The average annual precipitation is approximately 208 centimeters (85 inches) per year (NOAA, 1993). Data were collected from the weather station in Aberdeen, Washington, at an elevation of 3.01 meters (10 feet) above mean sea level. The distribution of precipitation varies during a typical year, with most of the annual precipitation occurring from October through March. Prevailing winds are from the south or southwest during the wet season and from the northwest during the summer.

Temperatures are moderate throughout the year. The average monthly temperature ranges from 4.7° C (40.5° F) in January to 16.7° C (62.1° F) in July (NOAA, 1993). In the winter, average temperatures range from 0.5° C (32.9° F) to 5.5° C (41.9°F) and in the summer, from 15.6° C (60.1° F) to 21.7° C (71.1° F) (Pringle, 1986).

3.2 Surface Water Hydrology

The lower Chehalis River valley is a broad, low-gradient, east-west-trending valley. Prominent surface water features include the Chehalis River; the Wishkah River, which enters the Chehalis River across the river from the site; Grays Harbor, immediately downstream of the site; and the Hoquiam River, discharging to Grays Harbor, about 4 miles west of the site. The Chehalis River borders the site to the north. Other nearby surface water bodies include Shannon Slough, east of the sawmill.

3.3 Geology and Hydrogeology

3.3.1 Regional Geology

The site is on the southern bank of the Chehalis River, upstream of Grays Harbor. Geologic deposits in the lower Chehalis River valley include up to 300 feet of unconsolidated fill and alluvial, landslide, marine, and glacial sediments overlying bedrock (Eddy, 1966; Molenaar, Grimstad, and Walters, 1980; Logan, 1987). The alluvial, landslide, marine, and glacial sediments were deposited during the Pleistocene and Holocene epochs. Bedrock was deposited in the Miocene epoch.

Fill consists of sediments dredged from the river or bay, imported materials, wood debris, and landslide materials. The alluvium consists of silt, sand, and gravel deposited in streambeds and alluvial fans. The landslide deposits contain rock, soil, and organic fragments deposited by mass wasting. Marine sediments are composed of silt, sand, and gravel found in uplifted terraces along the valley walls. Glacial deposits consist primarily of stratified sand and gravel deposited in streams downgradient of the glacier. Found at depth within the valley and in the hills surrounding the valley, bedrock is primarily composed of silty sandstone, with lesser amounts of conglomerate and siltstone.

3.3.2 Site Geology

The site subsurface soil types were evaluated by drilling nine soil borings, conducting surface sampling, and excavating soil during remediation. The borings were advanced in May and August 1990 and completed as shallow monitoring wells, as described in Section 2.3 (Figure 2). McDonald Holt, Inc., of Puyallup, Washington, performed the drilling and soil sampling using a truck-mounted hollow-stem auger drilling rig. The borings were advanced to a maximum depth of 16 feet bgs at boring D-05. As borings were advanced, soil samples were collected and classified according to American Society of Testing and Materials (ASTM) D-2488. Geologic logs of borings advanced during the investigation are presented in Appendix E.

Historical photos of the mill site indicate that most of the mill was constructed on fill extended from the old shoreline of the Chehalis River. The boring logs for monitoring wells D-01 through D-09 show that the fill thickness increases toward the shoreline. The site is generally underlain by four soil types: gravel, sand, wood waste, and silt. Much of the site is paved with asphaltic concrete and is underlain by 1 to 2 feet of sandy gravel. Wood fill consisting of large pieces of intact wood, as well as smaller wood fragments, underlies the sand in four borings (D-05, D-07, D-08 and D-09). Wood waste was probably used as fill as the property was extended. A silt layer, containing some organics and some wood debris near the top of the unit, was encountered beneath the sand or the wood in several borings (D-02, D-03, D-04e, and D-05). Silt was not encountered in the other five borings, since they were only 9-feet deep and did not extend far enough to encounter the silt unit. The hydraulic conductivity of the silt unit is probably significantly less than that of the sand or wood waste units.

3.3.3 Regional Hydrogeology

Groundwater in the lower Chehalis River valley is found locally in all the previously mentioned geologic units. Productive aquifers occur in the alluvial and glacial deposits. Bedrock wells do not generally yield significant quantities of groundwater. Two main alluvial aquifers exist within the valley, one at a depth of less than 100 feet and one at a depth of greater than 100 feet. Wells within the alluvial aquifers yield up to 3,000 gallons per minute (gpm). The municipality of Aberdeen obtains drinking water from reservoirs north of the city (Anderson, 1995).

A statewide groundwater quality assessment prepared by the Washington Department of Ecology (Ecology, 1988) indicates that groundwater quality is poor within Grays Harbor County. Locally, contaminants in groundwater include heavy metals, solvents, chlorides, coliform, and total dissolved solids. Naturally occurring iron and sulfur constituents, saltwater intrusion, on-site sewage disposal, urbanization, industrial activity, and landfill disposal all contribute to groundwater degradation. In addition, frequent historical flooding in the floodplain of the Grays Harbor estuary or tidal influences on the area's rivers also negatively impact shallow groundwater quality.

3.3.4 Site Hydrogeology

Groundwater levels were measured at the site from two to four times per year between 1990 and 1993. Depth to groundwater ranged from 1.83 to 5.58 feet (see Appendix D). On the basis of measurements from reference points surveyed to the mean lower low-water datum, groundwater elevations during this period varied from 9.01 to 11.23 feet. Groundwater elevations were highest in the southeastern part of the site (at D-03) and relatively level across the rest of the site.

A tidal response study was conducted from March 29 to April 1, 1996, to determine the potential influence of river fluctuations on groundwater levels at the site (Appendix F). Eight monitoring wells and one point in the Chehalis River were monitored. Table 2 presents the tidal study results. Figure 3 shows the mean groundwater elevation at each monitored location during a tidal day early in the study. The elevation was highest in the southeastern part of the facility, was relatively even across the rest of the monitored facility, and was lowest at the river. Although the groundwater gradient beneath the monitored portion of the facility was relatively flat, the inferred groundwater flow direction is toward the river. The groundwater gradient beneath the monitored portion of the facility was about 0.003 feet/foot, and the groundwater gradient between the monitored portion of the facility and the river was about 0.015 feet/foot.

4 HAZARDOUS SUBSTANCE MANAGEMENT AND HANDLING PRACTICES

4.1 Hazardous Substance Identification and Quantities Related to Independent Remedial Action

Two different wood-treatment chemicals have been used over time at the planer mill: a sodium pentachlorophenate solution, and a dilute NP-1 solution. Sodium pentachlorophenate was used in the planer mill for antistain control of the lumber before 1986. Because sodium pentachlorphenate hydrolyzes to form PCP, both sodium pentachlorphenate and PCP will be referred to as PCP in the remainder of this report. The date PCP was first used is unknown. PCP releases at the facility are believed to be associated with spray booth and dip tank operations from the 1960s to the mid-1980s.

During the course of site operations, some quantity of chemicals may have been released to the environment. The quantity is unknown, since no specific spills or releases have been reported. Releases were probably caused by excess drippage from lumber after it left the spray booth. The lumber was transported from the spray booth on a chain belt conveyor. There was also reportedly a dip tank operation south of the grader areas that used PCP (years of operation unknown).

In November 1986, the mill began using a dilute solution (300:1 to 100:1) of NP-1 to control sapstain and mold on lumber. The NP-1 application area was located at the north end of the planer building. Judging from the material safety data sheet (MSDS) prepared by VWR, Inc., the composition of NP-1 was reported to be less than 65 percent didecyl dimethyl ammonium chloride, less than 20 percent iodopropanyl butyl carbomate, less than 5 percent petroleum naphtha, less than 10 percent ethanol, and less than 5 percent dimethyl sulfoxide.

4.2 On-site Treatment, Storage, and Disposal Related to Independent Remedial Action

4.2.1 Hazardous Substance Storage Tanks

Wood-treating chemicals (PCP and NP-1) were stored in several drums and containers in the mixing room and spray booth. PCP was also stored in an aboveground tank (approximately 500-gallon capacity) in the old hula trimmer area (see Figure 2).

4.2.2 Hazardous Waste Treatment Facilities On-site

There are no records or indications of present or former hazardous waste treatment facilities on site. Wastes were stored, but not treated, on the site.

4.2.3 Measures Taken to Contain Hazardous Substances or Wastes

The original mixing room and spray booth were demolished in 1991, leaving only the concrete floor. A new spray booth was then constructed, which included secondary containment.

4.2.4 Off-Site Sources

No hazardous substances from off-site sources have been treated, stored, or disposed of on-site.

5 NATURE AND EXTENT OF CONTAMINATION AND MEDIA AFFECTED

5.1 Documentation of Spills or Releases

There are no records of any spills or releases of sapstain-control chemicals at the planer mill. Surface and subsurface impacts probably result from multiple small leaks and spills during application operations over time.

5.2 Contaminants of Concern

The purpose of identifying the contaminants of concern (COCs) was to establish the basis for initiating cleanup actions at the site. On the basis of historical and current uses of sapstain control chemicals in the grader building, the potential COCs were PCP, NP-1, and other related semivolatile organics (e.g., trichlorophenols). Other compounds included in the groundwater sampling program were metals, pesticides, and polycholinated biphenyls (PCBs). Samples were analyzed for phenols and semivolatile organics using USEPA Methods 8040 ([phenols by gas chromatography [GC]) and 8270 (semivolatile organics by gas chromatography/mass spectroscopy [GC/MS]), and for PCP by GC with an electron capture detector (GC/ECD). Additional analyses included pesticides, PCBs, and total and dissolved metals. Laboratory reports are found in Appendix D. The laboratory results are also presented in a database file in Appendix H.

Section 5.2.1 describes the screening process used to determine COCs for the site.

5.2.1 Screening of Potential COCs

PCP. PCP was used as a wood-treatment chemical for antistain control of the lumber at the facility from the 1960s to the mid-1980s. Soil and groundwater samples collected in 1990 were analyzed for semivolatile organics, with PCP detected in both media above potential cleanup levels (see Section 6.1). Therefore, PCP was determined to be a COC for the site.

NP-1. NP-1 has been used to control sapstain on milled lumber at the facility since 1986. NP-1 contains the constituents specified in Section 4.1, including naphthalene. Soil and groundwater samples collected in 1990 were analyzed for semivolatile organics, with naphthalene detected at levels well below potential cleanup standards. At another Weyerhaeuser facility where NP-1 was used, Ecology had requested information concerning the characteristics of NP-1. Weyerhaeuser supplied information including the MSDS for NP-1, toxicity data, biological degradation data, and chemical leaching properties. After evaluating these data, Weyerhaeuser and Ecology determined that NP-1 was not a COC for the site. A copy of the MSDS for NP-1 is included in Appendix G.

Because the composition, characteristics, and use of NP-1 (application to milled lumber) at the Weyerhaeuser Aberdeen site are the same as at the other Weyerhaeuser facility, NP-1 was eliminated as a COC for this site.

Other Semivolatile Organics. Other related semivolatile organics (e.g., trichlorophenols) were detected at low concentrations in both soil and groundwater during the 1990 investigation. These compounds were determined not to be COCs for this site, because of their low concentrations and infrequent detection.

Metals. Total and dissolved concentrations of arsenic and mercury were above potential cleanup standards in groundwater samples collected in 1992 and 1993 (see Section 6.1). Tables 3 and 4 compare the total and dissolved metals in groundwater for downgradient monitoring well D-06 and cross-gradient monitoring well D-08. Comparing the values shows that dissolved metals concentrations are typically much lower than the total metals concentrations. Dissolved metals concentrations are more appropriate for use at the site because of the high turbidity of the groundwater samples. For example, the dissolved metals concentration of arsenic in D-06 was less than 3 µg/L, compared with a total metals concentration of 5 µg/L. For mercury, the dissolved metals concentration was less than 0.02 µg/L, compared with a total metals concentration of 0.4 µg/L.

A review of the historical operation of the facility did not identify any potential on-site source for these metals. There is also no obvious pattern or trend in the analytical data to suggest that an on-site source of these metals is impacting the groundwater. Concentrations of these metals in the downgradient monitoring wells are not significantly different from concentrations in other wells. On the basis of this evaluation, none of these metals were identified as COCs for this site.

PCBs and pesticides. PCBs and pesticides were not suspected as COCs for the site from a review of historical operations. Analytical results for samples analyzed for PCBs and pesticides were below detection limits. On the basis of these findings, these compounds were eliminated as COCs for the site.

5.2.2 Summary of COCs

From the evaluation in Section 5.2.1, the only COC at the site (both in soil and groundwater) is PCP.

5.3 Nature and Extent of Contamination

5.3.1 Soil

Several soil samples analyzed in 1989 and 1990 exceeded cleanup standards for PCP. After an evaluation of the analytical data and historical operations at the planer, Weyerhaeuser identified potential remediation areas (see Figure 4):

- **Area 1 - Sorting area.** Area 1 was defined as the sorting area near the former cherry brown[1] application area and former sapstain chemical mixing room. According to available information, cherry brown does not contain hazardous substances. The area was also adjacent to the spray booth. Potential PCP in the subsurface soils may have resulted from minor spills. This area is approximately 20-feet wide by 20-feet long.

- **Area 2 - Outside ramp area and inside soil area near spray booth.** Area 2 was defined as the outside ramp and inside soil area closest to the spray booth. It covers an area approximately 25-feet wide by 50-feet long. Area 2 was the location of the former spray booth operation before 1988. Surface soil staining under the former ramp indicated that spills had occurred in this area.

- **Area 3 - Area under wooden decking near old mixing room.** Area 3 was defined as the area under the wooden decking near the former mixing room. Mixed product storage and product recovery tanks were located in Area 3. It covers an area approximately 25-feet wide by 35-feet long. Minor spills may have occurred in this area.

- **Area 4 - Area adjacent to spray booth.** Area 4 was defined as a small area of soil next to the spray booth. It covers an area approximately 15-feet wide by 25-feet long. Minor spills may have occurred in this area.

- **Area 5 - Area north of conveyor belt.** Area 5 was defined as the area north of the conveyor belt. Minor spillage and drippage from the spray booth may have

[1] "Cherry Brown" is a latex-based coloring agent that was used historically north of the mixing room.

occurred in this area. It covers an area approximately 10-feet wide by 10-feet long.

- **Area 6 - West area beneath grader table.** Area 6 was defined as the western half of the area beneath the grader table. It covers an area approximately 20-feet wide by 50-feet long. Potential PCP contamination in this area was expected to be limited to 3 to 6 inches of sawdust and other debris that had accumulated over time below the grader table.

- **Area 7 - East area beneath grader table.** Area 7 was defined as the eastern half of the area beneath the grader table. It is also approximately 20-feet wide by 50-feet long. The only concern was sawdust that had accumulated below the grader table.

- **Area 8 - Stacker area and former dip tank operation area.** Area 8 was specified as the old trimmer outfeed and former dip tank operation area. The specific boundaries of this area were not defined but were estimated at approximately 10-feet wide by 20-feet long. Impacted subsurface soils associated with the former dip tank operation were suspected in this area.

5.3.2 Groundwater

Groundwater samples were collected from five monitoring wells (D-01 through D-05) in May and August 1990 and four additional monitoring wells (D-06 through D-09) in September 1990. Monitoring wells D-01, D-02, D-03, and D-08, located south to southeast of the grader building, were considered to represent background (upgradient) water quality. Monitoring well D-05 was considered to represent groundwater quality in the impacted area. Monitoring wells D-04e, D-07 and D-09 represent groundwater quality cross-gradient of the impacted area, while monitoring well D-06 represents downgradient water quality.

PCP was detected in monitoring well D-05, next to the grader building, at concentrations ranging from 1,300 to 9,990 µg/L during sampling between 1990 and 1993. PCP was detected in monitoring well D-04e during the May 1990 sampling at a concentration of 24 µg/L, and in the August 1990 sampling at a concentration of 6 µg/L. All sampling conducted in 1992 and 1993 did not detect PCP in this well. PCP was detected only once in monitoring well D-02, in May 1990 at a concentration of 83 µg/L. PCP was detected only once in monitoring well D-08, in July 1992 at a concentration of 1.3 µg/L. PCP has not been detected in monitoring wells D-01, D-03, D-06, D-07, or D-09. Other chlorophenols have been detected sporadically. Section 8 describes a statistical analysis using the PCP and other chlorophenol groundwater data for the monitoring wells. PCP is shown to be the only compound that exceeds cleanup levels, and its presence in groundwater at elevated concentrations is generally localized near monitoring well D-05.

6 SELECTION OF CLEANUP STANDARDS

6.1 Cleanup Levels

This section describes the three methods for establishing cleanup levels under MTCA, the rationale for selecting one of the methods, and the cleanup levels selected for soil and groundwater at the site.

6.1.1 Types of Cleanup Levels

MTCA provides three methods for determining cleanup levels, as described briefly below.

Method A. Method A applies to sites undergoing routine cleanup actions, or to sites where numerical standards are available for all hazardous substances in all media of concern. Predetermined cleanup levels are provided for approximately 25 chemicals in tables in MTCA. These cleanup levels are easy to use, but are often extremely conservative. Method A applies only to relatively simple, routine sites (e.g., gas stations). Method A cleanup levels have been developed for both residential and industrial exposure scenarios.

Method B. Method B is the standard approach applicable to all sites. Cleanup levels are determined according to equations provided in the regulation and using the most current toxicity data in the USEPA's Integrated Risk Information System (IRIS) database. The cleanup levels for soil are calculated assuming incidental ingestion of contaminated soil by a young child; this represents a conservative scenario for an industrial site.

Cleanup levels for groundwater generally assume drinking water as the beneficial use, unless the following criteria are met to demonstrate that the aquifer is not potable:

- Groundwater is not a current source of drinking water.
- Groundwater is not a potential future source of drinking water (because of, e.g., insufficient yield, natural background contamination, or technically impossible recovery).

- It is unlikely that contaminants will be transported to an aquifer that is or could be used for drinking water.

Ecology determines non-drinking-water-based groundwater cleanup levels for sites on a case-by-case basis.

Method C. Method C applies in cases where land use meets the criteria for classification as industrial, in other special cases where Method A or B cleanup levels are below area background concentrations, or in cases where Method A or B cleanup levels are not technically possible to achieve. As with Method B, cleanup levels are calculated by using equations provided in the regulation and by using the most current toxicity data in the USEPA's IRIS database. The equations use less conservative assumptions and in some cases allow higher risk levels than Method B. Institutional controls (e.g., site fence, deed restrictions) are generally required when Method C cleanup levels are used.

6.1.2 Selection of Cleanup Levels

Method A is not appropriate for the site because it is not a "routine" site and because there are no Method A cleanup levels for PCP, the only COC at the site. The decision whether to use Method B or Method C cleanup levels is based primarily on whether the site is defined as "industrial." The definition is found in WAC 173-340-745a(b). The Aberdeen sawmill property is currently zoned industrial (I) by the city of Aberdeen. The site is currently used for industrial purposes and has over a 70-year history of wood product and lumber production activities. Weyerhaeuser intends to use the site for industrial purposes in the foreseeable future. Institutional controls will be implemented as part of the remedial action. Because the site meets all the criteria for an industrial site as described above, Method C will be the method used to determine cleanup levels for soil.

6.1.3 Cleanup Levels for Soil

As described in Section 5.2, PCP was identified as the only COC for soil. No other chemicals were detected in soil at concentrations above Method C cleanup levels. The MTCA Method C soil cleanup level for PCP is 1,090 mg/kg.

6.1.4 Cleanup Levels for Groundwater

The cleanup levels for groundwater depend on whether the groundwater is an actual or potential future source of drinking water. There is no current use of the groundwater in the area. There is no viable future drinking water use of the groundwater, for the following reasons:

- Ambient, upgradient water quality is poor
- Municipal water is available at the site from the city of Aberdeen
- The property will continue to be used for industrial purposes in the foreseeable future
- A water well installed in the aquifer would not meet Ecology well construction standards (WAC 173-160-265)
- Saltwater intrusion from Grays Harbor Bay precludes the water from being a potential drinking water source

Because the groundwater is not a current or potential future source of drinking water, an alternate basis for establishing cleanup levels must be used. The groundwater discharges to the adjacent Chehalis River. Therefore, protection of the surface water was selected as an appropriate goal for identifying groundwater cleanup levels. Applicable requirements for protection of surface water are state surface water quality standards and federal ambient water quality criteria (AWQC) for protection of human health and aquatic organisms. AWQC are established for both marine and freshwater environments and are based on consumption of aquatic organisms only, or consumption of organisms plus drinking water. Because the Chehalis River is brackish and is not used for drinking water purposes, groundwater cleanup levels were established using AWQC for consumption of organisms, only.

As described in Section 5.2, PCP is the only COC for groundwater. The AWQC for PCP based on consumption of organisms only is 8.2 µg/L. PCP concentrations above marine AWQC were detected in groundwater samples collected from monitoring well D-05. PCP was detected in a groundwater sample collected from monitoring well D-02 on May 25, 1990, were above the AWQC. PCP was detected in well D-04e above the AWQC on May 28, 1990. PCP concentrations in groundwater samples collected from wells D-01, D-03, D-06, D-07, D-08, and D-09 have always been below the AWQC.

6.1.5 Point of Compliance

The point of compliance refers to the point or points where cleanup levels are attained. For soil, the point of compliance is generally the soil throughout the site, from the surface to the shallow water table. The point of compliance for the grader building would be the limits of the excavations. The point of compliance for groundwater is the Chehalis River.

6.2 Federal, State and Local Regulatory Requirements

6.2.1 Regulatory Requirements

Under MTCA (WAC 173-340-710), remedial actions in the state must comply with applicable federal and state laws. This section identifies federal, state, and local requirements that may apply during the implementation of remedial actions. The primary requirements considered potentially applicable to this site are listed below and summarized in Table 5 (state and local) and Table 6 (federal).

6.2.2 State and Local Requirements

The state and local requirements listed below may apply to the site.

Groundwater Quality

- MTCA groundwater cleanup standards (WAC 173-340-720)
- Public water system rules and regulation (Chapter 248-54 WAC)

Soil Quality

- MTCA soil cleanup standards (WAC 173-340-740)

Well Construction

- Minimum standards for construction and maintenance of wells (Chapter 173-160 WAC)

Surface Water

- Water quality standards for surface waters of the state (Chapter 173-201A WAC)

Dangerous Waste

- Dangerous waste regulations (Chapter 173-303 WAC)

Management of Extracted Groundwater

- Local publicly owned treatment works (POTW) discharge requirements
- Washington Water Pollution Control Act (RCW 90.48 and RCW 90.54)

- State NPDES permitting regulations (Chapter 173-220 WAC)

Health and Safety

- WISHA (WAC 296-62-300)

6.2.3 Federal Requirements

The following federal requirements may apply to this site:

Hazardous Waste Identification

- Hazardous Waste Toxicity Characteristic (40 CFR 261.24) under RCRA

Hazardous Waste Disposal

- Land Disposal - RCRA (40 CFR Part 268)

Surface Water

- AWQC

Management of Extracted Groundwater

- Discharge to surface water under NPDES permit - Clean Water Act (CWA) (40 CFR Parts 122-125)

- Discharge to POTWs - Section 307 of CWA (40 CFR Part 403)

Implementation of Remedial Action

- Occupational Safety and Health Act (OSHA; 29 CFR 1910.120)

6.3 Remedial Action Objectives

On the basis of the data generated by the field investigations and the evaluation of applicable cleanup standards under MTCA, the following conclusions were drawn regarding the need for remedial action at the site. All cleanup actions must meet the following threshold requirements under WAC 173-340-360(2):

- Protect human health and the environment.

- Comply with cleanup standards (WAC 173-340-700 through 173-340-760).

- Comply with applicable state and federal laws (WAC 173-340-710).
- Provide for compliance monitoring (WAC 173-340-410).

Specific remedial action objectives (RAOs) for soil and groundwater are described below.

6.3.1 Soil

The RAO for soil was to remove as much of the PCP-contaminated soil and wood waste as possible in the eight areas identified, without compromising the integrity of existing structures. For areas where soil left in place has concentrations of PCP exceeding the Method C cleanup level, the RAO was to prevent direct contact exposure using engineering and/or institutional controls.

6.3.2 Groundwater

The RAO for groundwater was to ensure that PCP-contaminated groundwater did not migrate from the source area and discharge to the Chehalis River at concentrations exceeding AWQC.

7 INDEPENDENT REMEDIAL ACTIONS PERFORMED

7.1 Rationale for Selected Remedial Action

On the basis of the nature and extent of contamination identified in Section 5, Weyerhaeuser selected the following remedial actions to satisfy the RAOs defined in Section 6.3:

- Soil excavation and landfill disposal
- Capping
- Process modifications and facility improvements
- Institutional controls
- Groundwater monitoring

The rationale for selecting the actions is described below.

Soil Excavation and Landfill Disposal. The initial site investigations suggested that the depth of the contaminated soil was shallow, ranging from the surface to approximately 6 feet bgs. The wood fill underlying the suspected release site(s) was believed to have collected much of the PCP released to the subsurface; PCP has a high octanol partitioning coefficient (K_{oc}), giving it a strong tendency to adsorb to organic material such as wood. Therefore, it was suspected that the high volume of wood waste in the fill material probably absorbed most of the PCP, thereby limiting its migration. Excavation of the contaminated material and off-site disposal of the waste was therefore selected as part of the remedial action.

Capping. Capping of the areas with soil, asphalt, or concrete was selected as part of the remedial action because the cap would prevent potential direct contact with any residual PCP concentrations.

Process Modifications and Facility Improvements. Construction of a new mixing room and spray booth planned for the grader building would allow further excavation of the PCP-impacted soil and debris. Use of PCP to control sapstain was discontinued in 1986.

Institutional Controls. Institutional controls can be implemented as part of a remedial action plan using Method C cleanup levels. For this site, institutional controls will include a deed restriction prohibiting the use of the shallow aquifer.

Groundwater Monitoring. Groundwater monitoring was selected as part of the remedial action on the basis of the groundwater laboratory results. Groundwater sampling indicated concentrations of PCP above the AWQC in one of the nine monitoring wells (D-05). Groundwater monitoring would effectively evaluate whether PCP concentrations in groundwater were increasing over time, or whether PCP was migrating toward the Chehalis River.

Weyerhaeuser evaluated other remedial alternatives, which included in situ bioremediation of PCP under methanogenic conditions. This alternative was ruled out because of site-specific conditions. The amount of PCP-contaminated soil was thought to be too small, judging from the initial site investigations, to justify the time and expense of implementing a technically complex solution such as in situ bioremediation. Excavation and off-site disposal were determined to be the most timely and cost-effective solution. It was also thought that excavation would effectively remove the source of PCP contamination. Site access limitations and production impacts were included in the evaluation.

7.2 Description of Independent Remedial Actions

From the initial site investigations described in Section 2.3, PCP was known to be present in subsurface soils in the vicinity of the planer building. Although the exact extent of soil contamination was not known, Weyerhaeuser decided to proceed with soil excavation in the known areas of concern, and to conduct additional excavation, as required, on the basis of the results of confirmation soil sampling.

Weyerhaeuser removed soil from the former spray booth and sapstain-control areas in several stages between 1990 and 1993. Each stage consisted of excavating an area followed by confirmation soil sampling. Most excavation used a small backhoe or Super Sucker™ vacuum truck. In some areas with limited access (such as Area 8), it was necessary to excavate the soil or wood waste by hand. The amount of excavation in most areas was limited by severe access constraints, concerns about the integrity of the building foundations, or both. No permits were required for the remedial action.

The following briefly describes the sequence of events in removing the contaminated fill. The sequential sampling and excavation diagrams referred to in the text are found in Appendix B. Table 7 summarizes the sequence of sampling and excavation.

7.2.1 1990 Soil Excavation and Confirmation Sampling

Remedial action began in July 1990 to clean up surface soils and debris in the former PCP-usage areas. Excavation of contaminated soil and wood debris was performed in Areas 1, 2, 3, 4, 6, 7, and 8, where the current or former spray booths and dip tank were located (see Figure B-4, Appendix B). Surface soils and sawdust were removed by hand or with the vacuum truck. A total of 262 tons of contaminated soil and debris was removed from the site and disposed of as dangerous waste at Chemical Waste Management's hazardous waste landfill in Arlington, Oregon. The extent of the excavation in some areas was limited by the presence of large pieces of process equipment, building foundations, and the shallow groundwater table.

Following this first stage of excavation, confirmation sampling was performed on July 20, August 15, and September 7, 1990. Soil samples were collected from 1 to 4 feet bgs and analyzed for PCP. The concentrations of PCP ranged from 3.4 to 8,600 mg/kg. Confirmation soil sampling results are shown in Figures B-4 and B-5 (Appendix B).

7.2.2 1991 Soil Excavation and Confirmation Sampling

A new spray booth and mixing room were scheduled for construction in the summer of 1991 during a planned facility shutdown. Supplemental soil sampling of Areas 2, 3, 4, 5, 7, and 8 was performed on May 30, 1991, to further evaluate the extent of the PCP contamination (Figure B-6). A total of 17 surface and subsurface samples was collected and analyzed for PCP. On the basis of the laboratory results, Weyerhaeuser determined that a significant area of soil contamination existed southwest of the current spray booth, in the location identified as Area 2. Concentrations of PCP in soil samples in Area 2 ranged from 11 to 10,000 mg/kg.

Excavation of contaminated debris and soil was performed in August 1991 in Areas 1, 2, 5, 6, 7, and 8. Confirmation soil sampling results are shown in Figures B-7 and B-8. The demolition of the cherry brown area and cleanup of Area 1 was planned to allow the construction of the new sapstain-control mixing room and spray booth. Demolition of the NP-1 storage tanks and mixing room and excavation in Areas 3 and 4 were postponed until 1992. Excavation of these areas was planned after demolition of the cherry brown area was complete.

Area 1 was excavated first to facilitate construction of the new mixing room and spray booth in this area. Contaminated soil and fill were excavated to the extent practicable. Complete excavation of all of the impacted soil was not possible because of limited accessibility and the potential for undermining the concrete foundation. The area was backfilled with clean fill to return the area to operation by the end of August. The confirmation soil sample collected in this area was below the Method C cleanup level for PCP.

Weyerhaeuser's original plan for excavation in Area 2 was to dewater before excavating to 12 to 15 feet bgs. The excavation of Area 2 began just west of the grader building. Over 20,000 gallons of water were pumped from the excavation, at an average rate of 670 gpm, in an attempt to lower the water table. During the 30-minute period of pumping, only a 6-inch drawdown of the water table was observed. The water was treated on site by carbon absorption before it was transported for disposal to Chemical Processor's industrial wastewater treatment facility in Kent, Washington.

Since it was found impractical to dewater Area 2, the excavation plan was modified. Weyerhaeuser evaluated installing sheet piling and barrier walls to allow excavation below the water table, but determined it was not practical due to severe access restrictions; including current building foundation. Therefore, soil and wood waste were excavated "in the wet," using a backhoe, to a maximum depth of approximately 16 feet bgs (6 feet below the water table) and placed in a staging area, to allow the liquids to drain back into the excavation. The excavated material was then placed in a roll-on/roll-off container and mixed with kiln dust to reduce the potential for a release of liquids from the debris. The excavated material was classified as a dangerous waste and transported to Chemical Waste Management's hazardous waste landfill in Arlington, Oregon. A total of 160tons of PCP-contaminated soil and debris was removed from Areas 1, 2, 5, 6, 7, and 8 in 1991.

Confirmation soil samples collected from Areas 1, 4, and 8 were below Method C cleanup levels. Areas 2 and 5 still contained PCP above the Method C cleanup level.

7.2.3 1992 Excavation and Confirmation Sampling

The final stage of excavation was conducted in September 1992. Additional excavation was performed in Areas 3 and 5 (Figure B-9). Decontamination of the Area 2 soil stockpile and supplemental soil sampling in Areas 2, 6, and 7 was also conducted.

Confirmation samples were collected from the four sidewalls and floor of Area 3. Two confirmation soil samples collected from the south sidewall and floor of Area 3 contained PCP concentrations above the Method C cleanup level, at concentrations of 1,400 and 6,000 mg/kg, respectively. Further excavation was not possible because of concerns about the building foundation. One additional confirmation soil sample was collected in Area 2 along the conveyor and the building wall, with a concentration of PCP of 1.8 mg/kg. The soil samples collected from the decontaminated surface of Area 2 were below the Method C cleanup level. Additional confirmation soil samples collected from Areas 6 and 7 were below Method C cleanup levels.

In 1992, approximately 100 tons of PCP-contaminated soil and debris were removed from the site and transported to Chemical Waste Management's hazardous waste landfill in Arlington, Oregon.

7.2.4 Summary

A total of approximately 522 tons of soil and debris was removed from the site. All of this material was transported to Chemical Waste Management's hazardous waste landfill in Arlington, Oregon. Figure 5 illustrates the final limits of excavation and the sample designations numbers for the final confirmation samples. Table 8 lists the sample designations and left-in-place concentrations. Soil samples collected at the limits of the excavation in Areas 2, 3, and 5 contained concentrations of PCP above the Method C cleanup level. Further excavation in these areas could not be performed because of severe access constraints and concerns regarding the building foundation. PCP concentrations in all the confirmation samples collected in Areas 1, 4, 6, 7, and 8 were below the Method C cleanup level.

7.3 Process Modifications

Several improvements in hazardous-waste-handling practices have been made at the Aberdeen sawmill since 1986. In November 1986, PCP usage at the facility was discontinued. NP-1 has been used as a substitute since 1986 for wood treating. In 1991, the mixing room and former spray booth were demolished and the debris properly disposed of as hazardous waste. Also in 1991, a new spray booth was designed and constructed with containment to prevent releases of chemicals to the subsurface. Site personnel were trained in 1990 and 1991 in handling NP-1 wastes from the spray booth operations.

7.4 Institutional Controls

A deed restriction has been placed on the title of the property, because of the residual PCP-contaminated soil and groundwater left in place at the site. The restriction notifies any potential future owners of the remaining contamination. The restriction specifies that the shallow groundwater beneath the site shall not be removed and used at the site as a drinking water supply source. Areas with elevated concentrations of PCP remaining in the soil shall be kept capped with an asphalt or concrete cover, and no excavation shall occur in these areas without taking appropriate precautions. A copy of the deed restriction is included in Appendix I.

7.5 Groundwater Monitoring

As part of the remedial action program at the site, groundwater monitoring was performed semiannually in 1990 during the investigation and in 1991 during initial excavation. Quarterly groundwater sampling was performed in 1992 and 1993. Because of the limited detection of PCP in the monitoring wells over this period, groundwater monitoring was discontinued after 1993. Section 8.1 presents the results of a statistical evaluation of PCP concentrations in the groundwater over time.

8 COMPLIANCE MONITORING REQUIREMENTS

8.1 Groundwater

EMCON performed a statistical analysis of the groundwater data collected over the four years of monitoring from 1990 to 1993, using MTCA Stat, version 2.1. The chemicals evaluated were PCP and related chlorophenols, including 2,4,5- and 2,4,6-trichlorophenol, and 2,3,4,5-, 2,3,4,6-, and 2,3,5,6-tetrachlorophenol. The database for the site was queried for all these compounds for each monitoring well. The data for each well were then evaluated individually.

Monitoring wells D-01, D-02, D-03, D-06, and D-07 showed either all nondetect or one detection for each compound listed above. PCP was not detected in downgradient monitoring well D-06, and cross-gradient well D-07. Cross-gradient monitoring well D-08 showed two detections of PCP, with a maximum concentration of 5 µg/L. Cross-gradient monitoring well D-04e showed two detections of PCP, with a maximum concentration of 24 µg/L. Monitoring well D-04e also showed one detection of 2,3,4,6-tetrachlorphenol, at a concentration of 9.1 mg/L, and two detections of 2,4,5-trichlorophenol, at a maximum concentration of 8 mg/L.

PCP was detected in all samples collected from well D-05, at concentrations of from 1,300 to 9,900 µg/L. 2,3,5,6- and 2,3,4,5-tetrachlorophenol were both detected twice, with maximum concentrations of 1,200 µg/L and 2,300 µg/L. 2,4,5- and 2,4,6 trichlorophenol were detected two and four times, at maximum concentrations of 420 and 8 µg/L.

EMCON determined that the PCP data for well D-05 had a lognormal distribution. The 95 percent upper confidence limit on the mean (UCL_{95}) for the entire data set (1990 to 1993) was 7,700 µg/L.

On the basis of this evaluation, only monitoring well D-05 has contained PCP concentrations above the AWQC of 8.2 µg/L. The aerial extent of elevated PCP concentrations in groundwater appears to be localized to this area. Downgradient monitoring well D-06 only shown detectable PCP once in October 1993 at a low concentration of 0.001 mg/L. PCP has been detected two times in cross-gradient monitoring well D-04e (May and August, 1990). Only the May 1990 sampling detected

PCP at a concentration above the AWQC. All sampling since August 1990 (seven rounds) has resulted in no detections.

After an evaluation of these data, Weyerhaeuser determined that PCP-contaminated groundwater was not migrating to the Chehalis River, and groundwater monitoring was discontinued.

Since PCP releases at the facility are believed to be associated with spray booth and dip tank operations from the 1960s to the 1980s, it is likely that groundwater would have migrated toward the river during this 20-year period. Given the absence of elevated PCP concentrations in the downgradient monitoring well (D-06), the repeated detection of elevated levels of PCP in only one monitoring well (D-05), and the four years of groundwater data collected to date, information is sufficient to determine that migration of PCP in groundwater at concentrations exceeding AWQC is not occurring, and no further monitoring is required.

8.2 Conclusions

As part of a remedial action program, Weyerhaeuser excavated approximately 522 tons of PCP-contaminated material from the grader building area at its Aberdeen sawmill facility. Excavation in several areas was limited by accessibility problems and building foundation concerns. Further excavation of the PCP-contaminated soil in these areas was determined to be impractical. Soil samples collected at the limits of the excavation in some areas exceeded the MTCA Method C cleanup levels for PCP. All the excavated areas have been backfilled with clean fill, and some have been paved and are located inside the grader building under cover. The soil boring and soil sample results at the limits of the excavation suggest that a localized area of PCP impacted soil and debris remains in place.

Groundwater sampling at the site from 1990 to 1993 identified high levels of PCP in a localized area around monitoring well D-05. Slightly elevated levels of PCP have been detected infrequently in the other wells. A statistical evaluation of the data indicates that migration of PCP toward the Chehalis River is not occurring at concentrations exceeding the AWQC.

On the basis of the above information, Weyerhaeuser requests a determination of no further action for the Weyerhaeuser Aberdeen sawmill grader building.

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

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TABLES

Table 1

1990 Semivolatile Organic Laboratory Results for Groundwater Sampling
Weyerhaeuser Sawmill
Aberdeen, Washington

Constituent	Monitoring Well and Date Sampled													
	D-01	D-01	D-02	D-02	D-03	D-03	D-04	D-04	D-05	D-05	D-06	D-07	D-08	D-09
	05/25/90	08/15/90	05/25/90	08/15/90	03/25/90	08/15/90	05/25/90	08/15/90	05/25/90	08/15/90	09/13/90	09/13/90	09/13/90	09/13/90
Phenol	ND	ND	ND	ND	ND	ND	10U	20U	22	140	10U	740E	280	23
2-Chlorophenol	ND	ND	0110	0.020 U	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	ND	ND	ND	ND	ND	ND	5J	79	9J	130	10U	55	54	5J
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	4J	20U	ND	ND	ND	ND
Benzoic Acid	4J	100U	4J	100U	120	100U	17J	20J	33J	130	51U	50U	50U	8J
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	10J	23	10U	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	2J	20U	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Napthalene	ND	ND	ND	ND	ND	ND	2J	20U	7J	8J	ND	ND	ND	23
4-Chloro-3-Methylphenol	ND	ND	22	20U	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	3J	6J	10U	ND	ND	17
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	10U	9J	10U	ND	ND	ND
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	8J	5J	190	420	51U	ND	ND	ND
4-Nitrophenol	ND	ND	190	100U	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol	ND	ND	ND	ND	ND	ND	5J	100U	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ND	ND	83	100U	ND	ND	24J	6J	6,900E	5,800E	51U	50U	50U	51J
bis(2-Ethylhexyl)phthalate	ND	ND	2J	20U	ND	ND	4J	ND	ND	ND	ND	ND	ND	ND

Note: All concentrations reported in µ/L.
ND = Not detected.
J = An estimated value below the quantitation limit.
U = Compound was analyzed for but not detected. Level of detection is shown.
E = Concentration exceeds the calibration range of the instrument.

Table 2

Tital Response Study Results
Weyerhaeuser Company Weyerhaeuser Sawmill
Aberdeen, Washington

Location	Water Elevation (3/30 - 3/31/96)[a]			
	Maximum	Minimum	Range	Mean
Wells				
D-02	9.89	9.85	0.04	9.87
D-03	10.55	10.48	0.07	10.51
D-04E	9.95	9.91	0.04	9.93
D-05	9.88	9.83	0.05	9.85
D-06	9.83	9.78	0.05	9.80
D-07	9.88	9.84	0.04	9.86
D-08	9.88	9.83	0.05	9.85
D-09	9.87	9.82	0.05	9.84
River				
Stilling Well	8.88	1.08	7.80	5.42

NOTE: Vertical datam = City of Aberdeen Datum (mean lower low water).
Water levels were not measured in monitoring well D-01 due to access problems.

[a] For period from 3/30 (01:55) to 3/31 (02:45).

Table 3

Total and Dissolved Metals Groundwater Sampling Results for D-06 (07/14/92)
Weyerhaeuser Sawmill
Aberdeen, Washington

Constituent	Total Metals (µg/L)	Dissolved Metals (µg/L)
Aluminum	105,000	<200
Antimony	<50	<50
Arsenic	5	<3
Barium	585	186
Beryllium	<10	<10
Bismuth	<50	<50
Boron	504	<500
Cadmium	<10	<10
Calcium	55,500	51,200
Chromium	56	<10
Cobalt	29	<10
Copper	186	<20
Iron	150,000	91,600
Lead	72	<50
Lithium	317	233
Magnesium	64,600	57,800
Manganese	9,250	9,150
Mercury	0.4	<0.20
Molybdenum	<10	<10
Nickel	42	<30
Phosphorus	2,120	291
Potassium	17,800	14,500
Selenium	<200	<200
Silver	<10	<10
Sodium	152,000	145,000
Strontium	851	753
Thallium	<1,000	<1,000
Tin	<50	<50
Vanadium	261	<10
Zinc	121	<20

Table 4

Total and Dissolved Metals Groundwater Sampling Results for D-08 (07/14/92)
Weyerhaeuser Sawmill
Aberdeen, Washington

Constituent	Total Metals (µg/L)	Dissolved Metals (µg/L)
Aluminum	49,700	<200
Antimony	<50	<50
Arsenic	6	<3
Barium	290	<100
Beryllium	<10	<10
Bismuth	<50	<50
Boron	<500	<500
Cadmium	<10	<10
Calcium	33,700	22,900
Chromium	49	<10
Cobalt	27	<10
Copper	119	<20
Iron	95,700	37,600
Lead	120	<50
Lithium	155	127
Magnesium	19,900	10,000
Manganese	4,610	3,740
Mercury	2.8	<0.2
Molybdenum	<10	<10
Nickel	37	<30
Phosphorus	2,760	<200
Potassium	5,230	<10
Selenium	<200	<200
Silver	<10	<10
Sodium	57,700	56,400
Strontium	324	226
Thallium	<1,000	<1,000
Tin	<50	<50
Vanadium	150	<10
Zinc	586	<20

Table 5

Summary of Potentially Applicable State and Local Requirements
Weyerhaeuser Sawmill
Aberdeen, Washington

Standard, Requirement, Criteria, Limitation	Citation	Description	Comments
Hazardous Waste Cleanup Model Toxics Control Act	Chapter 70.15D RCW	Gives the Department of Ecology power to investigate and clean up hazardous waste sites.	
Model Toxics Control Act Cleanup Regulation	Chapter 173-340 WAC	Establishes processes and standards to investigate and clean up hazardous substances.	
• Groundwater Cleanup Standards	WAC 173-340-720	Standards applicable to groundwater cleanup.	
• Soil Cleanup Standards	WAC 173-340-740	Standards applicable to soil cleanup.	
Minimum Standards for Construction and Maintenance of Wells	Chapter 173-160 WAC	Establishes minimum standards for water supply and resource protection wells.	Applicable to construction and maintenance of wells at the site.
Dangerous Waste Regulations	Chapter 173-303 WAC	State regulation that classifies and regulates dangerous and extremely dangerous waste.	Dangerous waste may be generated if activated carbon is used as part of a remedial alternative.
Public Water System Rules and Regulations	Chapter 248-54 WAC	Establishes water quality standards for public drinking water supplies.	Applicable cleanup standard cited in MTCA.
WISHA	WAC 296-62-300	Establishes training requirements for workers at hazardous waste sites.	Applicable to on-site workers performing remediation-related tasks.
Washington Water Pollution Control Act	RCW 90.48 and 90.54	Regulates discharges into state waters.	Applicable to storm drain discharges of treated groundwater.
State NPDES Permitting Regulations	Chapter 173-220 WAC	Establishes effluent discharge permit requirements.	Applicable to storm drain discharges of treated groundwater.
Local POTW Discharge Requirements		Establishes effluent discharge permit requirements.	Applicable to sewer discharges of treated groundwater.

Table 6

Summary of Potentially Applicable Federal Requirements
Weyerhaeuser Sawmill
Aberdeen, Washington

	Citation	Description	Comments
Resource Conservation and Recovery Act (RCRA) as amended by the Hazardous and Solid Waste Amendments (HSWWA)	42 USCA 7401-7642 40 CFR 264.94	Federal Act that classifies and regulates hazardous waste and facilities which treat, store, and dispose (TSD) of hazardous waste.	
• Hazardous Waste Identification	40 CFR 261.24	Established whether solid waste is hazardous.	Toxicity characteristic for 38 organics and 8 metals. Activated carbon, a process option that may be implemented at the site, may require analysis after it is exhausted.
Clean Water Act (CWA)	33 USCA 1251-1376 40 CFR 100-149	Federal act that established a system of minimum national effluent discharge standards; a construction grant program fo POTWs, ocean discharge requirements, and water quality criteria.	
• Water Quality Criteria	Sect. 340 of CWA	Established criteria based on designated or potential use of the water and designated use of the receiving waters.	Nonenforceable guidance developed under CWA and used by states to set water quality standards. May be reflected in NPDES limitations.
		Requires states to identify surface waters impaired by excessive amounts of toxics, and, where the conditions are primarily attributable to point source discharges, to develop individual control strategies.	Potentially applicable if treated water is discharged to surface water.
• National Pollutant Discharge Elimination System (NPDES) Permit	40 CFR 122-235	Requirements for permits and limitations for discharges of effluent to surface waters.	Potentially applicable if treated water discharge to surface water.
• Discharge of Publicly Owned Treatment Works (POTW)	Sec. 307 of CWA	Discharge from new sources to POTWs.	Applicable for discharge to local POTW. Reflected in permit limitations set by POTW.
Occupational Safety and Health Act (OSHA)	29 CFR 1910 SARA Sec. 126	Requires that on-site workers engaged in hazardous waste operations complete 40-hour health and safety training.	Worker protection standards that are applicable to workers on CERCLA sites.
RCRA as amended by HSWA			
• Land Disposal Restrictions	40 CFR 264.250	Requirements that may prohibit placement of certain hazardous wastes in land disposal unit.	Hazardous waste could be generated if activated carbon is used as part of a remedial alternative.
• Incineration	40 CFR 264.340	Requirements for incinerators of hazardous waste.	Potentially applicable if hazardous waste (e.g., spent activated carbon) generated on sit is incinerated off site.

Table 7

Soil Excavation Summary
Weyerhaeuser Sawmill
Aberdeen, Washington

Excavation Date	Areas Excavated	Quantity of Soil and Debris Excavated	Comments	Figure
July 1990	1, 2, 3, 4, 6, 7, 8	262 tons	Area 2 still contained PCP concentrations above Method C cleanup levels Area 3 still contained PCP concentrations above Method C cleanup levels	B-4
August 1991	1, 2, 5, 6, 7 and 8	160 tons	Area 1 is complete Area 2 still contained PCP concentrations above Method C cleanup levels; however, further excavation could not be conducted due to concerns regarding building foundations or severe access constraints Area 5 still contained PCP above Method C cleanup levels, however, further excavation could not be conducted due to concerns regarding building foundations or severe access constraints. Area 8 is complete	B-8
September 1992	3 and 5	100 tons	Area 3 still contained PCP concentrations above Method C cleanup levels; however, further excavation could not be conducted due to concerns regarding building foundations or severe access constraints Area 6 is complete Area 7 is complete	B-9

Note: Areas were sampled in 1990 and 1991 with results below Method C cleanup levels, but additional sampling was performed by Weyerhaeuser. After final sampling in area, the area was classified as clean.

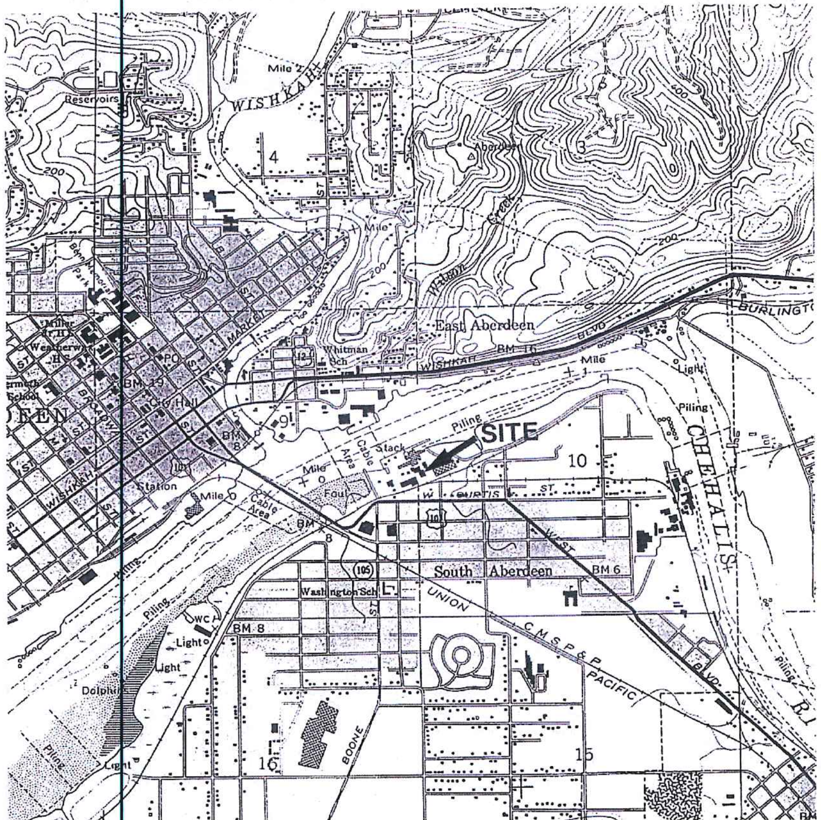
Table 8

Soil Sample Laboratory Results for PCP at Limits of Excavation Weyerhaeuser Sawmill Aberdeen, Washington

Date Sampled	Laboratory Sampling Identification	Sampling Location/Description	Depth (ft)	PCP Concentration (mg/kg)
05/24/90[b]	SAP-1	Surface soil	—	3.9[J]
07/15/90[b]	CB-17	End of conveyor, 6 point composite	—	14
09/07/90[b]	NP-1-1	Grab	3	3.4
07/20/90[b]	NP1-3	Grab	4	670
10/30/90[a]	WFWP1	Foundation borehole - grab	2 - 3	0.075
09/07/90[a]	NP1-4	Sidewall grab	4	<66
08/15/90[b]	WN6	Sidewall	1	95[D]
08/15/90[b]	W5	Sidewall	2	180[D]
05/30/91[b]	Wey-AB-204	Sidewall, east of Area 2	—	5,600
05/30/91[a]	Wey-AB-208	Surface grab	—	5[J]
05/30/91[a]	Wey-AB-209	Grab	2 - 4	<69[U]
08/15/92[b]	301	5 point composite	4 - 5	370[J]
08/15/92[a]	302	Floor grab	6	2,300
08/15/92[a]	303	5 point composite	3	190[J]
08/15/92[a]	304	North wall, 5 point composite	4	680[D]
08/22/91[a]	501	Surface grab	2	1,200
08/22/91[a]	502	5 point composite	2- 3	560
08/22/91[a]	503	5 point composite under slow down belt	1	340
08/22/91[a]	504	Floor - 5 point composite	6	700
08/22/91[a]	505	Wall - 4 point composite	—	130
08/16/91[a]	404	3 point composite	4	24
08/16/91[a]	401	Grab - center Area 2	16*	1,500
08/16/91[a]	402	Grab - hot spot Area A	16*	4,700
08/16/91[a]	406	5 point composite	6 - 8*	2,300
08/16/91[a]	405	3 point composite	4	590
08/16/91[a]	403	Grab - south end under cross timbers	5	1,900
09/22/92[a]	4-8	Northeast corner grader	—	0.31[J]
09/22/92[a]	3-7	Northwest corner grader chain-grab	—	0.47[J]
09/22/92[a]	5-9	Along conveyor clean sand & building	—	1.8
09/15/92[a]	OE-1	East wall	3	1,000[B]
09/15/92[a]	OE2	North wall of Area 3	3	2.1[B]
09/15/92[a]	OE-3	South wall	3	1,400[B]
09/15/92[a]	OE-4	Floor	5	6,000[B]
09/15/92[a]	OE-5	West wall	3	5.5[B]
09/15/92[a]	1-peripheral	Composite surface - 1 ft peripherally	1	290[D]
09/22/92[b]	2-Center	Surface composite	1	560

NOTE: D = Value for diluted sample.
J = Estimated value
U = Compound analyzed for but not detected at medium level.
* = Excavated/sampled below water table.
B = ?

[a] Represents oil left in place.
[b] Not clear whether this soil was excavated.



SOURCE: U.S.G.S. 7.5 MIN. SERIES, ABERDEEN QUADRANGLE, WA.

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DATE 4-96
DWN. MLP
REV.
APPR.
PROJECT NO.
40141-077.001

Figure 1
WEYERHAEUSER/ABERDEEN SAWMILL
ABERDEEN, WASHINGTON

SITE VICINITY MAP

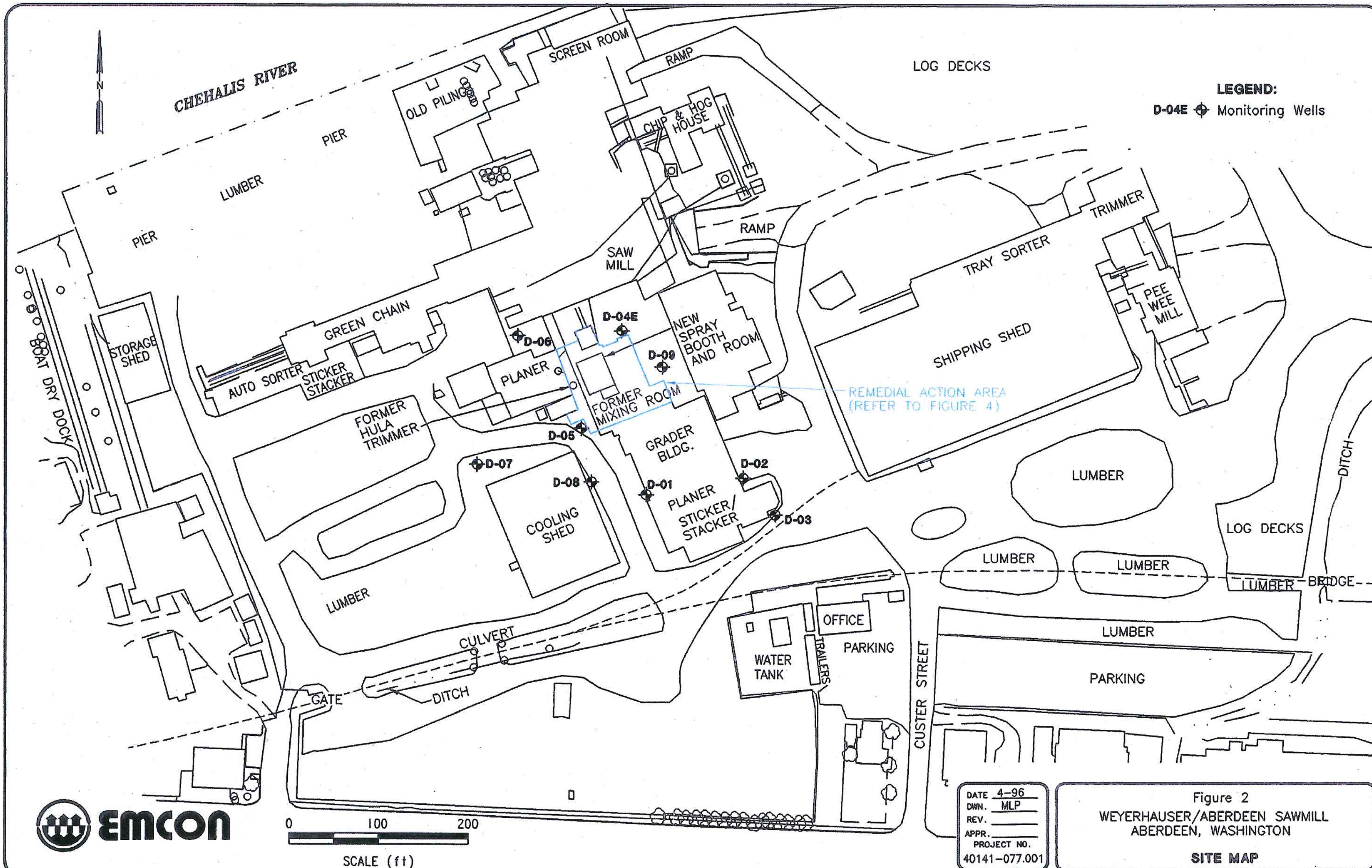

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Figure 2
WEYERHAUSER/ABERDEEN SAWMILL
ABERDEEN, WASHINGTON
SITE MAP

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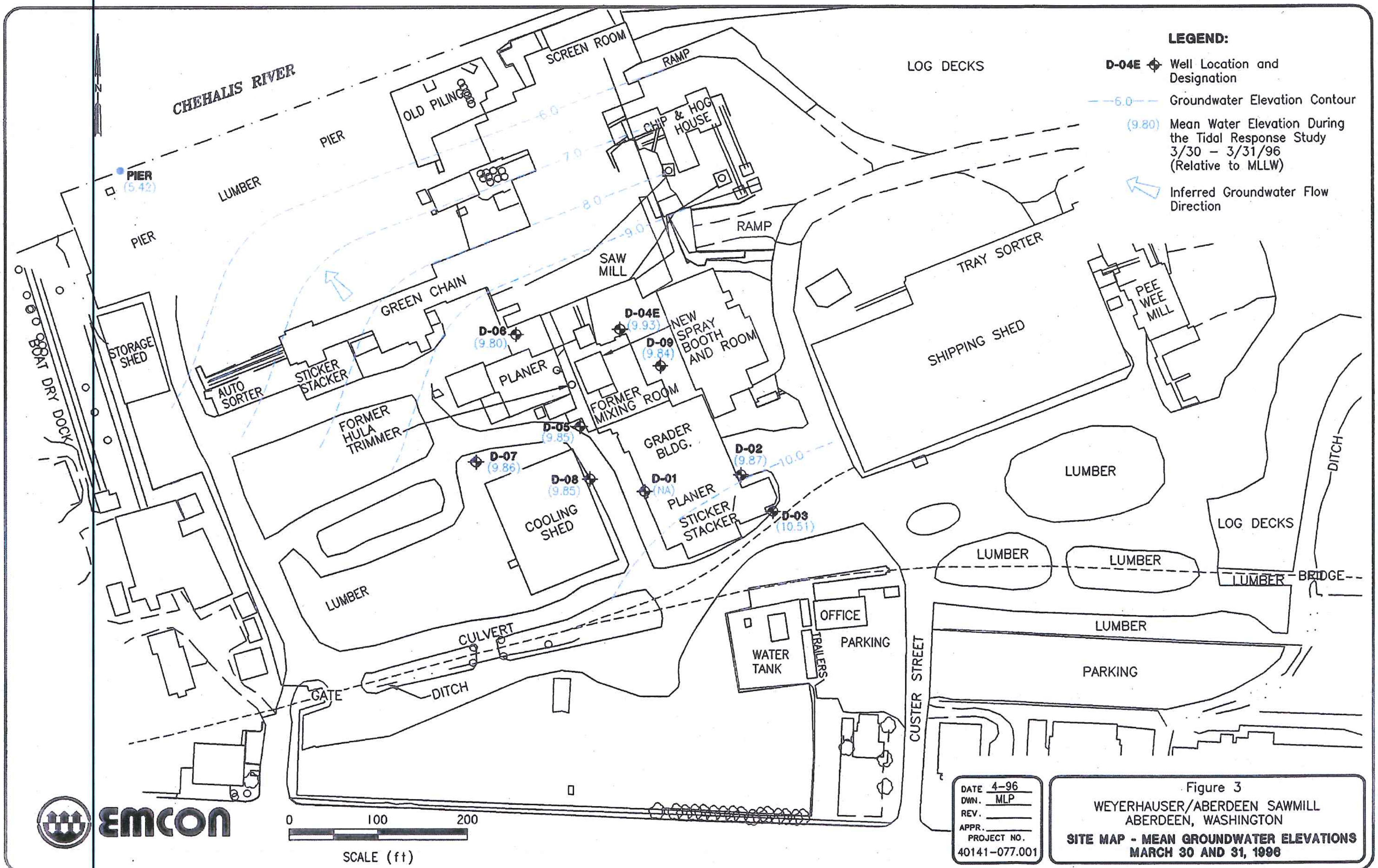

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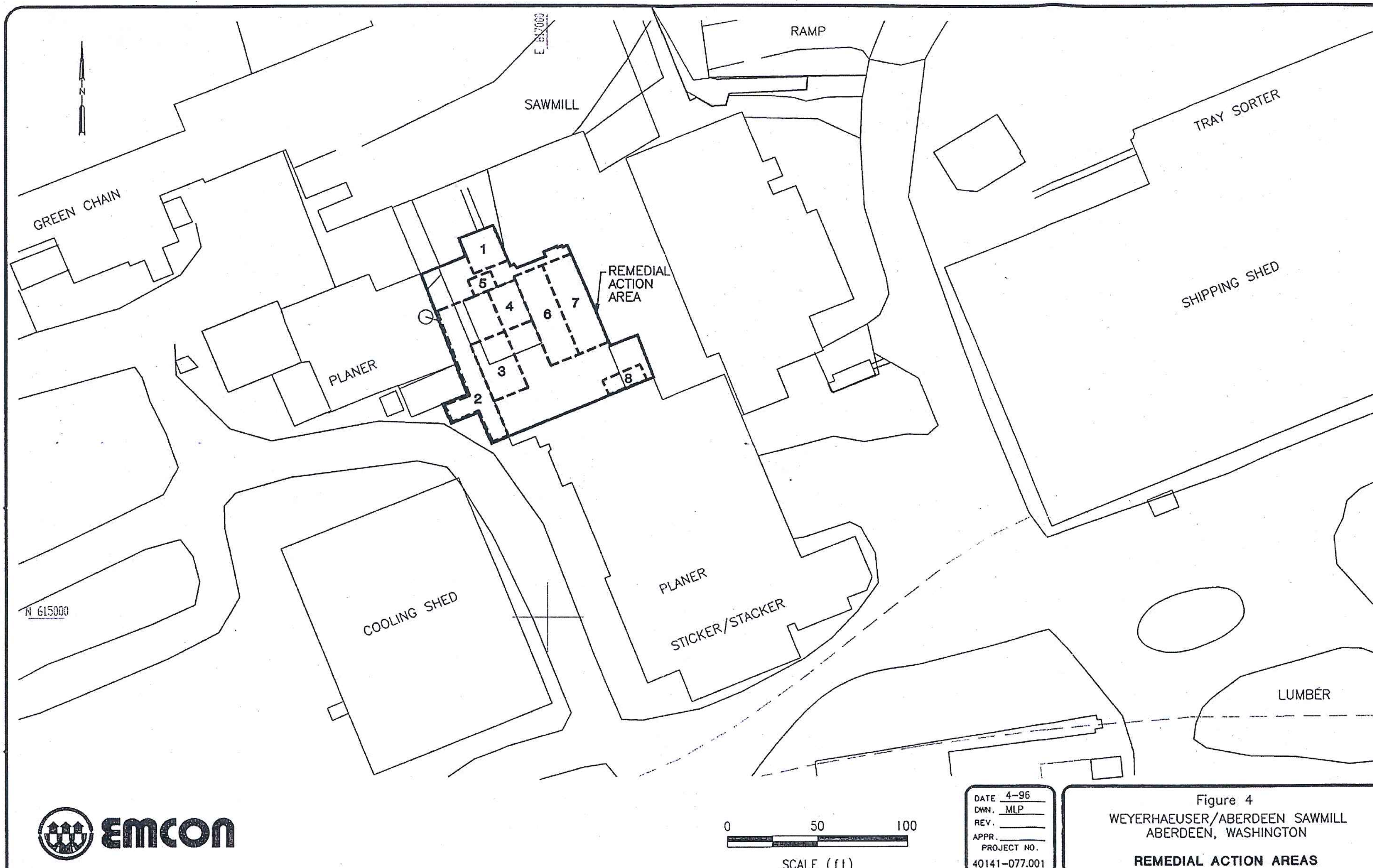

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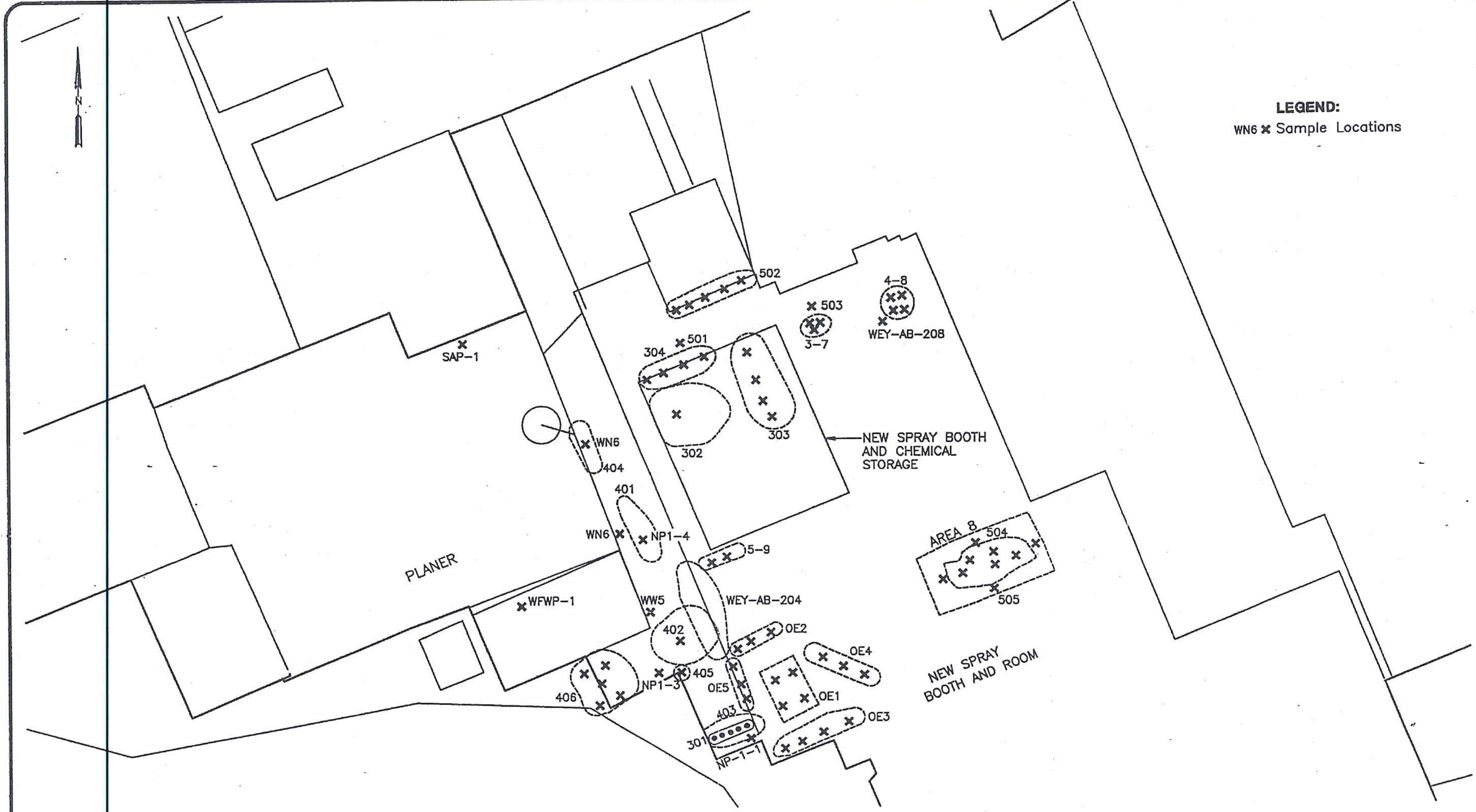
PROJECT NO.	40141-077.001

Figure 4
WEYERHAEUSER/ABERDEEN SAWMILL
ABERDEEN, WASHINGTON

REMEDIAL ACTION AREAS

1=50 5-15-96 G:\DWG\0141\077\001\B0001R03



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NOTE: TABLE PRESENTS LEFT-IN PLACE CONCENTRATIONS.

0 20 40
SCALE (ft)

DATE 4-96
DWN. MLP
REV.
APPR.
PROJECT NO.
40141-077.001

Figure 5
WEYERHAEUSER/ABERDEEN SAWMILL
ABERDEEN, WASHINGTON

SOIL SAMPLES AT LIMITS OF EXCAVATION

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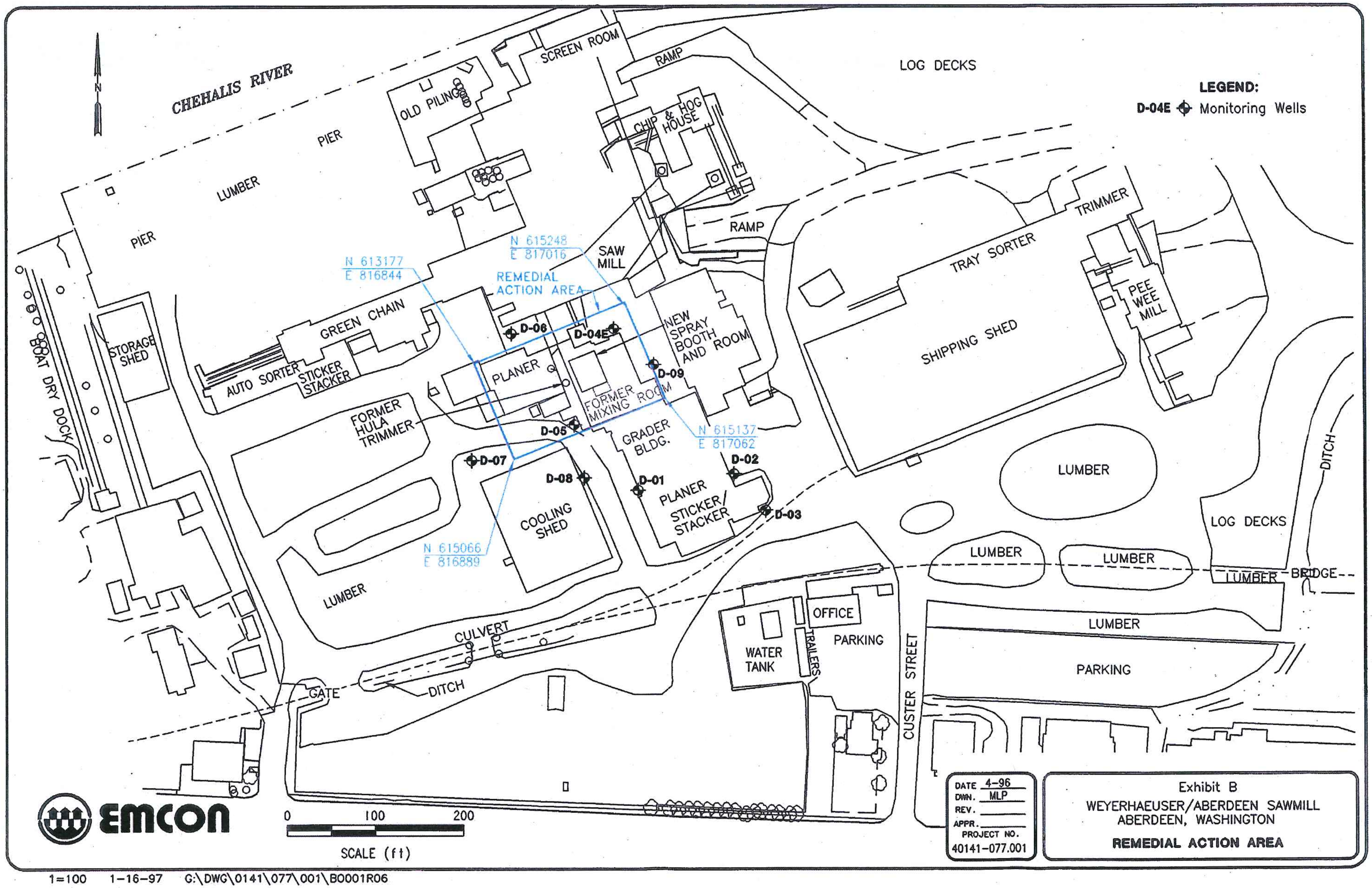


CHEHALIS RIVER
N
LOG DECKS
LEGEND:
D-04E Monitoring Wells
SCREEN ROOM
RAMP
OLD PILING
CHIP & HOG HOUSE
PIER
LUMBER
PIER
RAMP
SAW MILL
TRAY SORTER
TRIMMER
PEE WEE MILL
SHIPPING SHED
N 615248
E 817016
N 613177
E 816844
REMEDIAL ACTION AREA
GREEN CHAIN
STORAGE SHED
BOAT DRY DOCK
AUTO SORTER
STICKER STACKER
PLANER
D-06
D-04E
NEW SPRAY BOOTH AND ROOM
D-09
FORMER MIXING ROOM
FORMER HULA TRIMMER
D-05
GRADER BLDG.
N 615137
E 817062
D-02
D-07
D-08
D-01
PLANER STICKER/ STACKER
D-03
COOLING SHED
N 615066
E 816889
LUMBER
LUMBER
LOG DECKS
LUMBER
LUMBER
LUMBER
BRIDGE
DITCH
LUMBER
CULVERT
OFFICE
PARKING
WATER TANK
TRAILERS
CUSTER STREET
PARKING
GATE
DITCH
0
100
200
SCALE (ft)
EMCON
DATE 4-96
DWN. MLP
REV.
APPR.
PROJECT NO.
40141-077.001
Exhibit B
WEYERHAEUSER/ABERDEEN SAWMILL
ABERDEEN, WASHINGTON
REMEDIAL ACTION AREA
1=100 1-16-97 G:\DWG\0141\077\001\B0001R06

APPENDIX A-4

IRAP Report Addendum

EMCON
18912 North Creek Parkway • Suite 200 • Bothell, Washington 98011-8016 • (425) 485-5000 • Fax (425) 486-9766

April 13, 1998
Project 40141-077.001

Mr. Dom Reale
Washington State Department of Ecology
Toxics Cleanup Program
Olympia, Washington 98504-7775

Re: IRAP Report Addendum
Weyerhaeuser Aberdeen Sawmill
Aberdeen, Washington

Dear Mr. Reale:

On behalf of the Weyerhaeuser Company (Weyerhaeuser), EMCON is submitting this addendum to the Independent Remedial Action Program (IRAP) Report, dated January 17, 1997, for the above-referenced site. The work described in this document was performed based on the Washington Department of Ecology's (Ecology) verbal response after reviewing the IRAP report, and includes the following:

- Collection of additional groundwater data
- Revisions to the restrictive covenant for the property

BACKGROUND

As stated in the January 1997 IRAP report, a series of site assessments, site characterizations, soil remediation and groundwater monitoring were conducted at the site from May 1990 to October 1993.

As part of a remedial action program, Weyerhaeuser excavated approximately 522 tons of material contaminated with pentachlorophenol (PCP) from beneath the grader building area at its Aberdeen sawmill facility. Excavation in several areas was limited by accessibility problems and building foundation concerns. Further excavation of the PCP-contaminated soil in these areas was determined to be impractical. Soil samples collected at the limits of the excavation in some areas exceeded the Model Toxics Control Act (MTCA)[1] Method C cleanup levels for PCP. All the excavated areas have been backfilled with clean fill, and

1 Chapter 173-340 WAC, "The Model Toxics Control Act Cleanup Regulation; Method A Cleanup Levels." Amended January 1996.

some have been paved and are located inside the grader building under cover. The soil boring and soil sample results at the limits of the excavation suggest that a localized area of PCP-impacted soil and debris remains in place.

Groundwater sampling at the site from 1990 to 1993 identified high levels of PCP in a localized area around monitoring well D-05. Slightly elevated levels of PCP have been detected infrequently in the other wells. A statistical evaluation of the data indicates that migration of PCP toward the Chehalis River is not occurring at concentrations exceeding the ambient water quality criteria (AWQC).

Ecology stated that prior to granting "No Further Action" status for the site, Weyerhaeuser would have to demonstrate that PCP in groundwater was not bypassing the monitoring well network hydraulically downgradient of well D-05 (see Figure 1). Ecology agreed that this demonstration could be made by collecting a one time groundwater sample from a location between monitoring well D-06 and D-07 as shown on Figure 1.

In addition, Ecology requested that the restrictive covenant for the property be revised to be consistent with the new standard language for restrictive covenants issued under the MTCA.

ADDITIONAL GROUNDWATER DATA

Groundwater Sampling Activities

On August 27, 1997, Transglobal Environmental Geosciences (TEG) of Olympia, Washington drilled boring, GP-1, to the northwest of the planer infeed area (see attached figure). The boring was advanced using a hydraulic driven strataprobe drill rig. The boring was advanced to the water table at approximately 4.9 feet (ft) below ground surface (bgs). The subsurface lithology consisted mainly of sand and silty sand (see attached boring log). TEG advanced a temporary well screen which was set into the water table from approximately 4.5 to 7.0 ft bgs. The temporary well was purged using a peristaltic pump with new, clean, disposable PVC tubing. EMCON recorded field parameters of pH, specific conductivity, and temperature (see attached Field Sampling Data Sheet). After the field parameters stabilized to within 10 percent of the previous reading, EMCON collected water sample, GP-1-082797. The sample was submitted to the Weyerhaeuser Technology Center in Federal Way, Washington under standard chain of custody protocol for PCP analysis using United States Environmental Protection Agency Method 8151M.

Sampling Results and Conclusions

Review of groundwater sample laboratory results indicated that the groundwater sample collected from GP-1 did not contain PCP concentrations above the method reporting limits. Copies of the laboratory report and the chain of custody form are attached.

The results of the remediation and groundwater monitoring activities described in the January 1997 IRAP report and the results of the one time groundwater sample collected during August 1997, demonstrate that concentrations of pentachlorophenol in groundwater hydraulically downgradient of well D-05 do not exceed the AWQC.

Based on the information available to EMCON at this time, PCP groundwater concentrations above the AWQC do not appear to be bypassing the monitoring well network toward the Chehalis River. The additional groundwater monitoring activity described in this addendum demonstrates that groundwater concentrations do not exceed site cleanup levels.

RESTRICTIVE COVENANT

As part of the January 17, 1997 IRAP report, Weyerhaeuser included a restrictive covenant for the subject property dated November 15, 1996. This covenant was prepared consistent with the standard Ecology language in place at that time and was recorded with the Grays Harbor County Auditor. During discussions regarding the IRAP report in mid-1997, Ecology indicated that Ecology had changed the standard language for restrictive covenants and suggested that Weyerhaeuser revise the covenant for the site consistent with this changed standard.

Attachment B includes a copy of the "Rescission and Replacement of Restrictive Covenant" which rescinds the November 15, 1996 restrictive covenant and replaces it with a new covenant that meets the new Ecology requirements.

SUMMARY

Weyerhaeuser has addressed the two comments of Ecology on the January 17, 1997 IRAP report by:

- Collecting a groundwater sample downgradient of monitoring well D-05 that did not contain PCP above method reporting limits. This demonstrates that PCP does not appear to be bypassing the existing monitoring well network or migrating to the Chehalis River at concentrations above AWQC.

- Replacing the old restrictive covenant with a new document prepared consistent with current Ecology requirements for these documents.

On the basis of the above information, Weyerhaeuser requests a determination of "No Further Action" for the Weyerhaeuser Aberdeen sawmill grader building.

If you have any questions please call Brian O'Neal at (425) 485-5000.

Sincerely,

EMCON

Daniel Balbiani

for Brian O'Neal, P.E.
Project Manager

Attachments: Limitations
Attachment A - Groundwater Sampling and Analysis Data
Figure 1 - Site Map
Field Sampling Data Sheet
Boring Log
Laboratory Data and Chain of Custody Form
Attachment B - Revised Restrictive Covenant

cc/att: Mr. Ken Johnson - Weyerhaeuser Company, Office of the Environment
Mr. Joe Jackowski - Weyerhaeuser Company, Office of the Environment
Ms. Helen Bond - Weyerhaeuser Company, Aberdeen Lumber

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

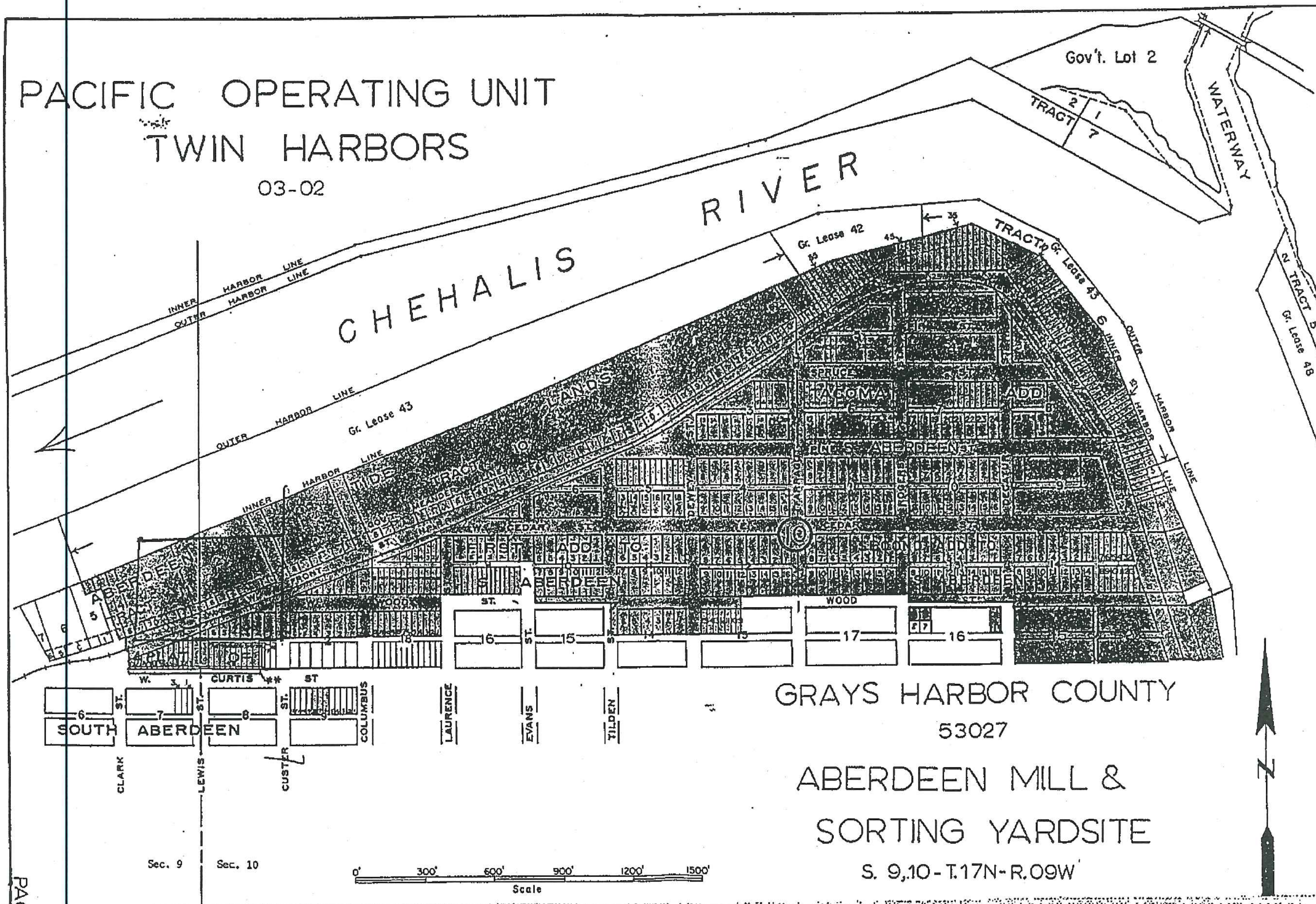
Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

The purpose of a geologic/hydrogeologic study is to reasonably characterize existing site conditions based on the geology/hydrogeology of the area. In performing such a study, it is understood that a balance must be struck between a reasonable inquiry into the site conditions and an exhaustive analysis of each conceivable environmental characteristic. The following paragraphs discuss the assumptions and parameters under which such an opinion is rendered.

No investigation is thorough enough to describe all geologic/ hydrogeologic conditions of interest at a given site. If conditions have not been identified during the study, such a finding should not therefore be construed as a guarantee of the absence of such conditions at the site, but rather as the result of the services performed within the scope, limitations, and cost of the work performed.

We are unable to report on or accurately predict events that may change the site conditions after the described services are performed, whether occurring naturally or caused by external forces. We assume no responsibility for conditions we were not authorized to evaluate, or conditions not generally recognized as predictable when services were performed.

Geologic/hydrogeologic conditions may exist at the site that cannot be identified solely by visual observation. Where subsurface exploratory work was performed, our professional opinions are based in part on interpretation of data from discrete sampling locations that may not represent actual conditions at unsampled locations.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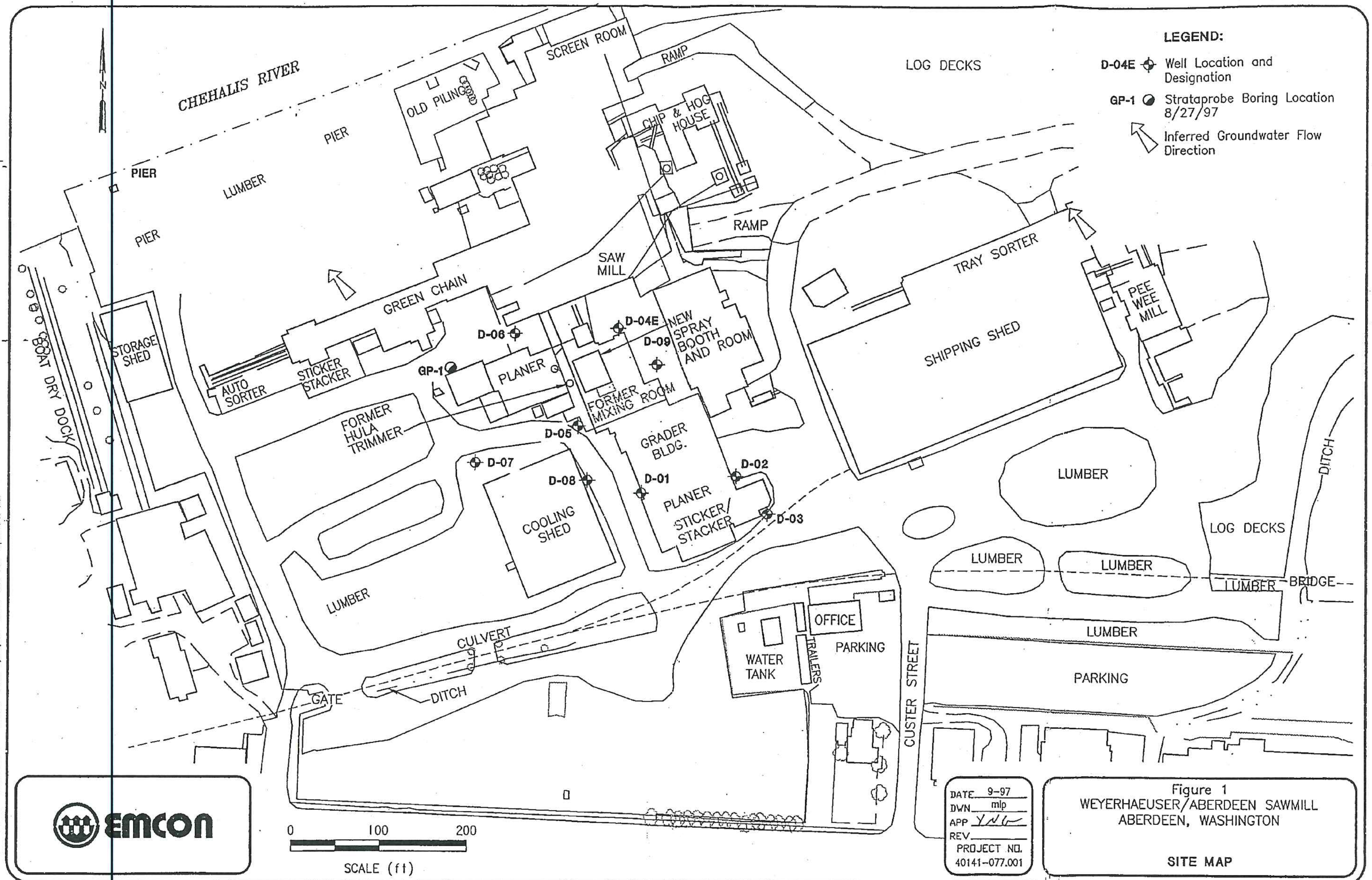
TWIN HARBORS
03-02
CHEHALIS RIVER
Gov't. Lot 2
TRACT 2 1 7
WATERWAY
TRACT 5
Gr. Lease 48
Gr. Lease 42
Gr. Lease 43
INNER HARBOR LINE
OUTER HARBOR LINE
TACOMA ADD.
FIRST ADD. TO S. ABERDEEN
SECOND ADD. TO S. ABERDEEN
WOOD ST.
CEDAR ST.
CURTIS ST.
CLARK
LEWIS ST.
CUSTER
COLUMBUS
LAURENCE
EVANS
TILDEN
SOUTH ABERDEEN
Sec. 9
Sec. 10
GRAYS HARBOR COUNTY
53027
ABERDEEN MILL &
SORTING YARDSITE
S. 9,10-T.17N-R.09W
0' 300' 600' 900' 1200' 1500'
Scale
N

Track

Sec. 10



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