12.3.16

Supplemental Preliminary Assessment Summary Report

Foss Maritime Company (Brix) Facility
9030 NW St Helens Road
Portland, OR 97231-1127

October 2000

Prepared by:
Anchor Environmental, L.L.C.
with Hahn and Associates, Inc.

USEPA SF
1187213

Supplemental Preliminary Assessment Summary Report

Foss Maritime Company (Brix) Facility
9030 NW St. Helens Road
Portland, Oregon 97231-1127

October 2000

Prepared by

Anchor Environmental, L.L.C.
with
Hahn and Associates, Inc.

Table of Contents

List of Figures ii
General Site Data 1
1 Introduction 2
2 Background 3
2.1 Site Description 3
2.2 Ownership and Operational History 3
2.2.1 General Site History 3
2.2.2 UST Operational History 4
2.3 Regulatory History 5
2.3.1 USTs 5
2.3.2 Spills 5
2.3.3 Hazardous Materials 5
2.3.4 Submerged and Submersible Lands Lease 6
3 Potential Chemical Sources 7
3.1 Fuel and Lubrication Oil Operations 7
3.2 Transformers 7
3.3 Drum Storage 8
3.4 General Chemical/Waste Handling 8
3.5 Underground Storage Tanks 8
3.6 Outfalls 9
3.7 Adjacent Site Uses 10
3.7.1 Upstream Sites 10
3.7.2 Downstream Sites 10
4. Evaluation of Potential Pathways 12
4.1 Soils and Groundwater 12
4.2 Surface Water 13
4.2.1 Stormwater Runoff 13
4.2.2 Near Water Work 13
4.2.3 Sediment Data 13
4.3 Air Pathway 14
5 Summary and Conclusions 15
6 References 16

Appendices

Appendix A – Preliminary Assessment Summary Report
Appendix B – Sanborn Fire Insurance Maps
Appendix C – Metsker Property Maps
Appendix D – Historical Research Summary
Appendix E – UST Permitting and Decommissioning Documentation
Appendix F – UST Upgrade Documentation
Appendix G – UST Soil Remediation Documentation
Appendix H – Hazardous Substance Database Reviews
Appendix I – Fire Department Hazardous Substance Survey
Appendix J – State Submersible Submerged Land Lease
Appendix K – 1993 Subsurface Investigation

List of Figures

Figure 1 – Site Location
Figure 2 – Site Map
Figure 3 – Aerial Photo 1936
Figure 4 – Aerial Photo 1955
Figure 5 – Aerial Photo 1961
Figure 6 – Aerial Photo 1971
Figure 7 – Aerial Photo 1980
Figure 8 – Aerial Photo 1998
Figure 9 – Adjacent Sites

GENERAL SITE DATA

Site Name and Address:	Foss Maritime Company (Brix) Facility 9030 NW St. Helens Road Portland, Oregon 97231-1127
Current Owner:	Foss Maritime Company 9030 NW St. Helens Road Portland, Oregon 97231-1127
Current Operator:	Foss Maritime Company 9030 NW St. Helens Road Portland, Oregon 97231-1127
Site Contacts:	Larry Johnson Manager, Marine Operations Foss Maritime Company Portland, Oregon 97231-1127
Latitude:	45° 35′ 17.856″
Longitude:	122° 46′ 17.064″
Legal Description:	Tax Lot No. 39, Section 11, 1N, 1W (b/p 2755/0879)
Direction to Site:	Foss Maritime (Brix) Facility is located south of St. Helens Road on the shore of the Willamette River. Take US-30 West from Portland. US-30 becomes NW Yeon Avenue and then NW St. Helens Road. The site is approximately 3 miles west of I-405 on US-30.

1 INTRODUCTION

This report presents the results of a Supplemental Preliminary Assessment (SPA) for the Foss Maritime Company (Brix) Facility (Foss Facility) located on NW St. Helens Road. The Foss Facility was identified by the Oregon Department of Environmental Quality (DEQ) as a potential source of contamination (polyaromatic hydrocarbons, thallium, and butylbenzylphthalate) to Willamette River sediments based on the Portland Harbor Study (EPA 1998). A Preliminary Assessment (Appendix A) was submitted to DEQ in February 2000, as requested in a letter from DEQ to Foss Maritime Company (Foss) dated November 19, 1999 (DEQ 1999). The Preliminary Assessment concluded the Foss Facility has not and is not a source to the Willamette River sediments. Upon review of that submittal, DEQ requested further information in a letter dated April 20, 2000 (DEQ 2000). This SPA is provided in response to the latest information request from DEQ and builds upon the information provided in the previous Preliminary Assessment.

This SPA provides and evaluates information on site history and activities to determine whether any potential releases of hazardous substances have or are occurring, particularly to sediments in Portland Harbor. The purpose of any Preliminary Assessment is to generally characterize potential chemical hazards at the site and provide sufficient information for DEQ to determine any need for further investigation or other actions. This SPA is not a full investigation or characterization of the site. The scope of information presented here includes review of available file information, interviews, review of materials handled on-site and procedures for their handling, and an on-site reconnaissance. This report also summarizes historical and current use of the Foss Facility and the immediate surrounding area.

2 BACKGROUND

2.1 Site Description

The property is situated between St. Helens Road to the southwest and the Willamette River at river mile 5.7 to the northeast (Figure 1). Industrial properties to the northwest (downstream; bulk fuel facilities) and southeast (upstream; historical log sorting yard) bound the other two sides of the site. Since first development in 1979, the site has been operated as a dispatch and coordination office for the company's boat fleet. In addition, Foss tugs take on fuel, take on and remove lubrication oil, and make minor repairs to small engines and equipment at the site. All activities are performed in accordance with procedures and best management practices (BMPs).

Topographically, the property dips gently to the north and lies at an elevation of approximately 25 feet above mean sea level (MSL). A 20-foot high armored embankment separates the northern property boundary and the Willamette River.

The 4.5-acre property consists of a two-story office building, a maintenance department offices and general stores building (used to store parts, tools, small quantities of paints, cleaners, etc.), an outdoor storage area, small sheds for storage of compressed gases, and a permanently moored maintenance barge (Figure 2). The site is completely fenced except for the area adjoining the river. The property is paved except the embankment along the Willamette River.

There are three Underground Storage Tanks (USTs) currently located on the site, near the maintenance department office building (Figure 2). Two tanks store diesel fuel, and one stores lubricating oil. The diesel and lubricating oil is pumped from the USTs through underground and aboveground piping to the fueling station located on the maintenance barge.

The site has five storm water catch basins that collect surface water from the parking lot and pipe it to the embankment where it flows over riprap and into the Willamette River (Figure 2). There is also a city storm water outfall located on the property. The City of Portland (City) requested an easement for the outfall to replace and relocate the pipe, which used to run under the main office building. The old pipe had collapsed. In the summer of 1999, the City installed a new pipe and connection on northwest boundary of the site and plugged the old connection and abandoned it in place.

2.2 Ownership and Operational History

Brix Maritime Co. (Brix) developed the property in 1979. Foss Maritime purchased Brix and this facility in 1993, and it has been operated by Foss since that time.

2.2.1 General Site History

As aerial photographs show (Figures 3 through 8), dating back to 1936 prior to the development by Brix, the property was undeveloped and unused. Sanborn Fire Insurance Maps for years 1926, 1932, 1955, and 1965 were reviewed and indicate the

site was undeveloped throughout this period (Appendix B). Metsker Property maps for 1927, 1936, and 1944 as well as Polk and Cole City directories were reviewed (property maps shown in Appendix C). These sources indicate several owners over this period, but no discernable development. Map and property directory research are described further in Appendix D.

In 1979 the site was developed with the current two-story office building and maintenance building, which house the purchasing department and maintenance department offices, respectively. In addition, office trailers, an outdoor storage area, small sheds for storage of compressed gases, and a permanently moored maintenance barge were added between 1979 and present. All of these buildings and structures are still located on the property today with the exception of the office trailers (Figure 2). The entire property has been covered with either buildings or asphalt, except the embankment along the Willamette River since operation at the site began in 1979 (Figures 7 and 8). No dredging of river sediments has been performed at or adjacent to the site.

The site has operated as a dispatch and coordination office for the company's boat fleet since 1979. The tugs tow barges filled with a variety of freight. The Foss tugs moor at the facility, wait for dispatch orders, and rotate crews. In addition, the tugs take on fuel, take on and remove lubrication oil, and make minor repairs to small engines and equipment.

According to Mr. Rafael Caballero, Purchasing Manager for Foss and previously for Brix, no ship repair work (e.g., abrasive grit, hull painting) has ever been performed at the Facility. Similarly, no large engine repair or other related repair operations have been conducted at the site.

2.2.2 UST Operational History

Five USTs were installed in 1979 in a single tank nest adjacent to the maintenance building. Two of these tanks were decommissioned by removal in 1998 (remaining tanks are shown in Figure 2). The original tank system included:

- Two 20,000-gallon diesel fuel USTs (both still remaining on site)
- Two 6,000-gallon lubrication oil USTs (one removed in 1998)
- One 2,000-gallon gasoline UST (removed in 1998).

The DEQ Facility Identification Number for tank system is #7374 (see documentation on tanks and tank decommissioning in Appendix E). All of the tanks and piping were constructed of single-wall steel at the time of installation. The diesel and lubrication oil USTs were (and are) piped to the maintenance barge in the Willamette River to service watercraft, and the gasoline UST was used for the refueling of company vehicles.

Documentation is available on the decommissioning of the oil and gasoline tanks (one each) in 1998 (Appendix E). This documentation is also available in the DEQ file #7374 relating to UST decommissioning activities are included in Appendix E.

Also in 1998, the two 20,000-gallon diesel fuel USTs and the remaining 6,000-gallon lubrication oil UST were upgraded and retrofit to comply with DEQ's 1998 upgrading requirements including installation of cathodic protection and tank lining systems (see documentation in Appendix F).

Potential chemical sources and site operations are described in more detail in Section 3. Note that no evidence was found that historical site operations differed from the descriptions of present operations in Section 3 unless otherwise noted.

2.3 Regulatory History

Because the site does not generate large amounts of wastes or manufacture goods, the regulatory history is limited. No indication that DEQ or United States Environmental Protection Agency (EPA) has performed inspections of the site was found. Several regulatory areas are described below.

2.3.1 USTs

As noted above, the site USTs are tracked under DEQ File #7374. Regulatory events relevant to this file are:

- Initial permitting and construction of five USTs (Appendix E)
- UST release reported to DEQ in 1993 (file number 26-93-009) and subsequent soil remediation (Appendix G)
- Decommissioning by removal of two USTs (Appendix E).

Available information indicates that the DEQ file number 26-93-009 remains open. (The release and subsequent remediation are described in Section 3.5). Therefore, it is assumed that a finding of no further action by DEQ was not made.

2.3.2 Spills

As discussed in Section 3.1, Foss policy is for Foss tugs to report any and all observed spills regardless of responsibility or vicinity to the Foss Facility, to allow quick action by the US Coast Guard before spills dissipate. Based on the Foss policy, the DEQ spill list for the facility is contained in Appendix H. This list includes spills that were not caused by the Foss Facility and sheens observed coming from the city stormwater outfall at the site.

2.3.3 Hazardous Materials

The Resource Conservation and Recovery Act (RCRA) Generators List identifies the facility as a conditionally exempt generator of hazardous waste. The Oregon State Fire Marshal conducted a hazardous substance information survey in 1997-1998 (Appendix I).

2.3.4 Submerged and Submersible Lands Lease

The Foss Facility has a submerged and submersible lands lease (ML-613) that reverted to a year-to-year basis in April 2000 (Appendix J). The current lease number is ML-9230.

3 POTENTIAL CHEMICAL SOURCES

Note this section would be titled "Waste Characteristics" if strictly following DEQ guidance for the preparation of the Preliminary Assessments. However, consistent with the content of DEQ guidance, this section discusses "potential chemical sources" to the environment, and therefore, this title is used. In most cases, the potential sources are petroleum products, which can contain a variety of volatile and semivolatile aliphatic and aromatic hydrocarbons. These are the potential chemicals of concern for each of the potential sources listed below unless otherwise noted.

3.1 Fuel and Lubrication Oil Operations

Diesel fuel and clean lubricating oil are pumped from the UST located near the maintenance office building onto tugs that are moored at the docks near the maintenance barge (Figure 2). Waste lubrication oil and bilge are pumped off of the tugs into a large tank located on the maintenance barge. A waste oil pump truck removes it from the barge tank and transports it to a waste oil recycling facility.

Foss Maritime policy is to report any and all observed spills regardless of responsibility, to allow quick action by the US Coast Guard before spills dissipate. The DEQ spill list for the facility is contained in Appendix H. This list includes spills that were not caused by the Foss Facility and sheens observed coming from the city storm water outfall at the site.

Some minor accidental spills (typically a few gallons or less) of petroleum products (oil, power steering fluid, and diesel fuel) have occurred at the facility. These spills were promptly reported and quickly contained and cleaned up. There is no evidence that any of these spills was of a significant magnitude or had the potential to contribute to elevated upstream or downstream chemical concentrations in river sediments.

The facility maintains spill response equipment on the maintenance barge and at the maintenance building in case of fuel or other spills. The facility staff is trained in 40-hour Hazardous Materials Handling and Spill Response techniques. The spill prevention and control is discussed at weekly safety meetings and regularly applied at the site.

3.2 Transformers

Two pad-mounted, fluid-filled electrical transformers are located on the property east of the storage buildings and south of the office building. The transformer located to the east of the storage buildings is labeled as containing non-regulated levels of polychlorinated biphenyls (PCBs). The transformer located south of the office building is not labeled and is therefore assumed to contain PCBs. Both transformers are in good condition and do not appear to have had any leaks or spills. The utility that owns the transformers is responsible for the cleanup of any release of transformer fluids to the environment.

3.3 Drum Storage

An outdoor drum storage area is located along the southeastern corner of the Foss Facility, behind the maintenance office building (Figure 2). The number of drums stored in this asphalt-paved area varies and all drums are labeled, lidded, and secured. The drums are used to store used oil filters generated as a result of maintenance conducted at the permanent barge. The two storm water catch basins located in the storage yard vicinity are equipped with oil absorbing diapers as a precautionary measure, though no spills have been reported.

3.4 General Chemical/Waste Handling

The Foss Facility stores small quantities of paint, thinners, cleaners, and other materials that are normally associated with operation of a facility such as this. Potential chemicals of concern could include small amounts of many types of solvents in cleaners etc. and metals in paints. All potentially hazardous wastes, oily wastes, and parts (i.e. fuel filters) are recycled at DEQ approved facilities.

The 1997-1998 Oregon State Fire Marshal Hazardous Substance Information Survey summarizes the types and quantities of hazardous materials stored on the site (Appendix I). The survey includes canisters of oxygen (for use in welding small engine and equipment repairs), paint and petroleum distillates (used for rust reduction after repairs), and propane.

3.5 Underground Storage Tanks

The site UST operational history is described in Section 2.2.2. In January 1993, lubricating oil was observed coming up through a seam between asphalt and concrete paving within the UST area. This release was reported to DEQ and assigned file number 26-93-009 (see documentation in Appendix G).

An investigation of the observed oil release was performed in February 1993 (Appendix K). The source of the release was a hole in one of the lubrication oil transfer lines, near the northeast corner of the maintenance building. Approximately 45 cubic yards of petroleum-contaminated soil was excavated, treated off-site, and then disposed of off-site. The transfer line was replaced with a fiberglass pipe.

During the 1993 investigation, petroleum hydrocarbons were detected in soils in two areas that were not remediated (Appendix K). One area was associated with the fuel line leak and the other area was just south of the USTs. In the south area, small amounts of gasoline were detected. (Note that the gasoline UST was subsequently removed.)

Even though groundwater quality data are not available, no petroleum hydrocarbons were detected by analytical testing of soils or observed by field screening anywhere on the site at the depth of the observed water table (Appendix K). Thus, the hydrocarbons observed had not migrated to the water table and no pathway to surface water exists (see Section 4.1 for more discussion). Because both areas were fully characterized and

petroleum hydrocarbons were well above the water table, no further remediation was conducted.

There are no more recent data (than 1993) available on the soils in an around the USTs. However, the 1998 upgrade information (Appendix F) for the three remaining tanks indicates that leaks from these tanks were and are unlikely for the following reasons:

- Internal inspections were conducted before upgrades and no holes or leaks were found in any tank
- Thickness testing indicated all tank walls were within 97.5% to 98.7% of design thickness
- All tanks were epoxy coated
- All tanks were fitted with spill and overflow protection
- Pipes were replaced above and below ground
- Fiberglass vent lines were installed.

Because existing petroleum hydrocarbons in the surrounding soil are limited and further leaks from these tanks was unlikely, these tanks are not considered a potential source of contamination to surface waters or sediments.

3.6 Outfalls

A City 48-inch stormwater/sewer outfall, which collects discharges from the NW St. Helens Road and facilities to the southwest, discharges to the Willamette River directly in front of the Foss Facility (Figure 2). Historically, this stormwater/sewer traveled underneath the office building. In 1999, Foss granted the City a twenty-foot-wide easement for relocation of the stormwater/sewer and outfall. The present outfall location for this 48-inch stormwater/sewer is presented on Figure 2. No data are available from the City regarding chemical concentrations in the stormwater/sewer discharge or the potential impacts to sediments. Further, it is unclear what areas and facilities are served by this outfall or the number overflow events that have occurred. Potential chemicals of concern from stormwater/sewer discharges that can impact river sediments are extensive and can include a wide variety of metals, inorganic compounds, and organic compounds such as PAHs, phthalates, pesticides, etc. At least one of the spills recorded in DEQ spill listings identified this stormwater/sewer as the source (Appendix H).

3.7 Adjacent Site Uses

Properties upstream of the Foss Facility presently include the City stormwater/sewer outfall easement, Marine Finance Corporation (Hendren Tow Boats), Transloader International, and the U.S. Army Corps of Engineers facility (Corps; Figure 9). Properties downstream of the Foss Facility include Shore Oil Company (formerly Time Oil) and the Mobil/Arco facility. The limited information available on the stormwater/sewer outfall is described in Section 3.6. Other adjacent site uses are described below.

3.7.1 Upstream Sites

Marine Finance Corp., also known as Hendren Tow Boat Co. is located approximately 0.25 mile to the southeast of the subject property. Marine Finance Corp has been identified as a potential source of contamination in the Portland Harbor Sediment Study (EPA 1998). A Preliminary Assessment (PA) and XPA are being initiated by the ODEQ at the site, although these reports have not been provided to Foss.

Transloader International Company is located approximately 0.25 mile to the southeast of the subject property. The property is currently used as a log sorting yard. Transloader International, also known as General Construction Co., was identified as a potential source of contamination in the Portland Harbor Sediment Study (EPA 1998). A PA has been recommended at the site under low priority, although its status in unclear.

The Corps facility is located 0.5 mile to the southeast of the subject property. The ECSIS SSR indicated that this site has served as a maintenance port since 1904 and that contamination of the Willamette River sediments may have occurred partly as a result of site activities such as vessel maintenance, and spills from vessels in dock and refueling operations (Appendix H). The site appears on the Confirmed Release Listing (CRL) and entered the Voluntary Cleanup Program (VCP) in October 1999. Actions taken to control potential releases to river sediments is unclear.

3.7.2 Downstream Sites

The Shore Oil Company site is to the immediate northwest of the Foss Facility site (downstream). Oil is loaded, offloaded and stored in above ground storage tanks at the site. The facility is listed as a Large Quantity Generator of hazardous waste in the RCRA Generators List. According to DEQ Environmental Cleanup Site Information (ECSIS) list Site Summary Report (Appendix H) some petroleum product spills occurred at the site in 1988 and 1992. Remediation was conducted for these spills. The site has been identified as a potential source of contamination in the Portland Harbor Sediment Study (EPA 1998). DEQ has recommended a preliminary assessment for the site.

The Mobil Oil Terminal site is to the northwest of the Foss Facility. The Mobil facility has operated as a bulk fuel storage and dispensing facility since 1928. Groundwater and soil contamination have been documented at the site (ECSIS; Appendix H). A remedy for

the site was approved in a Record of Decision (ROD). This site entered the VCP in 1992 and appears on the CRL.

The ARCO Bulk Terminal is located approximately 0.5 mile to the northwest of the subject property. The ECSIS SSR indicates that a variety of releases have occurred at this bulk petroleum storage facility site (Appendix H). The site appears on the CRL. Ms. Janelle Waggy of ODEQ indicated that the site entered the VCP in February 2000.

4. EVALUATION OF POTENTIAL PATHWAYS

The potential Foss Facility sources and pathways to surface waters and sediments from the Foss Facility are evaluated below to determine whether there is any likely substantial transport of site sources to these aquatic environments.

4.1 Soils and Groundwater

Columbia River basalt is the shallowest bedrock unit underlying this general area on the southwest side of the Willamette River (CDM 1987 and HAI 1998). Unconsolidated alluvial deposits over lay the basalt, and various types of fill are often found above the alluvial layer. The alluvial deposits often consist of interbedded layers of sand, silt, and clay. Soil borings conducted at the Foss Facility in 1993 (Appendix K) generally show the following:

- Upper layer of gravel (fill) from about 0 to 4 ft below ground surface (bgs)
- Sand from about 4 to 23 ft bgs
- Silty Clay from about 23 ft bgs to boring termination (about 27 ft bgs).

Groundwater was found between 24 and 26 ft bgs in April of 1993. The general groundwater gradient is toward the river (CDM 1987 and HAI 1998). No evidence of drinking water or other groundwater wells has been found between the southwestern site edge and the river.

As described in Section 3, soil sampling was conducted in 1993, but no groundwater samples were taken. Soil analysis results indicate petroleum hydrocarbons detected in two borings. Oil, detected at 200 ppm near the site of the transfer line leak, was found no deeper than 10.5 ft bgs, well above the groundwater level of about 26 ft bgs. Gasoline, detected just south of the USTs, was detected at low levels (13 ppm) at 20.5 ft bgs, again well above the groundwater level.

Given the relatively low concentrations of these detections, and distance above the groundwater level, it appears very unlikely that these contaminants could migrate the river. This is consistent with the attenuation/adsorption rates typical of petroleum products in soils. Typical organic carbon partitioning coefficients for petroleum oils (fuel oil for example) are in the greater than 10,000 range, indicating extreme adsorption to most soils (HSDB 2000). Therefore, there appears to be no reasonable mechanism whereby these low levels of petroleum products could enter the Willamette River.

Further, the gasoline UST has been removed. When the remaining USTs were inspected in 1998 no holes or leaks were found and tank walls were very close to original design thickness (see Section 3.5). Consequently, it is very unlikely that these USTs were a source of any leaks after 1993.

4.2 Surface Water

4.2.1 Stormwater Runoff

The entire property is covered with either buildings or asphalt, except the embankment along the Willamette River. Stormwater from the parking areas is collected and routed to the embankment via two storm water pipes. There are very few uncovered and uncontained sources of spills or leaks on the property. Where such leaks are possible (e.g., drums containing used oil filters), storm drains contain oil absorbent diapers that are regularly inspected and replaced when necessary.

No stormwater sampling data are available for the site. However, storm water runoff from the parking, building, and storage areas likely exhibits water quality characteristics similar to any commercial or light industrial site. A large City 48-inch stormwater/sewer, which drains a large partially developed area, also discharges at the site. In comparison to this input, the relatively small stormwater discharge from this 4.5-acre site is extremely minor.

4.2.2 Near Water Work

Some work is conducted over or near open river water that could potentially provide a direct pathway of contaminants to surface waters (e.g., refueling). As the spill reporting history in Appendix H shows, Foss is extremely diligent about reporting even the smallest spills and quickly acting to contain and remove spills wherever possible. The spill record also shows that all of these spills were very minor (a few gallons or less in all but one case).

The facility maintains spill response equipment on the maintenance barge and at the maintenance building in case of fuel or other spills. The facility staff is trained in 40-hour Hazardous Materials Handling and Spill Response techniques. The spill prevention and control is discussed at weekly safety meetings and regularly applied at the site. Therefore, it appears very unlikely that the Facility contributes sufficient petroleum hydrocarbons to substantially effect surface water concentrations or cause the build up of these chemicals in sediments offshore.

4.2.3 Sediment Data

In the previously submitted Preliminary Assessment (Appendix A), sediment data were presented to support the above conclusion that no build up of chemicals in offshore sediments is evident. DEQ commented that it was inappropriate to assess risks by screening against established guidelines and criteria at this time. However, it is important to note that information on sediment quality offshore of the site provides direct evidence of whether a historic pathway to sediments might have existed. Low levels of contamination in the nearest downstream sediments indicate that substantial contamination from the Foss Facility over time is unlikely and that there is no complete and/or substantial pathway.

Sediment data are reviewed in the previously submitted Preliminary Assessment (Appendix A). In summary, the nearest downstream sediment sampling location from the Portland Harbor Study is SD052 (EPA 1998). Previous correspondence with DEQ (DEQ 1999) indicated that butylbenzylphthalate and PAHs might be of concern in this area.

Butylbenzylphthalate was found at 29 ug/kg in surface sediments at SD052, only slightly more than the study detection limit for this compound (around 19 to 20 ug/kg). Further, given the large input of stormwater (a known source of phthalates) from the City outfall directly upstream of this station, this low level detection is unlikely to have been caused by potential Foss Facility sources.

Total LPAHs and HPAHs were also detected at SD052 at 803 and 3907 ug/kg, respectively. However, these levels are well below upper effects thresholds established by NOAA for total LPAHs and HPAHs at 5,300 and 6,500 ug/kg, respectively (see Appendix A for presentation of NOAA values). Again, these concentrations do not indicate any complete or substantial pathway from the Foss Facility to sediments in the river.

4.3 Air Pathway

There are no potential on-site sources of either volatilized, combusted, or dust borne contaminants that might enter the river via an air pathway. Only small amounts of cleaners and paints are routinely open to the air, where they might volatilize. The only combustion on site is in motors, similar to any urbanized area. The site is completely paved, thus preventing any significant windborne erosion of soils that might contain contaminants.

5 SUMMARY AND CONCLUSIONS

All of the potential chemical sources and pathways to the Willamette River historically and currently at the Foss Facility have been discussed in this SPA. The primary conclusions of the SPA are:

- No soil or groundwater contamination exists that has any reasonable prospect for entering the groundwater and migrating to area surface waters or sediments.
- Existing limited and low-level petroleum hydrocarbons in site soils was fully characterized in 1993.
- Inspections of USTs in 1998 found no holes or leaks in USTs and the USTs were upgraded at that time.
- The 1993 and 1998 efforts indicate no need for further soil sampling.
- There is no reasonable expectation of ongoing or future soil contamination at the site due to paving and UST inspections and upgrades.
- Stormwater discharges at the site are likely similar to any commercial or light industrial site and spill controls have been and are used at the site.
- Stormwater discharges and limited direct spills from the Facility have not resulted in any substantial measurable increase in sediment contamination immediately downstream of the site.
- Air transport of contaminants is not a pathway at the site.

Based on these conclusions, there is no need for any further sampling, investigation, or characterization of the site.

6 REFERENCES

Camp, Dresser, McKee (CDM). 1987. North Doane's Lake Site Characterization Work Plan, Final Draft. Denver, Colorado.

Department of Environmental Quality (DEQ). 1999. Request for Performance of Preliminary Assessment with Sampling for Foss Maritime Co. Site. November 19, 1999 letter from Eric Blischke to Larry Johnson.

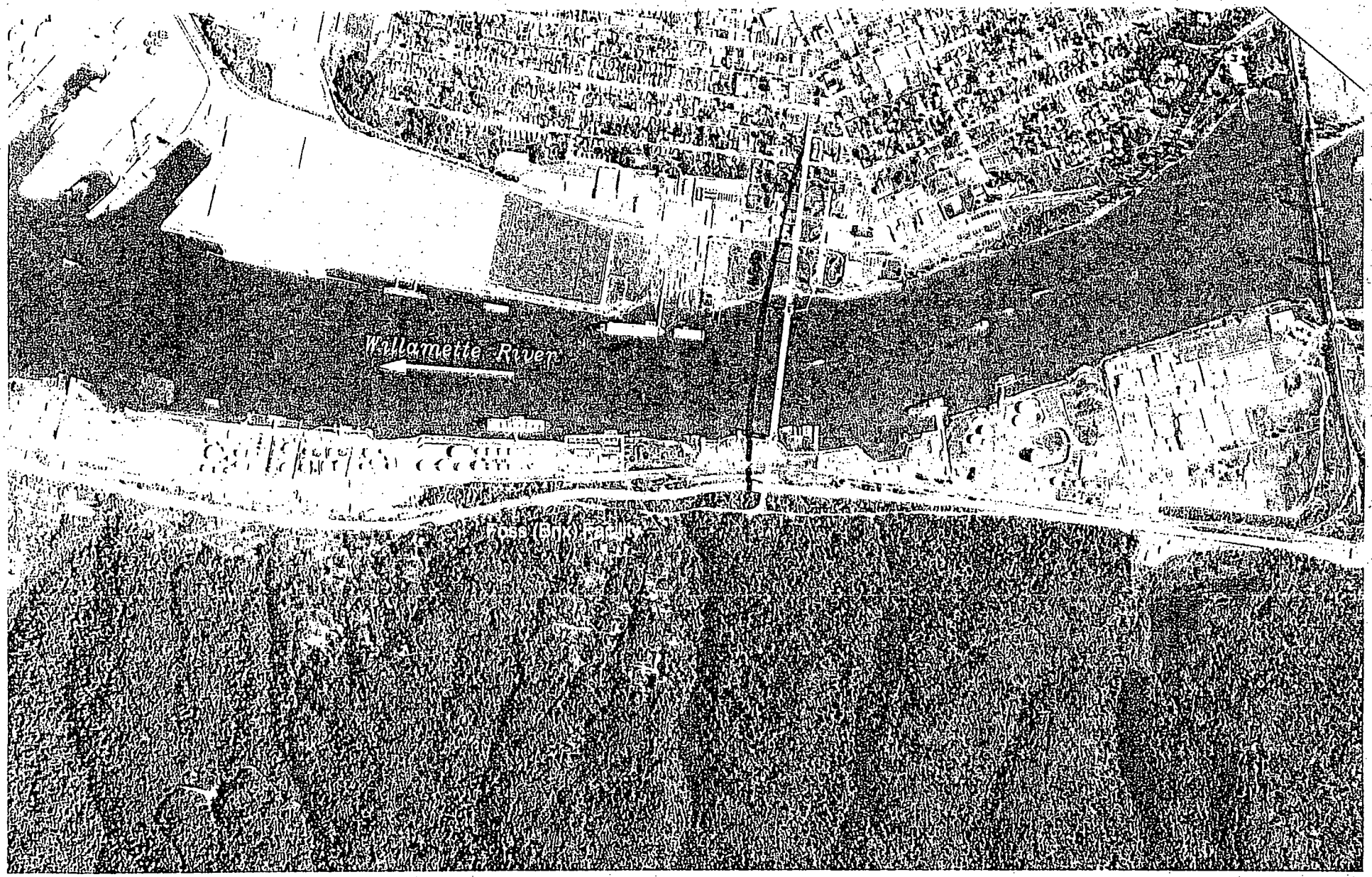
Department of Environmental Quality (DEQ). 2000. Comments Expanded Preliminary Assessment Foss Maritime Company. April 20, 2000 Letter from Rodney Struck to Larry Johnson.

Environmental Protection Agency (EPA). 1998. Portland Harbor Sediment Investigation Report, Multnomah County, Oregon. Prepared by Roy F. Weston under Contract No. 68-W9-0046.

Hahn and Associates (HAI). 1993. Subsurface Investigation, Brix Maritime Company, 9030 NW St Helens Road, Portland, Oregon. August 12, 1993. Prepared for Brix Maritime Company.

Hahn and Associates (HAI). 1998. Phase 1 Remedial Investigation Summary Report and Preliminary Analysis of Soil Data – Northwest Natural – Gasco Facility. Prepared for Northwest Natural. Portland, Oregon.

Hazardous Substances Data Base (HSDB). 2000. Web site at http://toxnet.nlm.gov/cgi-bin/sis/html/gen?HSDB. National Library of Medicine. Bethesda, Maryland.



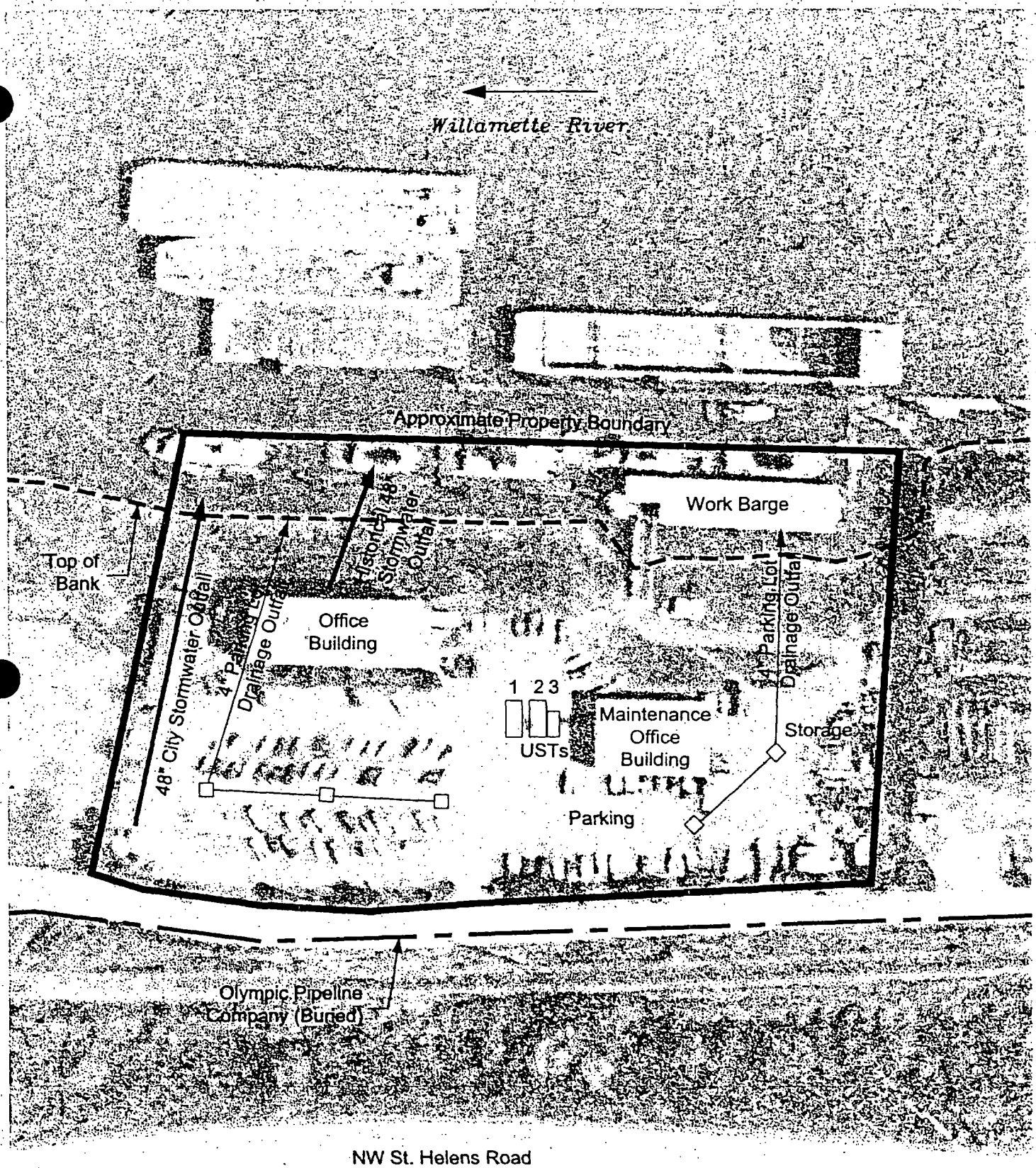
ANCHOR ENVIRONMENTAL, L.L.C.

0 1300
Scale In Feet

Source: Aerial photograph acquired from the Metro Data Resource Center, Oregon, 1997.

Figure 1
Site Location

10/04/00 BRX002a-01.DWG 99-056-01



Source: Aerial photograph acquired from WAC, Corp. 1991.

ANCHOR ENVIRONMENTAL, L.L.C.

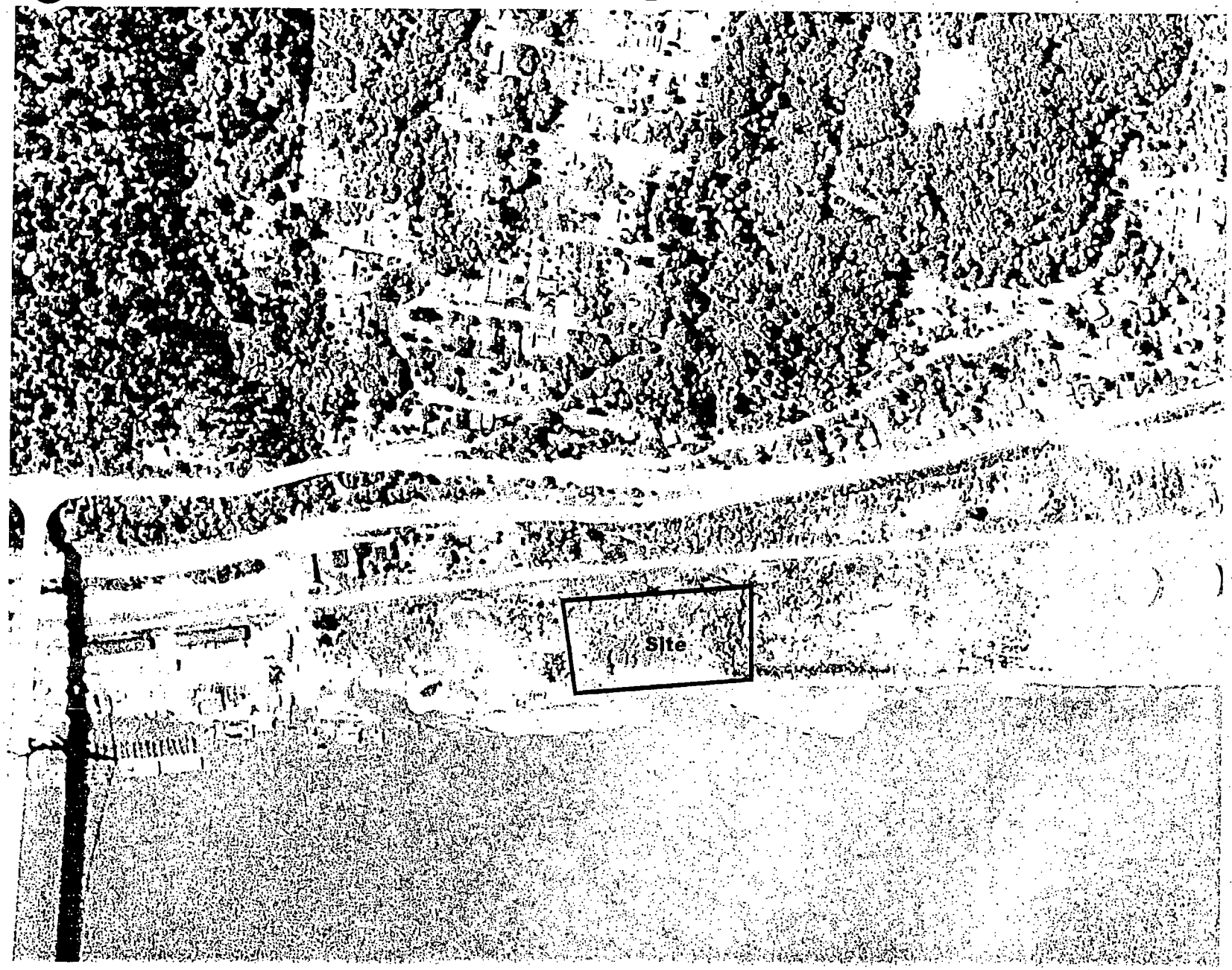
0 100
Scale in Feet

10/04/00 BRX002c-01.dwg 99-056-01

Figure 2
Site Map

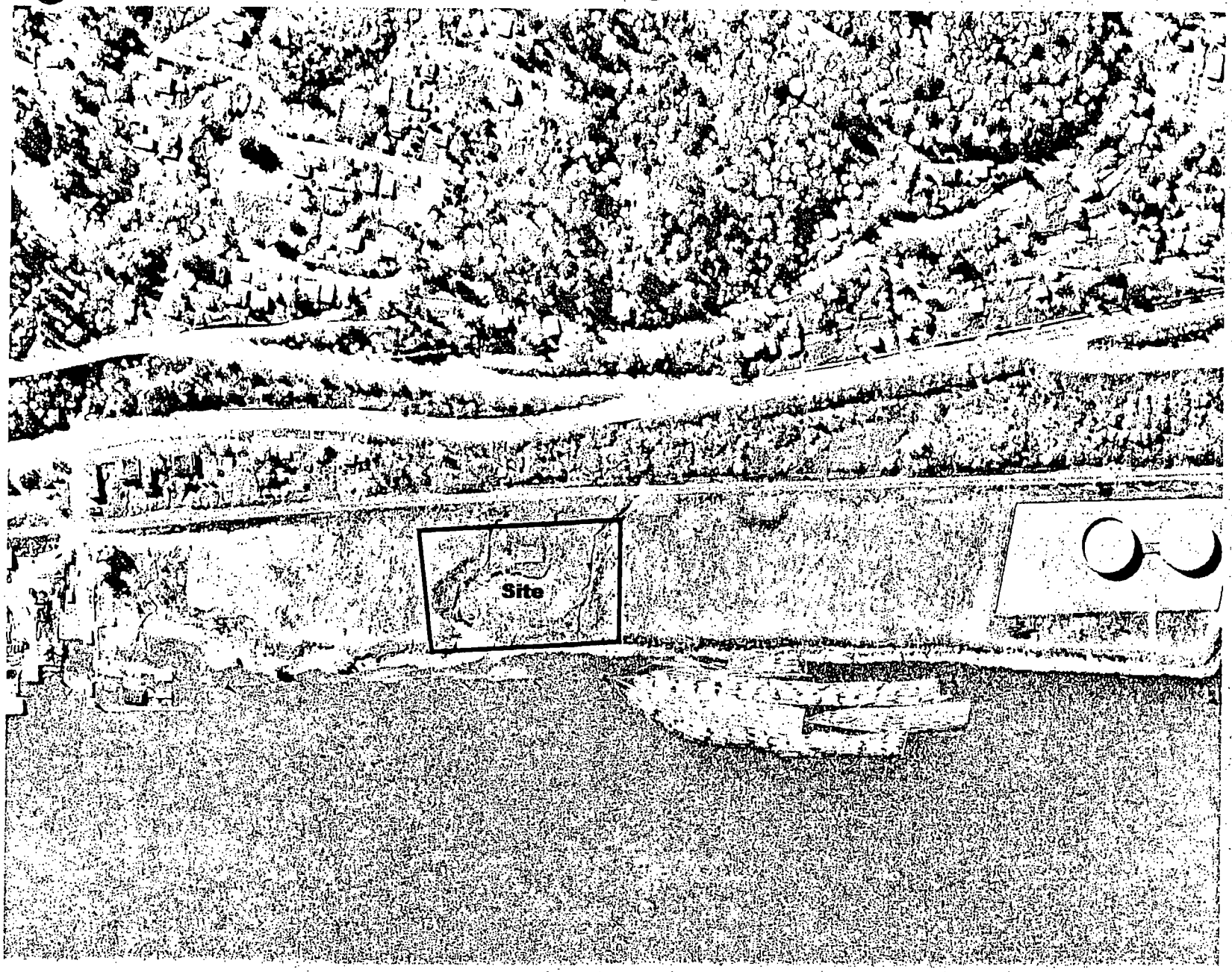
10/03/00 AERIAL PHOTO FIGURES.PPT

Figure 3
Aerial 1936



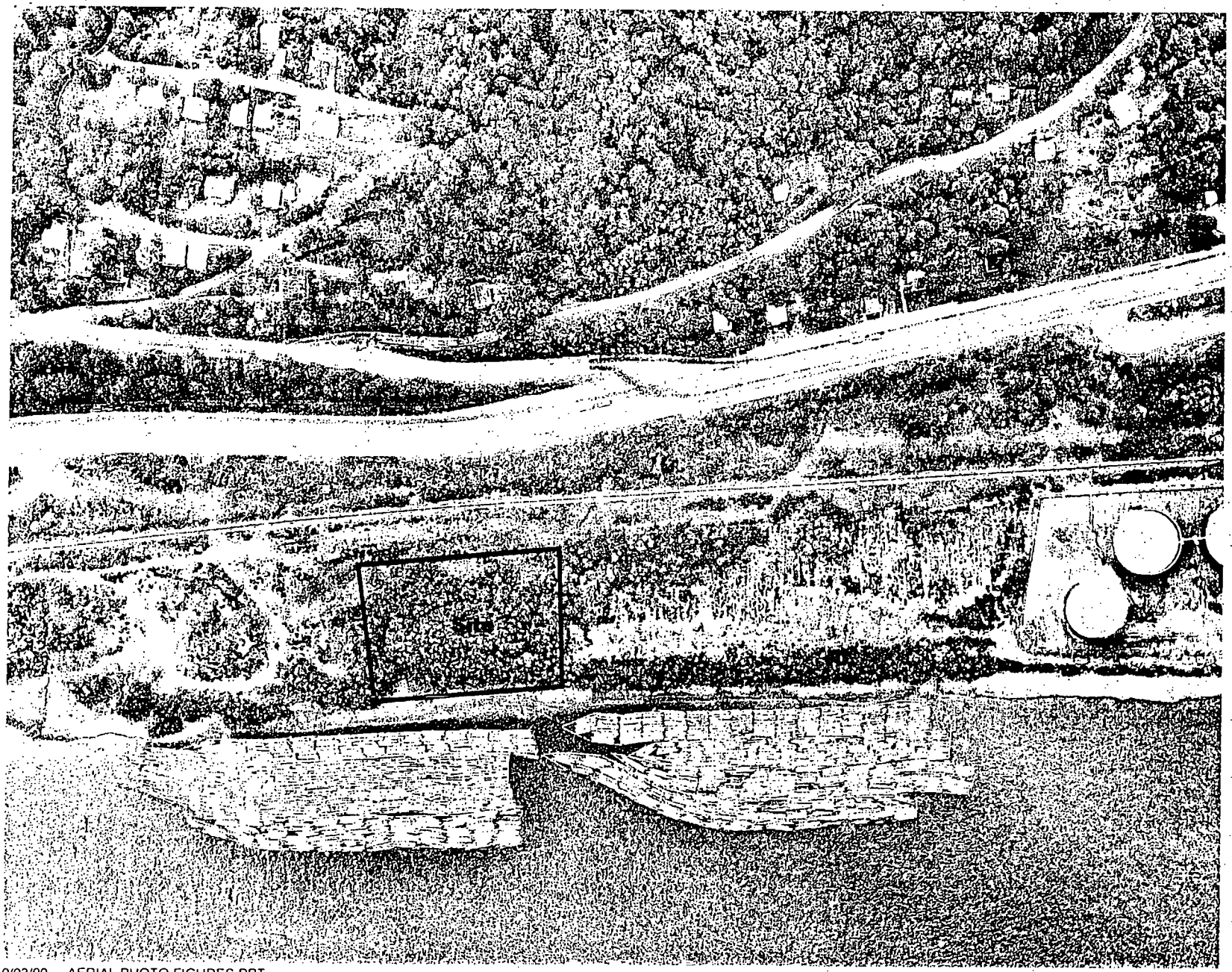
10/03/00 AERIAL PHOTO FIGURES.PPT

Figure 4
Aerial 1955



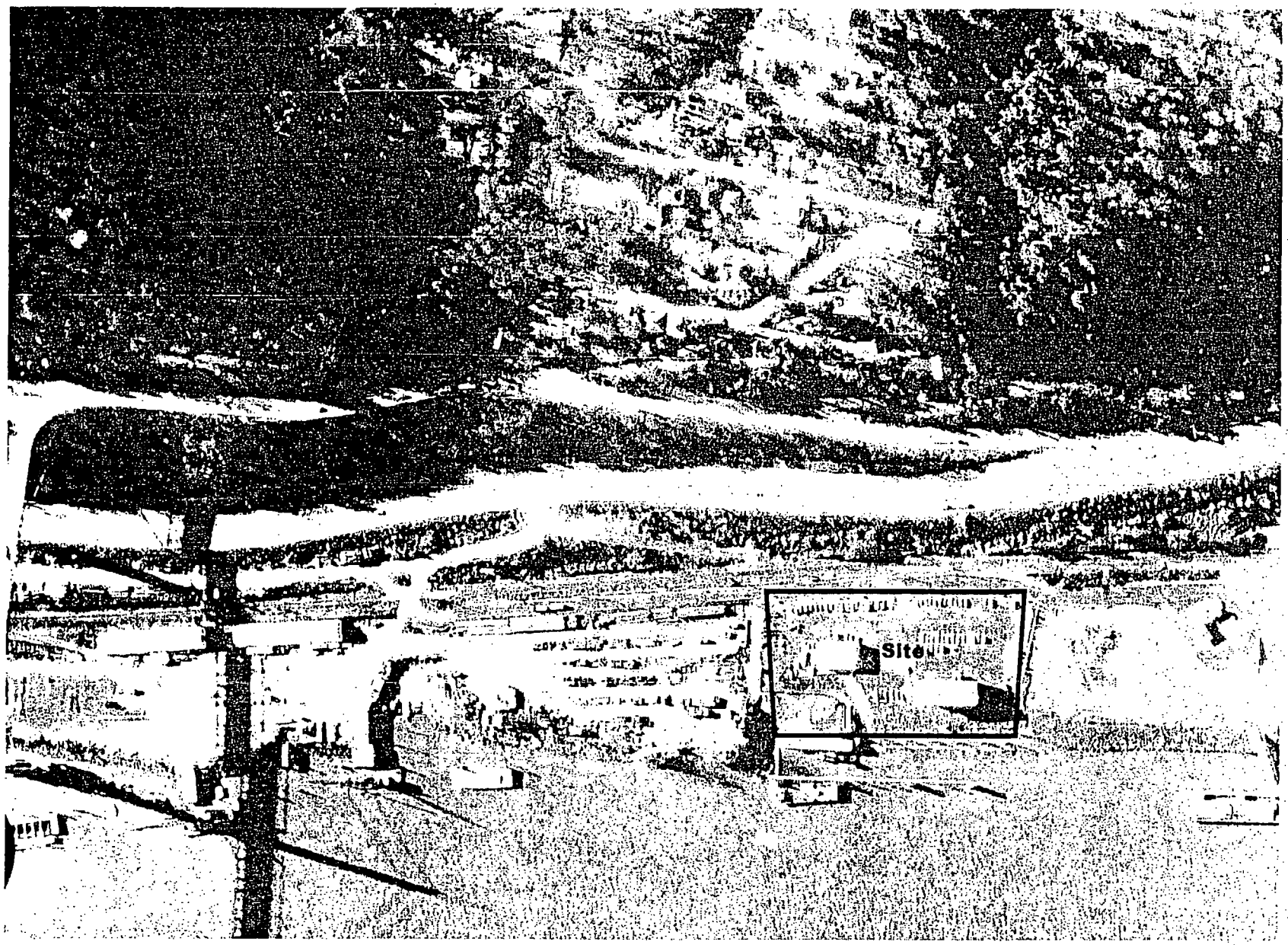
10/03/00 AERIAL PHOTO FIGURES.PPT

Figure 5
Aerial1961



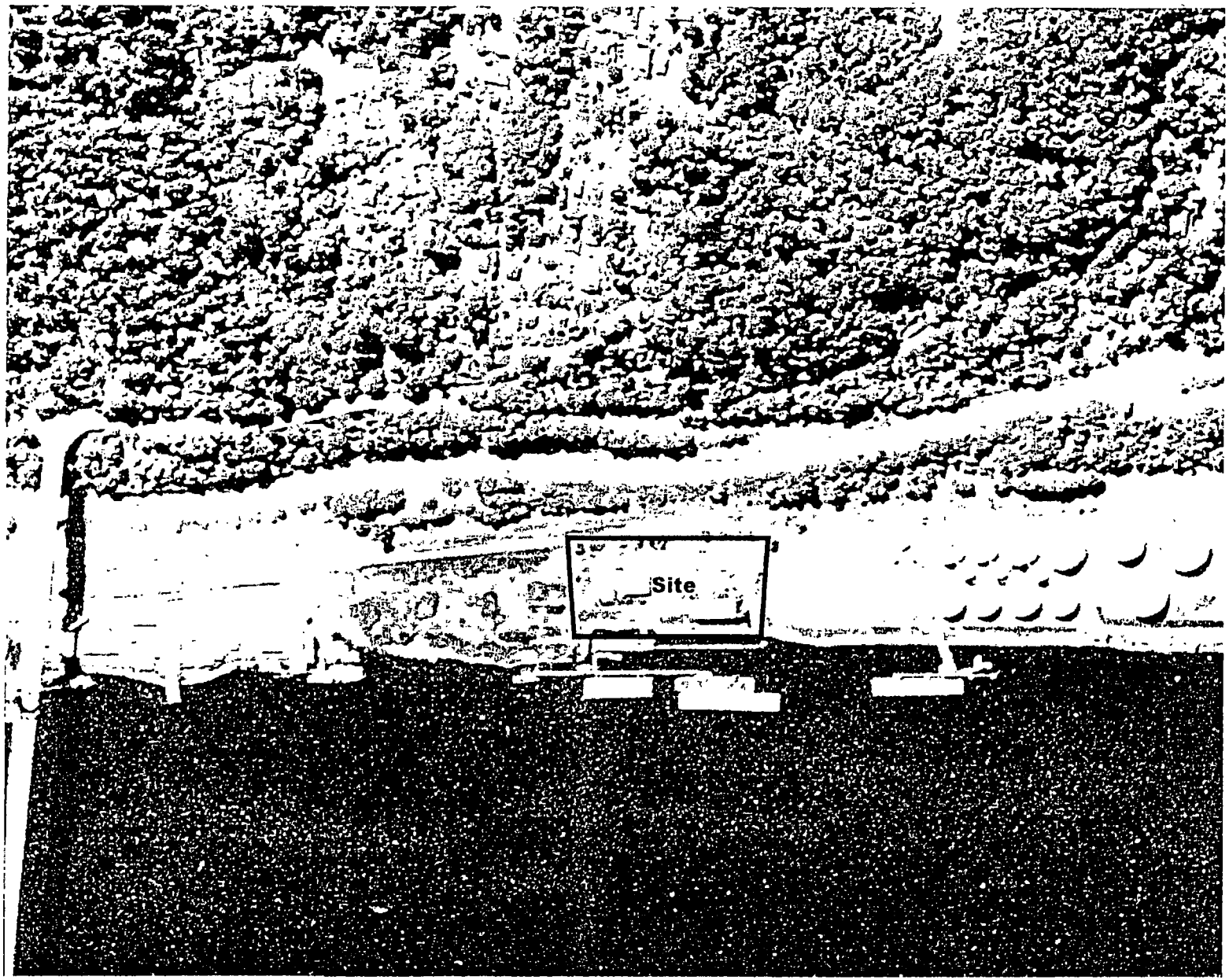
10/03/00 AERIAL PHOTO FIGURES.PPT

Figure 6
Aerial1971



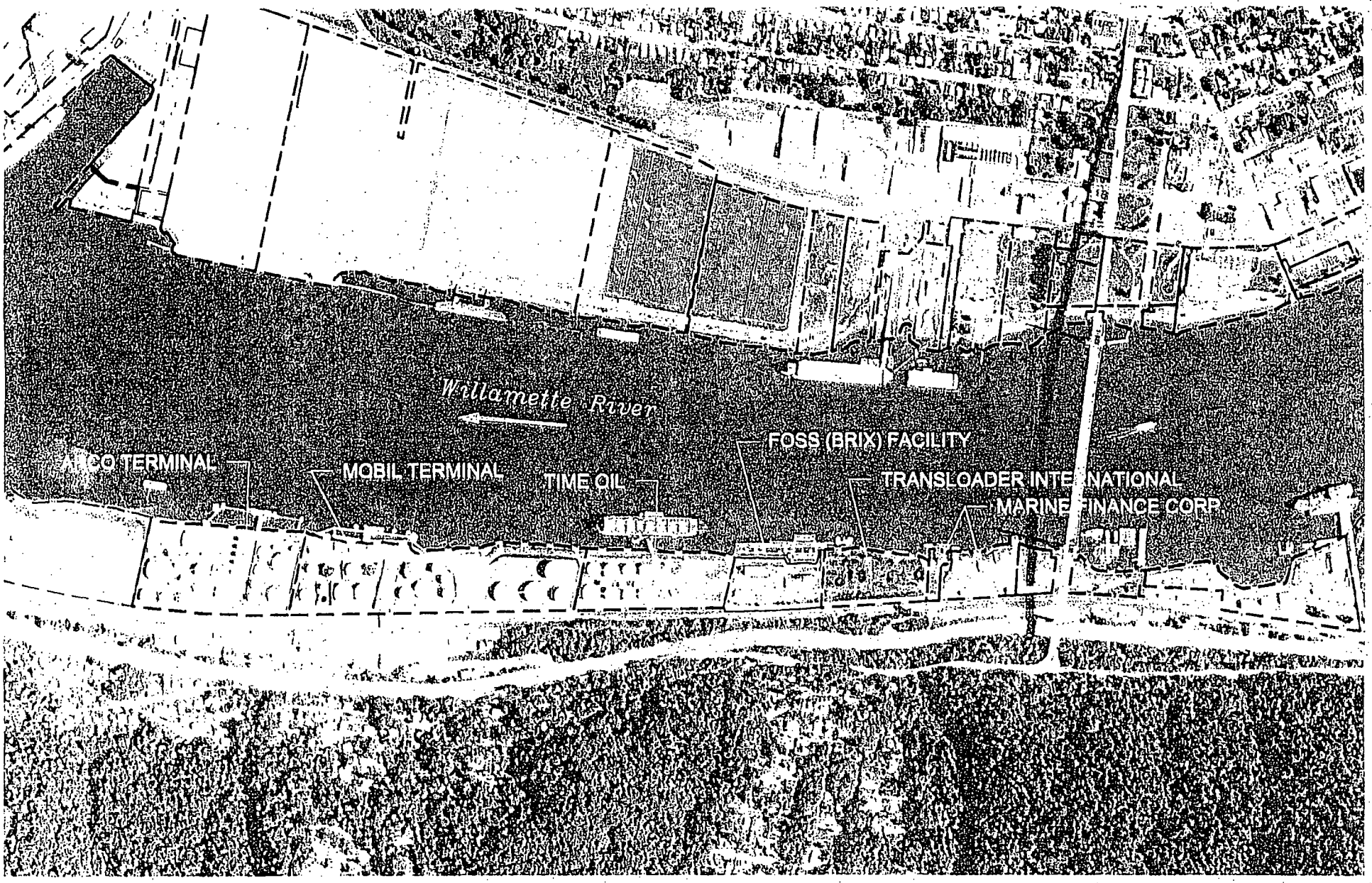
10/03/00 AERIAL PHOTO FIGURES.PPT

Figure 7
Aerial1980



10/03/00 AERIAL PHOTO FIGURES PPT

Figure 8
Aerial 1998



ANCHOR ENVIRONMENTAL, L.L.C.

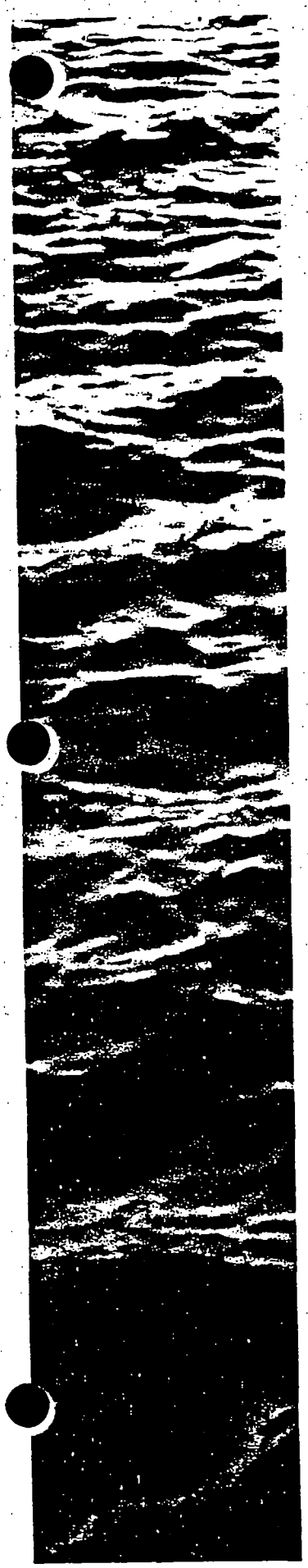
10/11/00 BRX003-01.DWG 99-056-01

Source:
1) Aerial photograph and Taxlot information acquired from the Metro Data Resource Center, Oregon, 1997.
2) Portland Harbor Sediment Investigation Report (EPA, 1998)

Figure 9
Adjacent Sites

APPENDIX A

Preliminary Assessment Summary Report



Expanded Preliminary Assessment Summary Report

Foss Maritime Company (Brix) Facility
9030 NW St. Helens Road
Portland, Oregon 97231-1127

February 15, 2000

Prepared By:
Anchor Environmental, L.L.C.

Expanded Preliminary Assessment Summary Report

Foss Maritime Company (Brix) Facility
9030 NW St. Helens Road
Portland, Oregon 97231-1127

February 15, 2000

Prepared by

Anchor Environmental, L.L.C.

Table of Contents

Introduction 1
Site Background 1
Review of Existing Information and Potenitial Pathways 2
  Underground Storage Tanks 2
  Outfalls 2
  Adjacent Site Uses 2
  Willamette River Sediment Quality 3
Evaluation of Potential Pathways 4
Summary and Conclusions 5
References 6

List of Tables

Table 1 – Dry Weight Surface and Subsurface Chemistry Data Near Foss Brix Site on Willamette River

Table 2 – Organic Carbon Normalized Surface and Subsurface Chemistry Data Near Foss Brix Site on Willamette River

List of Figures

Figure 1 – Site Location
Figure 2 – Site Map
Figure 3 – Existing Sediment Sample Locations
Figure 4 – Foss (Brix) Facility Looking Upstream
Figure 5 – Foss (Brix) Facility Looking Downstream

Introduction

On March 3, 1999, the Oregon Department of Environmental Quality (DEQ) requested additional site information on the Foss (Brix) Facility (Facility) located at 9030 NW St. Helens Road (DEQ, 1999a). In response, Foss Maritime Company (Foss) provided DEQ information on March 31, 1999. Subsequently, DEQ's November 19, 1999 letter requested that Foss perform an Expanded Preliminary Assessment (XPA) and sign the Voluntary Cleanup Letter Agreement (DEQ, 1999b). Foss returned the signed Voluntary Cleanup Letter Agreement in late December 1999.

The purpose of this XPA Summary Report is to review the historical and current use of the Facility and evaluate existing site information to assess whether the Facility has potentially contributed to elevated chemical concentrations in the adjacent Willamette River sediments.

The remainder of this XPA Summary Report is divided into the following sections:

- ✓ Site Background
- ✓ Review of Existing Data
- ✓ Evaluation of Potential Pathways
- ✓ Summary and Conclusions

Site Background

The property is situated between St. Helens Road to the south and borders the Willamette River at river mile 5.7 to the north (Figure 1). Topographically, the property dips gently to the north and lies at an elevation of approximately 25 feet above mean sea level (MSL). A 20-foot high embankment separates the northern property boundary and the Willamette River.

The Brix Maritime Company (Brix) developed the property in 1979; prior to this time, the property was undeveloped and unused. Development included construction of a two-story office building, office trailers, a maintenance building housing the purchasing department and maintenance department offices and general stores, an outdoor storage area, small sheds for storage of compressed gases, and a permanently moored maintenance barge (Figure 2). No ship repair work (e.g., abrasive grit, hull painting, etc.) has been performed at the Facility. The entire property is covered with either buildings or asphalt, except the embankment along the Willamette River. The Facility has a state waterway lease (ML-9230) from the Oregon Division of State Lands (DSL).

Review of Existing Information

Underground Storage Tanks

Five underground storage tanks (USTs) were installed in 1980 adjacent to the maintenance building. These tank systems included two 20,000-gallon diesel fuel USTs, two 6,000-gallon lubrication oil USTs, and one 2,000-gallon gasoline UST.

In January 1993, lubricating oil was observed coming up through a seam between asphalt and concrete paving within the UST area (Figure 2). This release was reported to DEQ (file number 26-93-009). The oil line was repaired in January 1993.

An investigation of the observed oil release was performed in February 1993 (HAI(a), 1993). To remove soil contamination in the vicinity of the oil release, approximately 45 cubic yards of petroleum-contaminated soil was excavated and disposed off-site. A subsurface investigation in the vicinity of the oil release and UST area was performed (HAI(b), 1993). No petroleum hydrocarbons were detected by analytical testing or observed by field screening at the depth of the observed water table. These data indicate that petroleum hydrocarbons did not migrate and that no pathway to surface water exists.

One of the 6,000-gallon lubrication oil USTs, and the 2,000-gallon gasoline UST were removed in 1998. In 1998, the two 20,000-gallon diesel fuel USTs and the remaining 6,000-gallon lubrication oil UST were upgraded and retrofit to comply with DEQs' 1998 upgrading requirements (installation of cathodic protection and tank lining systems). The location of the remaining three USTs are presented on Figure 2.

Outfalls

A City of Portland (City) 48-inch storm/sewer outfall which collects discharges from the NW St. Helens Road and facilities to the southwest discharges to the Willamette River directly in front of the Facility (Figure 2). Historically, this storm/sewer traveled underneath the office building. In 1999, Foss granted the City a twenty-foot-wide easement for relocation of the storm/sewer and outfall. The present outfall location for this 48-inch storm/sewer is presented on Figure 2. No data is available regarding chemical concentrations in the storm/sewer discharge or the potential impacts to sediments. Stormwater from the parking lot areas is not routed to the city system; rather stormwater is collected by catch basins and routed to four-inch pipes in two locations (Figure 2).

Releases

Foss proactively employs a policy of reporting any observed sheen to the Coast Guard, even if the sheen was in no way caused by Foss operations and regardless of the vicinity to the Facility. A few minor accidental spills (typically about a gallon or less) of petroleum products have occurred at the facility. These spills were promptly reported and quickly contained and cleaned up. Foss has also reported several "mystery spills" that in no way resulted from Foss operations. There is no evidence that any of these minor spills was of a significant magnitude or had the potential to contribute to elevated chemical concentrations in river sediments.

Adjacent Site Uses

Properties upstream of the Facility presently include a City storm/sewer outfall easements, Clydes Iron and Steel, and Hendren Tow Boats (Figures 3 and 4). Properties downstream include Time Oil and the Mobil/Arco facility. These bulk fuel facilities include off-loading piers (Figures 3 and 5). No information regarding upland contamination issues and discharges to the Willamette River are available for these sites.

Willamette River Sediment Quality

Existing surface and subsurface sediment quality data (EPA, 1998) in the vicinity of the site (upstream and downstream) were reviewed (Figure 3; Tables 1 and 2). DEQ's November 19, 1999 letter implied that butylbenzylphthalate and polyclyclic aromatic hydrocarbons (PAHs) may be an issue in the vicinity of the facility.

The United States Environmental Protection Agency (EPA) and DEQ have not established chemical or biological sediment quality criteria against which existing data can be compared to assess whether the chemical concentrations may pose a risk to the environment or human health; however, numerous freshwater sediment quality benchmarks are available. Attachment A is the National Oceanographic and Atmospheric Administration (NOAA) screening quick reference table which presents some of these benchmarks.

Based on our review of the existing data and consideration of the available freshwater sediment quality benchmarks, we conclude:

- ✓ Surface and subsurface butylbenzylphthalate concentrations range from 190 (U; undetected) to 29 ug/kg. Detection limit variability is significant (undetected at concentrations from 29 to 190 ug/kg) and clearly brings into question the significance of a detection of 29 ug/kg. No freshwater sediment quality benchmarks are available; however, the marine apparent effects threshold (AET) is 63 ug/kg.

- ✓ The highest concentration of low molecular weight PAHs (LPAH) and high molecular weight PAHs (HPAH) are detected in the upstream subsurface interval (SD055C; 0 to 90 centimeters) and the downstream subsurface interval (SD048C; 0 to 90 centimeters). The upper effects thresholds (UETs) established by NOAA for LPAHs and HPAHs are 5,300 and 6,500 ug/kg, respectively, thus indicating that subsurface conditions and land use practices adjacent to the upstream SD055C and downstream SD048C may require further investigation. Because no potential pathways were identified (see following section) from the Facility, these subsurface chemical concentrations are not associated with the Facility.
- ✓ Surface sediment LPAH concentrations range from 212 to 803 ug/kg (21 to 62 mg/kg organic carbon). Surface sediment HPAH concentrations range for 957 to 3,907 ug/kg (86 to 301 mg/kg organic carbon). For both cases the highest concentrations are just downstream of the City storm/sewer discharge point. The upper effects thresholds (UETs) established by NOAA for LPAHs and HPAHs are 5,300 and 6,500 ug/kg, respectively which indicate that surface sediment concentrations for LPAHs and HPAHs do not warrant further consideration.

Evaluation of Potential Pathways

The potential pathways by which the Foss (Brix) facility could have contributed to elevated chemical concentrations in the adjacent Willamette River sediments are briefly discussed below.

Groundwater

Based on groundwater studies (HAI, 1993), no petroleum hydrocarbons detected by analytical testing or observed by field screening at the depth of the observed water table. The discharge of groundwater to the Willamette River is not a potential pathway.

Soil and Surface Water

The entire property is covered with either buildings or asphalt, except the embankment along the Willamette River. Stormwater from the parking areas are collected and routed to the embankment. The routing of surface water to the embankment is not a potential pathway.

Air

Air is not a potential pathway.

Summary and Conclusions

This review of historical and current use of the Facility and evaluation of existing information concludes:

- ✓ Potential pathways from the Facility by which chemicals could enter the Willamette River do not exist.
- ✓ Surface sediment concentrations for LPAHs and HPAHs do not warrant further consideration.
- ✓ Subsurface conditions (elevated LPAHs and HPAHs) and land use practices adjacent to the upstream SD055C and downstream SD048C may require further investigation. However, because no potential pathways associated with the Facility were identified by which chemicals could enter the Willamette River, further investigation is most appropriately performed by the parties adjacent to SD055C and SD048C. No further investigation is warranted adjacent to the Facility.
- ✓ This Facility does not have the potential to have contributed to elevated chemical concentrations in the adjacent Willamette River sediments and no further investigation is warranted.

References

DEQ, 1999a. Site Assessment Review Notice for Foss (Brix) Facility. March 3, 1999 letter to Bruce Reed.

DEQ, 1999b. Request for Performance of Preliminary Assessment with Sampling for Foss Maritime Co. Site. November 19, 1999 letter to Larry Johnson.

EPA, 1998. Portland Harbor Sediment Investigation Report, Multnomah County, Oregon. Prepared by Roy F. Weston under Contract No. 68-W9-0046.

Hahn and Associates (HAI), 1993(a) Underground Storage Tank System Investigation, Brix Maritime Company, 9030 NW St Helens Road, Portland, Oregon. February 26, 1993

Hahn and Associates (HAI), 1993(b) Suburface Investigation, Brix Maritime Company, 9030 NW St Helens Road, Portland, Oregon. August 12, 1993

Attachment

Table 1. Dry Weight Surface and Subsurface Chemistry Data Near Foss Brix Site on Willamette River.

Parameter	Units	SD046 (surface) 0 to 10 cm	SD047 (surface) 0 to 10 cm	SD048 (surface) 0 to 10 cm	SD050 (surface) 0 to 10 cm	SD052 (surface) 0 to 10 cm	SD055 (surface) 0 to 10 cm	SD048 (subsurface) 0 to 90 cm	SD055-C (subsurface) 0 to 90 cm
Conventional Parameters									
Total organic carbon	%	1.1	1.2	1.3	1.1	1.3	1.0	1.7	2.2
Total sand	%	38.04 T	52.82 T	54.41 T	52.23 T	40.99 T	73.05 T	38.17 T	32.82 T
Total fines (silt + clay)	%	42.64 T	34.21 T	31.36 T	32.83 T	42.15 T	8.11 T	64.69 T	48.65 T
Metals									
Aluminum	mg/kg	36,900	29,100	32,700	33,200	37,600	16,600	35,100	35,000
Antimony	mg/kg	5 UJ	4 UJ	4 UJ	5 UJ	5 UJ	4 UJ	5 J	
Arsenic	mg/kg	5 U	4 U	5	5 U	5 U	4 U	4 U	8 U
Barium	mg/kg	173	142	154	162	179	111	167	180
Beryllium	mg/kg	0.6	0.51	0.57	0.55	0.66	0.39	0.57	0.6
Cadmium	mg/kg	0.3	0.2 U	0.3	0.3	0.4	0.2	0.4	0.6
Calcium	mg/kg	8,240	7,010	7,640 J	7,920	8,340 J	5,360 J	7,680	8,760
Chromium	mg/kg	34.5	27.7	31.2	31.9	36.1	18.6	33.9	36.6
Cobalt	mg/kg	17.5 J	16.2 J	17.1	16.8 J	18.3	12.9	18.1	18.8
Copper	mg/kg	36.4	30.3	33.3	35.5	37.9	18.8	42.6	64
Iron	mg/kg	39,700	35,900	38,300	37,400	41,500	29,800	41,700	42,100
Lead	mg/kg	13	12	10	13	16	9	27	31
Magnesium	mg/kg	6,560	5,360	5,930	6,120	6,460	3,710	6,170	6,610
Manganese	mg/kg	638	572	594	595	716	356	685	607
Mercury	mg/kg	0.04	0.04	0.05	0.05	0.05	0.02	0.07	0.13
Nickel	mg/kg	28.9	24.4	26	26.4	27.6	17.3	28.2 J	33 J
Potassium	mg/kg	1,230	1,070	1,100	1,110	1,270	760	1,130	1,140
Selenium	mg/kg	8	10	13	9	10	9	8	8 U
Silver	mg/kg	0.6	0.7	0.8	0.7	1	0.7	1.2	1.3
Sodium	mg/kg	1,220	1,010	1,070	1,130	1,120	753	1,030	936
Thallium	mg/kg	22	20	4	20	5 U	4 U	4 U	8 U
Titanium	mg/kg			1,870			1,520	1,970	1,790
Vanadium	mg/kg	99	87.4	96.3	92.5	101	71.9	99	100
Zinc	mg/kg	87.6 J	82 J	89.9	85.4 J	98.6	67.3	159	178
LPAHs 5300									
Total LPAHs[a]	ug/kg	288 T	262 T	444 T	595 T	803 T	212 T	12,721 T	69,410 T
Naphthalene	ug/kg	33	28	63	86	97	27	360 J	2,000
Acenaphthylene	ug/kg	20 U	19 U	19 U	20	26	19 U	61 J	610
Acenaphthene	ug/kg	40	30	51	70	66	28	1,300	7,900
Flourene	ug/kg	31	25	38	50	64	20	2,900 D	6,700
Phenanthrene	ug/kg	150	140	230	290	450	110	6,800 D	46,000 D
Anthracene	ug/kg	34	39	62	79	100	27	1,300	6,200
2-Methylnaphthalene	ug/kg	20 U	19 U	25	32	50	19 U	350 J	1,400
HPAHs 6500									
Total HPAHs[b]	ug/kg	957 T	1,031 T	2,305 T	1,941 T	3,907 T	1,750 T	14,132 T	136,300 T
Fluoranthene	ug/kg	210	200	380	430	780	250	4,500 D	33,000 D
Pyrene	ug/kg	190	260	400	380	770	270	4,100 D	40,000 D
Benz(a)anthracene	ug/kg	86	79	180	190	270	140	1,100	8,100
Chrysene	ug/kg	120	120	260	260	390	180	960	9,300
Total benzofluoranthenes	ug/kg	190 T	190 T	400 T	410 T	610 T	300 T	1,610 T	14,800 T
Benzo(a)pyrene	ug/kg	83	120	290	140	440	230	910	11,000
Indeno(1,2,3-cd)pyrene	ug/kg	57	62	160	89	260	150	470	8,900
Dibenzo(a,h)anthracene	ug/kg	21	19 U	45	42	67	40	82 N	1,400 N
Benzo(g,h,i)perylene	ug/kg	20 U	19 UJ	190	20 U	320	190	400	9,800
Semivolatiles									
1,2-Dichlorobenzene	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
1,4-Dichlorobenzene	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
1,2,4-Trichlorobenzene	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
Hexachlorobenzene	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
Dibenzofuran	ug/kg	20 U	19 U	19 U	26	30	19 U	1,100	1,300
Hexachlorobutadiene	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
N-Nitrosodiphenylamine	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
Phenol	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
2-Methylphenol	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
4-Methylphenol	ug/kg	20 U	25	280	21	600	53	68 J	190 U
2,4-Dimethylphenol	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
Pentachlorophenol	ug/kg	98 UJ	97 UJ	95 UJ	100 UJ	99 UJ	97 UJ	94 UJ	970 UJ
Benzyl Alcohol	ug/kg	20 UJ	19 UJ	19 UJ	20 UJ	20 UJ	19 UJ	6.1 JN	190 U
Benzoic Acid	ug/kg	200 U	190 U	190 U	200 U	200 U	190 U	740 J	1,900 U
Phthalates									
Dimethylphthalate	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
Diethylphthalate	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
Di-n-Butylphthalate	ug/kg	20 UJ	19 U	19 U	20 UJ	20 U	19 U	19 U	190 U
Butylbenzylphthalate 63	ug/kg	20 U	19 U	19 U	20 U	29	19 U	19 U	190 U
Bis(2-ethylhexyl)phthalate	ug/kg	170	250	110 U	150	190 U	73 U	110 UN	190 U
Di-n-Octyl phthalate	ug/kg	20 U	19 UJ	19 U	20 U	20 U	19 U	19 U	190 U

Source: EPA Willamette River Site Investigation Dataset, June 1998.

Parameter	Units	SD046 (surface) 0 to 10 cm	SD047 (surface) 0 to 10 cm	SD048 (surface) 0 to 10 cm	SD050 (surface) 0 to 10 cm	SD052 (surface) 0 to 10 cm	SD055 (surface) 0 to 10 cm	SD048 (subsurface) 0 to 90 cm	SD055-C (subsurface) 0 to 90 cm
PCBs									
Total PCBs	ug/kg			38 UT			39 UT	124 T	350 UT
Aroclor 1016	ug/kg			19 U			20 U	19 UJ	170 U
Aroclor 1221	ug/kg			38 U			39 U	38 UJ	350 U
Aroclor 1232	ug/kg			19 U			20 U	19 UJ	170 U
Aroclor 1242	ug/kg			19 U			20 U	19 UJ	170 U
Aroclor 1248	ug/kg			19 U			20 U	19 UJ	170 U
Aroclor 1254	ug/kg			19 U			20 U	61 J	170 U
Aroclor 1260	ug/kg			19 U			20 U	63 J	170 U
Pesticides									
4,4'-DDD	ug/kg			3.1			2.6	8 J	61
4,4'-DDE	ug/kg			1.9 U			2 U	3.5 J	17 U
4,4'-DDT	ug/kg			7.2			3.9	14 J	33
Aldrin	ug/kg			0.94 U			0.98 U	0.95 UJ	8.7 U
Alpha-BHC	ug/kg			0.94 U			0.98 U	0.95 UJ	8.7 U
Alpha-Chlordane	ug/kg			0.94 U			0.98 U	0.95 UJ	8.7 U
Beta-BHC	ug/kg			0.94 U			0.98 U	0.95 UJ	8.7 U
Delta-BHC	ug/kg			0.94 U			0.98 U	0.95 UJ	8.7 U
Dieldrin	ug/kg			1.9 U			2 U	1.9 UJ	17 U
Endosulfan I	ug/kg			0.94 U			0.98 U	0.95 UJ	8.7 U
Endosulfan II	ug/kg			1.9 U			2 U	1.9 UJ	17 U
Endosulfan Sulfate	ug/kg			1.9 U			2 U	1.9 UJ	17 U
Endrin	ug/kg			1.9 U			2 U	1.9 UJ	17 U
Endrin aldehyde	ug/kg			1.9 U			2 U	1.9 UJ	17 U
Endrin Ketone	ug/kg			1.9 U			2 U	5.5 UIJ	17 U
Gamma-BHC (Lindane)	ug/kg			0.94 U			0.98 U	0.95 UJ	8.7 U
Gamma-Chlordane	ug/kg			0.94 U			0.98 U	0.95 UJ	8.7 U
Heptachlor	ug/kg			0.94 U			0.98 U	0.95 UJ	8.7 U
Heptachlor Epoxide	ug/kg			0.94 U			0.98 U	0.95 UJ	8.7 U
Methoxychlor	ug/kg			9.4 U			9.8 U	9.5 UJ	87 U
Toxaphene	ug/kg			94 U			98 U	95 UJ	870 U
Organotins									
Tetra-n-butyltin	ug/kg			5.7 U			5.8 U	5.7 U	5.8 U
Tributyl Tin	ug/kg			26 J			5.8 UJ	63	45
Tributyl Tin (as TBT cation)	ug/kg			23.14 J			5.162 UJ	56.07	40.05
Dibutyl Tin	ug/kg			5.7 U			5.8 U	5.7 UJ	5.8 UJ
Butyl Tin	ug/kg			5.7 U			5.8 U	5.7 U	5.8 U
Other Compounds									
1,3-Dichlorobenzene	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
2,2'-Oxybis(1-Chloropropane)	ug/kg	20 U	19 U	19 UJ	20 U	20 UJ	19 UJ	19 U	190 U
2,4,5-Trichlorophenol	ug/kg	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
2,4,6-Trichlorophenol	ug/kg	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
2,4-Dichlorophenol	ug/kg	59 U	58 U	57 U	60 U	60 U	58 U	57 U	580 U
2,4-Dinitrophenol	ug/kg	200 UJ	190 UJ		200 UJ		190 UJ	190 UJ	1,900 UJ
2,4-Dinitrotoluene	ug/kg	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
2,6-Dinitrotoluene	ug/kg	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
2-Chloronaphthalene	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
2-Chlorophenol	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
2-Nitroaniline	ug/kg	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
2-Nitrophenol	ug/kg	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
3,3'-Dichlorobenzidine	ug/kg	98 U	97 UJ	95 U	100 U	99 U	97 UJ	94 U	970 U
3-Nitroaniline	ug/kg	120 U	120 UJ	110 UJ	120 U	120 UJ	120 UJ	110 U	1,200 U
4,6-Dinitro-2-methylphenol	ug/kg	200 U	190 U	190 UJ	200 U	200 UJ	190 U	190 U	1,900 U
4-Bromophenyl-phenylether	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
4-Chloro-3-methylphenol	ug/kg	39 U	39 U	38 U	40 U	40 U	39 U	38 U	390 U
4-Chloroaniline	ug/kg	59 U	58 UJ	57 UJ	60 U	60 UJ	58 UJ	57 U	580 U
4-Chlorophenyl-phenylether	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
4-Nitroaniline	ug/kg	98 UJ	97 U	95 UJ	100 UJ	99 UJ	97 UJ	94 U	970 U
4-Nitrophenol	ug/kg	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
bis(2-Chloroethoxy)methane	ug/kg	20 U	19 UJ	19 U	20 U	20 U	19 U	19 U	190 U
bis(2-Chloroethyl)ether	ug/kg	39 U	39 U	38 UJ	40 U	40 UJ	39 U	38 U	390 U
Carbazole	ug/kg	20 U	19 U	67 J	30	100 J	31 J	240	370
Hexachlorocyclopentadiene	ug/kg	98 UJ	97 UJ	95 UJ	100 UJ	99 UJ	97 UJ	94 U	970 U
Hexachloroethane	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
Isophorone	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
N-Nitroso-di-n-propylamine	ug/kg	39 U	39 UJ	38 U	40 U	40 U	39 U	38 U	390 U
Nitrobenzene	ug/kg	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U

Source: EPA Willamette River Site Investigation Dataset, June 1998.

Notes and Qualifiers:

(a) *Total LPAHs is the sum of the following compounds:* Naphthalene, Acenaphthalene, Acenaphthene, Fluorene, Phenanthrene, and Anthracene.

(b) sum of the following compounds:

U Analyte was undetected at the detection limit shown.

UJ Analyte was not detected at the estimated detection limit shown.

J Estimated value.

N Tentative identification. The compound does not meet spectral identification criteria but, in the analyst's judgment, the analyte is present.

D The reported analyte concentration was determined after dilution of the sample.

T Value is the arithmetic sum of detected analytes (e.g., individual HPAH compounds or PCB Aroclors) or the highest detection limit if no analytes were detected within the given compound class.

Table 2. Organic Carbon Normalized Surface and Subsurface Chemistry Data Near Foss Brix Site on Willamette River.

Parameter	Units	SD046 (surface) 0 to 10 cm	SD047 (surface) 0 to 10 cm	SD048 (surface) 0 to 10 cm	SD050 (surface) 0 to 10 cm	SD052 (surface) 0 to 10 cm	SD055 (surface) 0 to 10 cm	SD048 (subsurface) 0 to 90 cm	SD055-C (subsurface) 0 to 90 cm
Conventional Parameters									
Total organic carbon	%	1.1	1.2	1.3	1.1	1.3	1.0	1.7	2.2
Total sand	%	38.04 T	52.82 T	54.41 T	52.23 T	40.99 T	73.05 T	38.17 T	32.82 T
Total fines (silt + clay)	%	42.64 T	34.21 T	31.36 T	32.83 T	42.15 T	8.11 T	64.69 T	48.65 T
Metals									
Aluminum	mg/kg dry	36,900	29,100	32,700	33,200	37,600	16,600	35,100	35,000
Antimony	mg/kg dry	5 UJ	4 UJ	4 UJ	5 UJ	5 UJ	4 UJ	5 J	
Arsenic	mg/kg dry	5 U	4 U	5	5 U	5 U	4 U	4 U	8 U
Barium	mg/kg dry	173	142	154	162	179	111	167	180
Beryllium	mg/kg dry	0.6	0.51	0.57	0.55	0.66	0.39	0.57	0.6
Cadmium	mg/kg dry	0.3	0.2 U	0.3	0.3	0.4	0.2	0.4	0.6
Calcium	mg/kg dry	8,240	7,010	7,640 J	7,920	8,340 J	5,360 J	7,680	8,760
Chromium	mg/kg dry	34.5	27.7	31.2	31.9	36.1	18.6	33.9	36.6
Cobalt	mg/kg dry	17.5 J	16.2 J	17.1	16.8 J	18.3	12.9	18.1	18.8
Copper	mg/kg dry	36.4	30.3	33.3	35.5	37.9	18.8	42.6	64
Iron	mg/kg dry	39,700	35,900	38,300	37,400	41,500	29,800	41,700	42,100
Lead	mg/kg dry	13	12	10	13	16	9	27	31
Magnesium	mg/kg dry	6,560	5,360	5,930	6,120	6,460	3,710	6,170	6,610
Manganese	mg/kg dry	638	572	594	595	716	356	685	607
Mercury	mg/kg dry	0.04	0.04	0.05	0.05	0.05	0.02	0.07	0.13
Nickel	mg/kg dry	28.9	24.4	26	26.4	27.6	17.3	28.2 J	33 J
Potassium	mg/kg dry	1,230	1,070	1,100	1,110	1,270	760	1,130	1,140
Selenium	mg/kg dry	8	10	13	9	10	9	8	8 U
Silver	mg/kg dry	0.6	0.7	0.8	0.7	1	0.7	1.2	1.3
Sodium	mg/kg dry	1,220	1,010	1,070	1,130	1,120	753	1,030	936
Thallium	mg/kg dry	22	20	4	20	5 U	4 U	4 U	8 U
Titanium	mg/kg dry			1,870			1,520	1,970	1,790
Vanadium	mg/kg dry	99	87.4	96.3	92.5	101	71.9	99	100
Zinc	mg/kg dry	87.6 J	82 J	89.9	85.4 J	98.6	67.3	159	178
LPAHs									
Total LPAHs[a]	mg/kg OC	26 T	22 T	34 T	54 T	62 T	21 T	748 T	3,155 T
Naphthalene	mg/kg OC	3	2	5	8	7	3	21 J	91
Acenaphthylene	mg/kg OC	2 U	2 U	1 U	2	2	2 U	4 J	28
Acenaphthene	mg/kg OC	4	3	4	6	5	3	76	359
Flourene	mg/kg OC	3	2	3	5	5	2	171 D	305
Phenanthrene	mg/kg OC	14	12	18	26	35	11	400 D	2,091 D
Anthracene	mg/kg OC	3	3	5	7	8	3	76	282
2-Methylnaphthalene	mg/kg OC	2 U	2 U	2	3	4	2 U	21 J	64
HPAHs									
Total HPAHs[b]	mg/kg OC	87 T	86 T	177 T	176 T	301 T	175 T	831 T	6,195 T
Fluoranthene	mg/kg OC	19	17	29	39	60	25	265 D	1,500 D
Pyrene	mg/kg OC	17	22	31	35	59	27	241 D	1,818 D
Benz(a)anthracene	mg/kg OC	8	7	14	17	21	14	65	368
Chrysene	mg/kg OC	11	10	20	24	30	18	56	423
Total benzofluoranthenes	mg/kg OC	17 T	16 T	31 T	37 T	47 T	30 T	95 T	673 T
Benzo(a)pyrene	mg/kg OC	8	10	22	13	34	23	54	500
Indeno(1,2,3-cd)pyrene	mg/kg OC	5	5	12	8	20	15	28	405
Dibenzo(a,h)anthracene	mg/kg OC	2	2 U	3	4	5	4	5 N	64 N
Benzo(g,h,i)perylene	mg/kg OC	2 U	2 UJ	15	2 U	25	19	24	445
Semivolatiles									
1,2-Dichlorobenzene	mg/kg OC	2 U	2 U	1 U	2 U	2 U	2 U	1 U	9 U
1,4-Dichlorobenzene	mg/kg OC	2 U	2 U	1 U	2 U	2 U	2 U	1 U	9 U
1,2,4-Trichlorobenzene	mg/kg OC	2 U	2 U	1 U	2 U	2 U	2 U	1 U	9 U
Hexachlorobenzene	mg/kg OC	2 U	2 U	1 U	2 U	2 U	2 U	1 U	9 U
Dibenzofuran	mg/kg OC	2 U	2 U	1 U	2	2	2 U	65	59
Hexachlorobutadiene	mg/kg OC	2 U	2 U	1 U	2 U	2 U	2 U	1 U	9 U
N-Nitrosodiphenylamine	mg/kg OC	2 U	2 U	1 U	2 U	2 U	2 U	1 U	9 U
Phenol	ug/kg dry	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
2-Methylphenol	ug/kg dry	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
4-Methylphenol	ug/kg dry	20 U	25	280	21	600	53	68 J	190 U
2,4-Dimethylphenol	ug/kg dry	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
Pentachlorophenol	ug/kg dry	98 UJ	97 UJ	95 UJ	100 UJ	99 UJ	97 UJ	94 UJ	970 UJ
Benzyl Alcohol	ug/kg dry	20 UJ	19 UJ	19 UJ	20 UJ	20 UJ	19 UJ	6 JN	190 U
Benzoic Acid	ug/kg dry	200 U	190 U	190 U	200 U	200 U	190 U	740 J	1,900 U
Phthalates									
Dimethylphthalate	mg/kg OC	2 U	2 U	1 U	2 U	2 U	2 U	1 U	9 U
Diethylphthalate	mg/kg OC	2 U	2 U	1 U	2 U	2 U	2 U	1 U	9 U
Di-n-Butylphthalate	mg/kg OC	2 UJ	2 U	1 U	2 UJ	2 U	2 U	1 U	9 U
Butylbenzylphthalate	mg/kg OC	2 U	2 U	1 U	2 U	2	2 U	1 U	9 U
Bis(2-ethylhexyl)phthalate	mg/kg OC	15	21	8 U	14	15 U	7 U	6 UN	9 U
Di-n-Octyl phthalate	mg/kg OC	2 U	2 UJ	1 U	2 U	2 U	2 U	1 U	9 U

Source: EPA Willamette River Site Investigation Dataset, June 1998.

Table 2 (continued). Organic Carbon Normalized Surface and Subsurface Chemistry Data Near Foss Brix Site on Willamette River.

Parameter	Units	SD046 (surface) 0 to 10 cm	SD047 (surface) 0 to 10 cm	SD048 (surface) 0 to 10 cm	SD050 (surface) 0 to 10 cm	SD052 (surface) 0 to 10 cm	SD055 (surface) 0 to 10 cm	SD048 (subsurface) 0 to 90 cm	SD055-C (subsurface) 0 to 90 cm
PCBs									
Total PCBs	mg/kg OC			3 UT			4 UT	7 T	16 UT
Aroclor 1016	mg/kg OC			1 U			2 U	1 UJ	8 U
Aroclor 1221	mg/kg OC			3 U			4 U	2 UJ	16 U
Aroclor 1232	mg/kg OC			1 U			2 U	1 UJ	8 U
Aroclor 1242	mg/kg OC			1 U			2 U	1 UJ	8 U
Aroclor 1248	mg/kg OC			1 U			2 U	1 UJ	8 U
Aroclor 1254	mg/kg OC			1 U			2 U	4 J	8 U
Aroclor 1260	mg/kg OC			1 U			2 U	4 J	8 U
Pesticides									
4,4'-DDD	mg/kg OC			0.2			0.3	0.5 J	3
4,4'-DDE	mg/kg OC			0.1 U			0.2 U	0.2 J	1 U
4,4'-DDT	mg/kg OC			1			0.4	1 J	2
Aldrin	mg/kg OC			0.1 U			0.1 U	0.1 UJ	0.4 U
Alpha-BHC	mg/kg OC			0.1 U			0.1 U	0.1 UJ	0.4 U
Alpha-Chlordane	mg/kg OC			0.1 U			0.1 U	0.1 UJ	0.4 U
Beta-BHC	mg/kg OC			0.1 U			0.1 U	0.1 UJ	0.4 U
Delta-BHC	mg/kg OC			0.1 U			0.1 U	0.1 UJ	0.4 U
Dieldrin	mg/kg OC			0.1 U			0.2 U	0.1 UJ	1 U
Endosulfan I	mg/kg OC			0.1 U			0.1 U	0.1 UJ	0.4 U
Endosulfan II	mg/kg OC			0.1 U			0.2 U	0.1 UJ	1 U
Endosulfan Sulfate	mg/kg OC			0.1 U			0.2 U	0.1 UJ	1 U
Endrin	mg/kg OC			0.1 U			0.2 U	0.1 UJ	1 U
Endrin aldehyde	mg/kg OC			0.1 U			0.2 U	0.1 UJ	1 U
Endrin Ketone	mg/kg OC			0.1 U			0.2 U	0.3 UIJ	1 U
Gamma-BHC (Lindane)	mg/kg OC			0.1 U			0.1 U	0.1 UJ	0.4 U
Gamma-Chlordane	mg/kg OC			0.1 U			0.1 U	0.1 UJ	0.4 U
Heptachlor	mg/kg OC			0.1 U			0.1 U	0.1 UJ	0.4 U
Heptachlor Epoxide	mg/kg OC			0.1 U			0.1 U	0.1 UJ	0.4 U
Methoxychlor	mg/kg OC			1 U			1 U	1 UJ	4 U
Toxaphene	mg/kg OC			7 U			10 U	6 UJ	40 U
Organotins									
Tetra-n-butyltin	mg/kg OC			0.4 U			1 U	0.3 U	0.3 U
Tributyl Tin	mg/kg OC			2 J			1 UJ	4	2
Tributyl Tin (as TBT cation)	mg/kg OC			2 J			1 UJ	3	2
Dibutyl Tin	mg/kg OC			0.4 U			1 U	0.3 UJ	0.3 UJ
Butyl Tin	mg/kg OC			0.4 U			1 U	0.3 U	0.3 U
Other Compounds									
1,3-Dichlorobenzene	ug/kg dry	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
2,2'-Oxybis(1-Chloropropane)	ug/kg dry	20 U	19 U	19 UJ	20 U	20 UJ	19 UJ	19 U	190 U
2,4,5-Trichlorophenol	ug/kg dry	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
2,4,6-Trichlorophenol	ug/kg dry	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
2,4-Dichlorophenol	ug/kg dry	59 U	58 U	57 U	60 U	60 U	58 U	57 U	580 U
2,4-Dinitrophenol	ug/kg dry	200 UJ	190 UJ		200 UJ		190 UJ	190 UJ	1,900 UJ
2,4-Dinitrotoluene	ug/kg dry	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
2,6-Dinitrotoluene	ug/kg dry	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
2-Chloronaphthalene	ug/kg dry	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
2-Chlorophenol	ug/kg dry	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
2-Nitroaniline	ug/kg dry	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
2-Nitrophenol	ug/kg dry	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
3,3'-Dichlorobenzidine	ug/kg dry	98 U	97 UJ	95 U	100 U	99 U	97 UJ	94 U	970 U
3-Nitroaniline	ug/kg dry	120 U	120 UJ	110 UJ	120 U	120 UJ	120 UJ	110 U	1,200 U
4,6-Dinitro-2-methylphenol	ug/kg dry	200 U	190 U	190 UJ	200 U	200 UJ	190 U	190 U	1,900 U
4-Bromophenyl-phenylether	ug/kg dry	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
4-Chloro-3-methylphenol	ug/kg dry	39 U	39 U	38 U	40 U	40 U	39 U	38 U	390 U
4-Chloroaniline	ug/kg dry	59 U	58 UJ	57 UJ	60 U	60 UJ	58 UJ	57 U	580 U
4-Chlorophenyl-phenylether	ug/kg dry	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
4-Nitroaniline	ug/kg dry	98 UJ	97 U	95 UJ	100 UJ	99 UJ	97 UJ	94 U	970 U
4-Nitrophenol	ug/kg dry	98 U	97 U	95 U	100 U	99 U	97 U	94 U	970 U
bis(2-Chloroethoxy)methane	ug/kg dry	20 U	19 UJ	19 U	20 U	20 U	19 U	19 U	190 U
bis(2-Chloroethyl)ether	ug/kg dry	39 U	39 U	38 UJ	40 U	40 UJ	39 U	38 U	390 U
Carbazole	ug/kg dry	20 U	19 U	67 J	30	100 J	31 J	240	370
Hexachlorocyclopentadiene	ug/kg dry	98 UJ	97 UJ	95 UJ	100 UJ	99 UJ	97 UJ	94 U	970 U
Hexachloroethane	ug/kg dry	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
Isophorone	ug/kg dry	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U
N-Nitroso-di-n-propylamine	ug/kg dry	39 U	39 UJ	38 U	40 U	40 U	39 U	38 U	390 U
Nitrobenzene	ug/kg dry	20 U	19 U	19 U	20 U	20 U	19 U	19 U	190 U

Source: EPA Willamette River Site Investigation Dataset, June 1998.

Notes and Qualifiers:

(a) Total LPAHs is the sum of the following compounds: Naphthalene, Acenaphthalene, Acenaphthene, Fluorene, Phenanthrene, and Anthracene.

(b) Total HPAHs is the sum of the following compounds: Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Total Benzofluoranthenes, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, Dibenzo(a,h)anthracene, and Benzo(g,h,i)perylene.

U Analyte was undetected at the detection limit shown.

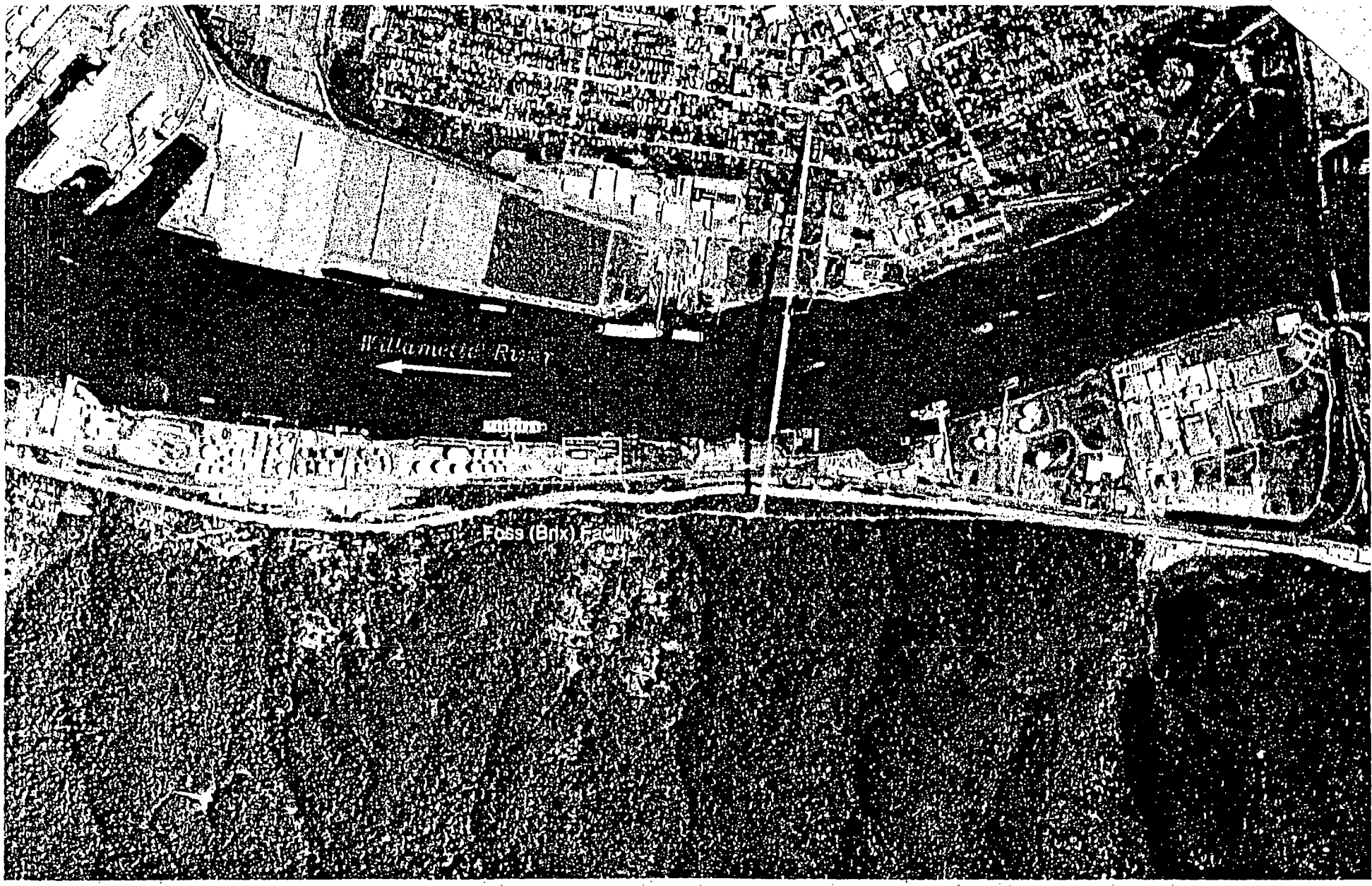
UJ Analyte was not detected at the estimated detection limit shown.

J Estimated value.

N Tentative identification. The compound does not meet spectral identification criteria but, in the analyst's judgment, the analyte is present.

D The reported analyte concentration was determined after dilution of the sample.

T Value is the arithmetic sum of detected analytes (e.g., individual HPAH compounds or PCB Aroclors) or the highest detection limit if no analytes were detected within the given compound class.



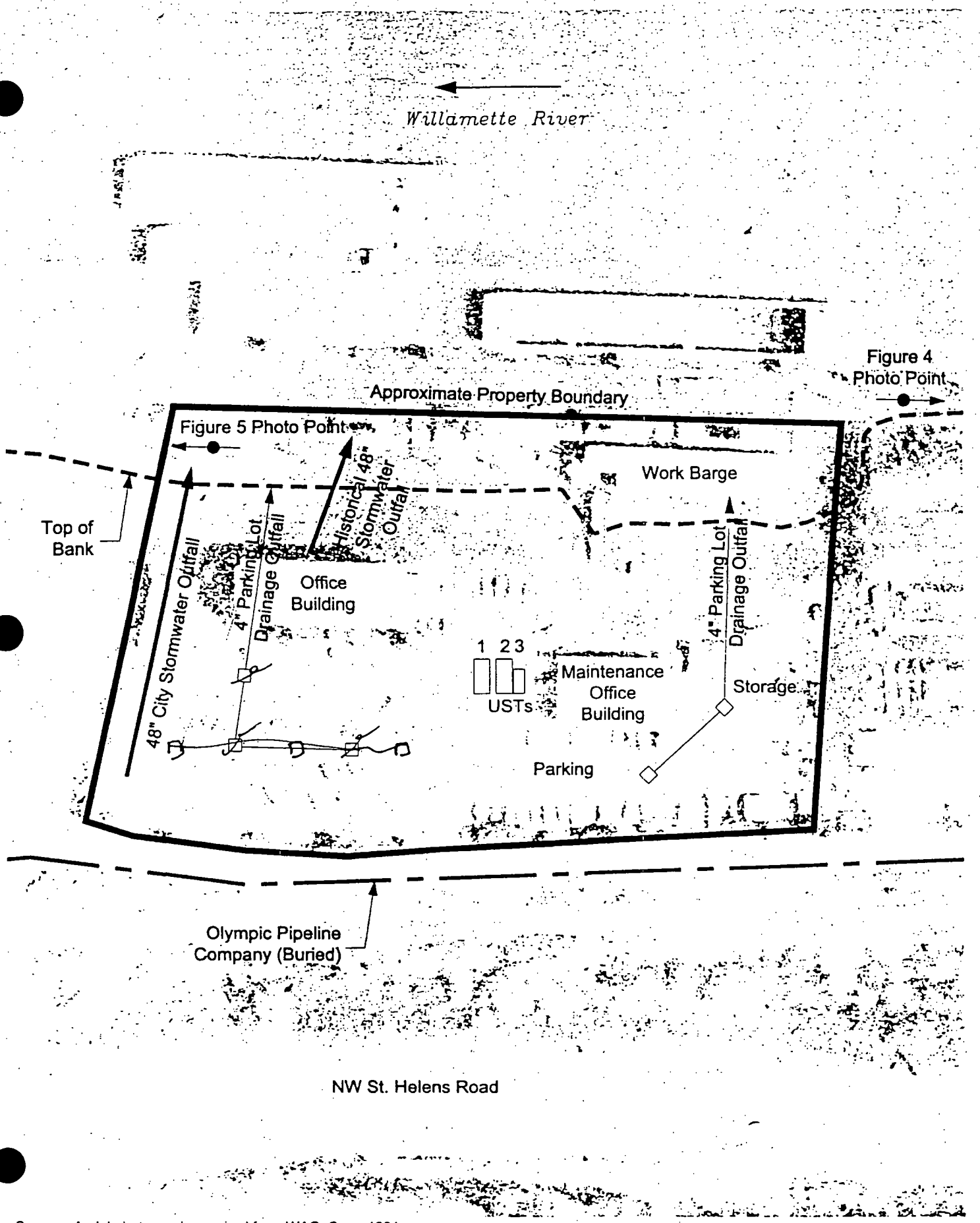
ANCHOR ENVIRONMENTAL, L.L.C.

0 1300
Scale In Feet

Source: Aerial photograph acquired from the Metro Data Resource Center, Oregon, 1997.

Figure 1
Site Location

02/15/00 BRX002a-01.DWG 99-056-01



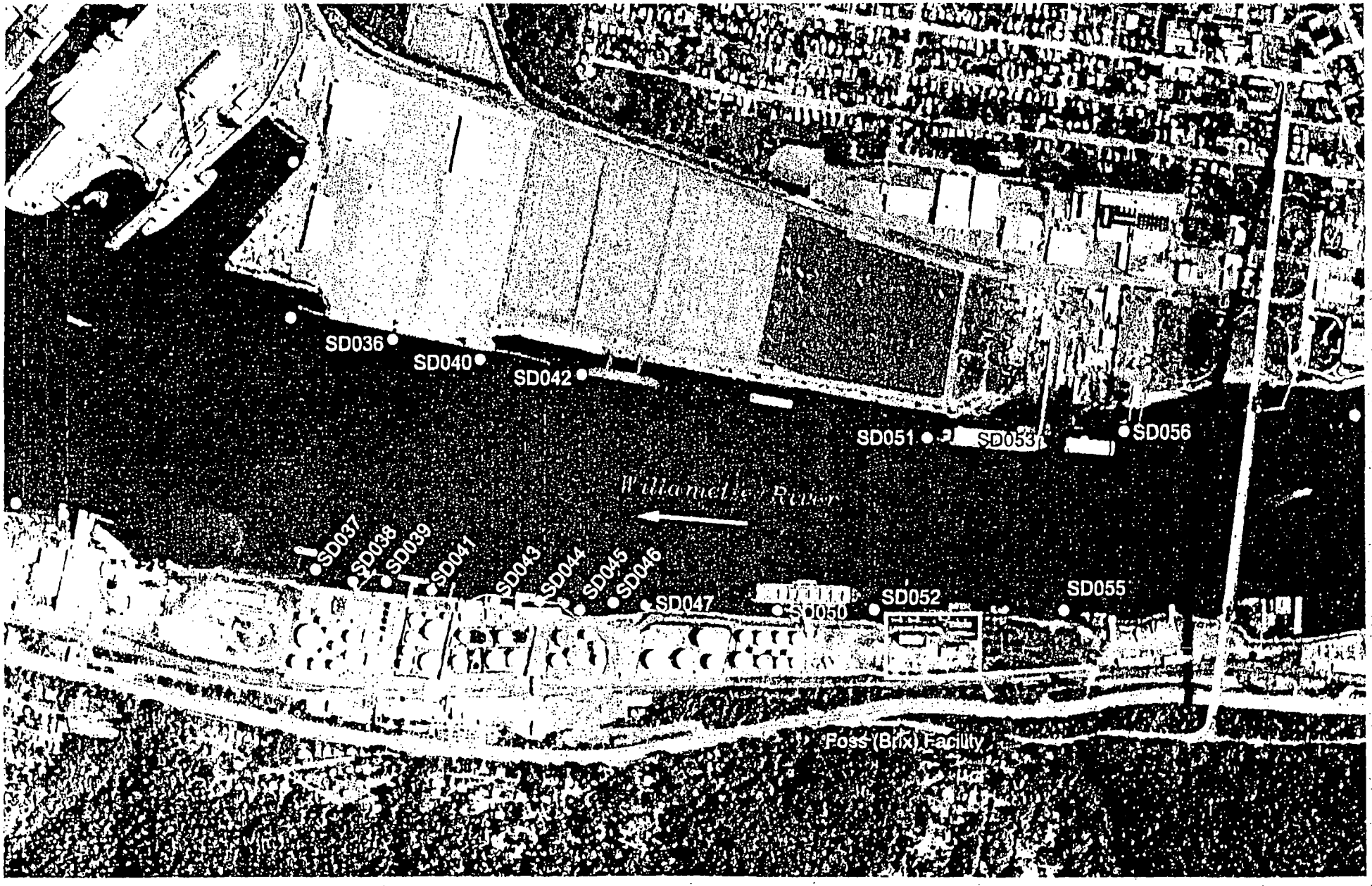
Source: Aerial photograph acquired from WAC, Corp. 1991.

ANCHOR ENVIRONMENTAL, L.L.C.

0 100
Scale in Feet

Figure 2
Site Map

02/15/00 BRX002c-01.dwg 99-056-01



ANCHOR ENVIRONMENTAL, L.L.C.

02/15/00 BRX002b-01.DWG 99-056-01

0 800
Scale in Feet

Source: Aerial photograph acquired from the Metro Data Resource Center, Oregon, 1997.

Portland Harbor Sediment Investigation Report (EPA, 1998)

Surface sediment sampling location

● SD053 Surface and subsurface sediments sampling location

-C Indicates core sample could not be co-located with surface sediment sampling location due to subsurface obstruction and/or insufficient recovery.

Figure 3
Existing Sediment Sample Locations

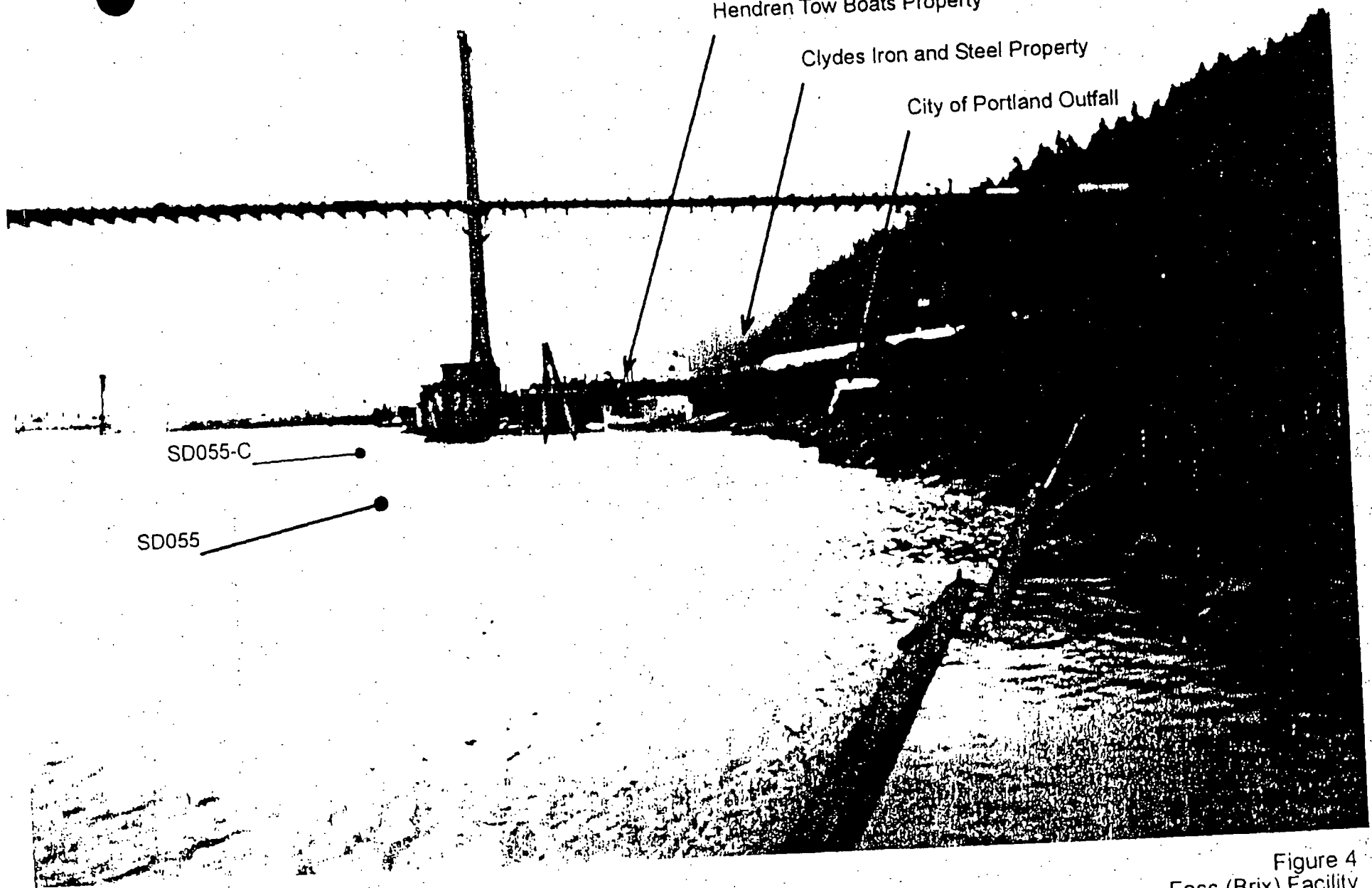
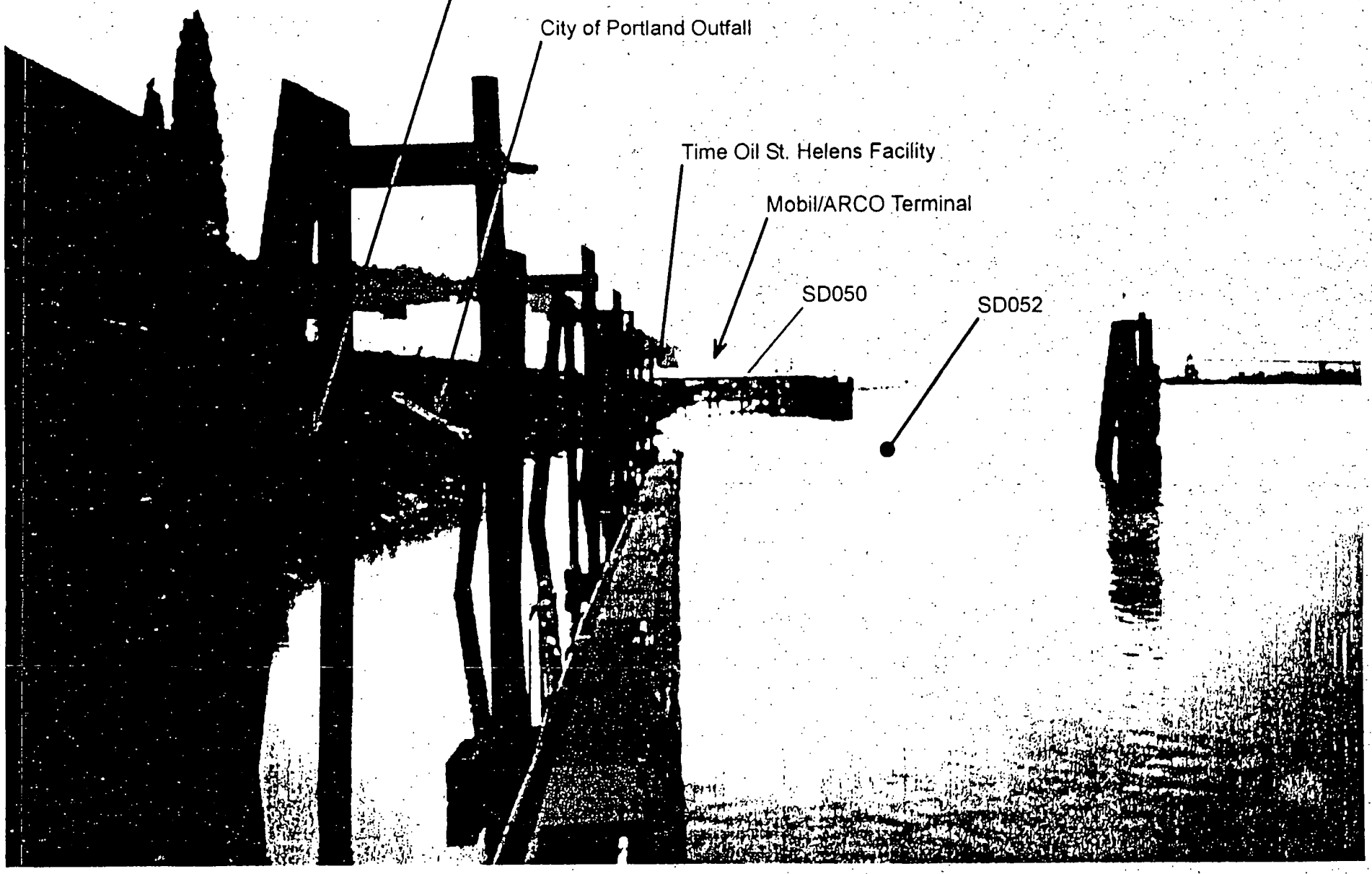


Figure 4
Foss (Brix) Facility
Looking Upstream

ANCHOR ENVIRONMENTAL, L.L.C.

02/10/00 BRX003b-01 fh8 99-056-01



ANCHOR ENVIRONMENTAL, L.L.C.

02/10/00 BRX003b.01 fh8 99-056-01

Figure 5
Foss (Brix) Facility
Looking Downstream

Screening Quick Reference Table for Inorganics in Solids

These tables were developed for internal use for screening purposes only; they do not represent official NOAA policy and do not constitute criteria or clean up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

(values in ppb dry weight)

TRACE ELEMENT	FRESHWATER SEDIMENT					MARINE SEDIMENT					SOIL	
	"Background" [1]	Lowest ARCs *H. azteca* TEL	Threshold Effects Level (TEL)	Probable Effects Level (PEL)	Upper [2] Effects Threshold (UET)	Threshold Effects Level (TEL)	Effects Range-Low (ERL)	Probable Effects Level (PEL)	Effects Range Median (ERM)	Apparent [3] Effects Threshold (AET)	Background Geometric Mean	Range
Predicted Toxicity Gradient:		Increasing				Increasing						
ALUMINUM (Al) (%)	0.26%	2.55%									4.7%	0.5->10%
ANTIMONY (Sb)	160				3,000 M					9,300 E	480	bd-8,800
ARSENIC (As)	1,100	10,798	5,900	17,000	17,000 B	7,240	8,200	41,600	70,000	57,000 B	5,200	bd-97,000
BARIUM (Ba)	700									48,000 A	440,000	10,000-0.5%
CADMIUM (Cd)	100-300	583	696	3,530	3,000 B	676	1,200	4,210	9,600	2,700 E		
CHROMIUM (Cr)	7,000-13,000	36,286	37,300	90,000	95,000 H	52,300	81,000	160,400	370,000	96,000 E	37,000	1000-0.2%
COBALT (Co)	10,000										6,700	bd-70,000
COPPER (Cu)	10,000-25,000	28,012	35,700	197,000	86,000 B	18,700	34,000	108,200	270,000	390,000 MO	17,000	bd-700,000
IRON (Fe) (%)	0.99-1.8 %	18.84%			4% B						1.8%	0.01->10%
LEAD (Pb)	4,000-17,000	34,175	35,000	91,300	127,000 H	30,240	46,700	112,180	218,000	430,000 E	16,000	bd-700,000
MANGANESE (Mn)	400,000	614,722			1,100,000 B						330,000	bd-0.7%
MERCURY (Hg)	4-51		174	486	560 M	130	150	696	710	410 M	58	bd-4,600
NICKEL (Ni)	9,900	19,514	18,000	35,900	43,000 H	15,900	20,900	42,800	51,600	110,000 E	13,000	bd-700,000
SELENIUM (Se)	290									1,000 A	260	bd-4,300
SILVER (Ag)	<500				4,500 H	730	1,000	1,700	3,700	>560 MO		
STRONTIUM (Sr)	49,000										120,000	bd-0.3%
TIN (Sn)	5,000										890	bd-10,000
VANADIUM (V)	50,000										58,000	bd-500,000
ZINC (Zn)	7,000-38,000	94,150	123,100	315,000	520,000 M	124,000	150,000	271,000	410,000	410,000 B	48,000	bd-0.28%

1 "Background" values are derived from a compilation of sources, but come primarily from Int. Joint Comm. Sediment Subcommittee (1988).

2 Entry is lowest value among a compilation of UET levels: B - Benthic community impacts; H - *Hyallela azteca* bioassay; M - Microtox bioassay

3 Entry is lowest value among the five AET tests: A - Amphipod bioassay; B - Benthic community impacts; M - Microtox bioassay; O - Oyster larvae bioassay; E - Echinoderm larvae

SOURCES:

Sediment: PTI Environ. Serv., Contaminated Sediments Criteria Rpt., 1989; Wash. Dept. Ecol. Publ. 95-308, 1995 and 97-323a, 1997; J. Great Lakes Res. 22(3):624-638, 1996; Gries & Waldow, Puget Sound Dredged Disposal Analysis Rpt., 1996; Environ. Manage. 19(1):81-97, 1996; The AET Approach; Briefing Rpt. to the EPA SAB, Sept. 1988; Int. Joint Comm., Procedures for Assessment of Contaminated Sediment in the Great Lakes, 1988; Ecotox. (5):253-278, 1996; EPA Rpt. 905-R96-008, Sept. 1996.

Soil: Shacklette and Boerngen 1984; USGS Prof. Paper 1270. bd denotes below detection limits.

FOR MORE INFORMATION CONTACT:

Michael Buchman
NOAA/HAZMAT

7600 Sand Point Way N.E.
Seattle, Washington 98115-0070
Tel: 206•526•6340
Fax: 206•526•6865
Internet: MIB@HAZMAT.NOAA.GOV

noaa SQRTs

Screening Quick Reference Table for Inorganics in Water

These tables were developed for internal use for screening purposes only: they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

(values in ppb)

TRACE ELEMENT	GROUND WATER	UNFILTERED SURFACE WATER				FILTERED SURFACE WATER			
	Maximum Contaminant Levels (MCLs)	Ambient Water Quality Criteria				Ambient Water Quality Criteria			
		Freshwater		Marine		Freshwater		Marine	
		acute	chronic	acute	chronic	acute	chronic	acute	chronic
ALUMINUM (Al)	50–200	pH 750	pH 87						
ANTIMONY (Sb)	6	88 p	30 p	1500 p	500 p				
ARSENIC (As^{+5})		360	190	69	36				
ARSENIC (As^{+3})		850*		2319*					
ARSENIC, total	50					360	190	69	36
BARIUM (Ba)	2000								
BERYLLIUM (Be)	4	130*	5.3*						
CADMIUM (Cd)	5	3.9	1.1	43	9.3	3.7 ‡	1.0 ‡	42	9.3
CHROMIUM (Cr^{+3})	< 100	1700	210	10300*		550	180		
CHROMIUM (Cr^{+6})	< 100	16	11	1079	50	15	10	1100	50
CHROMIUM, total	100								
COPPER (Cu)	1300 p	18	12	2.9		17	11	2.4	2.4
IRON (Fe)	300		1000						
LEAD (Pb)	15 p	83	3.2	217	8.5	65 ‡	2.5 ‡	210	8.1
MANGANESE (Mn)	50								
MERCURY (Hg)	2	2.4	0.012	2.1	0.025	2.1	Use total	1.8	Use total
NICKEL (Ni)	100	1400	160	75	8.3	1400	160	74	8.2
PHOSPHORUS (P)					0.1				
SELENIUM (Se)	50	20	5	294	71	Use total	Use total	290	71
SILVER (Ag)	100	4.1	0.12	2.3		3.4		1.9	
		0.92 p		7.2 p	0.92 p				
THALLIUM (Tl)	2	1400*	40*	2130*					
ZINC (Zn)	5000	120	110	95	86	110	100	90	81
Cyanide (HCN)	200	22	5.2	1		22	5.2	1	1

p — proposed

* Lowest Observable Effect Level

pH must be between 6.5 and 9.0 units

Hardness-dependent value with 25 mg/L as minimum & 400 mg/L as maximum calcium carbonate; value entered is for 100 mg/L calcium carbonate. Use equations to determine exact criteria.

‡ Conversion factor for samples filtered through a 0.45 µm filter is hardness-dependent itself.

For salinity between 1 and 10 ppt, use the more stringent of either fresh or marine values.

noaa SQRTs™

Screening Quick Reference Table for Inorganics in Water

These tables are for screening purposes for internal use only; they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy, however, NOAA is not liable for errors. Numbers are subject to change as new data become available.

(values in ppb)

TRACE ELEMENT	UNFILTERED SURFACE WATER — HARDNESS CALCULATIONS FOR FRESHWATER CRITERIA: acute	UNFILTERED SURFACE WATER — HARDNESS CALCULATIONS FOR FRESHWATER CRITERIA: chronic	FILTERED SURFACE WATER — CONVERSION FACTORS: acute	FILTERED SURFACE WATER — CONVERSION FACTORS: chronic
CADMIUM (Cd)	$CMC = e^{1.128[\ln(hardness)] - 3.828}$	$CCC = e^{0.7852[\ln(hardness)] - 3.49}$	$CF = 1.136672 - 0.041838[\ln(hardness)]$	$CF = 1.101672 - 0.041838[\ln(hardness)]$
CHROMIUM (CR^{+6})	$CMC = e^{0.819[\ln(hardness)] + 3.688}$	$CCC = e^{0.819[\ln(hardness)] + 1.561}$	CF = 0.316	CF = 0.860
COPPER (Cu)	$CMC = e^{0.9422[\ln(hardness)] - 1.464}$	$CCC = e^{0.8545[\ln(hardness)] - 1.465}$	CF = 0.960	CF = 0.960
LEAD (Pb)	$CMC = e^{1.273[\ln(hardness)] - 1.46}$	$CCC = e^{1.273[\ln(hardness)] - 4.705}$	$CF = 1.46203 - 0.145712[\ln(hardness)]$	$CF = 1.46203 - 0.145712[\ln(hardness)]$
NICKEL (Ni)	$CMC = e^{0.846[\ln(hardness)] + 3.3612}$	$CCC = e^{0.846[\ln(hardness)] + 1.1645}$	CF = 0.998	CF = 0.997
SILVER (Ag)	$CMC = e^{1.72[\ln(hardness)] - 6.52}$	CCC — No criteria	CF = 0.85	
ZINC (Zn)	$CMC = e^{0.8473[\ln(hardness)] + 0.8604}$	$CCC = e^{0.8473[\ln(hardness) + 0.7614}$	CF = 0.978	CF = 0.986

Hardness calculations may be used to derive an exact criterion based on sample-specific hardness.
Hardness may range from 25 to 400 mg/L as calcium carbonate. For hardness outside this range, use 25 and 400 mg/L as the minimum and maximum value allowed.

Multiply CMC or CCC by Conversion Factor (CF) to determine exact dissolved criterion for samples filtered through 0.45 µm filter.
For cadmium and lead, the conversion factor itself is hardness-dependent.

For salinity between 1 and 10 ppt, use the more stringent of either fresh or marine values.

CMC – Criteria Maximum Concentration is the highest level for an average 1-hour exposure and is synonymous with "acute."
CCC – Criteria Continuous Concentration is the highest level for an average 4-day exposure and is synonymous with "chronic."

Sources:

MCL	EPA 810-F-94-001A EPA 570/9-91-019FS
AWQC:	Fed. Reg. 4 May 1995, Vol. 60 (86): 22229-22237 US EPA, Quality Criteria for Water Summary 1994, EPA Health and Ecological Criteria Division

For More Information Contact:

Michael Buchman
NOAA/HAZMAT
7600 Sand Point Way N.E.
Seattle, Washington 98115-0070
Tel: 206•526•6340
Fax: 206•526•6865
Internet: MFB@HAZMAT.NOAA.GOV

Screening Quick Reference Table for Organics

These tables were developed for internal use for screening purposes only; they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

(all values in ppb; dry weight for sediment and soil)

CHEMICAL	CAS No.	WATER: Maximum Contaminant Level	WATER: Ambient Water Quality Criteria[1] Freshwater acute	WATER: Freshwater chronic	WATER: Marine acute	WATER: Marine chronic	SEDIMENT: Freshwater Sediment: Lowest ARCs *H. azteca* TEL	SEDIMENT: Freshwater Sediment: Threshold Effects Level (TEL)	SEDIMENT: Freshwater Sediment: Probable Effects Level (PEL)	SEDIMENT: Freshwater Sediment: Upper Effects Threshold[2] (UET)	SEDIMENT: Marine Sediment: Threshold Effects Level (TEL)	SEDIMENT: Marine Sediment: Effects Range-Low (ERL)	SEDIMENT: Marine Sediment: Effects Range-Median (ERM)	SEDIMENT: Marine Sediment: Probable Effects Level (PEL)	SEDIMENT: Marine Sediment: Apparent Effects Threshold[3] (AET)	SOIL: Agricultural Target[4]	SOIL: Urban park / Residential Target[4]
CHLORINATED DIOXINS & PCBS																	
TCDD 2,3,7,8-	1746016	0.00003	<0.01*	<0.00001*						0.0088 H						0.01	1
POLYCHLORINATED BIPHENYLS	1336363	0.5	2	0.014	10	0.03	31.62	34.1	277	26 M	21.55	22.7	180	188.79	130 M	500	5000
SEMIVOLATILES																	
BENZIDINE	92875		2500*														
BENZOIC ACID	65850														650 OBM		
BENZYL ALCOHOL	100516														57 M		
CHLOROANILINE 4-	106478		250*C	50*C	160*C	129*C											
DIBENZOFURAN	132649									6100 H					110 E		
DIPHENYLHYDRAZINE 1,2-	122667		270*														
ISOPHORONE	78591		117000*		12900*												
SEMIVOLATILE, NITROAROMATICS																	
DINITROTOLUENE 2,4-	121142		330*	230*	590* S	370*S											
NITROBENZENE	98953		27000*		6680*												
N-NITROSODIPHENYLAMINE	86306		5850C*		3300000*C										28 B		
SEMIVOLATILE, ORGANOCHLORINES																	
ALDRIN	309002		3		1.3					40 B					10 E		
CHLORDANE	57749	2	2.4	0.0043	0.09	0.004		4.5	8.9	30 B	2.26	0.5	6	4.79	>4.5 E		
CHLORONAPHTHALENE 2-	91587		1600* C		7.5* C												
DDD	72548		0.6*		3.6*			3.54	8.51	<60 B	1.22	2	20	7.81	<16 B		
DDE	72559		1050*		14*			1.42	6.75	<50 B	2.07	2.2	27	374.17	<9 B		
DDT	50293		1.1	0.001	0.13	0.001				50 B	1.19	1	7	4.77	12 E		
DDT, total								6.98	4450	50 B	3.89	1.58	46.1	51.7	37 E		
DIELDRIN ‡	60571		2.5	0.0019	0.71	0.0019		2.85	6.67	300 B	0.715	0.02	8	4.3	1.9 E		
ENDOSULFAN	115297		0.22	0.056	0.034	0.0087											
ENDRIN ‡	72208	2	0.18	0.0023	0.037	0.0023		2.67	62.4	500 B							
HEPTACHLOR	76448	0.4	0.52	0.0038	0.053	0.0036				10 B					2 E		
HEPTACHLOR EPOXIDE	1024573	0.2	0.52	0.0038	0.053	0.0036		0.6	2.74	30 B							
HEXACHLOROBENZENE	118741	1	6 p	3.68 p	160*C	129*C				100 B					22 B	50	2000
HEXACHLOROBUTADIENE	87683		90*	9.3*	32*										1.3 E		

‡ — EPA Proposed Criteria, based on Equilibrium Partitioning, for Dieldrin are 11,000 and 20,000, and for Endrin are 4,200 and 760 µg/kg O.C. in freshwater and marine sediment, respectively.

1 p - proposed; * - Lowest Observable Effect Level; C - value for chemical class; S - value for the summation of all isomers.

2 Entry is lowest value among AET tests on 1% TOC basis: B - Benthic community impacts; M - Microtox bioassay; H - *Hyallela azteca* bioassay; — - value on dry weight basis.

3 Entry is lowest value among five AET tests: A - Amphipod bioassay; B - Benthic community impacts; M - Microtox bioassay; O - Oyster larvae bioassay; E - Echinoderm larvae bioassay.

4 Residues greater than target require remediation to levels below target for applicable agricultural or recreational/residential use in British Columbia; 'A' denotes value to protect adjacent aquatic habitat.

noaa SQuiRTs™

Screening Quick Reference Table for Organics

These tables were developed for internal use for screening purposes only. They do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

(all values in ppb; dry weight for sediment and soil)

CHEMICAL	CAS No.	WATER: Maximum Contaminant Level	WATER: Ambient Water Quality Criteria[1] Freshwater acute	WATER: Freshwater chronic	WATER: Marine acute	WATER: Marine chronic	SEDIMENT: Freshwater Sediment: Lowest ARCs H. azteca TEL	SEDIMENT: Freshwater Sediment: Threshold Effects Level (TEL)	SEDIMENT: Freshwater Sediment: Probable Effects Level (PEL)	SEDIMENT: Freshwater Sediment: Upper[2] Effects Threshold (UET)	SEDIMENT: Marine Sediment: Threshold Effects Level (TEL)	SEDIMENT: Marine Sediment: Effects Range-Low (ERL)	SEDIMENT: Marine Sediment: Effects Range-Median (ERM)	SEDIMENT: Marine Sediment: Probable Effects Level (PEL)	SEDIMENT: Marine Sediment: Apparent[3] Effects Threshold (AET)	SOIL: Agricultural Target[4]	SOIL: Urban park / Residential Target[4]
HEXACHLOROCYCLOHEXANE (BHC)	608731		100*		0.34*					100 B						50	2000
HEXACHLOROCYCLOPENTADIENE	77474	50	7*	5.2*	7*												
HEXACHLOROETHANE	67721		980*	540*	940*												
LINDANE	58899	0.2	2	0.08	0.16			0.94	1.38	9 B	0.32			0.99			
METHOXYCHLOR	72435	40		0.03		0.03											
MIREX	2385855			0.001		0.001				800 B							
PENTACHLOROBENZENE	608935		250°C	50°C	160°C	* 129C										100	1000
TETRACHLOROBENZENE 1,2,4,5-	95943		250°C	50°C	160°C	* 129C										100	1000
TOXAPHENE	8001352	3	0.073	0.0002	0.21	0.0002											
SEMIVOLATILE, ORGANOPHOSPHATES																	
CHLORPYRIFOS	2921882		0.083	0.041	0.011	0.0056											
MALATHION	121755			0.1		0.1											
PARATHION MIXTURE	56382		0.065	0.013													
SEMIVOLATILE, PHENOLICS																	
CHLOROPHENOL 2-	95578		4380*													50	500
DICHLOROPHENOL 2,4-	120832		2020*	365*												50	500
DIMETHYLPHENOL 2,4-	105679		2120*												29 OM	100	1000
DINITROPHENOL	51285		230°C	150°C	4850°C											100	1000
METHYL PHENOL 2- (O-CRESOL)	95487														55 E	100	1000
METHYL PHENOL 4- (p-CRESOL)	106445														110 E	100	1000
NITROPHENOL 4-	100027		230°C	150°C	4850°C											100	1000
PENTACHLOROPHENOL (at pH 7.8)	87865	1.0 p	20 pH	13 pH	13	7.9									360 A	35A pH	35 A pH
PHENOL	108952		10200*	2560*	5800*					48 H					420 O	100	1000
TETRACHLOROPHENOL 2,3,4,6-	58902				440*											50	500
TRICHLOROPHENOL 2,4,5-	95954		100 p	63 p	240 p	p11										50	500
TRICHLOROPHENOL 2,4,6-	88062			970*												50	500
SEMIVOLATILE, PHTHALATES																	
BUTYL BENZYL PHTHALATE	85687		940°C	3°C	2944°C	* 3.4 C									63 M		
DI(2-ETHYLHEXYL) PHTHALATE	117817	6	400 p	360 p	400 p	p360				750 M	182.16			2646.51	1300 B		
DIETHYL PHTHALATE	84662		940°C	3°C	2944°C	* 3.4 C									200 B		
DIMETHYL PHTHALATE	131113		940°C	3°C	2944°C	* 3.4 C									71 M		
DIOCTYL PHTHALATE	117840		940°C	3°C	2944°C	* 3.4 C									6200 B		
N-BUTYL PHTHALATE	84742		940°C	3°C	2944°C	* 3.4 C				110 H					1400 AOM		

1 p - proposed; * - Lowest Observable Effect Level; C - value for chemical class; S - value for the summation of all isomers; pH - value is dependent on pH.

2 Entry is lowest value among AET tests on 1% TOC basis; B - Benthic community impacts; M - Microtox bioassay; H - *Hyallela azteca* bioassay — value on dry weight basis

3 Entry is lowest value among five AET tests; A - Amphipod bioassay; B - Benthic community impacts; M - Microtox bioassay; O - Oyster larvae bioassay; E - Echinoderm larvae bioassay.

4 Residues greater than target require remediation to levels below target for applicable agricultural or recreational/residential use in British Columbia; 'A' denotes value to protect adjacent, aquatic habitat

Screening Quick Reference Table for Organics

These tables were developed for internal use for screening purposes only; they do not represent official NOAA policy and do not constitute criteria or clean up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

(all values in ppb; dry weight for sediment and soil)

CHEMICAL	CAS No.	WATER: Maximum Contaminant Level	WATER: Ambient Water Quality Criteria[1] Freshwater acute	WATER: Freshwater chronic	WATER: Marine acute	WATER: Marine chronic	SEDIMENT: Freshwater sediment: Lowest ARCs *H. azteca* TEL	SEDIMENT: Freshwater sediment: Threshold Effects Level (TEL)	SEDIMENT: Freshwater sediment: Probable Effects Level (PEL)	SEDIMENT: Freshwater sediment: Upper[2] Effects Threshold (UET)	SEDIMENT: Marine sediment: Threshold Effects Level (TEL)	SEDIMENT: Marine sediment: Effects Range-Low (ERL)	SEDIMENT: Marine sediment: Effects Range-Median (ERM)	SEDIMENT: Marine sediment: Probable Effects Level (PEL)	SEDIMENT: Marine sediment: Apparent[3] Effects Threshold (AET)	SOIL: Agricultural Targets[4]	SOIL: Urban park / Residential Targets[4]
SEMIVOLATILE, PAHS																	
ACENAPHTHENE	83329		1700*	520*	970*	710*				290 M	6.71	16	500	88.9	130 E		
ACENAPHTHYLENE	208968				300°C					160 M	5.87	44	640	127.87	71 E		
ANTHRACENE	120127				300°C		10			260 M	46.85	85.3	1100	245	280 E		
BENZO(K)FLUORANTHENE	207089				300°C		27.2			13,400B					1800 EC	100	1000
BENZO-A-PYRENE	50328	0.2			300°C		32.4	31.9	782	700 B	88.81	430	1600	763.92	1100 E	100	1000
BENZO[B]FLUORANTHENE	205992				300°C										1800 EC	100	1000
BENZO[GHI]PERYLENE	191242				300°C					300 M					670 M		
BENZ[A]ANTHRACENE	56553				300°C		15.72	31.7	386	500 B	74.83	261	1600	692.53	960 E	100	1000
CHRYSENE	218019				300°C		28.83	57.1	862	800 B	107.77	384	2800	845.98	950 E		
DIBENZ[A,H]ANTHRACENE	53703				300°C		10			100 M	6.22	63.4	260	134.61	230 OM	100	1000
FLUORANTHENE	206440		3980*		40*	16*	31.46	111	2355	1,500 M	112.82	600	5100	1493.54	1300 E		
FLUORENE	86737				300°C		10			300 M	21.17	19	540	144.35	120 E		
INDENO(1,2,3-CD)PYRENE	193395				300°C		17.32			330 M					600 M	100	1000
METHYLNAPHTHALENE, 2-	91576				300°C						20.21	70	670	201.28	64 E		
NAPHTHALENE	91203		2300*	620*	2350*		14.65			800 B	34.57	160	2100	390.64	230 E	100	5000
PHENANTHRENE	85018		30 p	6.3 p	7.7 p	4.6 p	18.73	41.9	515	800 B	86.68	240	1500	543.53	660 E	100	5000
PYRENE	129000				300°C		44.27	53	875	1,000 B	152.68	665	2600	1397.6	2400 E	100	10000
LMW PAHs					300°C		76.42			5,300 M	311.7	552	3160	1442.00	1200 E		
HMW PAHs					300°C		192.85			6,500 M	655.34	1700	9600	6876.14	7900 E		
Total PAHs					300°C		284.05			12,000M	1684.06	4022	44792	16770.4			
VOLATILE, AROMATIC & HALOGENATED																	
BENZENE	71432	5	5300*		5100*	700*										8 A	8 A
BIS(2-CHLOROETHOXY)METHANE	111911		11000°C		12000°C	6400°C											
CARBON TETRACHLORIDE	56235	5	35200*		50000*											100	5000
CHLOROBENZENE	108907	100	250°C	50°C	160°C	129°C										100	1000
CHLORODIBROMOMETHANE	124481	100C	11000°C		12000°C	6400°C											
CHLOROFORM	67663	5	28900*	1240*												100	5000
DIBROMOMETHANE	74953	0.05	11000°C		12000°C	6400°C											
DICHLOROBENZENE 1,2-	95501	600	1120°S	763°S	1970°S	129°C									35 M	100	1000
DICHLOROBENZENE 1,4-	106467	75	1120°S	763°S	1970°S	129°C									110 BM	100	1000
DICHLOROBROMOMETHANE	75274	100C	11000°C		12000°C	6400°C											
DICHLORODIFLUOROMETHANE	75718		11000°C		12000°C	6400°C											

1 p - proposed; * - Lowest Observable Effect Level; C - value for chemical class; S - value for the summation of all isomers.
2 Entry is lowest value among AET tests on 1% TOC basis: B - Benthic community impacts; M - Microtox bioassay; H - *Hyallela azteca* bioassay.
3 Entry is lowest value among five AET tests: A - Amphipod bioassay; B - Benthic community impacts; M - Microtox bioassay; C - Oyster larvae bioassay; E - Echinoderm larvae bioassay.
4 Residues greater than target require remediation to levels below target for applicable agricultural or recreational/residential use in British Columbia: 'A' denotes value to protect adjacent, aquatic habitat

Screening Quick Reference Table for Organics

These tables were developed for internal use for screening purposes only; they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

(all values in ppb; dry weight for sediment and soil)

CHEMICAL	CAS No.	WATER: Maximum Contaminant Level	WATER: Ambient Water Quality Criteria[1] Freshwater acute	WATER: Freshwater chronic	WATER: Marine acute	WATER: Marine chronic	SEDIMENT: Freshwater sediment: Lowest ARCs H. azteca TEL	Freshwater sediment: Threshold Effects Level (TEL)	Freshwater sediment: Probable Effects Level (PEL)	Freshwater sediment: Upper Effects threshold[2] (UET)	Marine sediment: Threshold Effects Level (TEL)	Marine sediment: Effects Range-Low (ERL)	Marine sediment: Effects Range-Median (ERM)	Marine sediment: Probable Effects Level (PEL)	Marine sediment: Apparent Effects Threshold[3] (AET)	SOIL: Agricultural Target[4]	SOIL: Urban park / Residential Target[4]
DICHLOROETHANE 1,1-	75343															100	5000
DICHLOROETHYLENE 1,2-cis	540880	70	11600*S		224000*S											100	5000
DICHLOROETHYLENE 1,2-trans	156605	100	11600*S		224000*S											100	5000
DICHLOROPROPENE	542756		6060*S	244*S	790*S											100	5000
ETHYL BENZENE	100414	700	32000*		430*										4 E	1000000A	1000000A
ETHYLENE DICHLORIDE	107062	5	118000*	20000*	113000*												
METHYLENE CHLORIDE	75092	5														100	5000
PENTACHLOROETHANE	76017		7240*	1100*	390*	281*											
PROPYLENE DICHLORIDE	78875	5	23000*S	5700*S	10300*S	3040*S											
STYRENE	100425	100														100	5000
TETRACHLOROETHANE	79345		9320*													100	5000
TETRACHLOROETHANE 1,1,1,2-	630206		9320*S	2400*	9020*											100	5000
TETRACHLOROETHYLENE	127184	5	5280*	840*	10200*	450*									57 B	5000 A	5000 A
TOLUENE	108883	1000	17500*		6300*	5000*										300000A	300000A
TRICHLOROBENZENE 1,2,4-	120821	70	260*C	50*C	160*C	129*C									> 4.8 E	100	1000
TRICHLOROETHANE 1,1,1-	71556	200	18000*S		31200*											100	5000
TRICHLOROETHANE 1,1,2-	79005	5	18000*S	9400*												100	5000
TRICHLOROETHYLENE	79016	5	45000*	21900*	2000*											65 A	65 A
TRICHLOROFLUOROMETHANE	75694		11000*C		12000*C	6400*C											
VINYLIDENE CHLORIDE	75354	7	11600* S		224000*S												
XYLENE	1330207	10000													21 E	100	5000
VOLATILES, NITRILES																	
ACROLEIN	107028		68*	21*	55*												
ACRYLONITRILE	107131		7550*	2600*													

1 p - proposed; * - Lowest Observable Effect Level; C - value for chemical class; S - value for the summation of all isomers.
2 Entry is lowest value among AET tests on 1% TOC basis: B - Benthic community impacts; M - Microtox bioassay; H - *Hyallela azteca* bioassay.
3 Entry is lowest value among five AET tests: A - Amphipod bioassay; B - Benthic community impacts; M - Microtox bioassay; O - Oyster larvae bioassay; E - Echinoderm larvae bioassay.
4 Residues greater than target require remediation to levels below target for applicable agricultural or recreational/residential use in British Columbia; 'S' denotes value to protect adjacent, aquatic habitat.

Sources:

Water: EPA 810-F-94-001A; EPA 570/9-91-019FS; Fed. Reg. 4 May 1995, Vol. 60 (86): 22229-22237. US EPA, Quality Criteria for Water Summary 1994, EPA Health and Ecological Criteria Div.

Sediment: EPA 905-R96-008, Sept. 1996; J. Great Lakes Res. 22(3):624-638, 1996; Wash. Dep. Ecol. Publ. 95-308, 1995 and 97-323a, 1997; Environ. Manage. 19(1): 81 - 97, 1996; The AET Approach: Briefing Rpt. to the EPA SAB, September 1988; Gries & Waldow, Puget Sound Dredged Disposal Analysis Rept., 1996; Ecotox. (5):253-278, 1996

Soil: British Columbia Regulation 375/96, Contaminated Sites Regulation, June 13, 1997.

For More Information Contact:

Michael Buchman
NOAA/HAZMAT

7600 Sand Point Way N.E.
Seattle, Washington 98115-0070
Tel: 206•526•6340
Fax: 206•526•6865
Internet: MFB@HAZMAT.NOAA.GOV

Options For Selection of Analytical Methods: Metals

These tables were developed for internal use for screening purposes only; they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to change as new data become available.

TRACE ELEMENT	OTHER[1]	FLAME AA	FURNACE AA	ICP	EXTRACTION METHODS	
		7000B [2]	7010 [2]		Water	Soil / Sediment
ALUMINUM (Al)	6800	7020		6010B 6020A	3005A 3010A 3015A	3050B 3051A
ANTIMONY (Sb)	6200(55) 6800	7040	7041 7062 [3]	6010B 6020A	3005A 3015A	3050B 3051A
ARSENIC (As)	6200(60) 7063 7061A [3]		7060 7062 [3]	6010B 6020A	3005A 3010A 3015A 7063	3050B 3051A
BARIUM (Ba)	6200(60) 6800	7080A	7081 [3]	6010B 6020A	3005A 3010A 3015A	3050B 3051A
BERYLLIUM (Be)		7090	7091	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
CADMIUM (Cd)	6200 6800	7130	7131A	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
CALCIUM (Ca)	6200 6800	7140		6010B 6020A	3005A 3010A 3015A	3050B 3051A
CHROMIUM (CR), total	6200(200) 6800	7190	7191	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
CHROMIUM^{+6} (Cr^{+6})	7195 — 7199 [3]				7195 - 7199	3060A
COBALT (Co)	6200(330)	7200	7201	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
COPPER (Cu)	6200(85) 6800	7210	7211 [3]	6010B 6020A	3005A 3010A 3015A	3050B 3051A
IRON (Fe)	6200 6800	7380	7381 [3]	6010B 6020A	3005A 3010A 3015A	3050B 3051A
LEAD (Pb)	6200(45) 6800	7420	7421	6010B 6020A	3005A 3010A 3015A 3020A	3051A
MAGNESIUM (Mg)	6800	7450		6010B 6020A	3005A 3010A 3015A	3050B 3051A
MANGANESE (Mn)	6200(240)	7460	7461	6010B 6020A	3005A 3010A 3015A	3050B 3051A
MERCURY (Hg)	4500(0.5) 6200 6800 7470A 7471B 7472 7473 7474 [3]			6020A	7470A 7472 3015A	3051A 7471B 7473 7474
MOLYBDENUM (Mo)	6200(25) 6800	7480	7481	6010B	3005A 3010A 3015A 3020A	3050B 3051A
NICKEL (Ni)	6200(100) 6800	7520	7521	6010B 6020A	3005A 3010A 3015A	3050B 3051A
POTASSIUM (K)	6200 6800	7610		6010B 6020A	3005A 3010A 3015A	3050B 3051A
SELENIUM (Se)	6200 6800 7741A 7742 [3]		7740	6010B 6020A	3005A 3010A 3015A	3050B 3051A
SILVER (Ag)	6200 6800	7760A	7761 [3]	6010B 6020A	3005A 3015A	3051A 7760 7761
SODIUM (Na)		7770		6010B 6020A	3005A 3010A 3015A	3050B 3051A
STRONTIUM (Sr)	6200(30) 6800	7780		6010B	3015A	3050B 3051A
THALLIUM (Tl)	6200 6800	7840	7841	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
TIN (Sn)	6200(85)	7870				
VANADIUM (V)	6200 6800	7910	7911	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
ZINC (Zn)	6200(80) 6800	7950	7951 [3]	6010B 6020A	3005A 3010A 3015A	3050B 3051A
CYANIDE (HCN)	9010B — 9014 [3]					

1 Method 6200 is Portable X-Ray; 6800 is Elemental/Isotope Mass Spec.; 4500 is Immunoassay; 7063 is ASV; where available, soil detection limits in ppm are in parentheses.

2 Except as noted, most individual procedures are proposed to be integrated into Method 7000B or 7010.

3 Includes various methods. Follow the extraction procedure detailed in the individual determinative method.

Sources:

All method numbers refer to EPA SW-846, Volume III with changes as proposed for Volume IV.

ICP's advantage is that it allows simultaneous or rapid sequential determination of many elements, but suffers from interferences. AA determinations are normally completed as single element analyses. ICP and Flame AA have comparable detection limits (within a factor of 4), but ICP-MS (6020A) can drastically improve the detection limits (e.g., an order of magnitude lower). Furnace AA generally exhibits lower detection limits than ICP or Flame-AA, and offers more control over unwanted matrix components. X RAY and immunoassays allow field determinations.

FOR MORE INFORMATION CONTACT:

Michael Buchman
HOAA/HAZMAT

7600 Sand Point Way N.E.
Seattle, Washington 98115-0070
Tel: 206•526•6540
Fax: 206•526•6865
Internet: MFB@HAZMAT.NOAA.GOV

Options for Selection of Analytical Methods

These tables were developed for internal use for screening purposes only; they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

COMPOUNDS	FIELD METHODS [1]	GC/MS METHOD	SPECIFIC DETECTION METHOD	HPLC METHOD	EXTRACTION METHODS Water	EXTRACTION METHODS Soil / Sediment	CLEANUP METHOD
AROMATIC and HALOGENATED VOLATILES		8260B	8021B		5021 5030B 5032	5021 5032 5035	
CARBAMATES				8318 8321B	8318 8321B	8318 8321B	8318
CHLORINATED DIOXINS and FURANS			8280B 8290A		8280B 8290A	8280B 8290A 3545A	8280B 8290A
CHLORINATED HYDROCARBONS		8270D	8121		3510C 3520C 3535A	3540C 3550B	3620B 3640A
CHLORINATED PHENOXYACIDS	4015 (0.1 ppm)	8270D [2]	8151A	8321B	8151A 8321B 3535A	8321B 8151A 3545A 3580A	8151A 3620B
HALOETHERS		8270D	8111		3510C 3520C	3540C 3545 3550B	3620B 3640A
NITRILES and AMIDES		8260B	8031 8032A 8033	8315 8316	5030B — 5032 8031 8032A 8316	5031 5032 5035	8032A
NITROAROMATICS and KETONES		8270D	8091	8330A	3510C 3520C 3535A	3540C 3545 3550B	3620B 3640A
NITROAROMATICS (Explosives)	4050 (0.5 ppm) 4051 8515 (1 ppm)			8330A - 8332	8330A — 8332	8330A — 8332	8330A — 8332 3620B
NITROSAMINES		8270D	8070A		3510C 3520C 8070A	3540C 3545 3550B 8070A	3610B 3620B 3640A 8070A
NON-HALOGENATED VOLATILES		8260B	8015B		5030B — 5032	5021 5031 5032 5035	
ORGANOCHLORINES	4040 — 4042 (0.2 to 20 ppm)	8270D [2]	8081B 8275A		3510C 3520C 3535A	3540C 3545A 3550B 3562	3620B 3630C 3640A 3660
ORGANOPHOSPHATES		8270D [2]	8141B	8321B	3510C 3520C 3535A	3540C 3545A 3550B	3620B
PAHS	4035 (1 ppm)	8270D	8100 8275A	8310	3510C 3520C	3540C 3545 3550B 3561	3610B 3630 3640A 3650B
PCBS	4020 (5 ppm) 9078 (2 ppm)	8270D [2]	8082A 8275A		3510C 3520C 3535A	3540C 3545A 3550B 3665A 3562	3620B 3630C 3640A 3660 3665A
PHENOLICS	4010A (0.5 ppm)	8270D	8041		3510C 3520C	3540C 3545 3550B	3630 3640A 3650B 8041
PHTHALATES		8270D	8061A		3510C 3520C 3535A	3540C 3545 3550B	3610B 3620B 3640A
SEMI-VOLATILE ORGANICS		8270D			3510C 3520C 3535A	3540C 3545A 3550B	3640A 3650B 3660
TOTAL ORGANIC HALIDES (TOX)			9020B 9022		9020B 9022		
TOTAL PETROLEUM HYDROCARBONS	4030 (5 ppm) 9074		8015B				
VOLATILE ORGANICS		8260B	8015B 8021B		5030B — 5032	5021 5031 5032 5035	

1 Series 4000 are immunoassays and are for specific compounds within these classes (i.e., 2,4-D, TNT, RDX, and PCP). Soil detection limits are in parentheses.

2 This is not a method of choice, but rather a confirmatory method.

SOURCES:

All method numbers refer to EPA SW-846, Update III, with changes as proposed in Update IV.

Options shown are generally for chemical classes; more detailed information may be available for specific compounds.

GC/MS methods allow for scanning a broad range of volatile and semi-volatile compounds, but suffer from interference and higher detection limits. Specific determination methods and HPLC methods allow for more precise determinations of specific compounds of interest.

FOR MORE INFORMATION CONTACT:

Michael Buchman
NOAA/HAZMAT

7600 Sand Point Way N.E.
Seattle, Washington 98115-0070
Tel: 206•526•6340
Fax: 206•526•6865
Internet: MFB@HAZMAT.NOAA.GOV

Guidelines for Sample Collection & Storage

These tables were developed for internal use for screening purposes only; they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

MATERIAL	CONTAINER[1]	PRESERVATION	MAXIMUM HOLDING TIME	SAMPLE SIZE
INORGANICS				
CHROMIUM^{+6} (Cr^{+6})	P,G	Cool, 4°C	24 hours	400 mL/200 g
MERCURY (Hg)	P,G	HNO_3, to pH <2	28 days	400 mL/200 g
METALS, except Cr^{+6} and Hg	P,G	HNO_3, to pH <2	6 months	600 mL/200 g
CYANIDE by method no. 9010	P,G	Cool 4°C, pH >12 See method 9010	14 days	1000 mL
ALPHA, BETA, AND RADIUM RADIATION	P,G	HNO_3 to pH <2	6 months	1000 mL
ORGANICS				
BENZIDINES	G, TLC	Cool, 4°C	7 days until extraction, 40 days after extraction	1000 mL
CHLORINATED HYDROCARBONS	G, TLC	Cool, 4°C[3]	7 days until extraction, 40 days after extraction	1000 mL
DIOXINS AND FURANS	G, TLC	Cool, 4°C[3]	30 days until extraction, 45 days after extraction	1000 mL
HALOETHERS	G, TLC	Cool, 4°C[3]	7 days until extraction, 40 days after extraction	1000 mL
NITRITES	G, TLC	Cool, 4°C[3]	14 days	
NITROSAMINES	G, TLC	Cool, 4°C[3]	7 days until extraction, 40 days after extraction	1000 mL
NITROAROMATICS AND CYCLIC KETONES	G, TLC	Cool, 4°C[3]	7 days until extraction, 40 days after extraction	1000 mL
OIL and GREASE	G	Cool, 4°C[2]	28 days	1000 mL
TOTAL ORGANIC CARBON, by method no. 9060	P,G	Cool, 4°C[2] store in the dark	28 days	100 mL
TOTAL ORGANIC HALIDES by method no. 9020 / 9021	G, TLC	Cool, 4°C[2]	28 days	500 mL
PCBs	G, TLC	Cool, 4°C	7 days until extraction, 40 days after extraction	1000 mL/250 mL
PESTICIDES	G, TLC	Cool 4°C,	7 days until extraction, 40 days after extraction	1000 mL/250 mL
PHENOLS	G, TLC	Cool, 4°C[3]	7 days until extraction, 40 days after extraction	1000 mL
PHTHALATE ESTERS	G, TLC	Cool, 4°C	7 days until extraction, 40 days after extraction	1000 mL
POLYNUCLEAR AROMATIC HYDROCARBONS	G, TLC	Cool, 4°C[3] store in the dark	7 days until extraction, 40 days after extraction	1000 mL/250 mL
PURGEABLE AROMATIC HYDROCARBONS	VOA	Cool, 4°C[2,3]	14 days	40 mL
PURGEABLE HALOCARBONS	VOA	Cool, 4°C[3]	14 days	40 mL

1 P - Polyethylene; G - Amber glass containers; TLC - Teflon-lined cap; VOA - Volatile organic analyte vial of amber glass with teflon-lined septum.
2 Adjust to pH <2 with H_2SO_4, HCl, or solid $NaHSO_4$
3 Free chlorine must be removed before addition of HCl by exact addition of $Na_2S_2O_3$

SOURCES:

EPA SW846

FOR MORE INFORMATION CONTACT:

Michael Buchman
NOAA/HAZMAT
7600 Sand Point Way N.E.
Seattle, Washington 98115-0070
Tel: 206•526•6340
Fax: 206•526•6865
Internet: MFB@HAZMAT.NOAA.GOV

HAZMAT REPORT 97-2

Screening Quick Reference Tables

This set of NOAA **Screening Quick Reference Tables**, or SQuIRTs, presents screening concentrations for inorganic and organic contaminants in various environmental media. Guidelines for sample preservation and options for laboratory analytical techniques are also included.

The SQuIRT cards were developed for internal use by the Coastal Resource Coordination Branch (CRCB) of NOAA. The CRC Branch identifies potential impacts to coastal resources and habitats likely to be affected by hazardous waste sites. To initially identify substances which may threaten resources of concern to NOAA, environmental concentrations are compared to these screening levels. These tables are intended for preliminary screening purposes only: they do not represent official NOAA policy and do not constitute criteria or clean-up levels. NOAA does not endorse their use for any other purposes. Screening levels are reported with the number of significant figures they were originally reported with.

Further guidance on the recommended application of various screening guidelines is provided in the supporting source documentation (listed on the last page of each section). Users of the SQuIRT cards are encouraged to review supporting documentation to determine appropriateness for their specific use.

The SQuIRT card set is organized into the following sections:

- Inorganics in Solids (freshwater and marine sediment, plus soil)
- Inorganics in Water (groundwater and surface water)
- Organics in Water and Solids
- Analytical Methods for Inorganics
- Analytical Methods for Organics
- Guidelines for Sample Collection & Storage

For water samples, the CRCB compares measured contaminant concentrations to their applicable, EPA Ambient Water Quality Criteria (AWQC) for the protection of aquatic organisms for those substances for which such criteria have been developed. Because releases from hazardous waste sites are often continuous and long-term, surface water concentrations are compared directly with the chronic AWQC, when available. SQuIRT cards include trace element AWQC values for both filtered and unfiltered samples, as well as the formulae to calculate exact criteria for elements whose criteria are hardness-dependent. Groundwater concentrations are also screened against AWQC. However, given the dilution expected during migration and upon discharge of groundwater to surface water, CRCB uses 10 times the applicable AWQC for screening. If available, suitable site-specific dilution factors are used. Maximum Contaminant Levels (MCLs), applicable to drinking water sources and secondary MCLs applicable to groundwater, are also provided on the SQuIRT cards.

Promulgated criteria similar to the AWQC are generally not available for contaminated soils or sediments. For screening purposes, inorganic contaminant levels in soils are compared to the average concentrations found in natural soils of the United States. Organic compounds in soil are screened against risk-based Canadian soil standards. Soil standards for different land use categories are listed to provide perspective. Soil values are not used by NOAA to estimate aquatic exposures. NOAA screens soil concentrations only to estimate which contaminants may be elevated and thus represent potential contaminant sources to aquatic habitats of concern.

Multiple sediment screening values have been included in the NOAA SQuIRTs to help portray the entire spectrum of concentrations

CONTINUED ON LAST PAGE

which have been associated with various probabilities of adverse biological effects. This spectrum ranges from presumably non-toxic (which includes trace elements levels reported to represent non-anthropogenically impacted, background) to highly toxic levels. Conservative, lower-threshold screening values (e.g., TELs) are used to ensure a high degree of confidence that any contaminant sources eliminated from future consideration pose no potential threat to resources of concern to NOAA. Upper thresholds(e.g., AETs) identify compounds which are elevated to levels of potential toxic concern.

For sediment-associated contaminants, dry weight concentrations are screened by comparison with published sediment quality benchmarks. Some benchmarks are available only on a TOC normalized basis, and are footnoted as such. Separate values are provided for either freshwater or estuarine and marine sediments.

The Effects Range-Low (ERLs) and Effects Range-Median (ERMs) plus the Threshold Effects Levels (TELs) and Probable Effects Levels (PELs) are based upon the same data compilation, but use different calculation approaches. The ERL is calculated as the lower 10th percentile concentration of the available sediment toxicity data which has been screened for only those samples which were identified as toxic by original investigators. It is <u>not</u> an LC_{10}. Since the ERL is at the low end of a range of levels at which effects were observed in the studies compiled by the authors, it represents the value at which toxicity may begin to be observed in sensitive species. The ERM is simply the median concentration of the compilation of just samples labeled as toxic by the original investigators. It is <u>not</u> an LC_{50}. The TEL is calculated as the geometric mean of the 15th percentile concentration of the toxic effects data set and the median of the no-effect data set; as such, it represents the concentration below which adverse effects are expected to occur only rarely. The PEL, as the geometric mean of the 50% of impacted, toxic samples and the 85% of the non-impacted samples, is the level above which adverse effects are expected to occur frequently.

Apparent Effect Thresholds (AETs) relate chemical concentrations in sediments to at least one of five biological indicators of injury (i.e., four sediment bioassays or diminished benthic infauna abundance). AETs are essentially equivalent to the concentration observed in the highest non-toxic sample. As such, they represent the concentration above which adverse biological impacts would <u>always</u> be expected by that biological indicator due to exposure to that contaminant alone. Conversely, adverse impacts are known to occur at levels below the AET. The AET values listed were developed for use in Puget Sound (Washington) and only the lowest of the five potential AETs is listed.

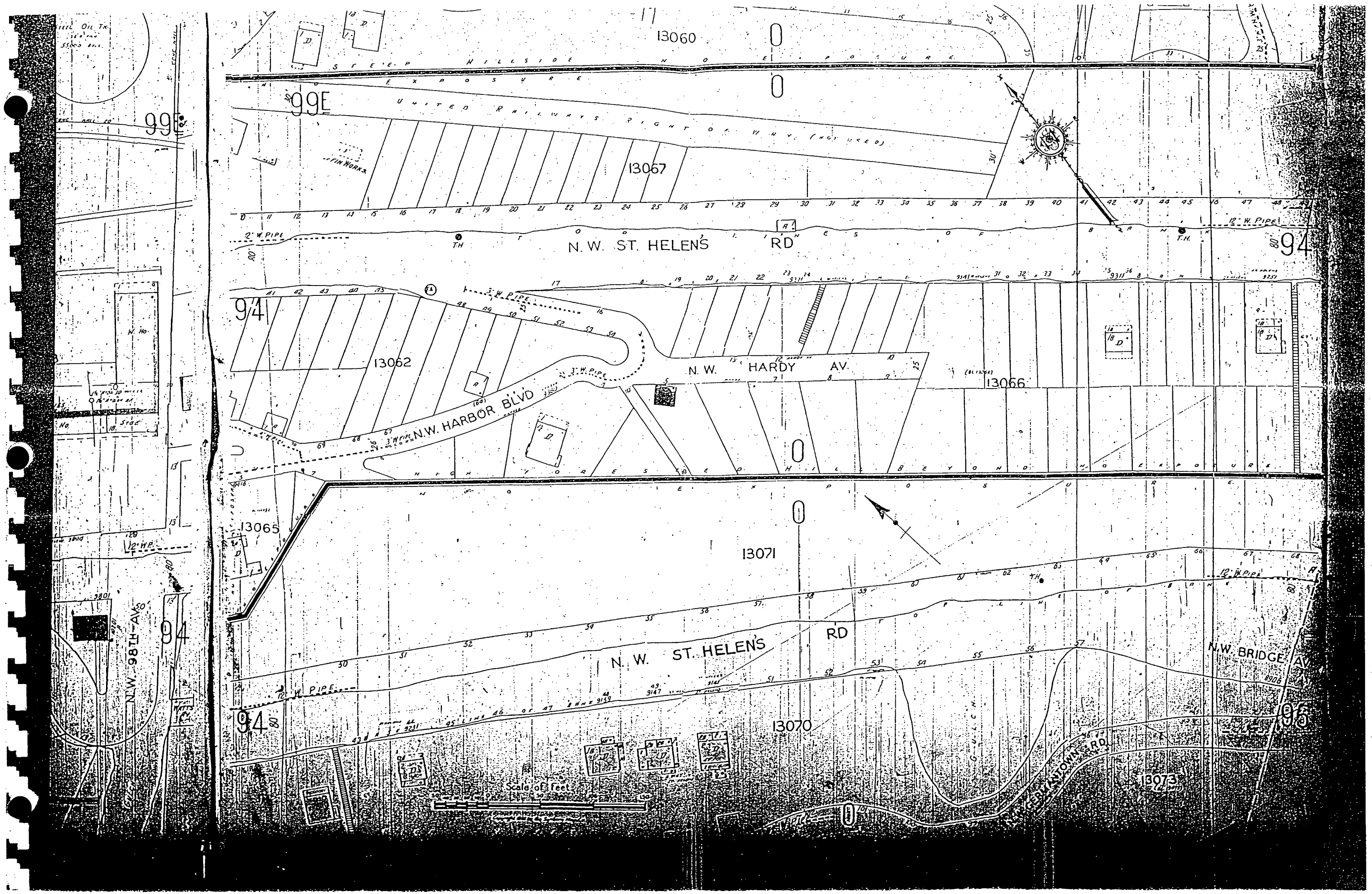
For freshwater sediments, the Upper Effects Threshold (UET) was derived by NOAA as the lowest AET from a compilation of endpoint analogous to the marine AET endpoints. The UETs for organic contaminants are listed for a sediment containing 1% TOC.

Every effort has been made to ensure accuracy of the information in these NOAA SQuiRT cards. However, NOAA is not liable for errors in transcription, errors in the original sources, or revision of values. These screening values are subject to change as new data become available. These cards may be freely reproduced and distributed, if they are distributed in their entirety, without modification, and properly credited to NOAA. The SQuiRT cards should be cited as "Buchman, M. F., 1998. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 97-2, Seattle WA, Hazardous Materials Response and Assessment Division, National Oceanic and Atmospheric Administration, 12 pages."

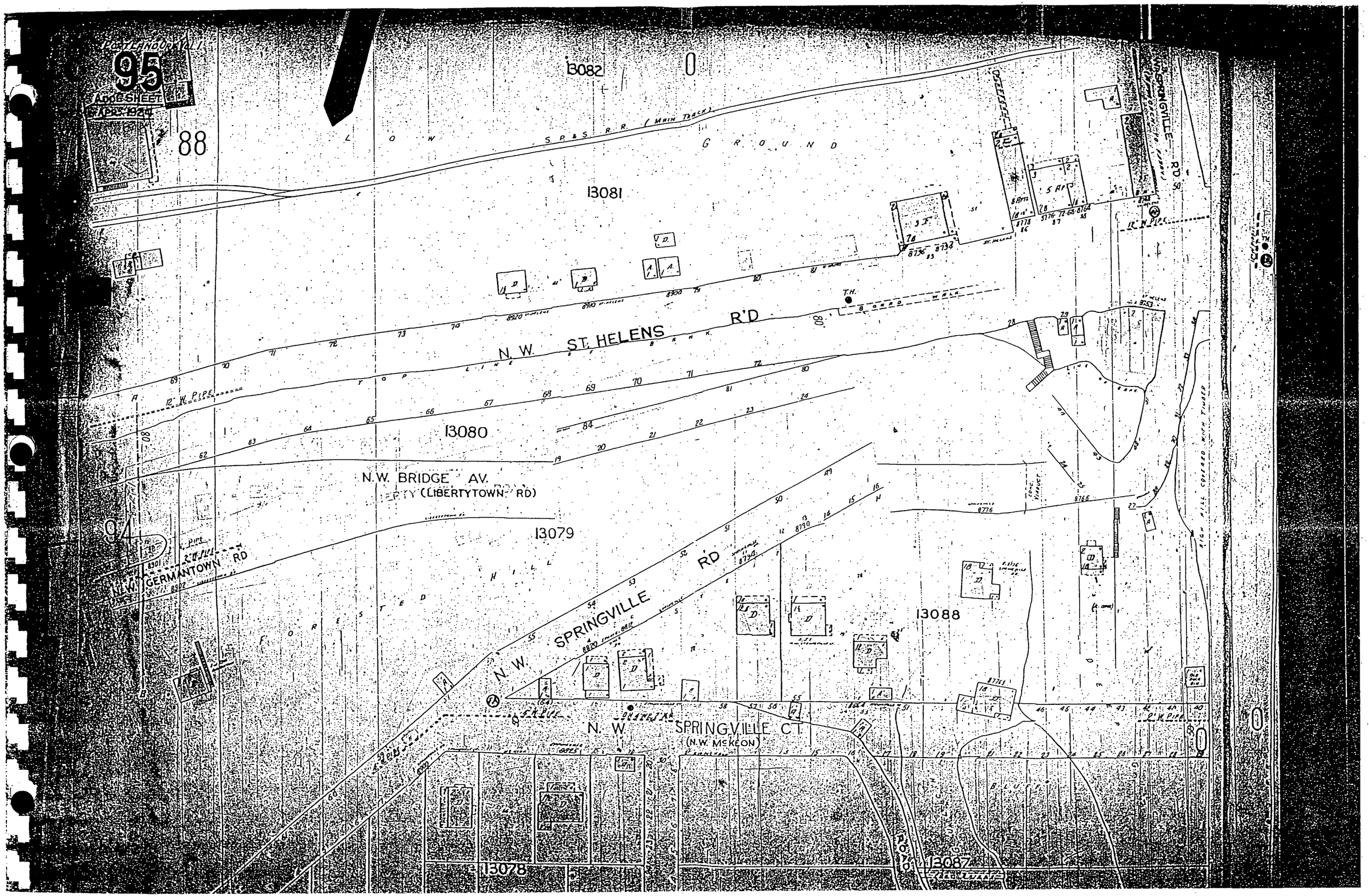
CONTINUED FROM FIRST PAGE

APPENDIX B

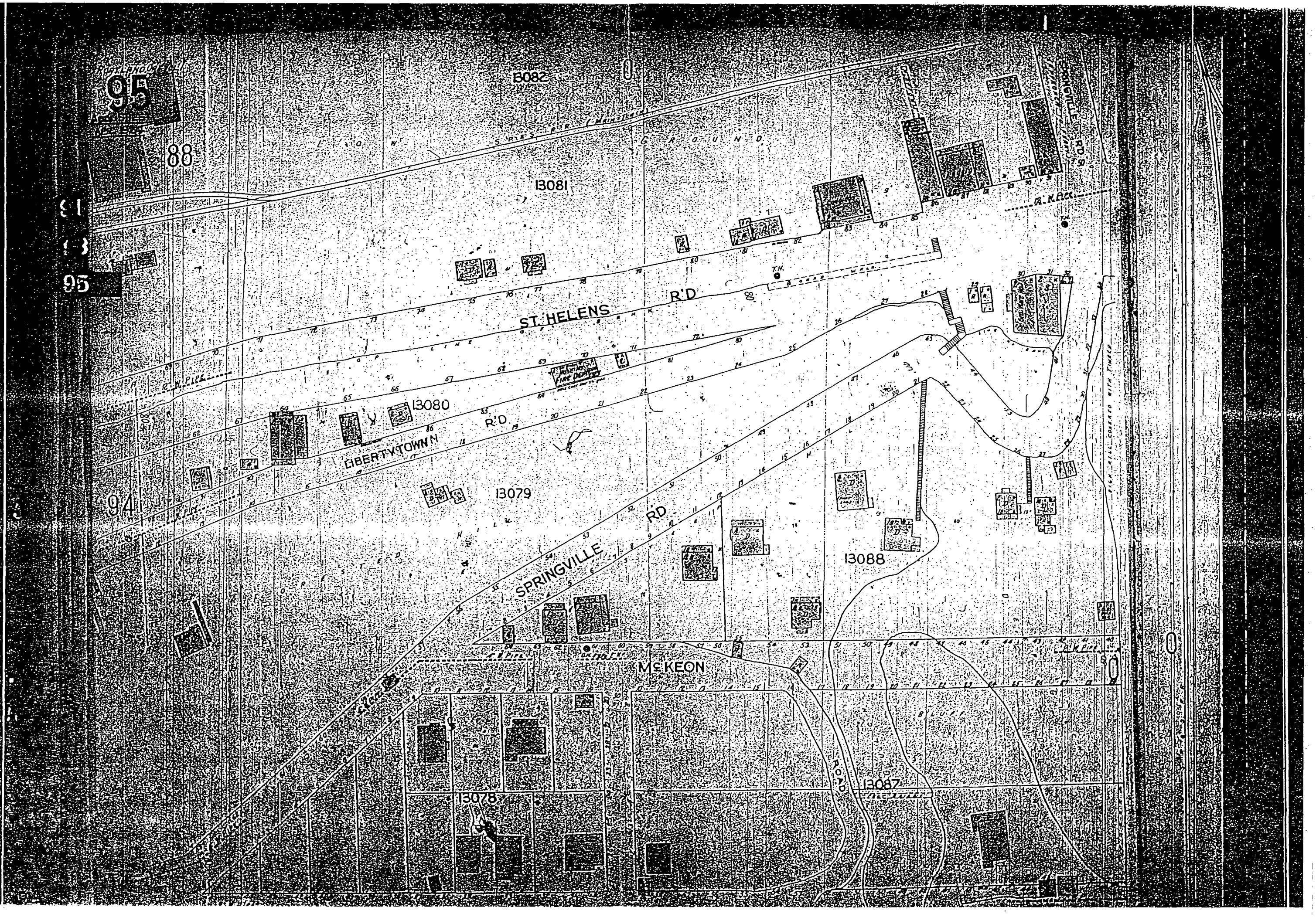
Sanborn Fire Insurance Maps



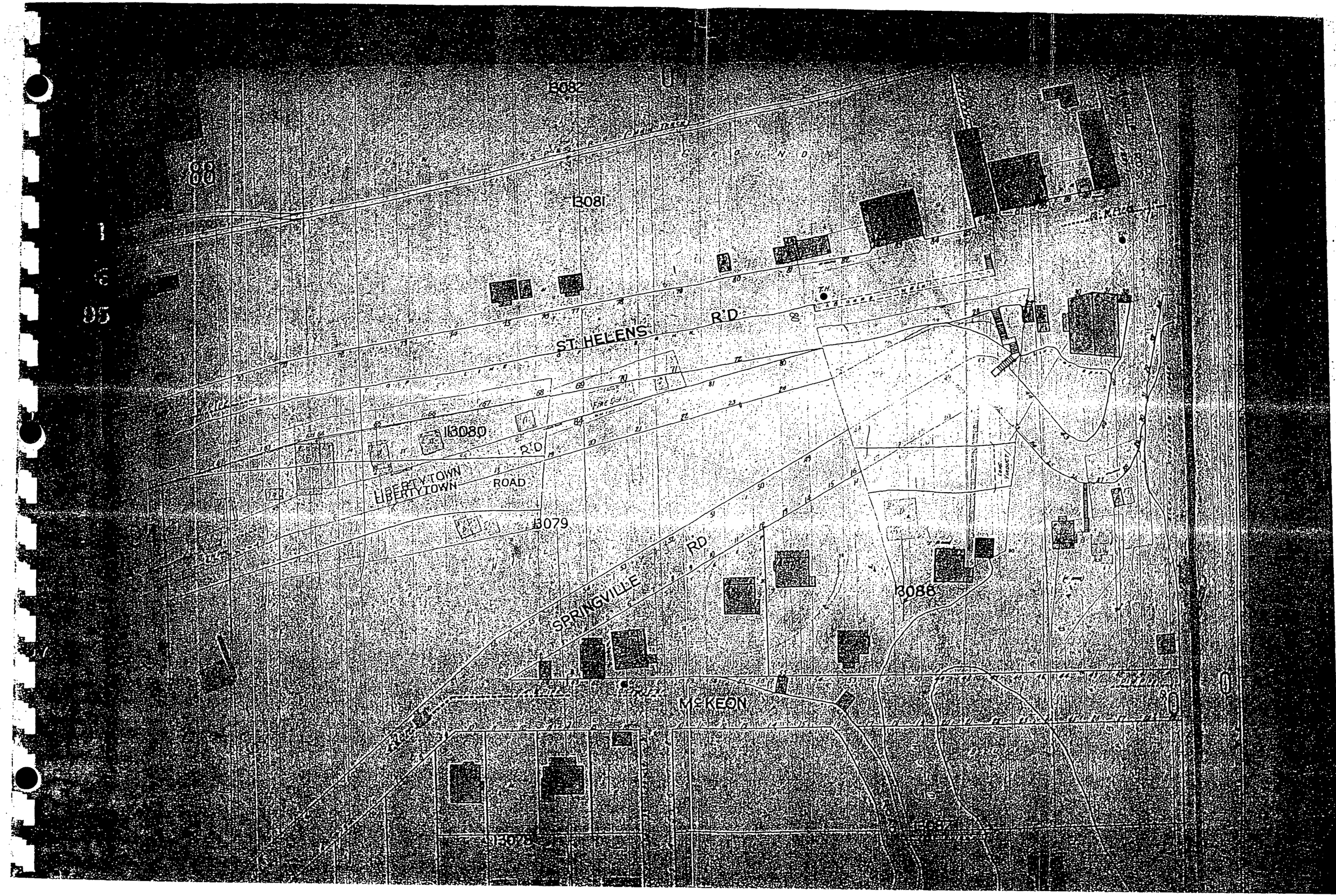
13060
STEEP HILLSIDE NO EXPOSURE
NO EXPOSURE
99E
UNITED RAILWAYS RIGHT OF WAY (NOT USED)
13067
FIN WORKS
2" W. PIPE
TH
N. W. ST. HELENS RD
12" W. PIPE
94
3" W. PIPE
13062
N. W. HARDY AV.
13066
N.W. HARBOR BLVD
HIGH FORESTED HILL BEYOND NO EXPOSURE
13065
13071
N. W. ST. HELENS RD
N.W. BRIDGE AV
N.W. 98TH AV
13070
GERMANTOWN RD
13073
Scale of Feet



PORTLAND, VOL. I
95
ADDL. SHEET
APR. 1924
88
13082
LOW GROUND
S.P.&S. R.R. (MAIN TRACK)
13081
N.W. ST. HELENS R'D
TOP LINE OF BANK
12" W. PIPE
13080
N.W. BRIDGE AV.
(LIBERTYTOWN RD)
13079
94
N.W. GERMANTOWN RD
FORESTED HILL
N.W. SPRINGVILLE RD
13088
N.W. SPRINGVILLE CT.
(N.W. McKEON)
13078
13087
ROAD
SPRINGVILLE RD



95
88
91
93
95
94
13082
13081
13080
13079
13088
13078
13087
ST. HELENS R'D
LIBERTYTOWN R'D
SPRINGVILLE RD
McKEON
ROAD


B082
B081
ST. HELENS RD
B080
LIBERTYTOWN ROAD
B079
SPRINGVILLE RD
B086
McKEON
B078

APPENDIX C

Metsker Property Maps

notice ok
set

Received
12/18/98

UNDERGROUND STORAGE TANK PROGRAM

DECOMMISSIONING TANK STATUS

FOR HOLDERS OF TEMPORARY UST PERMITS

TO PERMITTEE:

Raphael Caballero
Foss Maritime Company
9030 NW St. Helens Road
PO Box 83018
Portland, OR 97283-0018

FOR EXISTING FACILITY:

Facility ID Number: 7374
KNAPPTON CORPORATION
9030 NW ST HELENS RD
PORTLAND, OR 97203

DEQ records indicate the following tanks have not been upgraded to meet one or more of the 1998 technical standards for corrosion control, spill and overfill prevention and leak detection and must be decommissioned in accordance with OAR 340-150-0166 prior to December 22, 1998. Tanks that do not meet the 1998 technical standards by December 22, 1998 must permanently close as of that date or, at a minimum, elect the temporary closure option which requires permanent decommissioning no later than December 22, 1999. Instructions on how to comply with the general permit to decommission conditions and requirements, including temporary and permanent closure or change-in-service, will be mailed to you in late December 1998.

IF INFORMATION ON YOUR TANK STATUS IS CORRECT (i.e. the following tanks do not, or will not meet the 1998 technical standards for corrosion control, spill and overfill prevention and leak detection by December 22, 1998) **DO NOT RETURN THIS FORM.** You will be receiving further instructions about decommissioning these tanks in late December 1998.

IF OUR INFORMATION IS INCORRECT AND YOU DO INTEND TO OPERATE ONE OR MORE OF THE FOLLOWING TANKS on or after December 23, 1998, **PLEASE COMPLETE PAGE 2, THE *GENERAL PERMIT REGISTRATION FORM TO OPERATE.*** For any tanks listed below, just transfer the Tank ID Number and Tank Permit Number to page 2 and describe the facts pertaining to the installation, upgrading or retrofitting of the subject tanks. If necessary, please make extra copies of page 2 to register more tanks. Both the permittee and tank owner must sign the operating registration form and return it to the Department of Environmental Quality, UST Program, 811 SW 6th Avenue, Portland, OR 97204.

TANKS TO BE DECOMMISSIONED

Tank ID Number	Tank Permit Number	Tank ID Number	Tank Permit Number	Tank ID Number	Tank Permit Number
1	AEFG	2	AEFH	3	AEFJ
4	AEGK	5	AEGA		

Removed 12/98 SET

Removed 12/98 SET

Upgrade 3 TANKS 12/98 SET

APPENDIX F

UST Upgrade Documentation

Oregon Department of Environmental Quality

UNDERGROUND STORAGE TANK - UPGRADE / RETROFIT CHECKLIST

Activities conducted at one UST facility may be reported together by completing pages 1, 5, and 6 once for the entire facility.

1. UST SYSTEM OWNER AND LOCATION

DEQ Facility ID number: 7374

DEQ UST Facility Name: Foss Maritime Co.

Facility (location) address: 9030 NW St. Helens Road
Portland, OR

UST owner/operator name: Foss Maritime Co.

Owner/operator mailing address: P.O. Box 83018
Portland, OR 97283

Owner/operator Telephone: 503·286·0631

2. TANK UPGRADE/RETROFIT PERFORMED BY:

Service Provider: Ulrich Ind. Coatings DEQ License Number: 14319

Address: P.O. Box 772 Lic. Expiration Date: 1-24-99
Hillsboro, OR 97123

Telephone: 503·648·9587

Licensed Supervisor: Patrick Fogarty DEQ License Number: 15290

Lic. Expiration Date: 4-8-99

Pages 2 through 4 of this checklist must be completed separately for each UST system (tank and associated piping) upgraded or retrofitted at the site. For more than one UST system you may photocopy this form prior to completing.

3. UST SYSTEM INFORMATION

a. DEQ tank permit number (letters): AEFG

b. Year installed: 1979

c. Tank capacity in gallons: 20,000

d. Tank material (check): X steel ____ fiberglass reinforced plastic (FRP)
____ composite other (specify) ____

e. Tank construction (check): X single wall ____ double wall ____ partitioned

4. UPGRADE/RETROFIT INFORMATION

a. Reason for upgrade/retrofit (check all that apply):

X to comply with 1998 upgrading requirements for existing UST systems
____ to repair structural defects in tank(s)
____ preventive maintenance
____ to comply with corrective action requirements
____ other (describe): ____

b. Type of upgrade/retrofit (circle all that apply):

* installation of internal lining:
rubber alkyd (epoxy) phenolic glass other (specify) ____

* installation of spill and overfill prevention equipment:
catchment basin auto shutoff overfill alarm (ball float valve)
(drop tube valve) other (specify) @ spill buckets
sump sensors
INTS 1000 Incon Tank Monitor

* installation, upgrade/retrofit or repair of release detection equipment (check all that apply):

  ✓ automatic tank gauge

  ✓ vapor monitoring equipment

  ____ groundwater monitoring equipment

  ____ interstitial monitoring within secondary barrier

  ____ interstitial monitoring within double wall

  ✓ automatic line leak detector

  ____ other (specify) _____

* tank upgrade (describe if different from above): _____

  Cathodic protection

* replacement of metal pipe sections and fittings (indicate new piping material): _____

  ~~Eo~~ Environ (underground)

  steel pipe (above ground)

* replacement of fiber glass pipe sections and fittings (indicate new piping material): _____

* other piping changes if applicable (describe): _____

  Fiberglass vent lines

c. Date of completion of upgrade/retrofit indicated above: 10-21-98

5. **CHECKLIST** (Check YES or NO. Where a specific item is "not applicable" to the situation, please check the n/a box.)

	YES	NO	N/A
Was the DEQ Regional Office notified at least 30 days in advance of the planned project start date?	✓		
Was the DEQ Regional Office notified 72 hours in advance prior to beginning the upgrade/retrofit? If yes, indicate 3-day number issued: 26-3I-98-42	✓		
Are the UST annual permit fees current?	✓		
Was external cathodic protection (CP) installed/upgraded or retrofitted?	✓		
Was a separate CP report submitted or attached? to follow	✓		
Was a CP test station installed?			✓
Is a 6-month CP follow-up inspection/test scheduled? Projected inspection date: _____			✓
Was a site assessment conducted?			✓
Was contamination, including simple overfill, encountered and was it reported to DEQ? If so, indicate DEQ LUST number issued: __ __ - __ __ - __ __ __ __			✓
Were internal inspections of all USTs completed before lining began on any UST?	✓		
Have the results of the internal tank inspections been submitted to and/or discussed with DEQ?	✓	NA	
If there were holes in any of the USTs, has a SUSPECTED release been reported to DEQ? If yes, indicate date reported: _____		✓ NO HOLES	
Was the system tight-tested before placing back into service?			✓
Do all tank and piping materials comply with 40 CFR 280.20 as modified by OAR Chapter 340, Division 150?			✓
Have all items checked above been installed, upgraded or retrofitted in accordance with all codes, manufacturer's requirements and federal and state regulations?	✓		
Has the UST system owner/operator been provided with written documentation of the item(s) installed, upgraded or retrofitted and has the owner/operator been instructed to preserve these records?	✓		

Pages 2 through 4 of this checklist must be completed separately for each UST system (tank and associated piping) upgraded or retrofitted at the site. For more than one UST system you may photocopy this form prior to completing.

3. UST SYSTEM INFORMATION

a. DEQ tank permit number (letters): AEFH

b. Year installed: 1979

c. Tank capacity in gallons: 20,000

d. Tank material (check): X steel ____ fiberglass reinforced plastic (FRP)
____ composite other (specify) ____

e. Tank construction (check): X single wall ____ double wall ____ partitioned

4. UPGRADE/RETROFIT INFORMATION

a. Reason for upgrade/retrofit (check all that apply):

X to comply with 1998 upgrading requirements for existing UST systems
____ to repair structural defects in tank(s)
____ preventive maintenance
____ to comply with corrective action requirements
____ other (describe): ____

b. Type of upgrade/retrofit (circle all that apply):

* installation of internal lining:
  rubber alkyd (epoxy) phenolic glass other (specify) ____

* installation of spill and overfill prevention equipment:
  catchment basin auto shutoff overfill alarm (ball float valve)
  drop tube valve other (specify) spill buckets
  sump sensors
  INTS 1000 Incon Tank Monitor

* installation, upgrade/retrofit or repair of release detection equipment (check all that apply):

✓ automatic tank gauge

✓ vapor monitoring equipment

____ groundwater monitoring equipment

____ interstitial monitoring within secondary barrier

____ interstitial monitoring within double wall

✓ automatic line leak detector

____ other (specify) _____

* tank upgrade (describe if different from above): Cathodic protection

* replacement of metal pipe sections and fittings (indicate new piping material): Environ (underground) Steel pipe (above ground)

* replacement of fiber glass pipe sections and fittings (indicate new piping material): ____

* other piping changes if applicable (describe): Fiberglass vent lines

c. Date of completion of upgrade/retrofit indicated above: 10-21-98

5. **CHECKLIST** (Check YES or NO. Where a specific item is "not applicable" to the situation, please check the n/a box.)

	YES	NO	N/A
Was the DEQ Regional Office notified at least 30 days in advance of the planned project start date?	✓		
Was the DEQ Regional Office notified 72 hours in advance prior to beginning the upgrade/retrofit? If yes, indicate 3-day number issued: 26-3I-98-42	✓		
Are the UST annual permit fees current?	✓		
Was external cathodic protection (CP) installed/upgraded or retrofitted?	✓		
Was a separate CP report submitted or attached? to follow	✓		
Was a CP test station installed?			✓
Is a 6-month CP follow-up inspection/test scheduled? Projected inspection date: _____			✓
Was a site assessment conducted?			✓
Was contamination, including simple overfill, encountered and was it reported to DEQ? If so, indicate DEQ LUST number issued: __ __ - __ __ - __ __ __ __			✓
Were internal inspections of all USTs completed before lining began on any UST?	✓		
Have the results of the internal tank inspections been submitted to and/or discussed with DEQ?	✓	N/A	
If there were holes in any of the USTs, has a SUSPECTED release been reported to DEQ? If yes, indicate date reported: _____		✓ NO HOLES	
Was the system tight-tested before placing back into service?			✓
Do all tank and piping materials comply with 40 CFR 280.20 as modified by OAR Chapter 340, Division 150?			✓
Have all items checked above been installed, upgraded or retrofitted in accordance with all codes, manufacturer's requirements and federal and state regulations?	✓		
Has the UST system owner/operator been provided with written documentation of the item(s) installed, upgraded or retrofitted and has the owner/operator been instructed to preserve these records?	✓		

Pages 2 through 4 of this checklist must be completed separately for each UST system (tank and associated piping) upgraded or retrofitted at the site. For more than one UST system you may photocopy this form prior to completing.

3. UST SYSTEM INFORMATION

a. DEQ tank permit number (letters): AEFJ b. Year installed: 1979

c. Tank capacity in gallons: 6,000

d. Tank material (check): X steel ____ fiberglass reinforced plastic (FRP)
____ composite other (specify) ____

e. Tank construction (check): X single wall ____ double wall ____ partitioned

4. UPGRADE/RETROFIT INFORMATION

a. Reason for upgrade/retrofit (check all that apply):

X to comply with 1998 upgrading requirements for existing UST systems
____ to repair structural defects in tank(s)
____ preventive maintenance
____ to comply with corrective action requirements
____ other (describe): ____

b. Type of upgrade/retrofit (circle all that apply):

* installation of internal lining:
  rubber alkyd (epoxy) phenolic glass other (specify) ____

* installation of spill and overfill prevention equipment:
  catchment basin auto shutoff overfill alarm (ball float valve)
  drop tube valve other (specify) spill buckets
  sump sensors -
  INTS 1000 Incon Tank Monitor

* installation, upgrade/retrofit or repair of release detection equipment (check all that apply):

  ✓ automatic tank gauge

  ✓ vapor monitoring equipment

  _____ groundwater monitoring equipment

  _____ interstitial monitoring within secondary barrier

  _____ interstitial monitoring within double wall

  ✓ automatic line leak detector

  _____ other (specify) _____

* tank upgrade (describe if different from above): _____

  Cathodic Protection

* replacement of metal pipe sections and fittings (indicate new piping material): _____

  Environ (underground)

  Steel pipe (above ground)

* replacement of fiber glass pipe sections and fittings (indicate new piping material): _____

* other piping changes if applicable (describe): _____

  Fiberglass vent lines

c. Date of completion of upgrade/retrofit indicated above: 10-21-98

5. **CHECKLIST** (Check YES or NO. Where a specific item is "not applicable" to the situation, please check the n/a box.)

	YES	NO	N/A
Was the DEQ Regional Office notified at least 30 days in advance of the planned project start date?	✓		
Was the DEQ Regional Office notified 72 hours in advance prior to beginning the upgrade/retrofit? If yes, indicate 3-day number issued: 26-3I-98-42	✓		
Are the UST annual permit fees current?	✓		
Was external cathodic protection (CP) installed/upgraded or retrofitted?	✓		
Was a separate CP report submitted or attached? to follow	✓		
Was a CP test station installed?			✓
Is a 6-month CP follow-up inspection/test scheduled? Projected inspection date: _____			✓
Was a site assessment conducted?			✓
Was contamination, including simple overfill, encountered and was it reported to DEQ? If so, indicate DEQ LUST number issued: __ __ - __ __ - __ __ __ __			✓
Were internal inspections of all USTs completed before lining began on any UST?	✓		
Have the results of the internal tank inspections been submitted to and/or discussed with DEQ?	✓	Waived	
If there were holes in any of the USTs, has a SUSPECTED release been reported to DEQ? If yes, indicate date reported: _____		✓ NO HOLES	
Was the system tight-tested before placing back into service?			✓
Do all tank and piping materials comply with 40 CFR 280.20 as modified by OAR Chapter 340, Division 150?			✓
Have all items checked above been installed, upgraded or retrofitted in accordance with all codes, manufacturer's requirements and federal and state regulations?	✓		
Has the UST system owner/operator been provided with written documentation of the item(s) installed, upgraded or retrofitted and has the owner/operator been instructed to preserve these records?	✓		

PROJECT NUMBER: 96214

TANK NUMBER: #1 20,000

Foss Maritime

Loc	Top	R3/4	RSL	R1/4	Bot	L1/4	LSL	L3/4
1			7.7	7.7	7.6			
2			7.9	7.7	7.8			
3			7.9	8.0	7.9			
4			7.9	7.8	7.6			
5			7.6	8.0	7.9			
6			7.7	7.8	7.7			
7			7.8	7.9	7.8			
8			8.0	7.7	7.9			
9			7.9	7.7	7.8			
10			7.7	7.8	7.8			
11			7.9	7.8	7.8			
12			7.7	7.9	7.9			
13			7.7	7.8	7.8			
14			7.8	7.7	7.9			
15			7.8	7.7	7.7			
16			7.8	7.9	7.9			
17			7.9	7.9	7.9			
18			7.8	7.8	7.9			
19			7.9	7.9	8.0			
20			7.8	7.9	8.0			
21			8.0	7.8	7.9			
22			7.8	7.8	7.8			
23			7.9	8.0	8.0			
24			7.7	7.8	7.9			
25			7.9	8.0	7.9			
26			7.8	7.8	7.8			
27			7.8	7.8	7.9			
28			7.9	7.8	7.8			
29			7.9	7.8	7.7			
30			8.0	8.0	7.9			
31			7.9	7.7	7.8			
TOTAL			243.1	242.7	243.4			

Fill End	Horizontal	Vertical
1	7.7	7.7
2	7.8	7.9
3	7.9	7.8
4	8.0	7.9
5	7.9	7.7
6	7.9	7.8
7	7.8	7.7
8	7.8	7.9
9	7.8	7.9
10	8.0	8.0
11		
TOTAL	78.6	78.3

Other End	Horizontal	Vertical
1	7.9	7.8
2	8.0	7.9
3	7.9	7.8
4	7.8	7.9
5	7.9	7.8
6	7.9	7.8
7	8.0	7.9
8	7.9	7.8
9	7.8	7.9
10	7.9	8.0
11		
TOTAL	79.0	78.6

Tot. of Gauges % No. of Gauges = Ave. Thickness

1043.7 % 133 = 7.8

Average Thickness % Design Thickness = Percent of Design Thickness

7.8 % 8.0mm = 97.5 %

Certified by UTG Level 1: ACCEPT P.F OR REJECT _____

PROJECT NUMBER: 98214

TANK NUMBER: #2 20,000

Loc	Top	R3/4	RSL	R1/4	Bot	L1/4	LSL	L3/4
1				7.8	8.0	7.9		
2				7.8	7.9	7.8		
3				7.9	7.9	7.8		
4				7.7	7.8	7.9		
5				7.9	7.8	7.9		
6				7.8	7.8	7.9		
7				7.9	7.9	7.8		
8				7.9	8.0	7.9		
9				7.8	7.9	7.8		
10				7.9	7.9	7.9		
11				7.9	8.0	8.0		
12				7.8	7.9	8.0		
13				7.6	7.8	7.7		
14				7.7	8.0	7.8		
15				7.9	7.8	7.7		
16				7.8	7.9	7.8		
17				7.8	7.9	7.8		
18				7.8	7.9	7.8		
19				7.7	7.8	7.9		
20				7.8	7.7	7.6		
21				8.0	7.9	7.7		
22				8.0	7.8	7.8		
23				7.9	7.9	7.8		
24				7.9	8.0	7.7		
25				7.8	7.9	7.8		
26				7.8	7.8	7.9		
27				7.9	7.8	7.9		
28				7.8	7.9	8.0		
29				7.9	8.0	7.9		
30				7.8	7.9	8.0		
31				7.9	8.0	7.9		
TOTAL				242.9	244.5	243.1		

Fill End	Horizontal	Vertical
1	7.9	7.9
2	8.0	8.0
3	7.9	7.8
4	7.9	7.8
5	7.8	7.8
6	7.9	7.7
7	8.0	8.0
8	7.7	7.9
9	7.8	7.8
10	8.0	7.9
11		
TOTAL	78.9	78.6

Other End	Horizontal	Vertical
1	7.9	7.9
2	7.8	7.9
3	7.7	7.8
4	8.0	7.9
5	7.9	7.8
6	7.8	7.9
7	7.9	7.8
8	8.0	7.7
9	7.9	7.8
10	7.9	7.8
11		
TOTAL	78.8	78.3

Tot. of Gauges % No. of Gauges = Ave. Thickness

1045.1 % 133 = 7.9

Average Thickness % Design Thickness = Percent of Design Thickness

7.9 % 8.0mm = 98.7 %

Certified by UTG Level 1: ACCEPT P.F. OR REJECT _____

PROJECT NUMBER: 98214

TANK NUMBER: #3 6,000

Loc	Top	R3/4	RSL	R1/4	Bot	L1/4	LSL	L3/4
1				6.7	6.8	6.9		
2				6.8	6.8	6.9		
3				6.9	6.6	6.9		
4				6.9	6.5	6.7		
5				6.6	6.6	6.7		
6				6.8	6.7	6.9		
7				6.9	6.8	6.7		
8				6.7	6.7	6.7		
9				6.9	6.5	6.8		
10				6.5	6.7	6.8		
11				6.7	6.7	6.9		
12				6.7	6.6	6.8		
13				6.8	6.9	6.8		
14				6.9	6.9	6.8		
15				6.8	6.8	6.9		
16				6.7	6.5	6.8		
17				6.7	6.6	6.8		
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
TOTAL				115.0	113.7	115.8		

Fill End	Horizontal	Vertical
1	6.8	6.7
2	6.9	6.8
3	6.9	6.8
4	6.8	6.9
5	6.7	6.7
6	6.8	6.7
7	6.9	6.7
8	6.7	6.8
9		
10		
11		
TOTAL	54.5	54.0

Other End	Horizontal	Vertical
1	6.7	6.6
2	6.7	6.8
3	6.6	6.8
4	6.7	6.9
5	6.8	6.9
6	6.6	6.5
7	6.8	6.8
8	6.9	6.7
9		
10		
11		
TOTAL	53.8	54.0

Tot. of Gauges % No. of Gauges = Ave. Thickness

560.8 % 83 = 6.8

Average Thickness % Design Thickness = Percent of Design Thickness

6.8 % 6.9mm = 98.5 %

Certified by UTG Level I: ACCEPT P.E OR REJECT _____

INSTALLER'S OATH: I certify that I have been the Oregon DEQ licensed supervisor present on site during th above listed upgrade/retrofit/replacement activities and to the best of my knowledge they have been ucted in compliance with all state and federal laws, regulations and industry standards and procedures pertaining to underground storage tanks. I further certify that the information contained in this report and checklist is true to the best of my belief and knowledge.

Installer: Patrick Fogarty (print name) Patrick Fogarty (signature)

Position: Foreman

Company: UICC Date: 10-21-98

UST Service Provider Firm, Executive Officer:

Traci Ulrich (print name) Traci L Ulrich (signature) 10.28.98 (date)

UST FACILITY OWNER/OPERATOR UPGRADE CERTIFICATION STATEMENT: I hereby certify that the information provided on this checklist concerning the upgrade status of my tank system(s) is accurate.

Rafael A. Caballero (print name) RA Caballero (signature) 11/10/98 (date)

OWNER'S FINANCIAL RESPONSIBILITY INFORMATION SECTION

The tank owner has financial responsibility, if applicable, in accordance with OAR 340-150-004. Please specify:

Method of financial responsibility: Insurance

Insurer: American International Policy Number: M0330

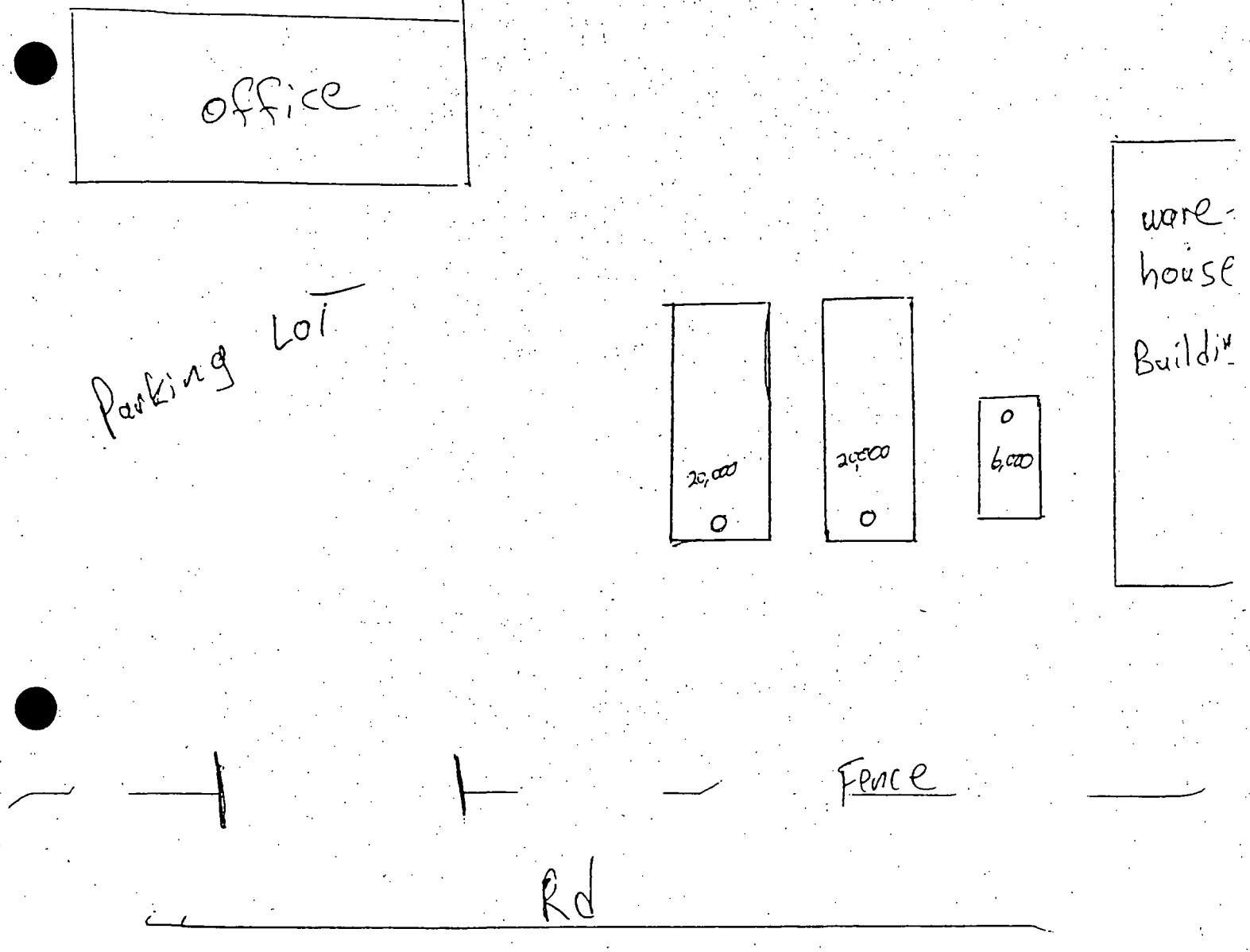
This form must be mailed to the appropriate DEQ Regional Office within 30 days after the upgrade/retrofit project is completed. For information, call the appropriate DEQ Regional Office or the toll free number, 1-800-742-7878.

DEQ INSPECTIONS: This form may be used by DEQ Inspectors for oversight purposes. A DEQ inspector is not required to inspect the upgrade/retrofit. A DEQ inspector may not be on site or available during all of the inspections listed on this form. In the case of an oversight inspection, the DEQ inspector should check all boxes that are appropriate for the inspection(s) and forward a copy to the appropriate Regional Office for the facility file.

Greg Tom NWR office by review

D[illegible]nspector's Signature [signature] Inspection Date(s) 12/23/98

6. AS-BUILT SITE PLAN



(always contact local authorities regarding permit requirements)

Oregon Department of Environmental Quality

UNDERGROUND STORAGE TANK - UPGRADE / RETROFIT CHECKLIST

Activities conducted at one UST facility may be reported together by completing pages 1, 5, and 6 once for the entire facility.

1. UST SYSTEM OWNER AND LOCATION

DEQ Facility ID number: 7374

DEQ UST Facility Name: Foss Maritime

Facility (location) address: 9030 St. Helens Rd. Ptld, Or. 97231

UST owner/operator name: Foss Maritime Co

Owner/operator mailing address: P.O. Box 83018 Portland, OR 97283-0018

Owner/operator Telephone: (503) 978-6544

2. TANK UPGRADE/RETROFIT PERFORMED BY:

Service Provider: Pacific N.W. Ser. DEQ License Number: 15034

Address: 1035-A Vandercook Way Lic. Expiration Date: 2/7/99
Longview, Wa. 98632

Telephone: (360) 425-6955

Licensed Supervisor: George W Nale DEQ License Number: 11562

Lic. Expiration Date: 2/29/00

Pages 2 through 4 of this checklist must be completed separately for each UST system (tank and associated piping) upgraded or retrofitted at the site. For more than one UST system you may photocopy this form prior to completing.

3. UST SYSTEM INFORMATION

a. DEQ tank permit number (letters): AEFH b. Year installed: 1979

c. Tank capacity in gallons: 20,000

d. Tank material (check): ✓ steel ____ fiberglass reinforced plastic (FRP)
____ composite other (specify) ____

e. Tank construction (check): X single wall ____ double wall ____ partitioned

4. UPGRADE/RETROFIT INFORMATION

a. Reason for upgrade/retrofit (check all that apply):

✓ to comply with 1998 upgrading requirements for existing UST systems
____ to repair structural defects in tank(s)
____ preventive maintenance
____ to comply with corrective action requirements
____ other (describe): ____

b. Type of upgrade/retrofit (circle all that apply):

* installation of internal lining:
  rubber alkyd (epoxy) phenolic glass other (specify) ____

* installation of spill and overfill prevention equipment:
  catchment basin auto shutoff overfill alarm (ball float valve)
  drop tube valve other (specify) ____

Pages 2 through 4 of this checklist must be completed separately for each UST system (tank and associated piping) upgraded or retrofitted at the site. For more than one UST system you may photocopy this form prior to completing.

3. UST SYSTEM INFORMATION

a. DEQ tank permit number (letters): AEGK

b. Year installed: 1979

c. Tank capacity in gallons: 6,000

d. Tank material (check): ✓ steel ____ fiberglass reinforced plastic (FRP)
____ composite other (specify) ____

e. Tank construction (check): ✓ single wall ____ double wall ____ partitioned

4. UPGRADE/RETROFIT INFORMATION

a. Reason for upgrade/retrofit (check all that apply):

✓ to comply with 1998 upgrading requirements for existing UST systems
____ to repair structural defects in tank(s)
____ preventive maintenance
____ to comply with corrective action requirements
____ other (describe): ____

b. Type of upgrade/retrofit (circle all that apply):

* installation of internal lining:
  rubber alkyd (epoxy) phenolic glass other (specify) ____

* installation of spill and overfill prevention equipment:
  catchment basin auto shutoff overfill alarm (ball float valve)
  drop tube valve other (specify) Spill Buckets

s 2 through 4 of this checklist must be completed separately for each UST system (tank and ociated piping) upgraded or retrofitted at the site. For more than one UST system you may otocopy this form prior to completing.

UST SYSTEM INFORMATION

a. DEQ tank permit number (letters): AEFG

b. Year installed: 1979

c. Tank capacity in gallons: 20,000

d. Tank material (check): ✓ steel ____ fiberglass reinforced plastic (FRP)
____ composite other (specify) ____

e. Tank construction (check): X single wall ____ double wall ____ partitioned

UPGRADE/RETROFIT INFORMATION

a. Reason for upgrade/retrofit (check all that apply):

✓ to comply with 1998 upgrading requirements for existing UST systems
____ to repair structural defects in tank(s)
____ preventive maintenance
____ to comply with corrective action requirements
____ other (describe): ____

b. Type of upgrade/retrofit (circle all that apply):

* installation of internal lining:
  rubber alkyd (epoxy) phenolic glass other (specify) ____

* installation of spill and overfill prevention equipment:
  catchment basin auto shutoff overfill alarm (ball float valve)
  drop tube valve other (specify) ____

* installation, upgrade/retrofit or repair of release detection equipment (check all that apply):

  ✓ automatic tank gauge

  ✓ vapor monitoring equipment

  ____ groundwater monitoring equipment

  ____ interstitial monitoring within secondary barrier

  ____ interstitial monitoring within double wall

  ✓ automatic line leak detector

  ____ other (specify) _____

* tank upgrade (describe if different from above): Spill Buckets

* replacement of metal pipe sections and fittings (indicate new piping material): Environ + FRP Vents

* replacement of fiber glass pipe sections and fittings (indicate new piping material): ____

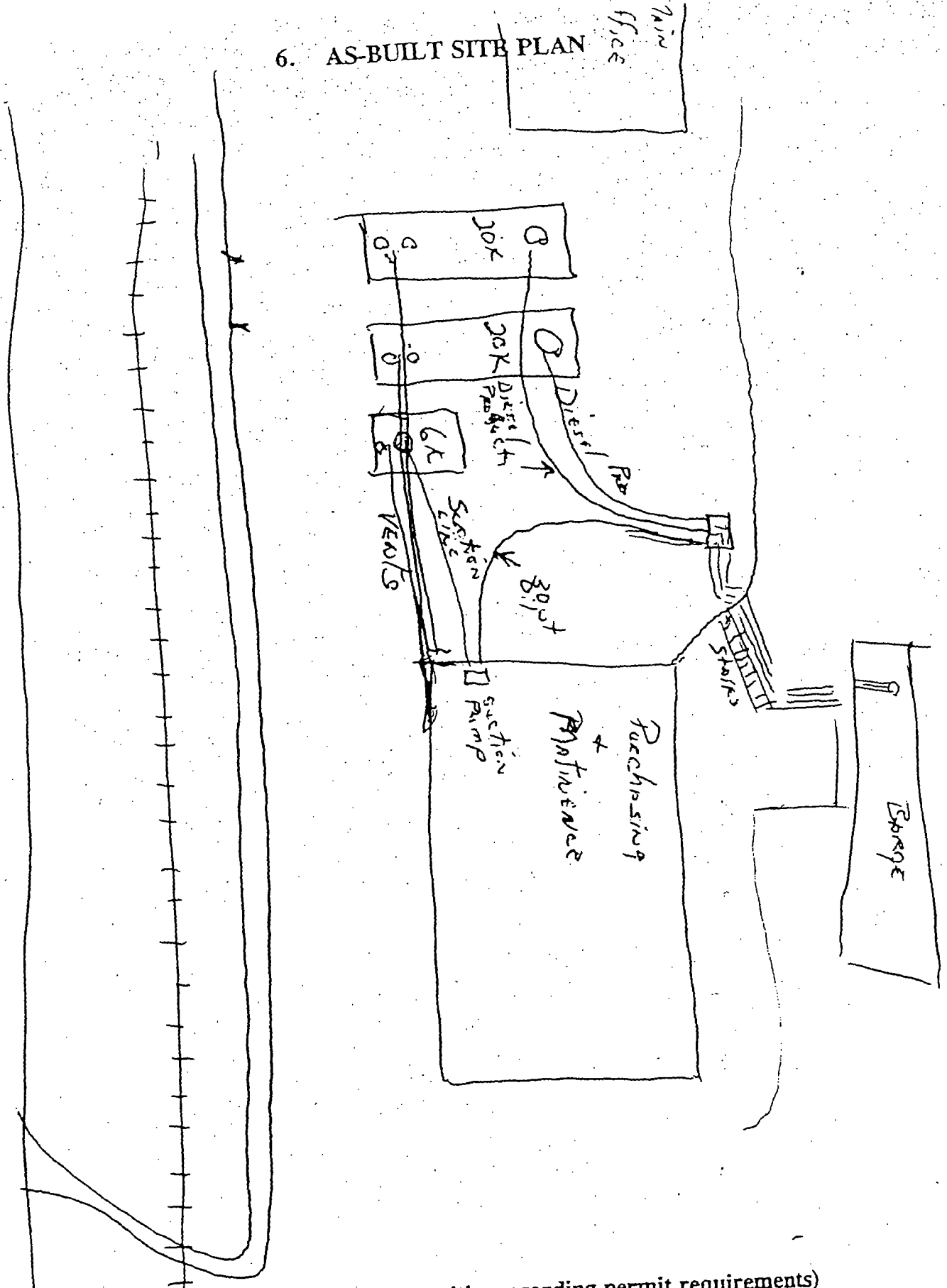
* other piping changes if applicable (describe): Above ground Steel

c. Date of completion of upgrade/retrofit indicated above: 11/13/98

5. CHECKLIST (Check YES or NO. Where a specific item is "not applicable" to the situation, please check the n/a box.)

	YES	NO	N/A
Was the DEQ Regional Office notified at least 30 days in advance of the planned project start date?	✓		
Was the DEQ Regional Office notified 72 hours in advance prior to beginning the upgrade/retrofit? If yes, indicate 3-day number issued: _____	✓		
Are the UST annual permit fees current?	✓		
Was external cathodic protection (CP) installed/upgraded or retrofitted?	✓		
Was a separate CP report submitted or attached?	✓		✓
Was a CP test station installed?			✓
Is a 6-month CP follow-up inspection/test scheduled? Projected inspection date: _____			✓
Was a site assessment conducted?			✓
Was contamination, including simple overfill, encountered and was it reported to DEQ? If so, indicate DEQ LUST number issued: 26-93-0009	✓		
Were internal inspections of all USTs completed before lining began on any UST?	✓		
Have the results of the internal tank inspections been submitted to and/or discussed with DEQ?			✓
If there were holes in any of the USTs, has a SUSPECTED release been reported to DEQ? If yes, indicate date reported: 10/19/98	✓		
Was the system tight-tested before placing back into service?	✓		
Do all tank and piping materials comply with 40 CFR 280.20 as modified by OAR Chapter 340, Division 150?	✓		
Have all items checked above been installed, upgraded or retrofitted in accordance with all codes, manufacturer's requirements and federal and state regulations?	✓		
Has the UST system owner/operator been provided with written documentation of the item(s) installed, upgraded or retrofitted and has the owner/operator been instructed to preserve these records?	✓		

6. AS-BUILT SITE PLAN



(always contact local authorities regarding permit requirements)

INSTALLER'S OATH: I certify that I have been the Oregon DEQ licensed supervisor present on site during the above listed upgrade/retrofit/replacement activities and to the best of my knowledge they have been conducted in compliance with all state and federal laws, regulations and industry standards and procedures pertaining to underground storage tanks. I further certify that the information contained in this report and checklist is true to the best of my belief and knowledge.

Installer: George N Nole (print name) — signature

Position: Supervisor

Company: P.N.S. Date: 11/16/98

UST Service Provider Firm, Executive Officer:

Patrick Murphy (print name) — signature — 11/16/98 (date)

UST FACILITY OWNER/OPERATOR UPGRADE CERTIFICATION STATEMENT: I hereby certify that the information provided on this checklist concerning the upgrade status of my tank system(s) is accurate.

Rafael A. Caballero (print name) — signature — 12/18/98 (date)

OWNER'S FINANCIAL RESPONSIBILITY INFORMATION SECTION

The tank owner has financial responsibility, if applicable, in accordance with OAR 340-150-004. Please specify:

Method of financial responsibility: Insurance

Insurer: American International Policy Number: MD330

This form must be mailed to the appropriate DEQ Regional Office within 30 days after the upgrade/retrofit project is completed. For information, call the appropriate DEQ Regional Office or the toll free number, 1-800-742-7878.

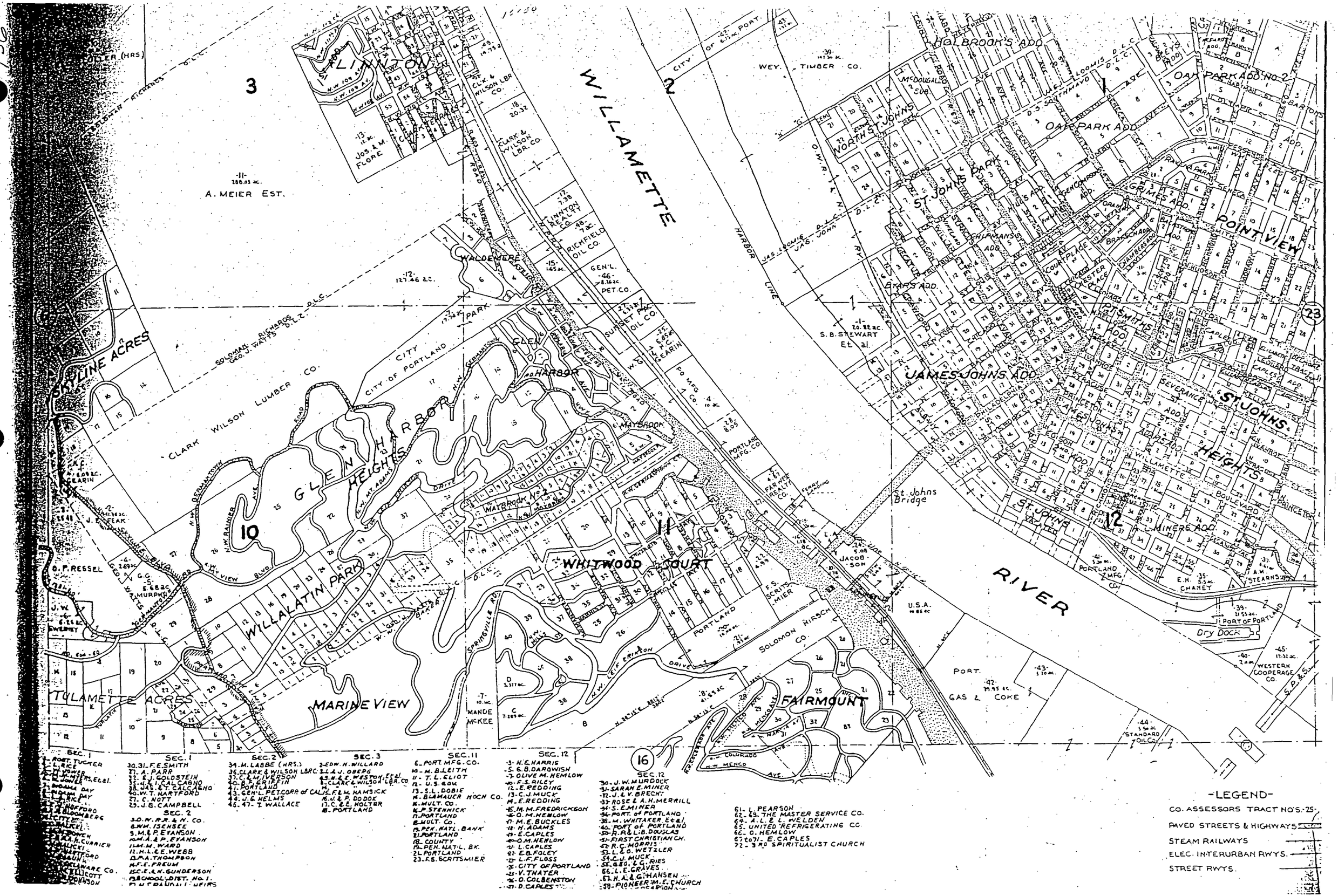
DEQ INSPECTIONS: This form may be used by DEQ Inspectors for oversight purposes. A DEQ inspector is not required to inspect the upgrade/retrofit. A DEQ inspector may not be on site or available during all of the inspections listed on this form. In the case of an oversight inspection, the DEQ inspector should check all boxes that are appropriate for the inspection(s) and forward a copy to the appropriate Regional Office for the facility file.

DEQ Inspector's Signature_____ Inspection Date(s)_____

APPENDIX G

UST Soil Remediation Documentation

WILLAMETTE
RIVER
LINNTON
A. MEIER EST.
WALDEMERE
GLEN HARBOR
GLEN HEIGHTS
WILLALATIN PARK
MARINE VIEW
WHITWOOD COURT
FAIRMOUNT
JAMES JOHNS ADD.
ST JOHNS HEIGHTS
POINTVIEW
OAK PARK ADD.
HOLBROOK'S ADD.
NORTH ST. JOHNS
ST JOHNS PARK
CITY OF PORT.
WEY. TIMBER CO.
CLARK WILSON LUMBER CO.
SOLOMON KIRSCH CO.
PORT. GAS & COKE
U.S.A.
PORT OF PORTLAND
Dry DOCK
WESTERN COOPERAGE CO.
STANDARD OIL CO.
HARBOR LINE
SEC. 1
SEC. 2
SEC. 3
SEC. 11
SEC. 12
-LEGEND-
CO. ASSESSORS TRACT NO'S.-25-
PAVED STREETS & HIGHWAYS



WILLAMETTE
RIVER
LINNTON
A. MEIER EST.
SKYLINE ACRES
CLARK WILSON LUMBER CO.
GLEN HARBOR HEIGHTS
WILLALATIN PARK
WHITWOOD COURT
MARINE VIEW
TULAMETTE ACRES
FAIRMOUNT
JAMES JOHNS ADD.
ST. JOHNS HEIGHTS
POINT VIEW
ST. JOHNS PARK
NORTH ST. JOHNS
HOLBROOK'S ADD.
OAK PARK ADD.
OAK PARK ADD. NO. 2
WEY. TIMBER CO.
S. B. STEWART Et al.
St. Johns Bridge
JACOBSON
U.S.A.
PORT. GAS & COKE
PORTLAND MFG. CO.
SOLOMON HIRSCH CO.
MANDE McKEE
WALDEMERE
MAYBROOK
MAYBROOK No. 2
CITY OF PORTLAND
CITY OF PORT.
HARBOR LINE
PORT OF PORTLAND
Dry Dock
WESTERN COOPERAGE CO.
STANDARD OIL CO.
SEC. 1
SEC. 2
SEC. 3
SEC. 11
SEC. 12
SEC. 12
-LEGEND-
CO. ASSESSORS TRACT NO'S. -25-
PAVED STREETS & HIGHWAYS
STEAM RAILWAYS
ELEC. INTERURBAN RWYS.
STREET RWYS.

1944

COUNTY

SOLOMAN RICHARDS D.L.C.

CITY OF PORTLAND (PARK)

SKYLINE ACRES

SOLOMAN RICHARDS GEO. J. WATTS D.L.C.

P. & N. HARRINGTON

GLEN HARBOR HEIGHTS

WILLALATIN PARK

TULAMETTE ACRES

MARINE VIEW

WHITWOOD COURT

FAIRMOUNT

WILLAMETTE RIVER

HARBOR LINE

WEYERH. TIMBER CO. WASH. CORP.

W. C. BAUMAN

CLARK & WILSON LBR. CO.

RICHFIELD OIL CO.

GEN'L. PET. CO.

SUNSET PAC. OIL CO.

PACIFIC OIL TERMS. CO.

PORTLAND MFG. CO.

MAYBROOK

WALDEMERE

GLEN

CITY OF PORTLAND

COLBROOK'S ADD.

OAK PARK ADD. NO. 2

OAK PARK ADD.

NORTH ST. JOHNS

ST. JOHNS PARK

POINT VIEW

JAMES JOHNS ADD.

ST. JOHNS HEIGHTS

A. L. MINERS ADD.

St. Johns Bridge

ST. JOHNS YACHT CLUB

PORTLAND MFG. CO.

PORT. TUG. & BARGE CO.

U.S.A.

PORT. ART ASS'N.

PORT. GAS & COKE

PORT OF PORTLAND Dry Dock

WESTERN COOPERAGE CO.

STANDARD OIL CO.

SEC. 1
1-ROBT. TUCKER
5-L. RICE
6-W. JOWER
10-H. MYERS, ET AL.
8-W. JOWER
7-DIDAMA DAY
9-DIDAMA DAY
9-ROBERT TUCKER
11-CITY OF PORTLAND
13A-R. BLOOMBERG
14-CITY
15C-HALICKI
16-H. M. BOWEN
17C-S. & A. H. CURRIER
18-W. HALICKI
19A-W. HARTFORD
20-MARY HELFRIGHT
21-THE DELAWARE CO.
22-R. M. ELLICOTT
23-W. R. JOHNSON
24-W. U.

SEC. 1
30, 31-I. & SMITH
27-E. F. ABBOTT
32-S. I. GOLDSTEIN
33-J. & I. CALCAGNO
34-WAS. & T. CALCAGNO
40-W. T. HARTFORD
27-C. NOTTLEY
29-J. B. CAMPBELL

SEC. 2
3-O. W. R. R. & N. CO.
8-ORE. FARMERS INST.
9-M. & P. EVANSON
10-M. A. & P. EVANSON
11-M. W. WARD
12-H. L. & E. WEBB
13-P. A. THOMPSON
4-D. & F. DAVIES
15-WHEEL & RIM SER. INS.
19-SCHOOL DIST. NO. 1.
22-M. CRANDALL, HEIRS
27-

SEC. 2
34-M. LABBE (HRS.)
52-F. & I. HUTCHINS
37-C. & M. IVERSON
40-B. & F. GRIFFIN
41-PORTLAND
43-O. W. R. & NAV. CO.
44-J. & HELMS
45, 47-T. WALLACE
55-J. & S. ANTROSIO
56-L. & HEBERT
58-M. M. WARD ETAL.

SEC. 3
2-S. & N. H. WILLARD
3-L. & J. OBERG
4-S. & N. & E. WESTON, ETAL
8-CLARK & WILSON LBR. CO.
14-"
15-F. & M. HAMSICK
16-J. & P. DODOK
17-S. & A. ILLIAS
18-PORTLAND
20-CITY OF PORTLAND
21-J. & L. WILKEY
23-L. & J. OBERG

SEC. 10
8-R. G. CLIFFORD
16-B. M. RICHARDSON
12-MARIE ROGERS

SEC. 11
6-PORT MFG. CO.
10-PORT. TUG & BARGE CO.
11-T. L. ELIOT
12-U. S. GOV.
13-S. L. DOBIE
14-BLAHAUER HOCH CO.
15-MULT CO.
16-P. STENICK
17-PORTLAND
18-JOHN REDDING
19-"
21-PORTLAND
18-COUNTY
19-PEN. ART'L. BK.
21-PORTLAND
23-COUNTY
31-A. & T. SCHIER
30-M. H. MONAHAN
29-F. ROTHLISBERGER

SEC. 12
3-CITY OF PORTLAND
5-G. & B. DAROWISH
7-OLIVE M. HEMLOW
10-F. S. RILEY
12-C. J. MUCK
13-C. J. MUCK
14-A. DERRIE
15-OLAF JOHNSON ETAL.
16-O. M. HEMLOW
17-M. E. BUCKLES
18-H. ADAMS
19-E. CAPLES
20-COUNTY
21-"
22-M. BUNTZEL
23-A. & G. PEDERSON
26-CITY OF PORTLAND
25-E. F. DEAN
26-DRAKE, WYMAN & VOSS

SEC. 12
30-J. W. MURDOCK
31-COUNTY
32-J. & V. BRECHT
33-ROSE & A. H. MERRILL
34-COUNTY
36-PORT OF PORTLAND
38-M. WHITAKER, ET AL.
40-PORT OF PORTLAND
50-B. R. BUTT
51-FIRST CHRISTIANICH.
52-R. C. MORRIS
53-MRS. G. M. RYNAS
54-C. J. MUCK
55-GEO. & C. RIES
56-L. E. GRAVES
53-H. A. & G. HANSEN
PIONEER M. E. CHURCH

SEC. 12
61-M. B. CANNON
64-J. & G. TWINEHAM
65-UNITED REFRIGERATING CO.
66-COUNTY
67-B. R. BUTT
72-THIRD SPIRITUALIST CHURCH
73-E. & B. MATTSEON
74-F. & M. MIKESH
68-T. & E. GRACE
69-70-71-COUNTY
75-J. A. MCKELLER
78-H. & M. DICKINSON
79 TO 82-E. F. DEAN
76-CRESCENT REALTY CO.
77-L. S. & E. CALLISON
83-WEST COOPERAGE CO.

-LEGEND-
CO. ASSESSORS TRACT NO'S.-25-
PAVED STREETS & HIGHWAYS
STEAM RAILWAYS
ELEC. INTERURBAN RWYS.
STREET RWYS

Reproduc
or part for pers
resale is prob

APPENDIX E

UST Permitting and Decommissioning Documentation

Department of Environmental Quality
811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229 -6652

UNDERGROUND STORAGE TANK PROGRAM

GENERAL PERMIT OPERATING CERTIFICATE

ISSUED TO:
Foss Maritime Company
Raphael Caballero
9030 NW St. Helens Road
PO Box 83018
Portland, OR 97283-0018

OPERATING CERTIFICATE NUMBER: 26 - 7374 - 1998 - OPER

FACILITY NAME AND LOCATION:

Knappton Corporation
9030 NW St. Helens Road
Portland, OR 97203

TANK OWNER: Foss Maritime Company

PERMITTEE: Foss Maritime Company

REGISTRATION TYPE: Operate
Regulated Substance Delivery Authorized

TANK PERMIT NO:	TANK ID NO:	TANK SIZE:	TANK CONTENTS:
AEFG	1	20,000 gallons	Diesel
AEFH	2	20,000 gallons	Diesel
AEGK	4	6,000 gallons	New Oil

Issued in accordance with the provisions of ORS Chapter 466.706 to 466.835, 466.994 and 466.995 and OAR 340-150-0001 to -0166 and ORS 465.200 to 465.455 and 465.990 and OAR 340-122-0205 to -0360.

The Oregon Department of Environmental Quality issues this operating certificate with the understanding that the permittee will operate in accordance with the conditions and requirements of the general permit to operate an underground storage tank pursuant to OAR 340-150-0163. This operating certificate remains valid until such time as a modified registration form is received by the department or the department suspends or revokes the operating certificate for failure by the permittee to comply with the conditions and requirements of the general permit to operate or applicable statutes or rules.

ISSUE DATE: 12/23/1998

Michael H. Kortenhof, Manager
UST Compliance and Cleanup Program
Waste Management and Cleanup Division

Regulated Substance Delivery Authorized

UNDERGROUND STORAGE TANK PROGRAM

GENERAL PERMIT REGISTRATION FORM TO OPERATE

FACILITY ID NUMBER: 7374

Complete this form **ONLY** if you intend to operate any of the tanks listed as **TANKS TO BE DECOMMISSIONED** on the reverse side of this page. Also include any new tanks which you have installed, **only** if you have not already received a general permit to operate registration form for these tanks in the mail. Please print your facility number in the space above.

This form must be mailed to the address on the instruction page. Both the permittee and tank owner must sign. Make a copy of this form for your records. Lastly, please call your DEQ regional office listed on page 4 of the instructions and discuss these changes you are making. It will help to speed up the processing of this registration form.

Tank ID Number	Tank Permit Number
1	AEFG

AEFG

Tank ID Number	Tank Permit Number
2	AEFH

AEFH

Tank ID Number	Tank Permit Number
4	AEFK

AEFK

Note: Failure to register and receive a general permit registration certificate to operate under the recently adopted rules means that after December 22, 1998 regulated substance cannot be deposited into the tanks.

Foss Maritime Co.

Legal Name* of **Tank Owner** as registered with the Secretary of State, Corporations Division

Rafael A. Caballero

Name of Official (Please Print)

RACaballero 12/18/98

Signature of Official Date

Foss Maritime Co.

Legal Name* of **Permittee** as registered with the Secretary of State, Corporations Division

Rafael A. Caballero

Name of Official (Please Print)

RACaballero 12/18/98

Signature of Official Date

I hereby register to operate the USTs described above in accordance with the conditions and requirements of the general permit pursuant to OAR 340-150-0163. I also certify that these tanks meet the 1998 technical standards for corrosion control, spill and overfill prevention and leak detection and I have arranged financial responsibility.

* If you are not registered with the Secretary of State, Corporations Division, provide the name that you currently use to identify your business to customers.

WNER NAME

VID POLLAND

APPTON CORP.

.BOX 03018

RTLAND OR 97203

OWNER SIGNATURE

UST-4099

ASSESSMENT

5 Tanks at $25.00 = $ 125.00

If different, fill in correct information

_____ Tanks at $25.00 = _____

AMOUNT REMITTED $ #125.00

ck # 20374

Each completed application must include the signatures of the tank owner, the property owner and the permittee. All three signature lines must be signed. The data sheets are part of the application and should be left attached and returned. Please return the completed application to the DEQ, Business Office, 811 SW 6th, Portland, OR 97204 using the envelope provided.

OPERTY OWNER

PLEASE PRINT CLEARLY

Schofield Corporation

PO BOX 03018

Portland Or 97203

PROPERTY OWNER SIGNATURE

PERMITTEE

PLEASE PRINT CLEARLY

Facility I.D. # _____ Tank I.D. # _____

x

PERMITTEE SIGNATURE

Yes, this data information sheet is correct

No, this data information sheet is not correct

SIC Code 4492

RECEIVED
MAR 30 1993

Please make copies for your records and return all 4 pages to DEQ

OREGON UST SURVEY

INSTRUCTIONS

Please check the data below for correctness. Make any changes right on this sheet. If you have new or additional information, please write it on the sheet. Leave these sheets attached to the application package and return them to the DEQ by May 1, 1988.

Tank Identification No.		TANK NO. 1	TANK NO. 2	TANK NO. 3	TANK NO. 4
1. Status of Tank *(check one)*	If temporarily out of use, Estimated time out of use: 1 month - 6 months	( )	( )	( )	( )
	6 months - 1 year	( )	( )	( )	( )
	1 year - 5 years	( )	( )	( )	( )
	5 years or more	( )	( )	( )	( )
	Estimated date to be brought back into use (mo/yr)	( )	( )	( )	( )
2. Was tank new at time of installation? (Y/N)		(Y)	(Y)	(Y)	(Y)
3. Containment Systems *(check one)*	Single-walled tank	(Y)	(Y)	(Y)	(Y)
	Double-walled tank	( )	( )	( )	( )
	Pit-lining system	( )	( )	( )	( )
	Unknown	( )	( )	( )	( )
4. Leak Detection System *(check all that apply)*	Visual	(Y)	(Y)	(Y)	(Y)
	Stock inventory	(Y)	(Y)	(Y)	(Y)
	Tile drain	( )	( )	( )	( )
	Vapor wells	( )	( )	( )	( )
	Sensor instrument (specify type):				
	In-ground detector	( )	( )	( )	( )
	Within walls of double-walled tank	( )	( )	( )	( )
	Ground water monitoring wells	( )	( )	( )	( )
	Continuous in piping	(Y)	(Y)	( )	( )
	Pressure test	(Y)	(Y)	(Y)	(Y)
	Internal inspection	( )	( )	( )	( )
	Other, specify	RED JACKET	RED JACKET		
	None	( )	( )	( )	( )
	Unknown	( )	( )	( )	( )
5. Overfill Protection (Yes/No)		(N)	(N)	(N)	(N)
6. Location of Piping *(check all that apply)*	No parts in contact with soil	( )	( )	( )	( )
	Parts contacting the soil which are:	( )	( )	( )	( )
	Unprotected metal	( )	( )	( )	( )
	Made of corrosion resistant materials	( )	( )	( )	( )
	Corrosion-resisted coated	(Y)	(Y)	(Y)	(Y)
	Cathodically protected	( )	( )	( )	( )
	Double-walled	( )	( )	( )	( )
	Within a secondary containment	( )	( )	( )	( )
	Interior lined	( )	( )	( )	( )
	Unknown	( )	( )	( )	( )
7. History of Tank Repairs *(check one except as indicated)*	If tank repaired, indicate date of last repairs (mo/yr)				
	None	(Y)	(Y)	(Y)	(Y)
	Unknown	( )	( )	( )	( )
8. History of Pipe Repairs *(check one except as indicated)*	If pipe repaired, indicate date (mo/yr)				
	None	(Y)	(Y)	(Y)	(Y)
	Unknown	( )	( )	( )	( )

FACILITY NAME
ADDRESS
CITY, STATE, ZIP

TANK DESCRIPTION

INSTRUCTIONS

Please check the data below for correctness. Make any changes right on this sheet. If you have new or additional information, please write it on the sheet. Leave these sheets attached to the application package and return them to the DEQ by May 1, 1988.

	TANK NO.	TANK NO.	TANK NO.	TANK NO.
Tank Identification No. (e.g., ABC-123), or Arbitrarily Assigned Sequential No. (e.g., 1,2,3,...)	1	2	3	4
1. Status of Tank (*Mark all that apply* ☒) — Currently in Use	(Y)	(Y)	(Y)	(Y)
Temporarily Out of Use	( )	( )	( )	( )
Permanently Out of Use	( )	( )	( )	( )
Brought into Use after 5/8/86	( )	( )	( )	( )
2. Age When Reported/Current Age	7/ 8	7/ 8	7/ 8	7/ 8
3. Estimated Total Capacity (Gallons)	20000	20000	6000	6000
4. Material of Construction (*Mark one* ☒) — Steel	(Y)	(Y)	(Y)	(Y)
Concrete	( )	( )	( )	( )
Fiberglass Reinforced Plastic	( )	( )	( )	( )
Unknown	( )	( )	( )	( )
Other, Please Specify				
5. Internal Protection (*Mark all that apply* ☒) — Cathodic Protection	( )	( )	( )	( )
Interior Lining (e.g., epoxy resins)	( )	( )	( )	( )
None	(Y)	(Y)	(Y)	(Y)
Unknown	( )	( )	( )	( )
Other, Please Specify				
6. External Protection (*Mark all that apply* ☒) — Cathodic Protection	( )	( )	( )	( )
Painted (e.g., asphaltic)	(Y)	(Y)	(Y)	(Y)
Fiberglass Reinforced Plastic Coated	( )	( )	( )	( )
None	( )	( )	( )	( )
Unknown	( )	( )	( )	( )
Other, Please Specify				
7. Piping (*Mark all that apply* ☒) — Bare Steel	( )	( )	( )	( )
Galvanized Steel	(Y)	(Y)	(Y)	(Y)
Fiberglass Reinforced Plastic	( )	( )	( )	( )
Cathodically Protected	( )	( )	( )	( )
Unknown	( )	( )	( )	( )
Other, Please Specify				
8. Substance Currently or Last Stored in Greatest Quantity by Volume (*Mark all that apply* ☒) — a. Empty	( )	( )	( )	( )
b. Petroleum	( )	( )	( )	( )
Diesel	(Y)	(Y)	( )	( )
Kerosene	( )	( )	( )	( )
Gasoline (including alcohol blends)	( )	( )	( )	( )
Used Oil	( )	( )	( )	( )
Other, Please Specify			NEW OIL	NEW OIL
Please — c. Hazardous Substance				
Indicate Name of Principal CERCLA Substance or Chemical Abstract Service (CAS) No.				
Mark box ☒ if tank stores a mixture of substances	☐	☐	☐	☐
d. Unknown	( )	( )	( )	( )
9. Additional Information (for tanks permanently taken out of service) a. Estimated date last used (mo/yr)				
b. Estimate quantity of substance remaining (gal.)				
c. Mark box ☒ if tank was filled with inert material	☐	☐	☐	☐

FACILITY NAME: KNAPPTON CORPORATION
ADDRESS: 9030 N.W. ST. HELENS RD.
CITY, STATE: PORTLAND OR 97203

WNER NAME

UST-4099

AVID POLLAND

APPTON CORP.

O.BOX 03018

RTLAND OR 97203

David A Pollard

OWNER SIGNATURE

Each completed application must include the signatures of the tank owner, the property owner and the permittee. All three signature lines must be signed. The data sheets are part of the application and should be left attached and returned. Please return the completed application to the DEQ, Business Office, 811 SW 6th, Portland, OR 97204 using the envelope provided.

ROPERTY OWNER

PLEASE PRINT CLEARLY

Seigfried Corporation

PO Box 03018

Portland Or 97203

D A Pollard

PROPERTY OWNER SIGNATURE

PERMITTEE

PLEASE PRINT CLEARLY

Facility I.D. # _____ Tank I.D. # _____

X D A Pollard

PERMITTEE SIGNATURE

Yes, this data information sheet is correct

No, this data information sheet is not correct

SIC Code 4493

Please make copies for your records and return all 4 pages to DEQ

TANK DESCRIPTION

INSTRUCTIONS

Please check the data below for correctness. Make any changes right on this sheet. If you have new or additional information, please write it on the sheet. Leave these sheets attached to the application package and return them to the DEQ by May 1, 1988.

		TANK NO.	TANK NO.	TANK NO.	TANK NO.
Tank Identification No. (e.g., ABC-123), or Arbitrarily Assigned Sequential No. (e.g., 1,2,3,...)		5			
1. Status of Tank (*Mark all that apply* ☒)	Currently In Use	(Y)	( )	( )	( )
	Temporarily Out of Use	( )	( )	( )	( )
	Permanently Out of Use	( )	( )	( )	( )
	Brought Into Use after 5/8/86	( )	( )	( )	( )
2. Age When Reported/Current Age		7/ 8			
3. Estimated Total Capacity (Gallons)		2000			
4. Material of Construction (*Mark one* ☒)	Steel	(Y)	( )	( )	( )
	Concrete	( )	( )	( )	( )
	Fiberglass Reinforced Plastic	( )	( )	( )	( )
	Unknown	( )	( )	( )	( )
	Other, Please Specify				
5. Internal Protection (*Mark all that apply* ☒)	Cathodic Protection	( )	( )	( )	( )
	Interior Lining (e.g., epoxy resins)	( )	( )	( )	( )
	None	(Y)	( )	( )	( )
	Unknown	( )	( )	( )	( )
	Other, Please Specify				
6. External Protection (*Mark all that apply* ☒)	Cathodic Protection	( )	( )	( )	( )
	Painted (e.g., asphaltic)	(Y)	( )	( )	( )
	Fiberglass Reinforced Plastic Coated	( )	( )	( )	( )
	None	( )	( )	( )	( )
	Unknown	( )	( )	( )	( )
	Other, Please Specify				
7. Piping (*Mark all that apply* ☒)	Bare Steel	( )	( )	( )	( )
	Galvanized Steel	(Y)	( )	( )	( )
	Fiberglass Reinforced Plastic	( )	( )	( )	( )
	Cathodically Protected	( )	( )	( )	( )
	Unknown	( )	( )	( )	( )
	Other, Please Specify				
8. Substance Currently or Last Stored In Greatest Quantity by Volume (*Mark all that apply* ☒)	a. Empty	( )	( )	( )	( )
	b. Petroleum	( )	( )	( )	( )
	Diesel	( )	( )	( )	( )
	Kerosene	( )	( )	( )	( )
	Gasoline (Including alcohol blends)	(Y)	( )	( )	( )
	Used Oil	( )	( )	( )	( )
	Other, Please Specify				
Please	c. Hazardous Substance				
Indicate Name of Principal CERCLA Substance or Chemical Abstract Service (CAS) No.					
k box ☒ if tank stores a mixture of substances		☐	☐	☐	☐
	d. Unknown	( )	( )	( )	( )
9. Additional Information (for tanks permanently taken out of service)	a. Estimated date last used (mo/yr)	_____	_____	_____	_____
	b. Estimate quantity of substance remaining (gal.)				
	c. Mark box ☒ if tank was filled with inert material (e.g., sand, concrete)	☐	☐	☐	☐

CITY, STATE, ZIP PORTLAND OR 97203

OREGON UST SURVEY

INSTRUCTIONS

Please check the data below for correctness. Make any changes right on this sheet. If you have new or additional information, please write it on the sheet. Leave these sheets attached to the application package and return them to the DEQ by May 1, 1988.

Tank Identification No.	TANK NO. 5	TANK NO.	TANK NO.	TANK NO.
1. Status of Tank *(check one)* — If temporarily out of use, Estimated time out of use:	( )	( )	( )	( )
1 month - 6 months	( )	( )	( )	( )
6 months - 1 year	( )	( )	( )	( )
1 year - 5 years	( )	( )	( )	( )
5 years or more	( )	( )	( )	( )
Estimated date to be brought back into use (mo/yr)	( )	( )	( )	( )
2. Was tank new at time of installation? (Y/N)	(Y)	( )	( )	( )
3. Containment Systems *(check one)* — Single-walled tank	(Y)	( )	( )	( )
Double-walled tank	( )	( )	( )	( )
Pit-lining system	( )	( )	( )	( )
Unknown	( )	( )	( )	( )
4. Leak Detection System *(check all that apply)* — Visual	(Y)	( )	( )	( )
Stock inventory	(Y)	( )	( )	( )
Tile drain	( )	( )	( )	( )
Vapor wells	( )	( )	( )	( )
Sensor instrument (specify type):				
In-ground detector	( )	( )	( )	( )
Within walls of double-walled tank	( )	( )	( )	( )
Ground water monitoring wells	( )	( )	( )	( )
Continuous in piping	(Y)	( )	( )	( )
Pressure test	( )	( )	( )	( )
Internal inspection	( )	( )	( )	( )
Other, specify	RED JACKET			
None	( )	( )	( )	( )
Unknown	( )	( )	( )	( )
5. Overfill Protection (Yes/No)	(N)	( )	( )	( )
6. Location of Piping *(check all that apply)* — No parts in contact with soil	( )	( )	( )	( )
Parts contacting the soil which are:	( )	( )	( )	( )
Unprotected metal	( )	( )	( )	( )
Made of corrosion resistant materials	( )	( )	( )	( )
Corrosion-resisted coated	(Y)	( )	( )	( )
Cathodically protected	( )	( )	( )	( )
Double-walled	( )	( )	( )	( )
Within a secondary containment	( )	( )	( )	( )
Interior lined	( )	( )	( )	( )
Unknown	( )	( )	( )	( )
7. History of Tank Repairs *(check one except as indicated)* — If tank repaired, indicate date of last repairs (mo/yr)				
None	(Y)	( )	( )	( )
Unknown	( )	( )	( )	( )
8. History of Pipe Repairs *(check one except as indicated)* — If pipe repaired, indicate date (mo/yr)				
None	(Y)	( )	( )	( )
Unknown	( )	( )	( )	( )

ADDRESS: 9030 N.W. ST. HELENS RD.
CITY, STATE, ZIP: PORTLAND OR 97203

THANK YOU FOR YOUR ASSISTANCE

CHECKLIST - PERMIT APPLICATION PROCESSING

Facility Number: 73741
Application Number: UST-4099
Date Received: 5/30/88

Permittee Information Entered ✓
SIC Code Entered ✓
Tank Contents checked ✓
Tank ID number checked ✓
Permit Ordered ✓
Date: 9/20/88

AEFG, AEFH, AEFJ, AEGK, AEGA

Property Owner Information Entered ✓
Corrections made to tank information N/A
Date: 2/25/91

Other actions needed:

Returned to owner/permittee _____
Date: _____

Incomplete _____
Other _____

Received back from owner/permittee _____
Date: _____

Comments: changed name to
Property Owner # 13075 Brix Maritime Co.
Rafael Caballero
4/6/90 [illegible]

Notification for Underground Storage Tanks

FORM APPROVED
OMB NO. 2050-0049
APPROVAL EXPIRES 6-30-88

Return To: Oregon Department of Environmental Quality
Underground Storage Tank Program
P.O. Box 1760
Portland, Oregon 97207

STATE USE ONLY
I.D Number 7374
Date Received

GENERAL INFORMATION

Notification is required by Federal law for all underground tanks that have been used to store regulated substances since January 1, 1974, that are in the ground as of May 8, 1986, or that are brought into use after May 8, 1986. The information requested is required by Section 9002 of the Resource Convervation and Recovery Act, (RCRA), as amended.

The primary purpose of this notification program is to locate and evaluate underground tanks that store or have stored petroleum or hazardous substances. It is expected that the information you provide will be based on reasonably available records, or, in the absence of such records, your knowledge, belief, or recollection.

Who Must Notify? Section 9002 of RCRA, as amended, requires that, unless exempted, owners of underground tanks that store regulated substances must notify designated State or local agencies of the existence of their tanks. Owner means—

(a) in the case of an underground storage tank in use on November 8, 1984, or brought into use after that date, any person who owns an underground storage tank used for the storage, use, or dispensing of regulated substances, and

(b) in the case of any underground storage tank in use before November 8, 1984, but no longer in use on that date, any person who owned such tank immediately before the discontinuation of its use.

RECEIVED MAY 05 1986

What Tanks Are Included? Underground storage tank is defined as any one or combination of tanks that (1) is used to contain an accumulation of "regulated substances," and (2) whose volume (including connected underground piping) is 10% or more beneath the ground. Some examples are underground tanks storing: 1. gasoline, used oil, or diesel fuel, and 2. industrial solvents, pesticides, herbicides or fumigants.

What Tanks Are Excluded? Tanks removed from the ground are not subject to notification. Other tanks excluded from notification are:

1. farm or residential tanks of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;
2. tanks used for storing heating oil for consumptive use on the premises where stored;
3. septic tanks;
4. pipeline facilities (including gathering lines) regulated under the Natural Gas Pipeline Safety Act of 1968, or the Hazardous Liquid Pipeline Safety Act of 1979, or which is an intrastate pipeline facility regulated under State laws;
5. surface impoundments, pits, ponds, or lagoons;
6. storm water or waste water collection systems;
7. flow-through process tanks;
8. liquid traps or associated gathering lines directly related to oil or gas production and gathering operations;
9. storage tanks situated in an underground area (such as a basement, cellar, mineworking drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

What Substances are Covered? The notification requirements apply to underground storage tanks that contain regulated substances. This includes any substance defined as hazardous in section 101 (14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), with the exception of those substances regulated as hazardous waste under Subtitle C of RCRA. It also includes petroleum, e.g., crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute).

Where To Notify? Completed notification forms should be sent to the address given at the top of this page.

When To Notify? 1. Owners of underground storage tanks in use or that have been taken out of operation after January 1, 1974, but still in the ground, must notify by May 8, 1986. 2. Owners who bring underground storage tanks into use after May 8, 1986, must notify within 30 days of bringing the tanks into use.

Penalties: Any owner who knowingly fails to notify or submits false information shall be subject to a civil penalty not to exceed $10,000 for each tank for which notification is not given or for which false information is submitted.

INSTRUCTIONS

Please type or print in ink all items except "signature" in Section V. **This form must be completed for each location containing underground storage tanks.** If more than 5 tanks are owned at this location, photocopy the reverse side, and staple continuation sheets to this form.

Indicate number of continuation sheets attached. 0

I. OWNERSHIP OF TANK(S)

Owner Name (Corporation, Individual, Public Agency, or Other Entity)
Knappton Corporation

Street Address
PO Box 03018 9030 NW St. Helens Rd.

County
Mult.

City: Portland State: Ore Zip Code: 97203

Area Code Phone Number
503-286-0631

Type of Owner (*Mark all that apply* ☒)

☒ Current ☐ Former

☐ State or Local Gov't. ☐ Federal Gov't. ☐ (GSA facility I.D. no.) 13075

☒ Private or Corporate ☐ Ownership uncertain

II. LOCATION OF TANK(S)

(If same as Section 1, mark box here ☒)

Facility Name or Company Site Identifier, as applicable

Street Address or State Road, as applicable

County

City (nearest) State Zip Code

Indicate number of tanks at this location 5

Mark box here if tank(s) are located on land within an Indian reservation on other Indian trust lands ☐

III. CONTACT PERSON AT TANK LOCATION

Name (if same as Section 1, mark box here ☐)
David A. Polland

Job Title
Purchasing Mgr.

Area Code Phone Number
503-286-0631

IV. TYPE OF NOTIFICATION

☐ Mark box here only if this is an amended or subsequent notification for this location.

V. CERTIFICATION (Read and sign after completing Section VI.)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Name and official title of owner or owner's authorized representative	Signature	Date Signed
David A. Polland, Purchasing Manager	DA Polland	5/2/86

CONTINUE ON REVERSE SIDE

Please complete the voluntary UST Survey on Page 4.

Owner Name (from Section I) Knapptun Corp. Location (from Section II) 9030 NW St. Helens Rd Portland Page No. 1 of 1 Pages

VI. DESCRIPTION OF UNDERGROUND STORAGE TANKS (Complete for each tank at this location.)

Tank Identification No. (e.g., ABC-123), or Temporarily Assigned Sequential No. (e.g., 1,2,3...)	Tank No. 1	Tank No. 2	Tank No. 3	Tank No. 4	Tank No. 5
1. Status of Tank *(Mark all that apply ☒)* Currently in Use	✓	✓	✓	✓	✓
Temporarily Out of Use					
Permanently Out of Use					
Brought into Use after 5/8/86					
2. Estimated Age (Years)	7	7	7	7	7
3. Estimated Total Capacity (Gallons)	20,000	20,000	6,000	6,000	2,000
4. Material of Construction *(Mark one ☒)* Steel	✓	✓	✓	✓	✓
Concrete					
Fiberglass Reinforced Plastic					
Unknown					
Other, Please Specify					
5. Internal Protection *(Mark all that apply ☒)* Cathodic Protection					
Interior Lining (e.g., epoxy resins)					
None	✓	✓	✓	✓	✓
Unknown					
Other, Please Specify					
6. External Protection *(Mark all that apply ☒)* Cathodic Protection					
Painted (e.g., asphaltic)	✓	✓	✓	✓	✓
Fiberglass Reinforced Plastic Coated					
None					
Unknown					
Other, Please Specify					
7. Piping *(Mark all that apply ☒)* Bare Steel					
Galvanized Steel	✓	✓	✓	✓	✓
Fiberglass Reinforced Plastic					
Cathodically Protected					
Unknown					
Other, Please Specify					
8. Substance Currently or Last Stored in Greatest Quantity by Volume *(Mark all that apply ☒)* **a. Empty**					
b. Petroleum Diesel	✓	✓			
Kerosene					
Gasoline (including alcohol blends)					✓
Used Oil					
Other, Please Specify			New oil	New oil	
Please **c. Hazardous Substance**					
Indicate Name of Principal CERCLA Substance					
or Chemical Abstract Service (CAS) No.					
Mark box ☒ if tank stores a mixture of substances					
d. Unknown					
9. Additional information (for tanks permanently taken out of service) a. Estimated date last used (mo/yr)	/	/	/	/	/
b. Estimate quantity of substance remaining (gal.)					
c. Mark box ☒ if tank was filled with inert material (e.g., sand, concrete)					

RECEIVED MAY 06 1986

PA Form 7530-1 (11-85) Reverse

THANK YOU FOR YOUR ASSISTANCE

X

REMEMBER...

If you are an owner:

1. Affix mailing label to form
2. Complete EPA Form 7530-1
3. Sign Section V of EPA Form
4. Complete Oregon UST Survey Information
5. Fold form on dotted lines
6. Make sure DEQ address is visible
7. Mail to DEQ by May 8, 1986

FOLD HERE

RETURN ADDRESS KNAPPTON CORPORATION
9030 N.W. St. Helens Road
P. O. Box 03018
Portland, Oregon 97203

Affix Mailing Label

13075

PORTLAND OR MAY 5 PM

Affix Postage Here

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
P.O. Box 1760
Portland, Oregon 97207

---------- Facility Information ----------

Facility ID	7374	SIC Code 4492	(TOWING AND TUGBOAT SERVICE)		
LUST data	Y			Received 06MAY1986	
acility Name	KNAPPTON CORPORATION				
Address	9030 NW ST HELENS RD				
ity/State/Zip	PORTLAND	OR	97203	Indian	N
County	26 MULTNOMAH				
ntact Person	DAVID A. POLLAND, PURCHASING MANAGER			Ph (503) 286-0631	
ubsequent Not	N	Latitude	Longitude	Signature	Y

ount: *1 <Replace>

		Contacts	
ermitee:	Name	Raphael Caballero	
	Organization	Foss Maritime Company	
	Address1	9030 NW St. Helens Road	
	Address2	PO Box 83018	
	City, ST Zip	Portland	OR 97283-0018
	Phone1	(503) 286-0631	
vner:	Name	Raphael Caballero	
	Organization	Foss Maritime Company	
	Address1	9030 NW St. Helens Road	
	Address2	PO Box 83018	
	City, ST Zip	Portland	OR 97283-0018
	Phone1	(503) 286-0631	
operty Owner:	Name	Raphael Caballero	
	Organization	Foss Maritime Company	
	Address1	9030 NW St. Helens Road	
	Address2	PO Box 83018	
	City, ST Zip	Portland	OR 97283-0018
	Phone1	(503) 286-0631	

ount: 1 v <Replace>

UST Compliance Query

---------- Facility ----------

acility ID	7374	SIC 4492	LUST facility Y
Facility Name	KNAPPTON CORPORATION		
Facility Address	9030 NW ST HELENS RD		
City, ST Zip	PORTLAND		OR 97203

Comments

---------- Tanks ----------

ınk ID	2	Contents:	
ank Status	ACTIVE	Empty	
ate Decomm.		Petroleum	DIESEL
ermit #	AEFH	Haz. Material	
ermit Status	ACTIVE	Unknown	
nstalled	06MAY1979	Construction	STEEL
allons	20000	External Prot	PAINTED
verfill			
eak Detect	VISUAL, STOCK INVENTORY, IN PIPING, PRESSURE TEST,		

ount: 2 ^ v <Replace>

UST Compliance Query

---------- Facility ----------

Facility ID 7374 SIC 4492 LUST facility Y
Facility Name KNAPPTON CORPORATION
Facility Address 9030 NW ST HELENS RD
City, ST Zip PORTLAND OR 97203
Comments

---------- Tanks ----------

ank ID	4	Contents:	
ank Status	ACTIVE	Empty	
ate Decomm.		Petroleum	NEW OIL
ermit #	AEGK	Haz. Material	
ermit Status	ACTIVE	Unknown	
nstalled	06MAY1979	Construction	STEEL
allons	6000	External Prot	PAINTED
erfill			
eak Detect	VISUAL, STOCK INVENTORY, PRESSURE TEST,		

ount: 4 ^ v <Replace>

Oregon Department of Environmental Quality

UNDERGROUND STORAGE TANK DECOMMISSIONING CHECKLIST

NUMBER: 7374 DATE: 9/10/98

FACILITY NAME: Foss Maritime

FACILITY ADDRESS: 9030 NW St Helens Rd

PHONE: (503) 286-0631

SAFETY EQUIPMENT ON JOB SITE:

Fire Extinguisher: Type/Size: 20# ABC Recharge Date: _____

Combustible Gas Detector: Model: Gas Tech Calibration Date: _____

Oxygen Analyzer: Model: _____ Calibration Date: _____

DECOMMISSIONING: All Tanks: N/A = Not Applicable

Check (√) Appropriate Box

	YES	NO	UNKNOWN	N/A
1. All electrical equipment grounded and explosion proof?	√			
2. Safety equipment on job site?	√			
3. Overhead electrical lines located?	√			
4. Subsurface electrical lines off or disconnected?	√			
5. Natural gas lines off or disconnected?	√			
6. No open fires or smoking material in area?	√			
7. Vehicle and pedestrian traffic controlled?	√			
8. Excavation material area cleared?	√			
9. Rainwater runoff directed to treatment area?				√
10. Drained and collected product from lines?	√			
11. Removed product and residual from tank?	√			
12. Cleaned tank?	√			
13. Excavated to top of tank?	√			
14. Removed tank fixtures? (pumps, leak detection equipment)	√			
15. Removed product, fill and vent lines?	√			

TANK ABANDONMENT IN-PLACE:

16. Sampling plan approved by DEQ? Date: _____ DEQ Staff: _____			

D. DECOMMISSIONING: All Tanks: N/A = Not Applicable
Check (√) Appropriate Box

	YES	NO	U[illegible]
17. Contamination concerns fully resolved?	✓		
[illegible]. Material? Type: N/A			

E. TANK REMOVAL:

19. Tank placement area cleared, chocks placed?	✓			
20. Purged or ventilated tank to prevent explosion? Method used: CO_2 Meter reading: LEL 9 Oxy 4	✓			
21. No chains or steel cables wrapped around tank for removal?	✓			
22. Tank removed, set on ground, blocked to prevent movement?	✓			
23. Tank set on truck and secured with straps(s)?	✓			
24. Tank labeled before leaving site?	✓			

F. SITE ASSESSMENT:

25. Site assessed for contamination? See OAR 340-122-340 over fill on up gracked tanks 20K diesels	✓			
26. Soil samples taken and analyzed?	✓			
27. Decommissioning/Change-in-Service report sent to DEQ?	✓			
28. Was contamination found? Date/Time: 10/15/98 AM	✓			
29. Was contamination reported to DEQ? By: Mark Keening Date/Time: 10/19/98 10:55 AM DEQ Staff: Greg Turan				
30. Was hazardous waste determination made for tank contents (Liquids/sludges)?				

31. Disposal location of tank(s) contents.

Name: Oil Rerefining Date: _____

Address: _____

_____ Attach disposal receipt.

32. Disposal or recycling location of removed tank(s) and associated piping.

Name: Switzer Steel Date: _____

Address: _____

_____ Attach disposal receipt.

33. If tank(s) are intended to be reused, identify new tank site.

Name: N/A Date: _____

Address: _____ Purpose of Reuse: _____

Rcd 12/18/98
NWR-UST

Oregon Department of Environmental Quality

NDERGROUND STORAGE TANK DECOMMISSIONING/SERVICE CHANGE REPORT

DEQ FACILITY NUMBER: 7374 DATE: 11/12/98

FACILITY NAME: Foss Maritime

FACILITY ADDRESS: 9030 St Helens Rd

PHONE: (503) 286-0631

he following information MUST be submitted by the underground storage tank owner, operator or licensed DEQ Supervisor within 0 days following completion of the tank decommissioning or changing tank contents to a non-regulated substance. (OAR 340-150-01 through -150).

he attached supplemental checklist should be prepared by the person performing the decommissioning or service change. The necklist should be provided to DEQ and the tank owner to demonstrate that all required practices were followed.

rdinarily the checklist is filled out by the DEQ licensed Service Provider or Supervisor. Owners who wish to personally ecommission a tank or change service must follow all DEQ and other applicable standards. The owner should contact the DEQ egional Office prior to starting the work to receive current copies of underground storage tank regulations.

A. DATES:

Decommissioning/Service Change Notice - Date Submitted: 9/14/98 (30 days before work starts).

Work Start Telephone Notice - Date Submitted: 10/14/98 (3 working days before work starts).

DEQ Person Notified: Greg Turan

Date Work Started: 10/19/98 Date Work Completed: 10/21/98

Note: Provide the following information if any soil or water contamination is found during the decommissioning or service change. Contamination must be reported by the UST owner or operator within 24 hours. The licensed service provider must report ontamination within 72 hours after discovery unless previously reported.

Date Contamination Reported: 10/19/98 By: Mark Kreuing

DEQ Person Notified: Greg Turan

Backfill Telephone Notice - Date Called: _____ (before backfilling).

DEQ Person Notified: _____

B. PERMITS: Note: DEQ permits may be needed where soil or water cleanup is required.

DEQ Water Discharge Permit #: _____ Date: _____

Disposed to (Location): _____

DEQ Solid Waste Disposal Permit #: _____ Date: _____

Soil Disposal or Treatment Location: _____

TANK INFORMATION:

TANK ID	DEQ-UST PERMIT #	TANK SIZE IN (GALLONS)	PRODUCT: GASOLINE, DIESEL, USED OIL, OTHER? PRESENT	NEW	CLOSURE OR SERVICE CHANGE? TANK REMOVAL	CLOSURE • INPLACE	OTHER • USE	TANK REPLACED YES*	
#1	AEGK	6000	Oil		✓				✓
~~#2~~	AEGA	2000	Gas		✓				✓

- Where decommissioned tank(s) are replaced by new underground storage tanks the UST owner or operator must submit a new permit application containing information on the new tanks 30 days before placing them in service.

- Submit a soil sampling plan to the DEQ regional office and receive plan approval prior to starting work if 1) tank is to be decommissioned in-place, 2) tank contents are changed to a non-regulated substance, 3) tank contains a regulated substance other than petroleum, or 4) tank changed to non-regulated use.

DISPOSAL INFORMATION:

TANK ID	TANK AND PIPING DISPOSAL METHOD: SCRAP	LAND-FILL	OTHER	IDENTIFY LOCATION & PROPERTY OWNER	DISPOSAL LOCATION OF TANK CONTENTS: LIQUIDS *	SLUDGES *
#1	✓			9030 St Helens Rd. Foss Maritime	Oil Refining	Oil Refining
2	✓			" "	" "	" "

Note: The tank contents, the tank and the piping may be subject to the requirements of Hazardous Waste regulations. If you have questions, contact the DEQ regional office for your area.

CONTAMINATION INFORMATION: * Note: Sampling is required if groundwater is encountered. See cleanup rules.

TANK ID #	GROUND * WATER IN PIT ?	PRODUCT ODOR IN SOIL ?	PRODUCT STAINS IN SOIL ?	NUMBER OF SAMPLES	LABORATORY (NAME, CITY, STATE, PHONE)
#1	NO	No	No	2	Way East
2	"	"	"	2	" "

APPENDIX D

Historical Research Summary

HISTORICAL RESEARCH SUMMARY

At the request of Anchor Environmental LLC (Anchor), the following is a summary of the historical research results for the Foss Maritime (Foss) facility, located at 9030 NW St. Helens Road, Portland, Multnomah County, Oregon, completed by Hahn and Associates, Inc. (HAI). The resources researched included the following: a review of aerial photographs, Sanborn Fire Insurance Maps, city directories, Metsker Maps, Portland Fire Bureau files, City of Portland Resource/Records Center files, City of Portland residential underground storage tank (UST) records, and a review of State and Federal Database Records. A listing of these resources is included in the main document (page i). In addition, at the request of Anchor, a brief site inspection of the property was conducted on July 19, 2000 and observations of the surrounding properties were made from the subject property.

1.0 Site Inspection

1.1 Subject Property

On July 19, 2000, Mr. Dennis Terzian, Senior Environmental Scientist of Hahn and Associates, conducted a brief site inspection of the subject property exterior, the permanent barge area, the property boundaries, and chemical storage areas. Mr. Terzian was accompanied by Mr. Rafael Caballero, Purchasing Manager for Foss Maritime. The adjacent properties to the north and south of the subject site were also observed from the subject property.

The subject property was occupied by a two-story office building, a maintenance building which housed the purchasing and maintenance department offices and general stores, an outdoor storage area, small sheds for the storage of compressed gases, and a permanently moored maintenance barge. The remainder of the property was asphalt-paved, except for the embankment along the Willamette River.

Evidence of three underground storage tanks (USTs) was observed at the subject property. For additional information regarding these USTs, refer to the July 2000 UST Report completed by HAI for this site. Aboveground storage tanks (ASTs) were not observed on the property.

Two pad-mounted, fluid-filled electrical transformers were observed on the property and were located east of the storage buildings and south of the office building. The transformer located to the east of the storage buildings was labeled as containing non-regulated levels of polychlorinated biphenyls (PCBs). The transformer located south of the office building was not labeled and is therefore assumed to contain PCBs. Both transformers were observed to be in good condition. The utility that owns the transformers is responsible for the cleanup of any release of transformer fluids to the environment. Leaks or spills were not identified at or in the vicinity of the transformers.

An outdoor drum storage area was observed along the southeastern corner of the property. Approximately twenty-one, 55-gallon steel drums stored on wooden pallets were observed in this asphalt-paved area. The drums were labeled and secured and leaks or spills were not identified at or in the vicinity of the drums. Mr. Caballero indicated that the drums were used to store used oil filters generated as a result of maintenance conducted at the permanent barge.

1.2 Personal Interview

On July 19, 2000, HAI conducted an interview with Mr. Caballero regarding the operations at the subject property. Mr. Caballero indicated that the property has been used by Brix/Foss Maritime since it's construction in 1980. Mr. Caballero has been associated with the property since 1985. Foss perform watercraft maintenance at the property. Automotive servicing activities have not been performed at the property. The three existing USTs and associated components meet the Oregon Department of Environmental Quality (ODEQ) 1998 upgrade requirements. All reported Federal Emergency Response Notification System (ERNS) releases at the subject property occurred on the permanent barge and were limited to the Willamette River. Spill containment measures such as baffles and recollection of spilled materials were employed for these spills.

1.3 Adjacent Properties

The subject property is bounded to the north by Shore Oil Company (9400 NW St. Helens Road) beyond which was Mobil Oil Corporation (9420 NW St. Helens Road); to the south by vacant property, beyond which was Hendren Towboat (8444 NW St. Helens Road); to the east by the Willamette River; and to the west by a service drive and utility right-of-way, beyond which was a railroad spur.

Shore Oil Company, formerly Time Oil Company, was observed to have numerous aboveground bulk storage vessels located within 0.25 miles of the subject property. Several stockpiles of recently deposited fill were observed on the vacant parcel to the south of the property. Dead vegetation was observed along the western side of the adjacent service drive in the area of an open stormwater drainage culvert, which traverses east across the subject property as a subsurface culvert. Mr. Cabalerro indicated that the culvert drains stormwater from NW St. Helens Road to the Willamette River.

2.0 Historical Resources

Sanborn Fire Insurance Maps

The Oregon Historical Society (OHS) Library, located in Portland, Oregon was visited to review available Sanborn Fire Insurance Maps (SFIMs) for the subject property for the years 1926, 1932, 1955, and 1965.

The SFIMs showed a portion of the property and indicate that the subject property was undeveloped for each year reviewed. An "S.P.& S." railroad, north-south traversing main rail line appeared to be located to the west of the property in each of the SFIMs reviewed. The surrounding properties to the west, south, and southwest were undeveloped or residential in the 1926 SFIM. Many of the residences to the west of NW St. Helens Road were no longer present in the 1932 or later SFIMs. An unidentified commercial or industrial structure was located to the north of the property in each of the SFIMs reviewed.

Metsker Maps

The OHS Library was visited on July 26, 2000 to review available Metsker Maps for the subject property for the years 1927, 1936, and 1944.

The Metsker Map from 1927 indicated that the subject property occupied the northern portion of a 10.31-acre parcel owned by "Sec. Sav. & Tr. Co". The remainder of the Sec. Sav. & Tr. Co. parcel continued southward and included a ferry landing, The Sec. Sav. & Tr. Co. parcel was bounded to the south by a parcel owned by L.A Jacobson, The subject property was bounded to the north by a parcel owned by Portland Manufacturing Company (Portland Manufacturing), beyond which was a lot owned by W.G. and H.C. Gearin. The N.P.R.R railway bounded the property to the west. The property usage in the area appeared commercial/industrial along the Willamette Riverfront and residential west of the riverfront.

The Metsker Map from 1936 indicated that the property was part of a larger parcel of property owned by Portland Manufacturing. To the south, beyond the larger Portland Manufacturing-owned parcel was a parcel owned by Far West Realty Co., which included the ferry landing, followed by the L.A. Jacobson-owned parcel, which had been divided by St. Johns Bridge. An additional 10-acre Portland Manufacturing-owned parcel bounded the subject property to the north, beyond which was the W.G. and H.C. Gearin parcel, followed by parcels owned by Sunset Pac. Oil Co., Gen'l Pet. Co., and Richfield Oil Co. The N.P.R.R. railway remained unchanged to the west of the property. The surrounding area property usage remained commercial/industrial along the Willamette Riverfront and residential west of the riverfront.

The Metsker Map from 1944 indicated that the property was part of a larger parcel of property owned by Portland Manufacturing, which extended some 10 acres north of the subject property southward to the northern side of the west ramp of St. Johns Bridge. Portland Tug and Barge owned the parcel to the south of the west ramp of the bridge. The parcels to the north or the larger Portland Manufacturing-owned property were indicated to be owned by "Pac. St. Oil Terms Co.", Sunset Pac. Oil Co., Gen'l Pet. Co., and Richfield Oil Co. The N.P.R.R. railway and surrounding property usage remained unchanged.

Aerial Photography Review

Historical Aerial Photographs from the U.S. Army Corps of Engineers Central Map Files, office in Portland, Oregon, for the years 1936, 1955, 1961, 1971, 1980, and 1998 were reviewed. The 1940 aerial photograph did not include coverage of the subject property. Copies of these aerial photographs are included in the main document.

The aerial photograph from 1936 indicated that the property was vegetated and sand-covered and that the northeastern portion of the property lay beneath the waters of the Willamette River. A possible dock and an apparent watercraft appeared on the water-covered portion of the property. A small unidentified object, possibly a small outbuilding, was located on the central portion of the property near the river. A log raft was noted in the Willamette River which bounded the property to the east. A north-south traversing railroad line bounded the property to the west, beyond which was undeveloped vegetated land and NW St. Helens Road. The parcels to the north and south of the property consisted of undeveloped sand bars. The surrounding properties to the west and southwest were

undeveloped and vegetated or wooded or used for residential and possibly commercial purposes. The St. Johns bridge was visible further south of the property in this photograph.

The aerial photograph from 1955 indicated that the subject property was undeveloped and vegetated with a sandy area on the northeastern corner of the property. The northeastern portion of the property had been filled and was no longer under water as depicted in the 1936 aerial photograph. A log raft was noted in the river adjacent to the property to the east. The railroad remained to the west and the area to the west of the property was more densely vegetated. The adjacent parcel to the north and south remained undeveloped, but were vegetated. Two ASTs were noted approximately 900 feet to the north of the property. This northern adjacent property was only partially visible in the 1955 aerial photograph. A maritime operation with several small buildings and a riverside barge/docking area was observed approximately 400 feet to the south of the property. The surrounding area usage to the west and southwest was essentially unchanged.

The 1961 and 1971 aerial photographs depict the subject property as undeveloped and vegetated. A small stream was noted on the central portion of the property in the 1961 aerial photograph, traversing the property from east to west. A log raft was noted along the west bank of the Willamette River along the property's eastern border. The adjacent and surrounding area was essentially unchanged, excepting the addition of a third AST further north of the property in the 1971 aerial photograph. Lumber transport activities, including large log rafts depicted in the 1971 aerial photograph, were observed along the Willamette River, east of the subject property.

The 1980 aerial photograph depicts the two existing structures on the subject property, the auto parking area and the permanent barge along the Willamette River. The railroad line area to the west of the property appears to have been expanded. The area further west and southwest appeared unchanged. The adjacent property to the south appeared paved or gravel covered and was in use for open-air storage operations of freight and lumber. Further south was a maritime operation that included at least two structures and several vessels along the Willamette River. The 1980 aerial photograph provided coverage of only a portion of parcels located to the north of the subject property. Two structures had been added to the adjacent parcel to the north, beyond which were at least two additional ASTs and an off-shore barge.

The aerial photograph from 1998 depicts the subject property as it appeared during the July 2000 site investigation. It appeared essentially unchanged from the 1980 aerial photograph, excepting the presence of a trailer truck or trailer located immediately south of the office building. The rail line to the west and the surrounding area to the west and southwest appeared unchanged. The adjacent property to the south was vacant (undeveloped) and several stockpiles of debris appeared to have been placed on this vacant property. The two structures, barge, and at least eleven ASTs were located on the parcels north of the property. At least three additional ASTs were observed on the Mobil Corp. property to the north of this site.

City Directories

The Multnomah County Public Library (MCPL) was visited on July 24, 2000 to review available Polk City Directories (PCDs) at approximate 5-year intervals for the years 1930 through 1985. In addition, Cole City Directories for the years 1991, 1995, and 1999 were reviewed at the MCPL. A review of PCDs indicated the following tenant history for the subject property and surrounding properties:

1930: No listings for NW St. Helens Road

1935: 8444 NW St. Helens Road, Jacobsen Construction / Portland Tug and Barge
9540 NW St. Helens Road, Sunset Pacific Oil Co.
9930 NW St. Helens Road, Signal Oil & Gas Co.

1940: 8444 NW St. Helens Road, Jacobsen Construction / Portland Tug and Barge
8920 NW St. Helens Road, Residential
9020 NW St. Helens Road, Residential
9540 NW St. Helens Road, Sunset Pacific Oil Co.
9634 NW St. Helens Road, General Petroleum Corp.
9900 NW St. Helens Road, Richfield Oil Co.

1944: 7900 NW St. Helens Road, Portland Gas and Coke Company
8444 NW St. Helens Road, Jacobsen Construction / Portland Tug and Barge
8920 NW St. Helens Road, Residential
9540 NW St. Helens Road, Sunset Oil Co.
9930 NW St. Helens Road, Richfield Oil Co.

1950: 7900 NW St. Helens Road, Portland Gas and Coke Company
8444 NW St. Helens Road, Portland Tug and Barge
8920 NW St. Helens Road, Residential
9420 NW St. Helens Road, General Petroleum Corp.
9930 NW St. Helens Road, Richfield Oil Co.

1955: 7900 NW St. Helens Road, Portland Gas and Coke Company
8444 NW St. Helens Road, Vacant
8920 NW St. Helens Road, Residential
9420 NW St. Helens Road, General Petroleum Corp.
9930 NW St. Helens Road, Richfield Oil Co.

1960: 7900 NW St. Helens Road, Northwest Natural Gas Co.
8444 NW St. Helens Road, General Construction Company (Warehouse)
8920 NW St. Helens Road, Residential
9420 NW St. Helens Road, Mobil Oil Corp.
9930 NW St. Helens Road, Richfield Oil Co.

1965: 7900 NW St. Helens Road, Northwest Natural Gas Co.
8444 NW St. Helens Road, General Construction Company (Warehouse)
9420 NW St. Helens Road, Mobil Oil Corp.
9930 NW St. Helens Road, Richfield Oil Co.

1970: 7900 NW St. Helens Road, Northwest Natural Gas Co.
9420 NW St. Helens Road, Mobil Oil Corp. / Olympic Pipeline
9930 NW St. Helens Road, Atlantic Richfield Oil Co.

1975: 7900 NW St. Helens Road, Northwest Natural Gas Co.
9420 NW St. Helens Road, Mobil Oil Corp. / Olympic Pipeline
9930 NW St. Helens Road, Arco Atlantic Richfield Oil Co.

1979: 7900 NW St. Helens Road, Northwest Natural Gas Co. / McKutchin Inspections Inc.
9420 NW St. Helens Road, Mobil Oil Corp. / Olympic Pipeline
9930 NW St. Helens Road, Arco Atlantic Richfield Oil Co.

1985: 7900 NW St. Helens Road, Pacific Northern Oil Co.

9420 NW St. Helens Road, Mobil Oil Corp.
9930 NW St. Helens Road, Arco Atlantic Richfield Oil Co.

1991: 7900 NW St. Helens Road, Pacific Northern Oil Co.
8444 NW St. Helens Road, Abrahams Scrap Metal, Clydes Iron and Steel, International Paper, Roche Engineering Corp, Watson Property, West State Inc., Western Boil. and Mech.
9030 Bricks Maritime (sic)
9420 NW St. Helens Road, Mobil Oil Corp. / Olympic Pipeline
9930 NW St. Helens Road, Atlantic Richfield Oil Co.

1995: 7900 NW St. Helens Road, Pacific Northern
8444 NW St. Helens Road, Clydes Iron and Steel, Devine Diving, Hendren Tow Boat
9030 NW St. Helens Road, Brix Maritime
9420 NW St. Helens Road, Mobil Oil Corp.

1999: 7900 NW St. Helens Road, Pacific Northern
8444 NW St. Helens Road, Darrell Andrews / Hendren Tow Boat Co.
9030 NW St. Helens Road, Foss Maritime Co.
9420 NW St. Helens Road, Mobil Oil Corp., Olympic Pipeline, Ranier Petroleum, Cowlitz Clean Sweep

2.1 Portland Fire Bureau

The Portland Fire Bureau (PFB) was visited to review available UST records for the subject property. Additional PFB records, typically for residential property USTs, were on-file with the City of Portland, Bureau of Environmental Services, and were obtained from that office. These files indicated that one 6,000-gallon gasoline UST, two 20,000-gallon diesel fuel USTs, and two 6,000-gallon lube oil USTs were installed at the subject property in 1979. The property was indicated to have been occupied by Knappton Tugboat Company at that time. A 1993 permit was reviewed, but contained no discernable information. One 2,000-gallon gasoline UST and one 6,000-gallon lube oil UST were decommissioned at the property in 1998. In addition, a 1998 permit indicates that three existing USTs were upgraded to "1998 EPA standards (i.e. tank lining, spill and overfill protection, tank monitoring detectors, new piping)."

2.2 Building Plans and Permits

Building plans and building, plumbing, electrical, and mechanical permits were reviewed at the City of Portland Records Center (CPRC), including microfiche, plumbing records, and the available original permit and inspection records for the addresses corresponding to the subject property. These files consisted primarily of permits associated with the construction of buildings at the subject site in 1979-1980. Original building plans had indicated six USTs in the current UST nest area. However, other resources reviewed indicate that only five USTs were actually installed in the nest. Permits indicated that an electric heating/cooling system was installed in 1979/1980. Storm drains were indicated to outfall to the Willamette River. No additional environmental concerns were observed as a result of this review.

3.0 Database Review

The following Federal and State databases were reviewed as requested by Anchor Environmental Inc.: The Federal Corrective Action Reports (CORRACTS) List, Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list; Federal Emergency Response Notification System (ERNS) List; Federal Region 10 Resource Conservation and Recovery Act (RCRA) Hazardous Waste (HW) Generator list; Oregon Department of Environmental Quality (ODEQ) Environmental Cleanup Site Information System (ECSIS) List; ODEQ Leaking Underground Storage Tank (LUST) list; ODEQ Underground Storage Tank (UST) list; and the ODEQ Spill list. In addition, facilities on the Confirmed Release List (CRL) or which are in the Voluntary Cleanup Program (VCP) have been noted under the ECSIS listings. For databases organized by zip code the following zip codes were reviewed: 97210 and 97231. Sites identified to the east of the Willamette River were not considered based on the width of the River (0.25 mile or further) and as it is considered a hydrologic barrier and contamination at these sites would not be expected to impact the subject property. The following Federal and State databases were reviewed as part of the historical research. The subject property and the agency-listed sites are illustrated in Figure 9 of the main document.

Federal CERCLIS List (0.5-mile radius)

The Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) which lists hazardous substance sites undergoing EPA investigations was reviewed for the subject property. The subject property or properties located within a 0.5-mile radius of the property did not appear on the CERCLIS list dated March 7, 2000, the most current list available.

Federal CORRACTS List (1.0-mile radius)

The Corrective Action Report (CORRACTS) List identifies hazardous waste handlers with RCRA corrective action activity. As of April 5, 2000, the subject property or properties within a 1.0-mile radius of the subject property did not appear on the CORRACTS list reviewed for this report.

Federal RCRA Generators List (Property and Adjoining Properties)

The EPA Hazardous Waste Generator (HWG) April 5, 2000 list, which lists facilities which have given notification as Fully Regulated Generators (FRG), Large Quantity Generators (LQG), Small Quantity Generators (SQG) or Conditionally Exempt Generators (CEG) was reviewed for the subject property and adjacent properties. The subject property appeared on the HWG list:

- Foss Maritime, 9030 NW St. Helens Road, Portland, Oregon, the subject property was listed as a CEG

In addition, the following adjacent property was identified on the HWG listing:

- Shore Oil Company, 9100 NW St. Helens Road (sic), Portland, Oregon, located adjacent to the subject property's northern boundary, was identified as a LQG

Federal ERNS List

The subject property appeared eight times on the EPA Emergency Response Notification System (ERNS) list for the period from October 1987 to December 31, 1999, the most recent update. All of these releases appeared to be directly to the Willamette River. In addition, Mr. Caballero indicated that these releases were directly to the Willamette River and were remediated to the extent possible.

Oregon Department of Environmental Quality ECSIS List (0.5-mile radius)

The ODEQ Environmental Cleanup Site Information (ECSIS) list, which lists hazardous substance sites undergoing ODEQ investigations, was reviewed for the subject property and surrounding properties. Sites to the east of the Willamette River, a hydrologic barrier, were not considered. Four sites, including the subject property, appeared on the ECSIS list. In addition, it has also been the ECSIS site appears on the CRL or is in the VCP, both subsets of the ECSIS list. Sites that appear on the CRL are indicated to have a reported release(s)

has been confirmed by laboratory analysis or other acceptable methodologies. Sites included in the VCP have agreed to perform some form of remedial activities on a voluntary basis with oversight from the ODEQ. The following sites, were located within a 0.5-mile radius of the subject property (Figure 1) and appear on the ECSIS list :

1) Foss Maritime/Brix Maritime (Foss), 9030 NW St. Helens Road, Portland, Oregon, the subject property

   Foss has been identified as a potential source of contamination (polynuclear aromatic hydrocarbons, thallium, and butylbenzylphthalate) of Willamette River Sediments based on the Portland Harbor Study. ODEQ has recommended that Foss conduct an extended preliminary assessment (XPA) to evaluate sediment contamination at the subject property and has deemed the XPA to be of high priority. The facility signed an agreement with ODEQ for inclusion in the VCP in December 1999.

2) Time Oil Company (Shore Oil), 9400 NW St. Helens Road, Portland, Oregon, located adjacent to the subject property's northern border

   The ECSIS Site Summary Report (SSR) indicated that significant petroleum products spills occurred at the site in 1988 and 1992. Remedial activities included soil excavation and the installation of a soil vapor system. Groundwater was also impacted. However, according to the SSR, groundwater monitoring indicates that benzene, toluene, ethylbenzene, and xylenes (BTEX) are below the maximum contaminant levels (MCLs) and that residual soil contamination may not be significant. This site has been identified as a potential source of contamination in the Portland Harbor Sediment Study. A preliminary assessment (PA) has been recommended at the site under medium priority.

3) Mobil Oil Terminal, 9420 NW St. Helens Road, Portland, Oregon, located 900 feet northwest of the subject property

   The facility has operated as a bulk fuel storage and dispensing facility since 1928. Extensive soil and groundwater contamination have been documented at the site. Sheens on the Willamette River were reported at the site in the 1960s and a slurry wall was constructed along the river bank in an effort to control releases to the river. A remedy for the site was approved in a Record of Decision (ROD) and includes free-

product recovery, soil vapor extraction, air sparging, and institutional controls to restrict land use and public access to the site. The soil vapor/air sparge system began operation in 1999. This site entered the VCP program in 1992 and appears on the CRL.

4) ARCO Bulk Terminal, 9930 NW St. Helens Road, Burlington, Oregon, located approximately 0.5 mile to the northwest of the subject property.

The ECSIS SSR indicates that a variety of releases have occurred at this site, including releases from historical operations, ASTs, underground pipelines, and product transfer activities with the releases having occurred from 1963 to present. A free-product recovery system comprised of retaining walls and "interceptor" wells was installed at the site in the 1970s and continues to operate. Free product was reported in monitoring and interceptor wells as recently as 1994. The site appears on the CRL. Ms. Janelle Waggy of ODEQ indicated that the site entered the VCP in February 2000.

5) Marine Finance Corp., also known as Hendren Tow Boat Co., 8444 NW St. Helens Road, Portland, Oregon, located approximately 0.25 mile to the south of the subject property.

Marine Finance Corp has been identified as a potential source of contamination in the Portland Harbor Sediment Study. A Preliminary Assessment (PA) and XPA are being initiated by the ODEQ at the site.

6) Transloader International Company, 8444 NW St. Helens Road, Portland, Oregon, located approximately 0.25 mile to the south of the subject property.

Transloader International, also known as General Construction Co., was identified as a potential source of contamination in the Portland Harbor Sediment Study. A PA has been recommended at the site under low priority

7) U.S. Army Corp of Engineers – Portland Moorings, 8010 NW St. Helens Road, Portland, Oregon, located 0.5 mile to the southeast of the subject property.

The ECSIS SSR indicated that this site has served as a maintenance port since 1904 and that contamination of the Willamette River sediments has occurred partly as a result of site activities such as vessel maintenance, and spills from vessels in dock and refueling operations. The site appears on the CRL and entered the VCP in October 1999.

Oregon Department of Environmental Quality LUST List (0.5-mile radius)

The subject property appeared on the ODEQ Leaking Underground Storage Tank (LUST) list of April 18, 2000. In addition, seven LUST sites appeared on this list within a 0.5-mile radius of the property:

1) Knappton Corporation/Brooks Maritime, 9030 NW St. Helens Road, Portland, Oregon, the subject property.

   The ODEQ LUST Incident Report indicates that a lube oil release that impacted both soil and groundwater was reported to ODEQ in 1993. For further information regarding the LUST listing for this site, refer to HAI's July 2000 UST Report.

2) Atlantic Richfield/Arco Bulk Plant, 9930 NW St. Helens Road, Portland, Oregon, located approximately 0.5 mile to the northwest of the subject property.

   A waste oil release to soil was reported at this site in 1992 after UST decommissioning. Groundwater was not reported to have been impacted as a result of this release.

The remaining five sites listed on the ODEQ LUST list within 0.5-mile of the subject property have been conferred No Further Action (NFA) status :

1) REH, Inc., 8444 NW St. Helens Road, Portland, Oregon, located 700 feet to the southeast of the subject property.

2) Illias J HOT, 8806 NW Bailey Portland, Oregon, located approximately 0.25 mile to the southwest of the subject property.

3) Williams, L HOT, 9421 NW Germantown Road, Portland, Oregon, located approximately 0.25 mile to the northwest of the subject property.

4) Mobil Oil Co., 9420 NW St. Helens Road, Portland, Oregon, located 0.25 mile to the north of the subject property.

Groundwater was not reported to have been impacted as a result of this July 16, 1992 release and a NFA listing has been assigned to this site.

5) Atlantic Richfield/Arco Bulk Plant, 9930 NW St. Helens Road, Portland, Oregon, located approximately 0.5 mile to the northwest of the subject property.

Groundwater was not reported to have been impacted as a result of this release.

6) Arco Bulk Plant-Pipeline, 9930 NW St. Helens Road, Portland Oregon, located approximately 0.5 mile to the northwest of the subject property.

The site has a NFA listing dated February 9, 1994.

ODEQ-Registered UST Sites (Property and Adjoining properties)
The subject property appeared on the October 20, 1999 UST list, the most recent list available. Three registered USTS appeared on the UST list. No adjoining properties appeared on the UST list. For further information regarding the UST listing for this site, refer to HAI's July 2000 UST Report.

ODEQ Spill Sites (Subject Property and Adjoining properties)
The ODEQ Spill database was researched by Ms. Peggy Sheldon of ODEQ from 1990 to 1994 and by Mr. Mike Greenburg and Ms. Mary Lou Perry, also with ODEQ, from 1995 to present for the following addresses: 8444, 9030, 9400, and 9420 NW St. Helens Road. The subject property, 9030 NW St. Helens Road, and Mobil Oil Corp,9420 NW St. Helens Road, had multiple listings on the ODEQ spill lists. Mr. Caballero indicated that all of the spills at the subject property occurred along the Willamette River and that these releases did not impact soil or groundwater at the subject property.

GLOSSARY OF ABBREVIATIONS

AST	Above Ground Storage Tank
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes,
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
CFR	Code of Federal Regulations
CPRC	City of Portland Records Center
CRL	Confirmed Release Listing
CORRACTS	Corrective Action Report
ECSIS	Environmental Cleanup Site Information System
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
ERNS	Emergency Response Notification System
FRG	Fully-Regulated Generator
HAI	Hahn and Associates, Inc.
HWG	Hazardous Waste Generator
LUST	Leaking Underground Storage Tank
MCLs	Maximum Contaminant Levels
MCPL	Multnomah County Public Library
NFA	No Further Action
NPL	National Priority List
ODEQ	Oregon Department of Environmental Quality
OHS	Oregon Historical Society
OWRD	Oregon Water Resources Department
PA	Preliminary Assessment
PCBs	Polychlorinated Biphenyls
PCDs	Polk City Directories
PFB	Portland Fire Bureau
RCRA	Resource Conservation and Recovery Act
SFIMs	Sanborn Fire Insurance Maps
SQG	Small Quantity Generator
SSR	Site Summary Report
SWDF	Solid Waste Disposal Facilities
SWDS	Solid Waste Disposal Sites
TSD	Treatment, Storage or Disposal Facility
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
XPA	Extended Preliminary Assessment

RESEARCH RESOURCES

City of Portland, Bureau of Environmental Services, residential UST records, July 26, 2000

Multnomah County Library, Polk and Cole City Directories, July 24, 2000

Oregon Department of Environmental Quality, state regulatory site lists

Oregon Historical Society, Sanborn Fire Insurance Maps, Polk City Directories, Metsker Maps, July 20 and 26, 2000

Portland Bureau of Buildings, Records Center, review of building, plumbing, electrical and mechanical plans and permits, July 19, 2000

Portland Fire Bureau, UST records, July 20, 2000

U.S. Army Corps of Engineers, Central Map Files, Portland, Oregon, aerial photographs review, July 19, 2000

U.S. Environmental Protection Agency, Federal regulatory sites lists

U.S. Geological Survey 7.5-Minute Quadrangle, Linnton Quadrangle, Oregon, 1990

OREGON PUBLIC ENVIRONMENTAL SYSTEM
LUST INCIDENT REPORT

July 20, 2000 10:49 am

----------INCIDENT INFORMATION----------

LOG NBR: 26-93-0009
UST FAC NBR: 7374 DATE REPORTED: 13-JAN-93

SITE NAME: KNAPPTON CORPORATION/BROOKS MARITIME
SITE ADDRESS: 9030 NW ST HELENS RD
SITE CITY: PORTLAND ZIP: 97203
SITE COUNTY: MULTNOMAH PHONE: (503) 286-0631

----------SITE ASSESSMENT----------

DATE DISCOVERED: 13-JAN-93 OFFSITE MIGRATION: U

CONFIRMATION:	DISCOVERY:	CAUSE:
(SI) Staff: N	(RM) Routine Monitoring: N	(TL) Tank Leak: N
(LD) Lab:DEQ: N	(DC) Decommissioning: N	(PL) Pipe Leak: Y
(LR) Lab:RP N	(CP) Complaint: N	(OF) Overfill: N
(LO) Lab:OTHER: N	(IC) Inventory Control: N	(SS) Surface Spill: N
(RR) RP Report: Y	(SA) Site Assessment: N	(PV) Pump/Valve Leak: N
(OT) Other: N	(TT) Tank Test: N	(OT) Other: N
	(OT) Other: Y	(UN) Unknown: N

----------CONTAMINANTS/IMPACTS----------

CONTAMINANTS:		MEDIA/IMPACT:
(UG) Unleaded Gasoline: N	(SV) Solvent N	(SL) Soil: Y
(LG) Leaded Gasoline: N	(BF) Bunker Fuel N	(GW) Groundwater: Y
(MG) Misc.Gasoline: N	(OP) Other Pet.Dist N	(SW) Surface Water: N
(DS) Diesil: N	(CH) Chemical N	(DW) Drinking Water N
(FO) Fuel Oil: N	(HO) Heating Oil: N	(FV) Facility(Vapor) N
(WO) Waste Oil: N	(UN) Unknown: N	(FP) Facility(Free Product): N
(LB) Lubricant: Y	(OT) Other: N	(UN) Unknown: N

----------SITE/SOIL MANAGEMENT----------

RELEASE STOPPED: 13-JAN-93 REMEDIATION COMPLETED:
CLEANUP STARTED: 13-JAN-93 NO FURTHER ACTION:

(opens_inc.rpt)

Oregon

DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHWEST REGION

Mailed: 2-3-93

DEQ FILE NO.: 26-93-009

SITE NAME: Brix Maritime

SITE ADDRESS: 9030 NW St. Helens Road
Portland Oregon 97283

RESPONSIBLE PARTY NAME: David Polland

RP COMPANY NAME: Brix Maritime

MAILING ADDRESS: P.O. Box 83018
Portland, Oregon 97283

DATE RELEASE REPORTED TO DEQ: 1-13-93

A release has been reported from an underground storage tank (UST) system at your facility located at the address listed above. As the responsible party for the facility, you are required to clean up the release according to OAR 340-122-201 through 340-122-360.

An Initial Report Form for UST Cleanup Projects is enclosed, which needs to be completed and returned to this office within twenty (20) days from the date the release was reported. An outline of additional reporting requirements and due dates is also enclosed.

Please read the rules carefully. As the responsible party, you should be aware of the regulations and requirements, even if you have hired a qualified consultant or service provider to do the actual work.

<u>Please reference the DEQ File Number listed in the top left corner of this letter in all future correspondence and reports.</u>

The Department is required to recover oversight costs on projects that we review and provide a final notice of compliance or "closure letter". As provided in the law, all petroleum contamination sites are eligible for recovery of costs by the Department. In order to receive oversight and more effectively schedule your project you will be asked to sign, and return within 30 days, an agreement to pay oversight costs with the Department. Not entering into the agreement does not release you from responsibility for investigation and/or cleanup of the contamination. Please read the attached information on the cost recovery process; contact Darby Bacon at 503-229-6635 if you have questions on cost recovery.

Thank you for your cooperation and continued efforts to comply with the regulations. If you have any questions, please contact the UST Section of Northwest Region at 503-229-5263.

A copy of the UST Cleanup Manual
X is enclosed
___ will be provided upon request

cc to Hahn & Assoc (Blair Loftis)

1500 SW First Avenue
Suite 750
Portland, OR 97201-5884
(503) 229-5263

DEQ-1

INITIAL REPORT FORM FOR UST CLEANUP PROJECTS

This report is due within twenty (20) days from the date of the release*

SITE INFORMATION

*DEQ File No.: 7374 *Date of Release: January 13, 1993

Site Name: Brix Maratime Company

Site Address: 9030 NW St. Helens Road
Portland, Oregon 97283-0018

Responsible Party: Brix Maratime Company Phone: 503-286-0631

RP Mail Address: P.O. Box 83018
Portland, Oregon 97283-0018

Service Provider: Hahn and Associates, Inc. Phone: 503-796-0717

SP Mail Address: 434 NW 6TH Ave, Suite 203
Portland, Oregon 97209-3600

* Note: This information is listed on the cover letter received by the Responsible Party.

FEB 09 1993

INITIAL CLEANUP INFORMATION

Y N Do you believe that this cleanup project can be conducted under the requirements for an UST Cleanup Matrix site?

► Groundwater use in the immediate area of the project (check all that apply) - complete whether or not the release is believed to have impacted groundwater.

___ Drinking water supply
___ Agricultural
X Industrial
___ Groundwater not used

► Facility location (check all that apply)

X <100 ft. from a wetland or surface stream (circle one or both)
___ within a residential area
X within an industrial/commercial area
___ Other (describe): _____

► 25 Current approximate depth to groundwater (in feet).

► UK Seasonal high groundwater level (in feet) if different.

Describe how depths were determined: Groundwater depth or gradient has not been assessed at this time.

INITIAL REPORT FORM FOR UST CLEANUP PROJECTS - PAGE 2

Y N NA Did you take immediate action to prevent any further release of the regulated substance into the environment? EXPLAIN: Drained leaking lubrication oil transfer line, ceased fueling operations, remove free product.

Y N NA Were steps taken to identify and mitigate fire, explosion, and vapor hazards? EXPLAIN: Free product was removed from excavation and stored in a steel 55-gallon drum.

Y N NA Did you remove as much of the regulated substance from the UST system as necessary to prevent further release to the environment? EXPLAIN: Removed product from damaged transfer line.

Y N NA Did you visually inspect any aboveground releases or exposed below ground releases and prevent further migration of the released substance in surrounding soils and groundwater? EXPLAIN: Removed free product (lube oil) from excavation, lined bottoms and sides of excavation with sorbent.

Y N NA Are/were there any vapors present in buildings or utility corridors? If yes, are you continuing to monitor and mitigate any additional fire and safety hazards posed by vapors and free product? EXPLAIN: No appreciable vapor danger associated with 30-weight oil

Y N NA Have you remedied any hazards posed by contaminated soils that were excavated or exposed as a result of release confirmation, site investigation, abatement, or cleanup activities? EXPLAIN: Approximately 50 cubic yards of soil stored on and covered with plastic diked with hay.

Y N NA Have you measured for the presence of a release where contamination is most likely to be present at the UST site? EXPLAIN: Characterization soil samples obtained from pipe trench and vicinity of release area.

Y N NA Did you investigate to determine the possible presence of free product and begin free product removal as soon as practicable? If yes, was the region notified? EXPLAIN: Lubrication oil seeped into excavation after approximately 12 hours, was pumped and bailed into drum.

Y N Was groundwater initially encountered in the excavation? If yes, how was this water handled/disposed? How many gallons involved? EXPLAIN:

Y N Was a sheen or odor observed on any water in the excavation? If yes, DESCRIBE OBSERVATIONS:

Y N Did groundwater recharge 24 hours after pumping the accumulated water in the excavation? If yes, what actions have you taken as a result? Did you resample the recharge water? EXPLAIN: _____

_____

_____

_____

Y/ N Are any SOIL OR WATER SAMPLE RESULTS available at the time of this report? If yes, attach all laboratory analysis reports and chain of custody forms.
(Only preliminary results available at this time)

GENERAL INFORMATION FOR ALL CONTAMINATED SOILS MANAGEMENT

Note: All soils temporarily stockpiled onsite prior to treatment or disposal must be contained within a bermed area, kept covered (and the cover anchored), and the entire area secured to prevent unauthorized access by the public. Non-contaminated soils should be protected and kept separated from contaminated soil.

Y N The level of contamination noted is expected to require removal of contaminated soil for treatment or disposal. If yes, complete the following. If no, go to Page 4, "Report Prepared By".

- Type of petroleum contamination (check all that apply):

  ___ Gasoline X Diesel ___ Waste Oil ___ Heating Oil

  X Other contamination (specify): 30-weight lubrication oil

- Estimated volume of soil if known (tons or cubic yards): 50 cubic yards

- Intended Disposition of Soils (check appropriate method):

  X Treatment

  X Thermal treatment offsite at an authorized facility

  Facility Name: Oregon Hydrocarbon, Inc. Phone No.: 503-735-9525

  Facility Address: P.O. Box 83685, Portland, OR 97283

  ___ Thermal treatment onsite with a mobil treatment unit **

  Company Name: _____ Phone No.: _____

  ___ Offsite soil aeration[1] or bioremediation **

  Treatment Site Address: _____

  ___ Onsite soil aeration or bioremediation **

  ___ Disposal

  Landfill Name: _____ Phone No.: _____

  Landfill Address: _____

1 Offsite soil aeration is banned within the Portland METRO area - see enclosed fact sheet.

** Permit from DEQ required, see page 5 if you would like forms mailed.

- Who will be conducting the soil treatment or disposal work?

Company Name: Oregon Hydrocarbon, Inc. Phone: 503-735-9525

Contact Name: Blair Loftis at Hahn and Associates, Inc. 503-796-0717

- What date(s) is the treatment or disposal intended to be started?

Yet to be determined. Will dispose of drill cuttings with excavation soil.

Note: You have approximately 30 days to stockpile contaminated soils onsite while making arrangements for proper disposal or treatment. After that time, you may be required to obtain a permit from DEQ for onsite management of the contaminated soil if you fail to take active measures to manage the soil in an appropriate manner.

THIS REPORT WAS PREPARED BY: Date: February 3, 1993

Individual: Blair T. Loftis Phone: 503-796-0717

Company: Hahn and Associates, Inc.

Address: 434 NW 6th Ave, Suite 203 Portland, Oregon 97209-3600

If this report was NOT prepared by the Responsible Party:

Y N NA Are you the licensed Matrix Service Provider for the project and authorized by the Responsible Party to submit reports on their behalf?

Matrix Service Provider License No.: 12606

NOTE: This initial report is intended to provide the Department with the basic initial information about activities associated with the release. It is anticipated that future reports will be much more detailed and will provide a more complete picture of the entire cleanup project. If appropriate, you may reference this initial report in subsequent reports if the information does not need to be repeated for clarity.

- Please attach additional information as necessary to explain any unusual circumstances associated with the project or if you need more space to respond to any of the questions in this report form.

Return this form to: DEQ-Northwest Region
UST Section
1500 SW First, Suite 750
Portland, OR 97201

If you have questions, call 503-229-5263 and ask for the underground storage tank (UST) Duty Officer.

>>>>>>> KEEP A COPY OF THIS REPORT FOR YOUR FACILITY RECORDS <<<<<<<

Soil Recycling Certificate

TPS Technologies Inc. does hereby certify that 61.37 tons of petroleum - contaminated soil received from

Brix Maratime Company
9030 North West Saint Helens Road
Portland, Oregon

Under Manifest/authorization number 07-00058 has been properly recycled to approved regulatory standards at our Soil Recycling Facility in Portland, Oregon

Dated this 11th day of June, 19 93

Sworn and Attested by:
TPS Technologies Inc.

By: Herus J Beatty

APPENDIX H

Hazardous Substance Database Reviews

Spills - at 9030 NW St. Helens Hwy

YR	OERS	Site Name	Address	City	Date
Description					
0	320		9030 NW St Helens Road	Portland	07FEB2000
Burp is sounding tube on tug. Lewiston tug. Boomed, pads applied.					
95	145	FOSS MARITIME	9030 NW ST HELENS RD	PORTLAND	18JAN1995
TUG BOAT LEAKED AROUND SHAFT ALLEY					
95	486	FOSS ENV.	9030 NW ST HELENS RD	PORTLAND	09MAR1995
POWER STEERING LINE BROKE SPILLING FLUID					
95	1175	FOSS MARITIME	9030 NW ST HELENS ROAD	PORTLAND	19JUN1995
BILGE PUMPING INTO WATER FROM TUGBOAT KNAPPTON - TOO LATE TO RECOVER					
96	222	FOSS MARITIME	9030 NW ST HELENS RD	PORTLAND	24JAN1996
.5 GALLON BILGE OIL INTO WILLAMETTE					
96	1403	FOSS MARITIME	9030 NW ST HELENS RD	PORTLAND	28MAR1996
DIESEL FUEL SPILLED ONTO WORK DECK & FUELING DOCK					
96	1679	St Helens Road	9030 NW St Helens Road	Portland	07MAY1996
97	1857	Foss Maritime	9030 NW Stevens	Portland	17JUL1997
Ocean Bear (FOSS) lost diesel into Multnomah channel when transporting logs for Boise Cascade.					
97	2378	Foss Maritime	9030 NW Street St. Helens Rd.	Portland	22SEP1997
100 yards X 100 Feet silver sheen					
97	2489	Foss Maritime	9030 NW St. Helens Rd	Portland	07OCT1997
300-400' long X 150' wide sheen from outfall					
98	67	Foss Maritime	9030 St Helens Rd	Portland	12JAN1998
Oil/water separator disconnedted- caused small sheen was on board barge. 1-5 gallons					
98	75	Foss Maritime	9030 NW St. Helens Road	Portland	12JAN1998
Bilge pump problem. -25 gallons spilled into the Willamette River. Pump shut off after 15-20 sec. Product contained in slip area. Boom and pads applied					
98	622	Foss Env.	9030 NW St. Helens Rd.	Portland	20MAR1998
5 gallons of lube oil released to surface water. Cleaned up using boom and absorbents. Tug boat transfer of lube from deck. Product already removed, wor					
98	2225	Foss Environmental	9030 St Helens Rd.	Portland	18SEP1998
Surface oil was washed from barge during severe Thunder storm Barge Foss # 208					
98	2318		9030 NW St Helens Rd	Portland	30SEP1998
Sheen observed in water-U.S.C.G. determined unrecoverable					
98	3142	Foss Maritime Dock	9030 NW St. Helens Rd.	Portland	23DEC1998
5 gallons oily Bilge slop spilled to Willamette when the valve froze, cousing a hose to rupture. Contained with booms- being cleaned up- NRC # 468694					

Attn: Penny - 5 pp

Received: 7/26/00 8:25AM; 5032296977 -> HAHN - ASSOCIATES; Page 1
07/26/00 08:26 ☎5032296977 DEQ WMC 001/004

Spills - FOSS

YR	OERS	Site Name	Address	City	Date
95	145	FOSS MARITIME	9030 NW ST HELENS RD	PORTLAND	18JAN1995
TUG BOAT LEAKED AROUND SHAFT ALLEY					
95	486	FOSS ENV.	9030 NW ST HELENS RD	PORTLAND	09MAR1995
POWER STEERING LINE BROKE SPILLING FLUID					
95	725	FOSS MARITIME		PORTLAND	14APR1995
TUG TRANSPERRING LUBE OIL TO VESSEL					
95	783	FOSS MARITIME	E. 611 A STREET	RAINIER	25APR1995
DIAPHRAM IN PUMP ON DECK FAILED-RELEASED BILGE WATER					
95	1175	FOSS MARITIME	9030 NW ST HELENS ROAD	PORTLAND	19JUN1995
BILGE PUMPING INTO WATER FROM TUGBOAT KNAPPTON - TOO LATE TO RECOVER					
95	1362	FOSS MARITIME	ST HELENS RD	PORTLAND	15JUL1995
SPILLAGE FROM LINES DURING REFUELING					
95	2061	FOSS MARITIME	2900 NW ST HELENS RD	PORTLAND	18OCT1995
LOADING ONTO BARGE OBSERVED LEAKING THROUGH 3" CRACK					
96	222	FOSS MARITIME	9030 NW ST HELENS RD	PORTLAND	24JAN1996
.5 GALLON BILGE OIL INTO WILLAMETTE					
96	1401	FOSS MARITIME	NOT GIVEN Just Reporting	PORTLAND	27MAR1996
DIESEL OIL TO RIVER FROM SHIP ANSAC ASIA					
96	1403	FOSS MARITIME	9030 NW ST HELENS RD	PORTLAND	28MAR1996
DIESEL FUEL SPILLED ONTO WORK DECK & FUELING DOCK					
98	1764	FOSS MARITIME DOCK		Rainier	15JUL1998
-20' X 300' SHEEN CAUSED BY 8 GAL DIESEL/ENGINE OIL LEAKED FROM BILGE PUMP ACCIDENTALY TURNED ON ON TUG "HELEN G"					

11 rows selected.

Received: 7/26/00 8:25AM; 07/26/00 08:26 ☎5032296977 5032296977 -> HAHN - ASSOCIATES; Page 2 DEQ WMC 002/004

Spills - Foss

YR	OERS	Site Name	Address	City	Date
Description					
~~0~~	~~1272~~	~~Foss, CU contractor~~	~~various locations~~	~~Albany~~	
~~4 drug labs for pickup, June 7~~					
95	1128	Foss Maritime		Gold Beach	12JUN1995
96	1984	Foss Environmental		Portland	19JUN1996
Sheen on the Willamette, 30 yards by 1 mile, by Foss building. Non-recoverable (USCG said)					
97	1222	Foss	611 East A Street	Rainier	08MAY1997
Brusco Tug was being cleaned when tank broke and fuel leaked onto beach. Grinder cut through fuel tank.					
97	1309	Foss Industries		Portland	15MAY1997
Sheen on river/drippage from lube oil transfer line (valve) soaked into soil- caused sheen as the tide rose.					
97	1857	Foss Maritime	9030 NW Stevens	Portland	17JUL1997
Ocean Bear (FOSS) lost diesel into Multnomah channel when transporting logs for Boise Cascade.					
97	2362	Foss Maritime	611 Ease A Street	Rainier	19SEP1997
4 gallons of diesel- bucket that catches drips was kicked over.					
97	2378	Foss Maritime	9030 NW Street St. Helens Rd.	Portland	22SEP1997
100 yards X 100 Feet silver sheen					
97	2489	Foss Maritime	9030 NW St. Helens Rd	Portland	07OCT1997
300-400' long X 150' wide sheen from outfall					
97	2543	Foss Maritime- Tug-Jim Moore	River MIle 5.5	Portland	14OCT1997
Sheen near St. John's Bridge/came from downstream of Foss-washed upstream due to tide.					
98	67	Foss Maritime	9030 St Helens Rd	Portland	12JAN1998
Oil/water separator disconnedted- caused small sheen was on board barge. 1-5 gallons					
98	75	Foss Maritime	9030 NW St. Helens Road	Portland	12JAN1998
Bilge pump problem. ~25 gallons spilled into the Willamette River. Pump shut off after 15-20 sec. Product contained in slip area. Boom and pads applied					
98	582	Foss Dock	611 East A Street	Rainier	18MAR1998
1-5gallons- from fishing vessel "Icy Point." Hydraulic line improperly attached.					
98	622	Foss Env.	9030 NW St. Helens Rd.	Portland	20MAR1998
5 gallons of lube oil released to surface water. Cleaned up using boom and absorbents. Tug boat transfer of lube from deck. Product already removed, wor					
98	2225	Foss Environmental	9030 St Helens Rd.	Portland	18SEP1998
Surface oil was washed from barge during severe Thunder storm Barge Foss # 208					
98	3142	Foss Maritime Dock	9030 NW St. Helens Rd.	Portland	23DEC1998
5 gallons oily Bilge slop spilled to Willamette when the valve froze, cousing a hose to rupture. Contained with booms- being cleaned up- NRC # 468694					

07/26/00 08:27 ☎5032296977 DEQ WMC 003/004

Spills - Foss

YR	OERS	Site Name	Address	City	Date
98	3158	Foss Environmental	Hillsboro HWY 219 at Wood St.	Hillsboro	27DEC1998

Description

Red layer of product- Suspected diesel- in Jackson Bottom. Estimated 500-1000 gallons of diesel released from a refueling truck.

YR	OERS	Site Name	Address	City	Date
99	201	Foss Maritime	9030 NW St. Helens Rd.	Portland	23JAN1999

Tug (Sora Brix) produced small sheen at her mooring after start up. Sheen stopped shortly after. Tug had not been started in some time likely a shaft al

18 rows selected.

99-0201

07/26/00 08:27 ☎5032296977 DEQ WMC 004/004

Spills - St. Helens Highway

YR	OBRS	Site Name	Address	City	Date
Description					
99	1195	None	11080 NW St. Helens Rd.	Portland	13MAY1999
MVA - power pole with 3 transformers-20 gallons non-pcp transformer oil. 15 gallons lead to storm drain leading to Columbia river. PCB ppm and < detection					
98	2359	GATX Docks	11400 NW St Helens Rd	Portland	
Tri-City Voyager (Barge), Dockline broke-200 gal Willamette, Portland Fire Boat notified/ Foss Maritime hired by RP, Coast Guard- 503-240-9301-Responded-d					
97	2555	Gatex	11400 NW St. Helens Rd	Linnton	16OCT1997
Valve crack at terminal. 1/2 gallon into river. Evaporated					
99	1575	Dock at Linnton	11400 NW St. Helens Road	Portland	13JUL1999
Sheen on water at dock in Linnton area of Portland on Willamette River-USCG investigating; non-recoverable; not coming from ship or dock fueling; black oi					
0	193	Industrial Contacts & Pakcers	3074 NW St. Helens	Portland	17JAN2000
55 gallon drum labled 30% H2O2, abandoned in front of their garbage dumpster, I advised them to secure drum and call DEQ NWR T.A. . Drum is empty					
96	2325	Texaco Refining & Marketing	3800 NW St Helens Road	Portland	05AUG1995
Overfill of tanker.					
99	1265	Equilon Enterprises	3800 NW St. Helens	Portland	12JUN1999
Hooking up a dry brake to a vehicle - brake popped off - 175 gallons of #2 diesel to containment pad.					
97	435	Texaco Loading Rack	3800 NW St. Helens Rd	Portland	04FEB1997
Truck pulled away with 3 load arms attached. Spilled to concrete and then containment system.					
96	3545		3800 NW St. Helens Rd.	Portland	14DEC1995
An Oregon Pacific Petroleum tanker was filling at the Texaco load rack when a valve failed and spilled 82 gallons of fuel. It was flushed into an					
99	2288		3821 NW St Helens Rd	Portland	25SEP1996
200 gal chainsaw oil spilled onto dirt Containment area					
0	901	none	4309 NW St Helens Road	Portland	
10 gallon in cooler dumped in empty lot					
98	227	Koppers Industries	7540 NW St. Helens Rd	Portland	26JAN1998
7 tons(0.5 soil) of coal tar pitch-overflowed during transfer from production tank to storage tank-float gauge stuck.					
98	2507	Pacific Northern Oil	7900 NW St.Helens	Portland	17OCT1996
MV Chesapeake, Blew fuel fill line wo/emptying the hose. Sprayed oil on dock and deck, some fell into river.					
97	2597	US Army Corp of Engineers	8010 NW St. Helens	Portland	22OCT1997
Sheen coming from underground source, bubbling up from sediments possibly due to disturbance by vessel prop wash and core sampling done					
97	2407	ACOE	8010 NW St. Helens Rd	Portland	26SEP1997
Leak of 50# propane from an old tank being moved.					
96	3275	St Johns Bridge	8010 NW St. Helens Rd.	Portland	24NOV1996
Oil slick of Black Fuel Oil					

07/31/00 10:18 ☎503 229 5830 DEQ: WMC 7 001

Post-it® Fax Note 7671 | Date 7/31/00 | # of pages ▶ 4
To Ann Carter | From Mary Lou Ely
Co./Dept. Hanna Assoc | Co.
Phone # 227- | Phone # 229-5815
Fax # 227-2209 | Fax #

Spills - St. Helens Highway

YR	CERS	Site Name	Address	City	Date
0	579	USA COE	8010 NW St. Helens Road	Portland	15MAR2000

Description: heavy oil being blown up river by wind - unknown source - very small amount - subsequently USA COE determined one of their staff had spilled oil (tiny bit

YR	CERS	Site Name	Address	City	Date
98	2318		9030 NW St Helens Rd	Portland	30SEP1998

Sheen observed in water-C.S.C.G. determined unrecoverable

YR	CERS	Site Name	Address	City	Date
0	320		9030 NW St Helens Road	Portland	07FEB2000

Burp is sounding tube on tug. Lewiston tug. Boomed, pads applied.

YR	CERS	Site Name	Address	City	Date
96	1679	St Helens Road	9030 NW St Helens Road	Portland	07MAY1996

YR	CERS	Site Name	Address	City	Date
97	2499	Foss Maritime	9030 NW St. Helens Rd	Portland	07OCT1997

300-400' long X 150' wide sheen from outfall Repeat!

YR	CERS	Site Name	Address	City	Date
98	622	Foss Env.	5030 NW St. Helens Rd.	Portland	20MAR1998

5 gallons of lube oil released to surface water. Cleaned up using boom and absorbents. Tug boat transfer of lube from deck. Product already removed, wor

YR	CERS	Site Name	Address	City	Date
98	3142	Foss Maritime Dock	9030 NW St. Helens Rd.	Portland	23DEC1998

5 gallons oily Bilge slop spilled to Willamette when the valve froze, causing a hose to rupture. Contained with booms- being cleaned up- NRC # 448694

YR	CERS	Site Name	Address	City	Date
99	201	Foss Maritime	9030 NW St. Helens Rd.	Portland	23JAN1999

Tug (Sara Brix) produced small sheen at her mooring after start up. Sheen stopped shortly after. Tug had not been started in some time likely a shaft al

YR	CERS	Site Name	Address	City	Date
98	75	Foss Maritime	9030 NW St. Helens Road Repeat!	Portland	12JAN1998

Bilge pump problem. -25 gallons spilled into the Willamette River. Pump shut off after 15-20 sec. Product contained in slip area. Boom and pads applied

YR	CERS	Site Name	Address	City	Date
97	2378	Foss Maritime	9030 NW Street St. Helens Rd. Repeat!	Portland	22SEP1997

100 yards X 100 feet silver sheen

YR	CERS	Site Name	Address	City	Date
98	67	Foss Maritime	9030 St Helens Rd	Portland	12JAN1998

Oil/water separator disconnedted- caused small sheen was on board barge. 1-5 gallons

YR	CERS	Site Name	Address	City	Date
98	2225	Foss Environmental	5030 St Helens Rd.	Portland	18SEP1998

Surface oil was washed from barge during severe Thunder storm Barge Foss # 203

YR	CERS	Site Name	Address	City	Date
0	2181	Time Oil Co	9150 ST Helens Road	Portland	15SEP1999

50 to 100 gals diesel spilled due to work on the pipeline

YR	CERS	Site Name	Address	City	Date
0	322		9420 NW St Helens Road	Linnton	

Prior to above date contaminated soil discovered while digging on site, investigation of extent/source proceding, & appears to be historical

YR	CERS	Site Name	Address	City	Date
97	2083	Arco Bulk Facility	9930 NW St Helens Road	Portland	13AUG1997

Drill- Tug hit fuel barge explorer simulating a spill of 650 drums. 25,000 gallons of #2 diesel. Containment over topped spilling. Unknown amount to Mi

YR	CERS	Site Name	Address	City	Date
97	226	ARCO Bulk Plant	5920 St. Helens Rd.	Portland	17JAN1997

A flange broke on the side of a tank.

07/31/00 10:19 ☎503 229 5830 DEQ: WMC 7 002

Spills - St. Helens Highway

YR	OERS Site Name	Address	City	Date
Description				
99	171 Willbridge Terminal	Front & St. Helens Rd.	Portland	21JAN1999
Worker doing construction at BN Railway yard noticed Heavy oders and diesel contamination near "moattrack" at Willbridge Doing.				
97	761 Lone Star Northwest	Kittridge Ave & St. Helens Rd.	Portland	20MAR1997
Truck broke hydraulic line/drove/spread it over 1/4 mile area, trying to make it back to the shop.				
93	1289 Union Docks	NW St. Helens Rd & NW Kittridge	Portland	31MAY1993
Fueling of Tugboat "Howard Olson" at Union Docks (Willbridge Area to NW St. Helens Rd & NW Kittridge) 23 gal diesel (#2) spill w/ 15 gal recovered on deck a				

35 rows selected.

Received: 07/31/00 10:19 ☎503 229 5830 DEQ: WMC 7 003

YR	OERS Site Name	Address	City	Date
0	332	9420 NW St Helens Road	Linnton	

Description: Prior to above date contamicated soil discovered while digging on site, investigation of extent/source proceding, & appears to be historical

YR	OERS Site Name	Address	City	Date
95	913 MOBIL	9420 NW ST HELENS RD	PORTLAND	14MAY1995

Description: THE PIPE FOR RACK LOADING STARTED LEAKING AT A COUPLING GASKET

YR	OERS Site Name	Address	City	Date
96	371 MOBIL OIL	9420 NW ST HELENS RD	ST HELENS	04FEB1996

Description: HEAVY RAIN FLOODED ENTIRE ST HELENS AREA

DASR	SCOUNTY	[illegible]	SST	SZP	WWY	DID	DORG	[illegible]	DCITY	DST	DZP	CID1	MATBP1	[illegible]	UNITS
4/9/90	MARION	[illegible]BURN	OR		STORM DRAIN SYSTEM > PUDDING RIVER	576211		1[illegible]OODBURN MONITOR RD NE	MONITOR	OR	97071	2348	WASTE OIL	[illegible].00	UK
4/30/90	MARION	WOODBURN	OR		ATMOSPHERE	577542	AGRIPAC	101 SOUTH BIRDSEYE AVE	WOODBURN	OR		88	AMMONIA, ANHYDROUS	200.00	LBS
8/15/90	MORROW	BOARDMAN	OR	97818	ATMOSPHERE	594656	LAMB WESTON	COLUMBIA AVE & OLSON RD PO BOX 279	BOARDMAN	OR	97818	88	AMMONIA, ANHYDROUS	20.00	LBS
1/22/90	MORROW	HINKLE	OR	80205	GRAVEL	565735	UNION PACIFIC RAILROAD	1860 LINCOLN STREET	DENVER	CO	80205	1851	OIL: DIESEL	800.00	GAL
1/15/90	MULTNOMAH	CASCADE	OR		FOURBAY LAKE	564810						1800	UNKNOWN OIL	0.00	UK
1/29/90	MULTNOMAH	CASCADE LOCKS	OR		COLUMBIA RIVER	566525						1800	UNKNOWN OIL	0.00	UK
5/14/90	MULTNOMAH	CASCADE LOCKS	OR	97014	COLUMBIA RIVER MILE 145	578821	ARMY CORPS OF ENGINEERS	US ARMY CORP OF ENGINEERS BONNEVILLE LOCK AN	CASCADE LOCKS	OR	97014	2348	WASTE OIL	0.00	UK
6/1/90	MULTNOMAH	CASCADE LOCKS	OR	97014	DRAINAGE DITCH > COLUMBIA RIVER	581416	ARMY CORPS OF ENGINEERS	US ARMY CORP OF ENGINEERS BONNEVILLE LOCK AN	CASCADE LOCKS	OR	97014	1880	OIL, MISC: LUBRICATING	8.00	GAL
2/5/90	MULTNOMAH	GRESHAM	OR		CLEAR CREEK	567087						1900	OIL, FUEL: NO. 2-D	0.00	UK
5/12/90	MULTNOMAH	GRESHAM	OR		JOHNSON CREEK	578274						1800	UNKNOWN OIL	0.00	UK
8/10/90	MULTNOMAH	GRESHAM	OR		STORM DRAIN	593578	PORTLAND GENERAL ELECTRIC	121 SW SALMON ST	PORTLAND	OR	97204	1802	OIL, MISC: TRANSFORMER (NON PCB)	1.00	GAL
8/12/90	MULTNOMAH	GRESHAM	OR		PARKING LOT	590153	TEXACO	3800 NW ST. HELENS RD	PORTLAND	OR	97210	0	GASOLINE: AUTOMOTIVE (UNLEADED)	20.00	GAL
1/8/90	MULTNOMAH	PORTLAND	OR	97208	ROSS ISLAND LAGOON	563888	PORT OF PORTLAND	PO BOX 3529	PORTLAND	OR	97208	1	POLYNUCLEAR HYDROCARBON (PAH)	20.00	LBS
1/12/90	MULTNOMAH	PORTLAND	OR	97287	WILLAMETTE RIVER MP08	564211	FOSS MARITIME	9030 NW ST HELENS ROAD	PORTLAND	OR	97287	1851	OIL: DIESEL	8.00	GAL
1/12/90	MULTNOMAH	PORTLAND	OR	97287	WILLAMETTE RIVER	564237	FOSS MARITIME	9030 NW ST HELENS ROAD	PORTLAND	OR	97287	1803	OTHER OIL	25.00	GAL
1/14/90	MULTNOMAH	PORTLAND	OR		WILLMATTE RIVER	564382	OREGON STEEL MILL	14400 N. RIVERGATE BLVD.	PORTLAND	OR	97203	1800	UNKNOWN OIL	0.00	UK
1/22/90	MULTNOMAH	PORTLAND	OR	97203	WILLAMETTE RIVER	565820						2347	HYDRAULIC OIL	2.00	GAL
1/22/90	MULTNOMAH	PORTLAND	OR	97283	WILLAMETTE RIVER	565841	FRITZ MARITIME AGENCY	1650 NORTHWEST NAITO PKWY SUITE 150	PORTLAND	OR	97209	2347	HYDRAULIC OIL	0.00	UK
1/22/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER	565843	FRITZ MARITIME	1050 NORTHWEST FRONT SUITE 150	PORTLAND	OR	97209	2347	HYDRAULIC OIL	1.00	PNT
1/24/90	MULTNOMAH	PORTLAND	OR	97203	WILLAMETTE RIVER	565883						1800	UNKNOWN OIL	0.00	UK
1/25/90	MULTNOMAH	PORTLAND	OR	97211	ALLEY>GUTTER>DRAIN>RIVER(WILLAMETTE)	565886		6719 NE MALLORY AVE	PORTLAND	OR	97211	1873	OIL, MISC: MOTOR	1.00	GAL
1/26/90	MULTNOMAH	PORTLAND	OR		SWAN ISLAND BOAT BASIN	565900	FOSS ENV. SERVICES	5420 NORTH LAGOON AVE	PORTLAND	OR	97217	1	BILGE SLOPS	1.00	GAL
1/28/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER	566386	JA RAINBOW		PORTLAND	OR	97203	2347	HYDRAULIC OIL	0.00	UK
1/29/90	MULTNOMAH	PORTLAND	OR		UNNAMED CREEK> WILLAMETTE RIVER	566418						1800	UNKNOWN OIL	2.00	GAL
1/29/90	MULTNOMAH	PORTLAND	OR	97210	BLACKTOP > SOIL	566458	KOPPERS INDUSTRIES INC.	7540 NW SAINT HELENS RD.	PORTLAND	OR	97210	1	COAL TAR PITCH	7.00	TON
2/3/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER	566852						1800	UNKNOWN OIL	0.00	UK
2/9/90	MULTNOMAH	PORTLAND	OR	97201	WILLAMETTE RIVER	567665	MORTON LILLY	1500 SW 1ST AVE #840	PORTLAND	OR	97201	2347	HYDRAULIC OIL	0.00	UK
2/12/90	MULTNOMAH	PORTLAND	OR	97227	WILLEMATTE RIVER	568188	MALCOLM DRILLING CO.	7808 SOUTH 200 7TH COURT	KENT	WA	98032	2347	HYDRAULIC OIL	1.00	GAL
2/17/90	MULTNOMAH	PORTLAND	OR		COLUMBIA RIVER	568824						1880	OIL, MISC: LUBRICATING	30.00	GAL
2/25/90	MULTNOMAH	PORTLAND	OR	97217	MATERIAL FROZE ON SIDE OF RAIL CAR	569781	SIMPSON TIMBER	2301 NORTH COLUMBIA BLVD	PORTLAND	OR	97217	1892	PHENOL	100.00	LBS
2/27/90	MULTNOMAH	PORTLAND	OR	97203	WILLAMETTE RIVER	569837						1800	UNKNOWN OIL	0.00	UK
3/20/90	MULTNOMAH	PORTLAND	OR	97231	WILLAMETTE RIVER	572065	FOSS MARITIME	9030 NORTHWEST ST HELENS RD	PORTLAND	OR	97231	1880	OIL, MISC: LUBRICATING	8.00	GAL
3/23/90	MULTNOMAH	PORTLAND	OR		WILLAMETTI RIVER > COLUMBIA RIVER	572270						1851	OIL: DIESEL	25.00	GAL
3/31/90	MULTNOMAH	PORTLAND	OR		CONCRETE / STORM DRAIN	573418	PORTLAND GENERAL ELECTRIC	121 SOUTHWEST SALMON	PORTLAND	OR	97204	1802	OIL, MISC: TRANSFORMER	2.00	GAL
4/13/90	MULTNOMAH	PORTLAND	OR	97203	WILLAMETTE RIVER > COLUMBIA RIVER	575427	UNOCAL AGRICULTURAL PROD	14003 N. RIVERGATE BLVD	PORTLAND	OR	97203	2281	UREA	1800.00	LBS
4/15/90	MULTNOMAH	PORTLAND	OR	97210	CONCRETE AND PAVEMENT	575591	CHEVRON ASPHALT	5501 NW FRONT AVE	PORTLAND	OR	97210	0	GASOLINE: AUTOMOTIVE (UNLEADED)	0.00	UK
4/24/90	MULTNOMAH	PORTLAND	OR		STORM DRAIN	576798	TOSCO	PO BOX 78	PORTLAND	OR	97207	0	GASOLINE: AUTOMOTIVE (UNLEADED)	20.00	GAL
4/27/90	MULTNOMAH	PORTLAND	OR	97230	STORM DRAIN	577432	NEPAK	2131 NORTHEAST 194TH ST	PORTLAND	OR	97230	1	GUNK AND RESIDUE OIL FROM ENGINE	0.00	UK
5/4/90	MULTNOMAH	PORTLAND	OR		WILAMETT RIVER	577801	MARITIME FIRE & SAFETY	200 SOUTHWEST MARKET ST NO 180	PORTLAND	OR	97201	1800	UNKNOWN OIL	0.00	UK
5/5/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER RM2	578213						1800	UNKNOWN OIL	0.00	UK
5/28/90	MULTNOMAH	PORTLAND	OR		SOIL	580727	UNION PACIFIC	1416 DODGE ST	OMAHA	NE	68179	1851	OIL: DIESEL	101.00	GAL
5/31/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER	581381	FOSS MARITIME	9030 NW ST HELENS ROAD	PORTLAND	OR	97287	1851	OIL: DIESEL	20.00	GAL
5/31/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER	581384	FOSS MARITIME		PORTLAND	OR		1851	OIL: DIESEL	25.00	GAL
5/28/90	MULTNOMAH	PORTLAND	OR	97225	ATMOSPHERE	582072	ALPENROSE DAIRY	6149 SOUTHWEST SHATTUCK ROAD	PORTLAND	OR	97225	88	AMMONIA, ANHYDROUS	0.00	UK
6/8/90	MULTNOMAH	PORTLAND	OR		SOIL	582700	CHEVRON	5531 NORTHWEST DOANE AVE	PORTLAND	OR		1803	OTHER OIL	10000.00	GAL
6/11/90	MULTNOMAH	PORTLAND	OR	97227	WILLAMETTE RIVER	582888	LONE STAR NORTHWEST	1050 NORTH RIVER ST.	PORTLAND	OR	97227	1	CEMENT POWDER	200.00	LBS
6/11/90	MULTNOMAH	PORTLAND	OR	97219	ASPHALT	583718		8904 SOUTHWEST 53RD	PORTLAND	OR	97219	1873	OIL, MISC: MOTOR	0.00	UK
6/24/90	MULTNOMAH	PORTLAND	OR	97203	ATMOSPHERE	584539	NAPA AUTO PARTS	10515 NORTH LOMBARD ST	PORTLAND	OR	97203	2	UNKNOWN MATERIAL	0.00	UK
7/13/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER	586547	FRITZ MARITIME AGENCY	1650 NORTHWEST NAITO PKWY SUITE 150	PORTLAND	OR	97209	1	PAINT	5.00	GAL
7/13/90	MULTNOMAH	PORTLAND	OR	97203	ATMOSPHERE	586583	UNOCAL	14003 NORTH RIVERGATE BLD	PORTLAND	OR	97203	88	AMMONIA, ANHYDROUS	0.00	UK
7/24/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER	587554	UNOCAL AGRICULTURAL PROD	14003 N. RIVERGATE BLVD	PORTLAND	OR	97203	1803	OTHER OIL	1.00	OP
7/29/90	MULTNOMAH	PORTLAND	OR	97210	WILLAMETTE RIVER	588228	ADVANCE AMERICAN DIVING	UNKNOWN	PORTLAND	OR	97210	2	UNKNOWN MATERIAL	0.00	UK
8/13/90	MULTNOMAH	PORTLAND	OR	97210	WILLAMETTE RIVER	591168	SHAVER TRANSPORTATION CO.	4900 NW FRONT AVE	PORTLAND	OR	97210	1800	UNKNOWN OIL	0.00	UK
8/22/90	MULTNOMAH	PORTLAND	OR		GRAVEL	591401	CHEVRON ASPHALT	5501 NW FRONT AVE	PORTLAND	OR		131	ASPHALT	185.00	GAL
8/24/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER	591689	A/L SHIPPING					1880	OIL, MISC: LUBRICATING	0.00	UK
9/15/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER	594605	M/V CSO CONSTRUCTOR	397 NORTH SAM HOUSTON PWY	HOUSTON	TX	77060	1800	UNKNOWN OIL	0.00	UK
9/18/90	MULTNOMAH	PORTLAND	OR	97287	WILLAMETTE RIVER	595051	FOSS MARITIME	9030 NW ST HELENS ROAD	PORTLAND	OR	97287	1800	UNKNOWN OIL	1.00	GAL
9/20/90	MULTNOMAH	PORTLAND	OR	97287	WILLAMETTE RIVER	595528	FOSS MARITIME	9030 NW ST HELENS ROAD	PORTLAND	OR	97287	1800	UNKNOWN OIL	0.00	UK
9/30/90	MULTNOMAH	PORTLAND	OR	97211	ATMOSPHERE	596570	FERRELL GAS	1 LIBERTY PLAZA	LIBERTY	MO	64068	2011	PROPANE	800.00	GAL
10/1/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER	597146	WILBUR ELLIS COMPANY	AGRICULTURE CHEMICAL DEPT 3145 NORTHWEST YE(	PORTLAND	OR		1	WEED KILLER	0.00	UK
10/3/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER > COLUMBIA RIVER	597253	GATX TERMINALS	PO BOX 83329	PORTLAND	OR	97283	0	GASOLINE: AUTOMOTIVE (UNLEADED)	200.00	GAL
10/9/90	MULTNOMAH	PORTLAND	OR		WILAMETTE RIVER	597724	LASCO SHIPPING	POB 10047	PORTLAND	OR	97210	2347	HYDRAULIC OIL	0.00	UK
10/9/90	MULTNOMAH	PORTLAND	OR		WILLAMETTE RIVER	597728	LASCO SHIPPING CO	3200 NORTHWEST YEON AVE	PORTLAND	OR	97210	2347	HYDRAULIC OIL	2.00	GAL
10/11/90	MULTNOMAH	PORTLAND	OR	97210	WILLAMETTE RIVER	597843						1800	UNKNOWN OIL	0.00	UK
10/12/90	MULTNOMAH	PORTLAND	OR	97210	WILLAMETTE RIVER	598009	MCCALL OIL & CHEMICAL	5480 NORTHWEST FRONT AVE	PORTLAND	OR	97210	2348	WASTE OIL	2.00	GAL
10/12/90	MULTNOMAH	PORTLAND	OR	97203	WILLAMETTE RIVER MM 4	598086	SCHNITZER STEEL	12005 N. BURGARD RD	PORTLAND	OR	97203	2347	HYDRAULIC OIL	0.00	UK
10/15/90	MULTNOMAH	PORTLAND	OR		ASPHALT	598155	SAFETY KLEEN SYSTEMS INC	16540 SOUTHEAST 130TH AVE	CLACKAMAS	OR		1041	MINERAL SPIRITS	0.00	UK
10/25/90	MULTNOMAH	PORTLAND	OR		SOIL	599248	CHEVRON ASPHALT	5501 NW FRONT AVE	PORTLAND	OR		131	ASPHALT	3.00	BBL
10/27/90	MULTNOMAH	PORTLAND	OR		WILAMETTE RIVER	599288						2	UNKNOWN MATERIAL	0.00	UK
11/3/90	MULTNOMAH	PORTLAND	OR	97210	WILLAMETTE RIVER	600528	TOSCO COMPANY	5528 NW DOANE	PORTLAND	OR	97210	1900	OIL, FUEL: NO. 2-D	1.00	GAL
11/3/90	MULTNOMAH	PORTLAND	OR		WILAMETTE RIVER	600529	OLYMPIC TUG AND BARGE	PO BOX 24006	SEATTLE	WA	98124	1900	OIL, FUEL: NO. 2-D	1.00	GAL
11/18/90	MULTNOMAH	PORTLAND	OR		ASPHALT> STORM DRAIN> WILAMETTE RIVER	601918	BUNZEL DISTRIBUTION	2820 SE MAXLWELL DRIVE	MILWAUKIE	OR		1851	OIL: DIESEL	0.00	UK
12/7/90	MULTNOMAH	PORTLAND	OR	97213	COLUMBIA SLOUGH > COLUMBIA RIVER	604105						1800	UNKNOWN OIL	0.00	UK
12/20/90	MULTNOMAH	PORTLAND	OR	97210	WILLAMETTE RIVER	605132	WACKER SILTRONIC	7200 NW FRONT AVE	PORTLAND	OR	97210	858	DIETHYLENE GLYCOL	800.00	GAL
12/23/90	MULTNOMAH	PORTLAND	OR	97287	WILLAMETTE RIVER	605582	FOSS MARITIME	9030 NW ST HELENS ROAD	PORTLAND	OR	97287	240	BILGE SLOPS	8.00	GAL
12/24/90	MULTNOMAH	PORTLAND	OR	97210	WILLAMETTE RIVER	605820	TOSCO COMPANY	5528 NW DOANE	PORTLAND	OR	97210	1800	UNKNOWN OIL	0.00	UK
10/15/90	MULTNOMAH	TROUTDALE	OR		SOIL	598152	CENTINEL TRANSPORTATION	UNKNOWN	WILMINGTON	DE		1893	LUBE OIL AND TRANSMISSION FLUID	0.00	UK
11/15/90	SHERMAN	RUFUS	OR		NO MATERIAL LEFT SYSTEM	601858	USACOE	PO BOX 564	THE DALLS	OR		1803	MOBILE DTE MED	500.00	GAL
9/25/90	TILLAMOOK	GARABALDI	OR		PACIFIC OCEAN	595590		7618 SE 13TH	PORTLAND	OR	97202				
9/23/90	TILLAMOOK	GARIBALDI	OR		TILLAMOOK BAY	594842	US COAST GUARD	STATION TILLAMOOK BAY	GARIBALDI	OR		1900	OIL, FUEL: NO. 2-D	2.00	GAL
4/19/90	UMATILLA	BARNHARD	OR		BALLAST / SOIL	576135	UNION PACIFIC	1416 DODGE ST	OMAHA	NE	68179	2240	TOLUENE	0.00	UK
7/28/90	UMATILLA	HERMISTON	OR	97838	ATMOSPHERE	588109	LAMB WESTON	78153 WESTLAND RD	HERMISTON	OR	97838	88	AMMONIA, ANHYDROUS	112.00	LBS
8/2/90	UMATILLA	HERMISTON	OR	97838	ATMOSPHERE	588549	LAMB WESTON	78153 WESTLAND RD	HERMISTON	OR	97838	88	AMMONIA, ANHYDROUS	100.00	LBS
7/8/90	UMATILLA	STANFIELD	OR		ATMOSPHERE	585617	PACIFIC GAS AND ELECTRIC	2100 SOUTHWEST RIVER PRKY	PORTLAND	OR		1822	NATURAL GAS	0.00	UK
8/4/90	UMATILLA	WESTON	OR		SOIL	590822	UNION PACIFIC	210 NORTH 13TH ST 18TH FLOOR	ST. LOUIS	MO		1900	OIL, FUEL: NO. 2-D	100.00	GAL
2/23/90	UNKNOWN	ASTORIA	OR		COLUMBIA RIVER	569160	OREGON STATE UNIV.	OREGON STAT UNIV POBOX 428	SOUTH BEACH	OR	97366	2347	HYDRAULIC OIL	4.00	GAL

ENVIRONMENTAL CLEANUP SI FORMATION
SITE SUMMARY REP

July 19, 2000 01:07 pm

SITE ID: 2364 SITE NAME: Foss Maritime/Brix Maritime CERCLIS NO:

ALIASES: Brix Maritime
Portland Harbor Sediment Study

ADDRESS: 9030 NW Saint Helens Rd Portland 97231

COUNTY: MULTNOMAH REGION: NWR

INVG STATUS: SUS NPL SITE: N ORPHAN SITE: N STUDY AREA: N

PROPERTY: TWNSHP/RANGE/SECT: 1N,1W,11 TAX LOTS: 4.46 acres

LATITUDE: 45 deg.35'5" LONGITUDE: 122 deg.45'18" SITE SIZE: 39

STUDY AREAS:

STUDY ID	STUDY NAME	INVG STATUS
2339	V.A.- Designated National Estuaries	XCN
2340	V.A.- Surface Waters, WQ-Limited for Toxics	XCN
1544	Lower Willamette River Basin Study Area (LWRBSA)	XCN
2068	Portland Harbor Sediments	XCN
2344	V.A.- High-Poverty Census Tracts	XCN

FACILITIES:

NAME: Foss Maritime Company

YEARS OF OPERATION: 1979 - Current

SIC CODES: 3462 4400

OPERATING STATUS: Active

PERMITS:

PERMIT NO:	PERMIT TYPE	ISSUED BY	COMMENTS
26-93-0009	LUST	DEQ/UST	Knappton Corp/Brooks Maritime
7374	UST	DEQ/UST	Foss Maritime
SEE NARRATIVE	Spill	DEQ/Spills	

HAZARDOUS SUBSTANCES/WASTE TYPES:

Thallium, butylbenzylphthalate, LPAHs, HPAHs

CONTAMINATION INFORMATION:

Weston sampling results from the Portland Harbor Sediment Study revealed PAHs, thallium and butylbenzylphthalate in river sediments.

SUBSTANCE CONTAMINATION

SUBSTANCE	MEDIA CONTAMINATED	CONCENTRATION LEVEL	EVIDENCE	OBSERV. DATE
BUTYL BENZYL PHTHALATE	Sediment	29 ppb - downstream	Laboratory Data	01SEP1997
POLYAROMATIC HYDROCARBONS (PA	Sediment	LPAH 803 ppb - downstre	Laboratory Data	01SEP1997
	Sediment	HPAHs 3907 ppb - downst	Laboratory Data	01SEP1997
THALLIUM	Sediment	20 ppm - downstream	Laboratory Data	01SEP1997

MEDIA CONTAMINATION COMMENTS:

Willamette River sediments.

STATUS OF INVESTIGATIVE OR REMEDIAL ACTION:

(6/8/99 JMW/SAP) Based on initial sampling results from a river sediment quality study, the Foss Maritime facility has been identified as a potential source of contamination to the Portland Harbor. A Site Assessment Review Notice was sent on March 3, 1999. Response from Foss Maritime was received on April 12, 1999. A site screening is scheduled (level III priority). (12/21/99 TG/SAP) Strategy Recommendation completed November 1999. An expanded Preliminary Assessment (XPA) on the Foss Maritime property should be conducted to evaluate sediment contamination, potential upland site contaminant sources and past waste management practices, and to determine the extent and source(s) of observed sediment contamination at sample station SD052. XPA is a high priority for follow-up.

INVESTIGATIVE, REMEDIAL, AND ADMINISTRATIVE ACTIONS

ACTION	START DATE	COMPL. DATE	RESP. STAFF	AGENCY CODE	REGION	LEAD PROGRAM
Site added to database	08JUN1999	08JUN1999	Janelle Waggy	DEQ	NW	VCS
Site Screening recommended (EV)	08JUN1999	08JUN1999	Steve Fortuna	DEQ	NW	SAS
SITE SCORING Priority for Further Action: HIGH	08NOV1999	08NOV1999	Thomas Gainer	DEQ	NW	SAS
Letter Agreement	18NOV1999	22DEC1999	Eric Blischke	DEQ	NW	VCS
Insufficient information to list	19NOV1999	19NOV1999	Thomas Gainer	DEQ	NW	SAS
SITE EVALUATION	19NOV1999	19NOV1999	Thomas Gainer	DEQ	NW	SAS
State Expanded Preliminary Assessment recommended (XPA) Priority for Further Action: HIGH	19NOV1999	19NOV1999	Thomas Gainer	DEQ	NW	VCS

ACTIVE PROJECTS

PROJECT ID	PROJECT NAME

14491 Foss Maritime Company Preliminary Assessment

COMMENT:

PARTY INFORMATION

SITE CONTACT:

Frank Williamson
Assistant General Counsel
Foss Maritime
660 W Ewing St
Seattle , WA 98119-1587
PHONE: 206/281-2800

ASSOCIATED PARTIES NAME AND ADDRESS	AFFILIATION	AFFILIATION STATUS	INFORMATION AS OF DATE
Brix Maritime Co Dba Foss Maritime Co 9030 NW St Helen Rd Portland , OR 97231 503 286-0631( ) COMMENTS:	Legal Owner		08JUN1999
Brix Maritime Co Dba Foss Maritime Co 9030 NW St Helen Rd Portland , OR 97231 503 286-0631( ) COMMENTS:	Facility Operator		08JUN1999

OWNERSHIP COMMENTS:

DATA SOURCES:

See also Spill files: 95-145, 95-486, 95-1175, 96-222, 96-1679, 96-1403, 97-201, 97-1857, 97-2378, 97-2489, 98-67, 98-75, 98-622, 98-2225, 98-3142 1) Portland Harbor Sediment Investigation Report, prepared by Roy F. Weston, Inc. for USEPA, May 1998.
2) Foss Maritime Company's response to DEQ Site Assessment Information Request,March 31, 1999.
3) DEQ LUST Database.
4) DEQ HWMIMSy Hazardous Waste Generator Database.
5) DEQ SPINS Spill Database.
6) MetroScan Property Records, Multnomah County, Oregon.

LAST UPDATED BY: jmw DATE: 03-FEB-00

(site_report.rpt)

ENVIRONMENTAL CLEANUP SITE INFORMATION
SITE SUMMARY REPORT

July 28, 2000 08:07 am

SITE ID: 1989 SITE NAME: Time Oil Linnton Terminal CERCLIS NO:

ALIASES: Portland Terminals

ADDRESS: 9400 NW St. Helens RD Portland 97210

COUNTY: MULTNOMAH REGION: NWR

INVG STATUS: SUS NPL SITE: N ORPHAN SITE: N STUDY AREA: N

PROPERTY: TWNSHP/RANGE/SECT: 1N,1W,11 TAX LOTS:

LATITUDE: 45 deg.35'20" LONGITUDE: 122 deg.46'22" SITE SIZE: 9 acres

STUDY AREAS:

STUDY ID	STUDY NAME	INVG STATUS
2344	V.A.- High-Poverty Census Tracts	XCN

FACILITIES: NAME: Time Oil Facility #03-042

COMMNETS: Bulk petroleum facility

YEARS OF OPERATION: Early 1980s to present

SIC CODES: 5171 OPERATING STATUS: Active

HAZARDOUS SUBSTANCES/WASTE TYPES:

Gasoline and other petroleum hydrocarbons; BTEX.
Portland Harbor Sediment Study: thallium, butylbenzylphthalate and PAHs.

CONTAMINATION INFORMATION:

In September 1988, approximately 1,000 gal. of gasoline spilled from an overfilled above-ground storage tank. Most product remained within the diked area around the tank farm, but penetrated into the ground. Some soil removal occurred, and Time Oil installed monitoring wells outside of the diked area in 1989. Another gasoline release occurred in July 1992, this time 250 gal., also within the containment area. Following soil removal, a boring to a depth of 16 feet showed gasoline concentrations in subsurface soil at up to 9,000 ppm. Groundwater monitoring in 1994 and 1995 showed BTEX levels declining with time, as well as TPH in the gasoline/diesel range. (GMW 6/5/97) Recent groundwater monitoring data show BTEX at non-detect levels, or at levels below MCLs in all wells. Additionally, based on non-detect BTEX and TPH results from

vapor samples extracted from this spill area between 3/97 and 5/97, it appears that residual soil contamination may not be significant. Further soil sampling would be needed to confirm this. (11/18/99 TG/SAP) Weston sampling results from the Portland Harbor Sediment Study revealed thallium, butylbenzylphthalate and PAHs in river sediments.

PATHWAYS:

The primary pathway of concern is the interconnection between the water table aquifer at the site and the Willamette River. Shallow groundwater flows towards the Willamette, and any contamination in shallow groundwater will therefore migrate towards the river. Groundwater is not used for domestic supply in the lowlands along the Willamette River in this area.

SUBSTANCE CONTAMINATION

SUBSTANCE	MEDIA CONTAMINATED	CONCENTRATION LEVEL	EVIDENCE	OBSERV. DATE
BENZENE	Groundwater	120 ppb	Laboratory Data	15AUG1993
	Soil	2.4 ppm	Laboratory Data	15AUG1993
	Groundwater	3.6 ppb	Laboratory Data	27JUN1995
	Groundwater	0.96 ppb	Laboratory Data	30APR1997
	Date released: 9/88 and 7/92			
	Quantity Released: unk.			
	Sample Depth: 16 ft.			
BUTYL BENZYL PHTHALATE	Sediment	29 ppb	Laboratory Data	01SEP1999
ETHYLBENZENE	Groundwater	6.6 ppb	Laboratory Data	27JUN1995
	Groundwater	0.17 ppb	Laboratory Data	30APR1997
	Date released: 9/88 and 7/92			
	Quantity Released: unk.			
GASOLINE	Groundwater	460 ppb	Laboratory Data	15AUG1993
	Soil	9,000 ppm	Laboratory Data	15AUG1993
	Groundwater	150 ppb	Laboratory Data	27JUN1995
	Date released: 9/88 and 7/92			
	Quantity Released: 1,000 gal./250 gal.			
	Sample Depth: 16 ft.			
POLYAROMATIC HYDROCARBONS (PA	Sediment	LPAHs - 803 ppb	Laboratory Data	01SEP1997
	Sediment	HPAHs - 3907 ppb	Laboratory Data	01SEP1997
THALLIUM	Sediment	20 ppm - dock	Laboratory Data	01SEP1997

TOLUENE	Groundwater 0.23 ppb Date released: 9/88 and 7/92 Quantity Released: unk.	Laboratory Data	30APR1997
XYLENEs	Groundwater 81 ppb Date released: 9/88 and 7/92 Quantity Released: unk.	Laboratory Data	30APR1997

MEDIA CONTAMINATION COMMENTS:

Willamette River sediment.

STATUS OF INVESTIGATIVE OR REMEDIAL ACTION:

Following the 9/88 gasoline release, 175 yards of soil were removed from the floor of the containment area, then aerated and disposed of on-site. The 7/92 release resulted in the excavation of 125 additional yards of soil, which were also aerated and spread on-site. Because soil contamination remained from these incidents, Time Oil treated residual hydrocarbons in-situ via soil vapor extraction (SVE) in 1993, and again between March and May 1997. Time Oil shut the SVE system down in May 1997 because extracted vapor contained very low concentrations of hydrocarbons, suggesting that residual soil contamination in the 1992 spill area was insignificant. (11/18/99 TG/SAP) A Preliminary Assessment should be conducted to evaluate potential upland site contaminant sources and past waste management practices. Medium priority for follow up.

INVESTIGATIVE, REMEDIAL, AND ADMINISTRATIVE ACTIONS

ACTION	START DATE	COMPL. DATE	RESP. STAFF	AGENCY CODE	REGION	LEAD PROGRAM
Site added to database	14JAN1997	14JAN1997	Gil Wistar	DEQ	NW	SAS
SITE EVALUATION COMMENTS: State screening.	14JAN1997	15JAN1997	Gil Wistar	DEQ	NW	SAS
Proposal for Confirmed Release List recommended	15JAN1997	15JAN1997	Gil Wistar	DEQ	NW	SAS
Remedial Action recommended (RA) Priority for Further Action: LOW COMMENTS: Treatment of remaining contaminated soil.	15JAN1997	15JAN1997	Gil Wistar	DEQ	NW	SAS

Facility proposed for Confirmed Release List	13FEB1997	13FEB1997	Kim Van Patten	DEQ	NW	SAS
Owner/operator comments received on listing notification COMMENTS: Comments from Scott Sloan of Time Oil.	13MAY1997	13MAY1997	Kim Van Patten	DEQ	NW	SAS
Review for final listing	03JUN1997	06JUN1997	Gil Wistar	DEQ	NW	SAS
Decision Not to List Site (on the CRL or Inventory) COMMENTS: Based on additional data submitted. Notice of decision not to list sent to Owner/Operato	06JUN1997	23JUN1997	Gil Wistar	DEQ	NW	SAS
Other remedial or investigative action recommended	06JUN1997	23JUN1997	Gil Wistar	DEQ	NW	SAS
Insufficient information to list COMMENTS: Portland Harbor Sediment Project.	18NOV1999	18NOV1999	Thomas Gainer	DEQ	NW	SAS
SITE SCORING Priority for Further Action: MED	18NOV1999	18NOV1999	Thomas Gainer	DEQ	NW	SAS
State Basic Preliminary Assessment recommended (PA) Priority for Further Action: MED COMMENTS: Portland Harbor Sediment Project	18NOV1999	18NOV1999	Thomas Gainer	DEQ	NW	SAS

LAST UPDATED BY: jmw DATE: 03-FEB-00

ACTIVE PROJECTS

PROJECT ID	PROJECT NAME
6941	Time Oil Linnton Terminal

COMMENT:

PARTY INFORMATION

SITE CONTACT:

ASSOCIATED PARTIES

NAME AND ADDRESS	AFFILIATION	AFFILIATION STATUS	INFORMATION AS OF DATE
Scott B. Sloan Time Oil Co. 2737 West Commodore Way Seattle , WA 98199-1233 (206) 286-6457((206) 789-2031 HM)	Owner		14JAN1997

COMMENTS:

OWNERSHIP COMMENTS:

DATA SOURCES: Reports of gasoline spills on 9/13/88 and 7/30/92; 1994-97 groundwater monitoring reports; Corrective Action Plan for site, prepared by Alisto Engineering Group, 8/24/96.
Portland Harbor Sediment Study: 1. Portland Harbor Sediment Investigation Report, prepared by Roy F. Weston, Inc. for USEPA, May 1988.
2. Time Oil Company's response to DEQ Site Assessment Information Request, March 20, 1999.
3. DEQ LUST Database 4. DEQ HWIMSy Hazardous Waste Generator Database.
5. DEQ SPILL Database.
6. MetroScan Property Records, Multnomah County, Oregon.

LAST UPDATED BY: jmw DATE: 03-FEB-00

(site_report.rpt)

ENVIRONMENTAL CLEANUP SITE INFORMATION
SITE SUMMARY REPORT

July 19, 2000 01:07 pm

SITE ID: 137

SITE NAME: Mobil Oil Terminal

CERCLIS NO:

ALIASES: Mobil Oil Bulk Plant - St. Helens RD

ADDRESS: 9420 NW St. Helens RD Portland 97231

COUNTY: MULTNOMAH

REGION: NWR

INVG STATUS: LIS

NPL SITE: N

ORPHAN SITE: N

STUDY AREA: N

PROPERTY:

TWNSHP/RANGE/SECT: 1N,1W,11

TAX LOTS: 25

LATITUDE: 45 deg.35'40"

LONGITUDE: 122 deg.46'52"

SITE SIZE: 24.23 acres

STUDY AREAS:

STUDY ID	STUDY NAME	INVG STATUS
1544	Lower Willamette River Basin Study Area (LWRBSA)	XCN
2339	V.A.- Designated National Estuaries	XCN
2340	V.A.- Surface Waters, WQ-Limited for Toxics	XCN
2068	Portland Harbor Sediments	XCN
2344	V.A.- High-Poverty Census Tracts	XCN

FACILITIES:

NAME: Mobil Oil Terminal

COMMNETS: Bulk petroleum terminal

YEARS OF OPERATION: since about 1928

SIC CODES: 5171

OPERATING STATUS: Active

PERMITS:

PERMIT NO:	PERMIT TYPE	ISSUED BY	COMMENTS
Unknown	Air	DEQ	
Unknown	Water	DEQ	

HAZARDOUS SUBSTANCES/WASTE TYPES:

petroleum

MANNER AND TIME OF RELEASE:

Periodic discharging of petroleum sludges to ground from 1928 to 1970. Spill on March 10, 1985; possibly other spills.

CONTAMINATION INFORMATION:

(07/18/97 MAF/VCS) The facility has been used for bulk storage and dispensing of fuel oils, gasolines, and diesel fuels since 1928. Prior to 1970, petroleum sludges from above-ground storage tanks were discharged onto the ground during periodic tank cleanings. In the late 1960s, petroleum sheens began to appear on the surface of the Willamette River adjacent to the site. Mobil has attempted to control the release by constructing a slurry wall along the river bank. In March 1985, 46,116 gallons of petroleum were spilled at the site. All but 11,004 gallons were recovered. Mobil entered DEQ's Voluntary Cleanup program in January 1992.

SUBSTANCE CONTAMINATION

SUBSTANCE	MEDIA CONTAMINATED	CONCENTRATION LEVEL	EVIDENCE	OBSERV. DATE
DIESEL - FUEL OIL	Groundwater Soil Tank Date released: 3/10/85 Quantity Released: 46,116 gals Data Source: NWR Mobil Oil spill file; Mult. source file			

COMMENTS: LUST RI, administratively closed in LUST; release unrelated to USTs. (LUST log #26-90-02

REMEDIAL INVESTIGATION	01JAN1992	31MAR1997	Michael Fernandez	DEQ	HQ	VCS
FEASIBILITY STUDY	01JAN1992	31MAR1997	Michael Fernandez	DEQ	HQ	VCS
RISK ASSESSMENT	01JAN1992	31MAR1997	Michael Fernandez	DEQ	HQ	VCS
Site Screening recommended (EV)	13JAN1994	13JAN1994	Dan Crouse	DEQ	HQ	SAS
SITE PRIORITY EVALUATION FOR FURTHER ACTION	14DEC1994	28MAR1996	Gil Wistar	DEQ	NW	SAS
Listing Review completed	27MAR1996	28MAR1996	Gil Wistar	DEQ	NW	SAS
Proposal for Confirmed Release List recommended	28MAR1996	28MAR1996	Gil Wistar	DEQ	NW	SAS
Proposal for Inventory recommended	29MAR1996	29MAR1996	Gil Wistar	DEQ	NW	SAS
Facility proposed for Confirmed Release List	18MAR1997	18MAR1997	Michael Fernandez	DEQ	HQ	VCS
Facility proposed for Inventory	18MAR1997	18MAR1997	Michael Fernandez	DEQ	HQ	VCS
PRELIMINARY ASSESSMENT EQUIVALENT COMMENTS: RI report considered PAE.	31MAR1997	31MAR1997	Matt McClincy	DEQ	NW	VCS
RECORD OF DECISION	01APR1997	17JUN1997	Michael Fernandez	DEQ	HQ	VCS
Review for final listing	14JUL1997	14JUL1997	Michael Fernandez	DEQ	HQ	VCS
Listing on Confirmed Release List recommended	15JUL1997	15JUL1997	Michael Fernandez	DEQ	HQ	VCS
Listing on Inventory recommended	15JUL1997	15JUL1997	Michael Fernandez	DEQ	HQ	VCS

COMMENTS: LUST RI, administratively closed in LUST; release unrelated to USTs. (LUST log #26-90-02

REMEDIAL INVESTIGATION	01JAN1992	31MAR1997	Michael Fernandez	DEQ	HQ	VCS
FEASIBILITY STUDY	01JAN1992	31MAR1997	Michael Fernandez	DEQ	HQ	VCS
RISK ASSESSMENT	01JAN1992	31MAR1997	Michael Fernandez	DEQ	HQ	VCS
Site Screening recommended (EV)	13JAN1994	13JAN1994	Dan Crouse	DEQ	HQ	SAS
SITE PRIORITY EVALUATION FOR FURTHER ACTION	14DEC1994	28MAR1996	Gil Wistar	DEQ	NW	SAS
Listing Review completed	27MAR1996	28MAR1996	Gil Wistar	DEQ	NW	SAS
Proposal for Confirmed Release List recommended	28MAR1996	28MAR1996	Gil Wistar	DEQ	NW	SAS
Proposal for Inventory recommended	29MAR1996	29MAR1996	Gil Wistar	DEQ	NW	SAS
Facility proposed for Confirmed Release List	18MAR1997	18MAR1997	Michael Fernandez	DEQ	HQ	VCS
Facility proposed for Inventory	18MAR1997	18MAR1997	Michael Fernandez	DEQ	HQ	VCS
PRELIMINARY ASSESSMENT EQUIVALENT COMMENTS: RI report considered PAE.	31MAR1997	31MAR1997	Matt McClincy	DEQ	NW	VCS
RECORD OF DECISION	01APR1997	17JUN1997	Michael Fernandez	DEQ	HQ	VCS
Review for final listing	14JUL1997	14JUL1997	Michael Fernandez	DEQ	HQ	VCS
Listing on Confirmed Release List recommended	15JUL1997	15JUL1997	Michael Fernandez	DEQ	HQ	VCS
Listing on Inventory recommended	15JUL1997	15JUL1997	Michael Fernandez	DEQ	HQ	VCS

ENVIRONMENTAL CLEANUP SITE ORMATION
SITE SUMMARY REPORT

July 19, 2000 01:07 pm

SITE ID: 1528 SITE NAME: ARCO Bulk Terminal CERCLIS NO:

ALIASES: ARCO Linnton Terminal
Portland Harbor Sediments

ADDRESS: 9930 NW St. Helens RD Burlington 97231

COUNTY: MULTNOMAH REGION: NWR

INVG STATUS: LIS NPL SITE: N ORPHAN SITE: N STUDY AREA: N

PROPERTY: TWNSHP/RANGE/SECT: 1N,1W,2 TAX LOTS: 48

LATITUDE: 45 deg.35'35" LONGITUDE: 122 deg.46'40" SITE SIZE: 14.21 acres

STUDY AREAS:

STUDY ID	STUDY NAME	INVG STATUS
1544	Lower Willamette River Basin Study Area (LWRBSA)	XCN
2339	V.A.- Designated National Estuaries	XCN
2340	V.A.- Surface Waters, WQ-Limited for Toxics	XCN
2068	Portland Harbor Sediments	XCN
2344	V.A.- High-Poverty Census Tracts	XCN

FACILITIES:

NAME: ARCO Bulk Terminal

COMMNETS: Petroleum bulk facility

YEARS OF OPERATION: 1963 to present

SIC CODES: 2911

OPERATING STATUS: Active

PERMITS:

PERMIT NO:	PERMIT TYPE	ISSUED BY	COMMENTS
4248	NPDES 1300-J	DEQ WQ	
26-2030	ACDP	DEQ AQ	
ORD052216603	RCRA Generator	DEQ RCRA	Conditionally Exempt Generator

HAZARDOUS SUBSTANCES/WASTE TYPES:

Petroleum products

MANNER AND TIME OF RELEASE:

Releases from historical operations, above-ground tanks, underground pipelines, product transfer. Time of release: unknown; potentially 1963 to present.

CONTAMINATION INFORMATION:

(6/30/94 GMW) The facility has 26 above-ground storage tanks containing gasoline, diesel, lube oil, and additives. Files from DEQ's Northwest Region office indicate that during the 1960s and early 1970s there were a number of complaints about seepage or discharge of petroleum into the Willamette River. To prevent further releases, ARCO installed an 800-foot concrete retaining wall along the river and placed four "interceptor" wells along the base of this seawall. The interceptor wells were designed to extract free product from groundwater before it entered the river, and remain in operation today. On July 12, 1991, ARCO reported a leak in a buried diesel pipeline. Although the total volume of diesel released is unknown, ARCO's contractor recovered 750 gallons of product from a sump installed around the piping repair. In 1993, about 1,800 tons of petroleum-contaminated soil were removed from the site, some of which came from the area around the 1991 diesel release. Excavations from three other areas on-site contributed to this accumulation of contaminated soil, including: 1) the March 1992 construction of a new railroad spur; 2) the June 1992 trenching for a new pipeline; and 3) the December 1992 removal of a waste oil tank. Also in 1993, Geraghty & Miller (G&M) installed five monitoring wells on-site. In well P-11, G&M measured a free-product thickness of up to 12.42 feet. All four interceptor wells contained free product, ranging from 0.85 to 1.7 feet.

SUBSTANCE CONTAMINATION

SUBSTANCE	MEDIA CONTAMINATED	CONCENTRATION LEVEL	EVIDENCE	OBSERV. DATE
DIESEL - FUEL OIL	Soil	36,000 ppm	Laboratory Data	18JAN1993
	Groundwater	100% (free product)	Observation	18JUN1993
	Date released: unknown			
	Quantity Released: unknown			
GASOLINE	Soil	500 ppm	Laboratory Data	18JAN1993
	Date released: unknown			
	Quantity Released: unknown			

MEDIA CONTAMINATION COMMENTS:

Substantial contamination of groundwater

ENVIRONMENTAL/HEALTH THREATS:

Because groundwater at this site eventually discharges to the Willamette River, the surface water pathway is the most threatened.

STATUS OF INVESTIGATIVE OR REMEDIAL ACTION:

(6/30/94 GMW) There is significant groundwater contamination beneath this site, with free product documented in a least six on-site wells, at up to 12.5 feet. The interceptor wells were installed over 20 years ago, and it is not clear how effective they are in preventing seepage of petroleum into the river. The presence of substantial layers of floating product at a few data points, and the size of the site point to the possibility of a widespread floating product plume. Therefore, Site Assessment recommends an RI/FS at the site, to determine the extent of groundwater contamination, and to evaluate remedial options. This action warrants a medium-to-high priority because of the magnitude of known contamination, and because continuing degradation of the Willamette River is the likely consequence of inaction. (3/1/00 JMW/SAP) Voluntary Agreement for Remedial Investigation and Source Control Measures forwarded to ARCO Products Company on February 29, 2000. Signed agreement due March 31, 2000.

INVESTIGATIVE, REMEDIAL, AND ADMINISTRATIVE ACTIONS

ACTION	START DATE	COMPL. DATE	RESP. STAFF	AGENCY CODE	REGION	LEAD PROGRAM

SITE EVALUATION	27JUL1993	29JUN1994	Gil Wistar	DEQ	NW	SAS
PRELIMINARY ASSESSMENT EQUIVALENT	27JUL1993	29JUN1994	Gil Wistar	DEQ	NW	SAS
Site added to database	28MAR1994		Gil Wistar	DEQ	NW	SAS
Listing Review completed	29JUN1994	30JUN1994	Gil Wistar	DEQ	NW	SAS
Proposal for Confirmed Release List recommended	30JUN1994	30JUN1994	Gil Wistar	DEQ	NW	SAS
Proposal for Inventory recommended	30JUN1994	30JUN1994	Gil Wistar	DEQ	NW	SAS
COMMENTS: See strategy recommendation for pathway information.						
Remedial Investigation/Feasibility Study recommended	01JUL1994	01JUL1994	Gil Wistar	DEQ	NW	SAS
Priority for Further Action: HMED						
COMMENTS: 12/17/97 Bill Robertson, current project manager.						

LAST UPDATED BY: jmw DATE: 01-MAR-00

Facility proposed for Confirmed Release List	26AUG1994	26AUG1994	Gil Wistar	DEQ	NW	SAS
Facility proposed for Inventory	26AUG1994	26AUG1994	Gil Wistar	DEQ	NW	SAS
Review for final listing	18OCT1994	18OCT1994	Gil Wistar	DEQ	NW	SAS
Listing on Confirmed Release List recommended	19OCT1994	19OCT1994	Gil Wistar	DEQ	NW	SAS
Listing on Inventory recommended	19OCT1994	19OCT1994	Gil Wistar	DEQ	NW	SAS
Facility placed on Confirmed Release List	24OCT1994	24OCT1994	Heather Schijf	DEQ	HQ	SAS
Facility placed on Inventory	24OCT1994	24OCT1994	Heather Schijf	DEQ	HQ	SAS
Refer to Program	14JAN1997	14JAN1997	Bill Robertson	DEQ	NW	HW
Priority for Further Action: HMED						
COMMENTS: Facility referred to the Site Response Program.						
Letter Agreement	29FEB2000		Thomas Gainer	DEQ	NW	VCS
COMMENTS: Voluntary Agreement for RI and Scope of Work.						
NEGOTIATIONS	29FEB2000		Thomas Gainer	DEQ	NW	VCS

ACTIVE PROJECTS

PROJECT ID	PROJECT NAME
14665	Arco Bulk Plant Terminal 22T VCP

COMMENT:

PARTY INFORMATION

SITE CONTACT:

Ralph Moran

ARCO Products Co
4 Centerpointe Dr Ste 179
LaPalma , CA 90623
PHONE: (714) 670-5126

ASSOCIATED PARTIES NAME AND ADDRESS	AFFILIATION	AFFILIATION STATUS	INFORMATION AS OF DATE
Roy Thun Environmental Engineer ARCO Products Company PO Box 5077 Buena Park , CA 90622 (213) 486-1293	Owner		06JUL1994

COMMENTS:

OWNERSHIP COMMENTS:

DATA SOURCES: "Site Characterization and System Evaluation Report, ARCO Terminal Station No. T22, 9930 NW St Helens Rd, Portland, Oregon" - Geraghty & Miller, March 25, 1994.
"Results of First Quarter 1997 Groundwater Monitoring and Sampling ARCO Terminal No. 22T", Geraghty & Miller, July 8, 1997.

LAST UPDATED BY: jmw DATE: 01-MAR-00

(site_report.rpt)

ENVIRONMENTAL CLEANUP SITE INFORMATION
SITE SUMMARY REPORT

July 28, 2000 08:07 am

SITE ID: 2352 SITE NAME: Marine Finance Corp CERCLIS NO:

ALIASES: Hendren Tow Boat Co
Portland Harbor Site Discovery
REH Inc
Riverside Industrial Park

ADDRESS: 8444 NW Saint Helens Rd Portland 97231

COUNTY: MULTNOMAH REGION: NWR

INVG STATUS: SUS NPL SITE: N ORPHAN SITE: N STUDY AREA: N

PROPERTY: TWNSHP/RANGE/SECT: 1N,1W,11 TAX LOTS: 32

LATITUDE: 45 deg.34'59" LONGITUDE: 122 deg.45'57.4" SITE SIZE: 9.7 acres

STUDY AREAS:

STUDY ID	STUDY NAME	INVG STATUS
2339	V.A.- Designated National Estuaries	XCN
2340	V.A.- Surface Waters, WQ-Limited for Toxics	XCN
1544	Lower Willamette River Basin Study Area (LWRBSA)	XCN
2068	Portland Harbor Sediments	XCN

FACILITIES:

NAME: Marine Finance Corp

YEARS OF OPERATION: October 1993 - current

SIC CODES: 5090

OPERATING STATUS: Active

PERMITS:

PERMIT NO:	PERMIT TYPE	ISSUED BY	COMMENTS
ORQ000005892	HW Generator	DEQ/RCRA	One time disposal
26-88-0046	LUST File	DEQ/UST	
11378	UST File	DEQ/UST	

CONTAMINATION INFORMATION:

Weston sampling results from the Portland Harbor Sediment Study revealed Methylnaphthalene, carbazole, dibenzofuran and PAHs in river sediments.

SUBSTANCE CONTAMINATION

SUBSTANCE	MEDIA CONTAMINATED	CONCENTRATION LEVEL	EVIDENCE	OBSERV. DATE
CARBAZOLE	Sediment	370 ppb	Laboratory Data	01JUN1997
DIBENZOFURAN	Sediment	1,300 ppb	Laboratory Data	01JUN1997
METHYLNAPHTHALENE,2-	Sediment	1,400 ppb	Laboratory Data	01JUN1997
POLYAROMATIC HYDROCARBONS (PA	Sediment	LPAHs - 69.4 ppm	Laboratory Data	01JUN1997
	Sediment	HPAHs - 136 ppm	Laboratory Data	02JUN1998

STATUS OF INVESTIGATIVE OR REMEDIAL ACTION:

(9/27/99 TG/SAP) Strategy Recommendation for high priority Expanded Preliminary Assessment to further evaluate link between site activities and adjacent sediment contamination. (4/21/00 RGS/VCP) DEQ is initiating a PA/XPA at the Marine Finance and Hendren Tow Boat facilities using one of DEQ's environmental contractors. Field investigation should occur summer 2000.

INVESTIGATIVE, REMEDIAL, AND ADMINISTRATIVE ACTIONS

ACTION	START DATE	COMPL. DATE	RESP. STAFF	AGENCY CODE	REGION	LEAD PROGRAM
Site added to database	25MAY1999		Janelle Waggy	DEQ	NW	VCS
Site Screening recommended (EV)	25MAY1999	25MAY1999	Steve Fortuna	DEQ	NW	SAS
Insufficient information to list	03SEP1999		Thomas Gainer	DEQ	NW	SAS
SITE EVALUATION	03SEP1999	03SEP1999	Thomas Gainer	DEQ	NW	SAS
SITE SCORING Priority for Further Action: HIGH	03SEP1999	03SEP1999	Thomas Gainer	DEQ	NW	SAS
State Expanded Preliminary Assessment recommended (XPA) Priority for Further Action: HIGH	03SEP1999	03SEP1999	Thomas Gainer	DEQ	NW	SAS
EXPANDED PRELIMINARY ASSESSMENT	24JAN2000		Rod Struck	DEQ	NW	SRS
NEGOTIATIONS	28FEB2000	17APR2000	Rod Struck	DEQ	NW	VCS
Letter Agreement COMMENTS: Letter Agreement terminated by DEQ on 4/17/00.	07APR2000	17APR2000	Rod Struck	DEQ	NW	SAS
Refer to Program COMMENTS: Referred to Orphan Program. PA/XPA to be conducted by DEQ.	17APR2000	17APR2000	Rod Struck	DEQ	NW	VCS

ACTIVE PROJECTS

PROJECT	PROJECT

ID	NAME
12419	Marine Finance Corp. (PH)

COMMENT:

PARTY INFORMATION

SITE CONTACT:

Mike Williams
Marine Finance Corporation
8444 NW St Helens Rd
Portland , OR 97231
PHONE: 503-286-7656

ASSOCIATED PARTIES

NAME AND ADDRESS	AFFILIATION	AFFILIATION STATUS	INFORMATION AS OF DATE
Floyd Hendren Hendren Tow Boat Co 12751 NW Springville Rd Portland , OR 97229 ( )	Operator		25MAY1999
Land/Bsn Owner Marine Finance Corporation 8444 NW St Helens Rd Portland , OR 97231 503 231-8991( )	Legal Owner		21APR2000

COMMENTS:

OWNERSHIP COMMENTS:

DATA SOURCES:

LAST UPDATED BY: jmw DATE: 21-APR-00

(site_report.rpt)

ENVIRONMENTAL CLEANUP SITE INFORMATION
SITE SUMMARY REPORT

July 28, 2000 08:07 am

SITE ID: 2367 — SITE NAME: Transloader International Company — CERCLIS NO:

ALIASES: Portland Harbor Sediment Study
Stanley Wagner Property

ADDRESS: 8444 NW Saint Helens Rd Portland 97231

COUNTY: MULTNOMAH — REGION: NWR

INVG STATUS: SUS — NPL SITE: N — ORPHAN SITE: N — STUDY AREA: N

PROPERTY:
TWNSHP/RANGE/SECT: 1N,1W,11 — TAX LOTS: 40

LATITUDE: 45 deg.34'59" — LONGITUDE: 122 deg.45'57" — SITE SIZE: 5 acres

STUDY AREAS:

STUDY ID	STUDY NAME	INVG STATUS
2339	V.A.- Designated National Estuaries	XCN
2340	V.A.- Surface Waters, WQ-Limited for Toxics	XCN
1544	Lower Willamette River Basin Study Area (LWRBSA)	XCN
2068	Portland Harbor Sediments	XCN

FACILITIES:

NAME: Transloader International Company

YEARS OF OPERATION: unknown

SIC CODES: 1629 — OPERATING STATUS: Inactive

CONTAMINATION INFORMATION:

Weston sampling results from the Portland Harbor Sediment Study revealed no contaminant concentrations exceeding Portland Harbor baseline values.

SUBSTANCE CONTAMINATION

SUBSTANCE	MEDIA CONTAMINATED	CONCENTRATION LEVEL	EVIDENCE	OBSERV. DATE

MEDIA CONTAMINATION COMMENTS:

Willamette River sediments.

STATUS OF INVESTIGATIVE OR REMEDIAL ACTION:

(6/9/99 JMW/SAP) Based on initial sampling results from a river sediment quality study, the General Construction property has been identified as a potential source of contamination to the Portland Harbor. A Site Assessment Review notice was sent on February 12, 1999. A response has not been received. Site screening is scheduled (level II priority). (7/23/99 TG/SAP) Strategy Recommendation for low-priority Preliminary Assessment. Although upland site activities are not well documented, it does not appear that the site has significantly impacted adjacent sediment. (12/7/99 TG/SAP) Revision to Strategy Recommendation, corrected property ownership from General Construction Company to Transloader International.

INVESTIGATIVE, REMEDIAL, AND ADMINISTRATIVE ACTIONS

ACTION	START DATE	COMPL. DATE	RESP. STAFF	AGENCY CODE	REGION	LEAD PROGRAM
Site added to database	09JUN1999	09JUN1999	Janelle Waggy	DEQ	NW	VCS
Site Screening recommended (EV)	09JUN1999	09JUN1999	Steve Fortuna	DEQ	NW	SAS
SITE EVALUATION Priority for Further Action: LOW	23JUL1999	20DEC1999	Thomas Gainer	DEQ	NW	SAS
State Basic Preliminary Assessment recommended (PA) Priority for Further Action: LOW	23JUL1999	20DEC1999	Thomas Gainer	DEQ	NW	SAS

Insufficient information to list	26JUL1999	20DEC1999	Thomas Gainer	DEQ	NW	SAS
SITE SCORING Priority for Further Action: LOW	20DEC1999	20DEC1999	Thomas Gainer	DEQ	NW	SAS

ACTIVE PROJECTS

PROJECT ID	PROJECT NAME
12422	General Construction Co.

COMMENT:

PARTY INFORMATION

SITE CONTACT:

JP Thompson
Transloader International Co, LLC
8888 NW Saint Helens Rd
Portland , OR 97231
PHONE: 503-247-3611

ASSOCIATED PARTIES

NAME AND ADDRESS	AFFILIATION	AFFILIATION STATUS	INFORMATION AS OF DATE
Transloader International Co, LLC 120 N Main St, Ste 300 Banks , OR 97106 ( )	Legal Owner		09DEC1999

COMMENTS:

OWNERSHIP COMMENTS:

DATA SOURCES: EPA. 1997. Portland Harbor Sediment Investigation Report.

LAST UPDATED BY: jmw DATE: 01-FEB-00

(site_report.rpt)

ENVIRONMENTAL CLEANUP SITE INFORMATION
SITE SUMMARY REPORT

July 28, 2000 08:07 am

SITE ID: 1641 SITE NAME: US Army COE - Portland Moorings CERCLIS NO: 9960010701

ALIASES: COE Civil Portland Moorings
U.S. Government Moorings
U.S. Moorings

ADDRESS: 8010 NW St. Helens RD Portland 97210

COMMENTS: Site is located 6.2 miles upstream from the confluence of Willamette and Columbia Rivers, on the west bank of the Willamette. Part of the site extends into T1N R1W, Section 11.

COUNTY: MULTNOMAH REGION: NWR

INVG STATUS: LIS NPL SITE: N ORPHAN SITE: N STUDY AREA: N

PROPERTY:

TWNSHP/RANGE/SECT: 1N,1W,12 TAX LOTS:

LATITUDE: 45 deg.34'54" LONGITUDE: 122 deg.45'47" SITE SIZE: 13.4 ac.

STUDY AREAS:

STUDY ID	STUDY NAME	INVG STATUS
2339	V.A.- Designated National Estuaries	XCN
2340	V.A.- Surface Waters, WQ-Limited for Toxics	XCN
2068	Portland Harbor Sediments	XCN

FACILITIES:

NAME: U.S. Moorings

COMMNETS: Maintanance & repair of Corps of Engineers vessels.

YEARS OF OPERATION: 1904 to present

SIC CODES: 3731 OPERATING STATUS: Active

HAZARDOUS SUBSTANCES/WASTE TYPES:

Petroleum hydrocarbons, PAHs, PCBs, and metals, including tributyl tin.

CONTAMINATION INFORMATION:

The site has been in operation since 1904, serving as a maintenance port for Corps of Engineers vessels. Contamination of Willamette River sediments has occurred partly as a result of site activities such as vessel maintenance (sandblasting, scaling, repair and painting, for example), and spills from vessels in dock and from refueling operations. Some of the sediment contamination may have resulted from migration from upstream sites such as Elf-Atochem, Rhone-Poulenc, Gould, and Gasco. In any case, Willamette River sediment sampling between 1988 and 1994 has shown elevated levels of PAHs, pesticides, and metals, including tributyl tin. Sediment contamination at the upstream end of the site was significant enough that the Corps abandoned plans to dredge this area.

SUBSTANCE CONTAMINATION

SUBSTANCE	MEDIA CONTAMINATED	CONCENTRATION LEVEL	EVIDENCE	OBSERV. DATE
ACENAPHTHENE	Sediment Date released: unk Quantity Released: unk	9.4 ppm	Laboratory Data	12OCT1989
ANTHRACENE	Sediment Date released: unk Quantity Released: unk	5.5 ppm	Laboratory Data	12OCT1989
ARSENIC	Sediment Date released: unk Quantity Released: unk	60 ppm	Laboratory Data	20DEC1994
BENZO(a)ANTHRACENE	Sediment Date released: unk Quantity Released: unk	4.7 ppm	Laboratory Data	12OCT1989
BENZO(a)PYRENE	Sediment Date released: unk Quantity Released: unk	5.5 ppm	Laboratory Data	12OCT1989
BENZO(b)FLUORANTHENE	Sediment Date released: unk Quantity Released: unk	6.8 ppm	Laboratory Data	12OCT1989
BENZO(ghi)PERYLENE	Sediment Date released: unk	5.7 ppm	Laboratory Data	12OCT1989

	Quantity Released: unk			
CHROMIUM	Sediment	87 ppm	Laboratory Data	20DEC1994
	Date released: unk			
	Quantity Released: unk			
CHRYSENE	Sediment	5.9 ppm	Laboratory Data	12OCT1989
	Date released: unk			
	Quantity Released: unk			
COPPER	Sediment	140 ppm	Laboratory Data	20DEC1994
	Date released: unk			
	Quantity Released: unk			
DDD,p,p'-	Sediment	0.47 ppm	Laboratory Data	12OCT1989
	Date released: unk			
	Quantity Released: unk			
DDT,p,p'-	Sediment	0.2 ppm	Laboratory Data	12OCT1989
	Date released: unk			
	Quantity Released: unk			
DIBENZO(a,h)ANTHRACENE	Sediment	0.83 ppm	Laboratory Data	12OCT1989
	Date released: unk			
	Quantity Released: unk			
DIBENZOFURAN	Sediment	0.77 ppm	Laboratory Data	12OCT1989
	Date released: unk			
	Quantity Released: unk			
DIELDRIN	Sediment	0.029 ppm	Laboratory Data	12OCT1989
	Date released: unk			
	Quantity Released: unk			
FLUORANTHENE	Sediment	20 ppm	Laboratory Data	12OCT1989
	Date released: unk			
	Quantity Released: unk			
FLUORENE	Sediment	5.3 ppm	Laboratory Data	12OCT1989
	Date released: unk			
	Quantity Released: unk			
INDENO(1,2,3-cd)PYRENE	Sediment	3.9 ppm	Laboratory Data	12OCT1989
	Date released: unk			
	Quantity Released: unk			
LEAD	Sediment	335 ppm	Laboratory Data	12OCT1989
	Date released: unk			
	Quantity Released: unk			
NAPHTHALENE	Sediment	21 ppm	Laboratory Data	12OCT1989
	Date released: unk			
	Quantity Released: unk			

PCBs	Soil Date released: unk Quantity Released: unk	0.6 ppm	Laboratory Data	11FEB1993
PETROLEUM HYDROCARBONS	Soil Date released: unk Quantity Released: unk Sample Depth: 0.5 ft.	2,400 ppm	Laboratory Data	29SEP1992
PHENANTHRENE	Sediment Date released: unk Quantity Released: unk	29 ppm	Laboratory Data	12OCT1989
PYRENE	Sediment Date released: unk Quantity Released: unk	27 ppm	Laboratory Data	12OCT1989
TRIBUTYLTIN	Sediment Date released: unk Quantity Released: unk	0.24 ppm	Laboratory Data	14JUN1994
ZINC	Sediment Date released: unk Quantity Released: unk	638 ppm	Laboratory Data	20DEC1994

ENVIRONMENTAL/HEALTH THREATS:

Sediment contamination in the Willamette River adjacent to the site is likely to be toxic to benthic organisms, bottom-feeding fish, and possibly anadromous fish that migrate through this area. Because DEQ has no data on contaminants dissolved or suspended in surface water, it is not clear how significant an effect this sediment contamination may have on migrating fish.

STATUS OF INVESTIGATIVE OR REMEDIAL ACTION:

(GMW 7/28/97) Notwithstanding the likely contribution from the upstream GASCO site to sediment contamination at Portland Moorings, there are on-site sources of contamination at Portland Moorings, including tributyl tin, other metals, PAHs, and petroleum hydrocarbons. Near-shore sediment contamination could pose risks to ecological receptors in the river, as well as to humans via direct contact and, potentially, ingestion of contaminated fish. In addition, since there are at least five documented drinking water wells within 1 mile of the site, groundwater is a potential pathway of concern. Further action needs include: 1) research on historical activities and chemical handling, storage and disposal areas on site; 2) further sampling of sediments and surface water adjacent to the site, for TBT and metals; 3) shallow groundwater sampling beneath Areas One and Two (refer to map in strategy recommendation); and 4) soil sampling for PCBs in areas where the Corps handled electrical or hydraulic equipment over the years. Further state action is a medium priority.

(10/29/97 JMW/SAP) On 10/22/97 and 10/23/97, minor releases to surface waters were reported at the US ACOE site. The most likely cause for the releases was determined to be a recent DEQ sediment sampling survey and the prop wash from an ACOE vessel that pulled in. DEQ's Spill Response Program will not be requesting a report. (4/18/00 ACV/VCP) Formal agreement negotiations; RI required. Part of Portland Harbor investigation.

REMEDIAL ACTION FUNDING:

Owner, operator or other party under agreement, order or consent decree under ORS 465.200 or 465

INVESTIGATIVE, REMEDIAL, AND ADMINISTRATIVE ACTIONS

ACTION	START DATE	COMPL. DATE	RESP. STAFF	AGENCY CODE	REGION	LEAD PROGRAM
Site added to CERCLIS	05FEB1993	05FEB1993		EPA		
EPA Basic Preliminary Assessment COMMENTS: (Prepared for EPA by ACOE Portland District.)	28SEP1993	20APR1994		EPA		
EPA Screening Site Inspection 1	03OCT1994	22MAY1995		EPA		
Site added to database	27DEC1994		Dan Crouse	DEQ	HQ	SAS
Site Screening recommended (EV)	10APR1995	10APR1995	Dan Crouse	DEQ	HQ	SAS
No Further Remedial Action Planned under Federal program	22MAY1995	22MAY1995		EPA		
SITE EVALUATION	17DEC1996	28JUL1997	Gil Wistar	DEQ	NW	SAS
PRELIMINARY ASSESSMENT EQUIVALENT COMMENTS: State PAE.	17DEC1996	28JUL1997	Gil Wistar	DEQ	NW	SAS
Listing Review completed	25JUL1997	28JUL1997	Gil Wistar	DEQ	NW	SAS
Proposal for Confirmed Release List recommended	28JUL1997	28JUL1997	Gil Wistar	DEQ	NW	SAS
Proposal for Inventory recommended	28JUL1997	28JUL1997	Gil Wistar	DEQ	NW	SAS

Other remedial or investigative action recommended	29JUL1997	29JUL1997	Gil Wistar	DEQ	NW	SAS

Priority for Further Action: MED

COMMENTS: Further sampling in specific areas and development of more thorough site usage history.

LAST UPDATED BY: jmw DATE: 18-APR-00

Facility proposed for Confirmed Release List	13AUG1997	13AUG1997	Gil Wistar	DEQ	NW	SAS
Facility proposed for Inventory	13AUG1997	13AUG1997	Gil Wistar	DEQ	NW	SAS
Petition or request granted	18NOV1997	18NOV1997	Kim Van Patten	DEQ	NW	SAS
COMMENTS: Verbal request for extension granted via phone conversation between Gil Wistar and Brand						
Extension requested by owner/operator	18NOV1997	18NOV1997	Kim Van Patten	DEQ	NW	SAS
COMMENTS: Verbal request for extension via phone conversation between Gil Wistar and Brandon Smith						
Owner/operator comments received on listing notification	26NOV1997	26NOV1997	Kim Van Patten	DEQ	NW	SAS
COMMENTS: Comments recieved from Thomas E. Savidge, P.E. Department of the Army. Comments forwarde						
Review for final listing	27JAN1998	06APR1998	Steve Fortuna	DEQ	NW	SAS
COMMENTS: Based on three letters from ACOE and on-site meeting held 3/12/98.						
Facility placed on Confirmed Release List	06APR1998	06APR1998	Mike Rosen	DEQ	NW	VCP
Facility placed on Inventory	06APR1998	06APR1998	Mike Rosen	DEQ	NW	VCP
VCS Waiting List	19JUN1998	08MAR1999	Janelle Waggy	DEQ	NW	VC
NEGOTIATIONS	08MAR1999	01OCT1999	Karla Urbanowicz	DEQ	NW	VCS
Letter Agreement	01OCT1999	01APR2000	Alicia Voss	DEQ	NW	VCS
COMMENTS: Formal agreement. Portland Harbor investigation.						

ACTIVE PROJECTS

PROJECT ID	PROJECT NAME
12492	US Moorings

COMMENT:

PARTY INFORMATION

SITE CONTACT:

ASSOCIATED PARTIES

NAME AND ADDRESS	AFFILIATION	AFFILIATION STATUS	INFORMATION AS OF DATE
Mac Robison Chief, Plant Maintenance Section U.S. Army Corps of Engineers P.O. Box 2946 Portland , OR 97208-2946 (503) 808-5400( )	Owner		17JAN1997

COMMENTS:

OWNERSHIP COMMENTS:

DATA SOURCES:

LAST UPDATED BY: jmw DATE: 18-APR-00

(site_report.rpt)

OREGON PUBLIC ENVIRONMENTAL SYSTEM
LUST INCIDENT REPORT

July 19, 2000 01:28 pm

----------INCIDENT INFORMATION----------

LOG NBR: 26-98-0581
UST FAC NBR: DATE REPORTED: 27-JUL-98

SITE NAME: ILLIAS J HOT
SITE ADDRESS: 8806 NW BAILEY
SITE CITY: PORTLAND ZIP: 97231
SITE COUNTY: MULTNOMAH PHONE: 286-5901

----------SITE ASSESSMENT----------

DATE DISCOVERED: 25-JUL-98 OFFSITE MIGRATION: N

CONFIRMATION:	DISCOVERY:	CAUSE:
(SI) Staff: N	(RM) Routine Monitoring: N	(TL) Tank Leak: N
(LD) Lab:DEQ: N	(DC) Decommissioning: N	(PL) Pipe Leak: N
(LR) Lab:RP N	(CP) Complaint: N	(OF) Overfill: N
(LO) Lab:OTHER: N	(IC) Inventory Control: N	(SS) Surface Spill: N
(RR) RP Report: N	(SA) Site Assessment: Y	(PV) Pump/Valve Leak: N
(OT) Other: N	(TT) Tank Test: N	(OT) Other: N
	(OT) Other: N	(UN) Unknown: Y

----------CONTAMINANTS/IMPACTS----------

CONTAMINANTS:		MEDIA/IMPACT:
(UG) Unleaded Gasoline: N	(SV) Solvent N	(SL) Soil: Y
(LG) Leaded Gasoline: N	(BF) Bunker Fuel N	(GW) Groundwater: N
(MG) Misc.Gasoline: N	(OP) Other Pet.Dist N	(SW) Surface Water: N
(DS) Diesil: N	(CH) Chemical N	(DW) Drinking Water N
(FO) Fuel Oil: N	(HO) Heating Oil: Y	(FV) Facility(Vapor) N
(WO) Waste Oil: N	(UN) Unknown: N	(FP) Facility(Free Product): N
(LB) Lubricant: N	(OT) Other: N	(UN) Unknown: N

----------SITE/SOIL MANAGEMENT----------

RELEASE STOPPED: 25-JUL-98 REMEDIATION COMPLETED: 29-DEC-98
CLEANUP STARTED: 25-JUL-98 NO FURTHER ACTION: 29-DEC-98

(opens_inc.rpt)

OREGON PUBLIC ENVIRONMENTAL SYSTEM
LUST INCIDENT REPORT

July 19, 2000 01:30 pm

----------INCIDENT INFORMATION----------

LOG NBR: 26-96-0313
UST FAC NBR: DATE REPORTED: 20-MAY-96

SITE NAME: WILLIAMS, L HOT
SITE ADDRESS: 9421 NW GERMANTOWN ROAD
SITE CITY: PORTLAND ZIP: 97231
SITE COUNTY: MULTNOMAH PHONE:

----------SITE ASSESSMENT----------

DATE DISCOVERED: 20-MAY-96 OFFSITE MIGRATION: N

CONFIRMATION:	DISCOVERY:	CAUSE:
(SI) Staff: N	(RM) Routine Monitoring: N	(TL) Tank Leak: Y
(LD) Lab:DEQ: N	(DC) Decommissioning: N	(PL) Pipe Leak: N
(LR) Lab:RP N	(CP) Complaint: N	(OF) Overfill: N
(LO) Lab:OTHER: N	(IC) Inventory Control: N	(SS) Surface Spill: N
(RR) RP Report: Y	(SA) Site Assessment: Y	(PV) Pump/Valve Leak: N
(OT) Other: N	(TT) Tank Test: N	(OT) Other: N
	(OT) Other: N	(UN) Unknown: N

----------CONTAMINANTS/IMPACTS----------

CONTAMINANTS:		MEDIA/IMPACT:
(UG) Unleaded Gasoline: N	(SV) Solvent N	(SL) Soil: Y
(LG) Leaded Gasoline: N	(BF) Bunker Fuel N	(GW) Groundwater: N
(MG) Misc.Gasoline: N	(OP) Other Pet.Dist N	(SW) Surface Water: N
(DS) Diesil: N	(CH) Chemical N	(DW) Drinking Water N
(FO) Fuel Oil: N	(HO) Heating Oil: Y	(FV) Facility(Vapor) N
(WO) Waste Oil: N	(UN) Unknown: N	(FP) Facility(Free Product): N
(LB) Lubricant: N	(OT) Other: N	(UN) Unknown: N

----------SITE/SOIL MANAGEMENT----------

RELEASE STOPPED: 29-MAY-96 REMEDIATION COMPLETED: 24-JUN-96
CLEANUP STARTED: 29-MAY-96 NO FURTHER ACTION: 24-JUN-96

(opens_inc.rpt)

OREGON PUBLIC ENVIRONMENTAL SYSTEM
LUST INCIDENT REPORT

July 19, 2000 01:29 pm

----------INCIDENT INFORMATION----------

LOG NBR: 26-90-0283
UST FAC NBR: 3562 DATE REPORTED: 07-AUG-90

SITE NAME: MOBIL OIL CO.
SITE ADDRESS: 9420 NW ST HELENS ROAD
SITE CITY: PORTLAND ZIP: 97231
SITE COUNTY: MULTNOMAH PHONE: (503)286-6748

----------SITE ASSESSMENT----------

DATE DISCOVERED: OFFSITE MIGRATION: N

CONFIRMATION:	DISCOVERY:	CAUSE:
(SI) Staff: N	(RM) Routine Monitoring: N	(TL) Tank Leak: N
(LD) Lab:DEQ: N	(DC) Decommissioning: N	(PL) Pipe Leak: N
(LR) Lab:RP N	(CP) Complaint: N	(OF) Overfill: N
(LO) Lab:OTHER: N	(IC) Inventory Control: N	(SS) Surface Spill: N
(RR) RP Report: N	(SA) Site Assessment: N	(PV) Pump/Valve Leak: N
(OT) Other: N	(TT) Tank Test: N	(OT) Other: N
	(OT) Other: N	(UN) Unknown: N

----------CONTAMINANTS/IMPACTS----------

CONTAMINANTS:		MEDIA/IMPACT:
(UG) Unleaded Gasoline: N	(SV) Solvent N	(SL) Soil: N
(LG) Leaded Gasoline: N	(BF) Bunker Fuel N	(GW) Groundwater: N
(MG) Misc.Gasoline: N	(OP) Other Pet.Dist N	(SW) Surface Water: N
(DS) Diesil: N	(CH) Chemical N	(DW) Drinking Water N
(FO) Fuel Oil: N	(HO) Heating Oil: N	(FV) Facility(Vapor) N
(WO) Waste Oil: N	(UN) Unknown: N	(FP) Facility(Free Product): N
(LB) Lubricant: Y	(OT) Other: N	(UN) Unknown: Y

----------SITE/SOIL MANAGEMENT----------

RELEASE STOPPED: REMEDIATION COMPLETED: 16-JUL-92
CLEANUP STARTED: 07-AUG-90 NO FURTHER ACTION: 16-JUL-92

(opens_inc.rpt)

OREGON PUBLIC ENVIRONMENTAL SYSTEM
LUST INCIDENT REPORT

July 28, 2000 08:56 am

----------INCIDENT INFORMATION----------

LOG NBR: 26-91-0254
UST FAC NBR: DATE REPORTED: 12-JUL-91

SITE NAME: ARCO BULK PLANT-PIPELINE
SITE ADDRESS: 9930 NW ST HELENS RD
SITE CITY: PORTLAND ZIP:
SITE COUNTY: MULTNOMAH PHONE:

----------SITE ASSESSMENT----------

DATE DISCOVERED: 11-JUL-91 OFFSITE MIGRATION: N

CONFIRMATION:	DISCOVERY:	CAUSE:
(SI) Staff: N	(RM) Routine Monitoring: N	(TL) Tank Leak: N
(LD) Lab:DEQ: N	(DC) Decommissioning: N	(PL) Pipe Leak: Y
(LR) Lab:RP N	(CP) Complaint: N	(OF) Overfill: N
(LO) Lab:OTHER: N	(IC) Inventory Control: N	(SS) Surface Spill: N
(RR) RP Report: N	(SA) Site Assessment: N	(PV) Pump/Valve Leak: N
(OT) Other: N	(TT) Tank Test: N	(OT) Other: N
	(OT) Other: Y	(UN) Unknown: N

----------CONTAMINANTS/IMPACTS----------

CONTAMINANTS:		MEDIA/IMPACT:
(UG) Unleaded Gasoline: N	(SV) Solvent N	(SL) Soil: Y
(LG) Leaded Gasoline: N	(BF) Bunker Fuel N	(GW) Groundwater: Y
(MG) Misc.Gasoline: N	(OP) Other Pet.Dist N	(SW) Surface Water: Y
(DS) Diesil: Y	(CH) Chemical N	(DW) Drinking Water N
(FO) Fuel Oil: N	(HO) Heating Oil: N	(FV) Facility(Vapor) N
(WO) Waste Oil: N	(UN) Unknown: N	(FP) Facility(Free Product): N
(LB) Lubricant: N	(OT) Other: N	(UN) Unknown: N

----------SITE/SOIL MANAGEMENT----------

RELEASE STOPPED: 11-JUL-91 REMEDIATION COMPLETED: 09-FEB-94
CLEANUP STARTED: 11-JUL-91 NO FURTHER ACTION: 09-FEB-94

(opens_inc.rpt)

APPENDIX I

Fire Department Hazardous Substance Survey

[redacted] 1997-1998

Facility ID Number
006130

OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

PLEASE TYPE OR PRINT ONLY CHANGES OR ADDITIONS IN THE [redacted] AREAS TO THE RIGHT OR BELOW THE PREPRINTED DATA

[redacted] **HAZARDOUS SUBSTANCE PRESENCE** Check the correct box to the left.

☒ YES ☐ NO Are there hazardous substances present at this site in reportable quantities?
If yes, complete sections A, B, C, and D. If no, complete sections A, B and C.
A hazardous substance is any substance for which a Material Safety Data Sheet (MSDS) is required. If a previously reported substance is no longer present, see instructions for Section A.

☐ YES ☒ NO Are there Extremely Hazardous Substances (EHS) at this site that meet the threshold planning quantities?

☐ YES ☒ NO Is this facility subject to the reporting requirements of Section 112(r) of the Clean Air Act?

[redacted] **DEMOGRAPHIC DATA** Complete, correct or add information in the [redacted] areas.

1. SIC CODE 1: 4449 DEFINITION: WATER TRANSPORT OF FREIGHT, NEC
2. SIC CODE 2: DEFINITION:
3. BUSINESS ACTIVITY: MARINE TRANSPORTATION
4. DUN & BRADSTREET #:
5. MANAGER'S NAME: ED BEALL
6. SEND TO ATTENTION OF:
7. E-MAIL ADDRESS:
8. BUSINESS NAME: FOSS MARITIME CO
9. DEPT OR DIV: ST HELENS RD SITE
10. SITE ADDRESS: 9030 NW ST HELENS RD
CITY: PORTLAND
COUNTY: MULTNOMAH
STATE: OR ZIP CODE: 97203
11. MAILING ADDRESS: PO BOX 83018
CITY: PORTLAND
COUNTY: MULTNOMAH
STATE: OR ZIP CODE: 97283
12. BUSINESS PHONE: 503-286-0651
13. NUMBER OF EMPLOYEES AT THIS SITE: 150
14. EMERGENCY ASSISTANCE CONTACT PERSON FOR THIS SITE: RAFAEL CABALLERO
15. EMERGENCY CONTACT PHONES: DAY 503-286-0651 NIGHT 503-286-06
16. RESPONSIBLE FIRE DEPARTMENT: PORTLAND FIRE BUREAU

SPECIAL FIRE DEPARTMENT INFORMATION This section is for information the fire service needs to know in case of an emergency.

17. ☐ YES ☒ NO WRITTEN EMERGENCY PLAN. IF YES, LOCATION: _____
18. ☒ YES ☐ NO AUTOMATIC FIRE SUPPRESSION SYSTEM PRESENT; e.g., sprinklered, halon system, etc.
19. ☐ YES ☒ NO ARE STORAGE BUILDINGS/TANKS/AREAS PLACARDED ACCORDING TO NFPA 704?
20. ☒ YES ☐ NO ARE OTHER TYPES OF PLACARDS USED?

[redacted] **PERSON COMPLETING FORM**
This person will be contacted to answer any questions needing clarification.

1. PRINT NAME: Rafael A. Caballero
2. SIGNATURE (REQUIRED): Rafael A. Caballero
3. DATE SURVEY COMPLETED: 10/6/98

FOSS MARITIME CO
ST HELENS RD SITE
PO BOX 83018
PORTLAND OR 97283

CHEMICAL

1997-1998 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number 006130

[redacted] SUBSTANCE INFORMATION - TYPE OR PRINT ONLY CHANGES IN THE [redacted] AREAS

MON NAME/TRADE NAME: OXYGEN [redacted]
DOUS INGREDIENT
HEST CONCENTRATION: OXYGEN [redacted]

2ND	1ST	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
	1 - PURE 2 - MIXTURE [redacted]	3	3	11	20			365	L 2 4	2.2 5.1	0007782-44-7
	1 - NEW 2 - NO LONGER REPORTABLE	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

STORAGE LOCATIONS AT SITE: GAS LOCKER, RAMP TO DOCK

UN/NA NO. (IF KNOWN): 1072

[redacted]

MMON NAME/TRADE NAME: PAINT [redacted]
AZARDOUS INGREDIENT
HIGHEST CONCENTRATION: PETROLEUM DISTILLATES [redacted]

2ND	1ST	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
	1 - PURE 2 - MIXTURE [redacted]	2	2	04	10			365	F 1 4	3.3 6.3	0064742-47-8
	1 - NEW 2 - NO LONGER REPORTABLE	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

STORAGE LOCATIONS AT SITE: WAREHOUSE, SOUTH SIDE

UN/NA NO. (IF KNOWN): 1263

[redacted]

COMMON NAME/TRADE NAME: PROPANE [redacted]
HAZARDOUS INGREDIENT
N HIGHEST CONCENTRATION: PROPANE [redacted]

2ND	1ST	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
	1 - PURE 2 - MIXTURE [redacted]	3	2	10	10			365	L 2 4	2.1 6.3	0000074-98-
	1 - NEW 2 - NO LONGER REPORTABLE	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

STORAGE LOCATIONS AT SITE: PROPANE LOCKER, WAREHOUSE VA
RD; NORTH SIDE

UN/NA NO. (IF KNOWN): 1075

[redacted]

COMMON NAME/TRADE NAME: [redacted]
HAZARDOUS INGREDIENT
IN HIGHEST CONCENTRATION: [redacted]

2ND	1ST	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
	1 - PURE 2 - MIXTURE [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	1 - NEW 2 - NO LONGER REPORTABLE										

STORAGE LOCATIONS AT SITE:

UN/NA NO. (IF KNOWN):

Facility ID Number 006130

1997-1998 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

SUBSTANCE INFORMATION - TYPE OR PRINT ONLY CHANGES IN THE [redacted] AREAS

COMMON NAME/TRADE NAME: ACETYLENE
HAZARDOUS INGREDIENT HIGHEST CONCENTRATION: ACETYLENE

	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE	3	3	11	20			365	L 2 4	2.1 6.3	0000074-86-2

1 - NEW; 2 - NO LONGER REPORTABLE

STORAGE LOCATIONS AT SITE: GAS LOCKER, RAMP TO DOCK.

UN/NA NO. (IF KNOWN): 1001

COMMON NAME/TRADE NAME: DIESEL #2
HAZARDOUS INGREDIENT HIGHEST CONCENTRATION: PETROLEUM DISTILLATES

	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE	2	2	30	30			365	B 1 4	3.3 6.4	0068476-34-1

1 - NEW; 2 - NO LONGER REPORTABLE

STORAGE LOCATIONS AT SITE: U/G TANK, UNDER PARKING LOT, IN FRONT OF WAREHOUSE.

UN/NA NO. (IF KNOWN): 1993

COMMON NAME/TRADE NAME: GASOLINE
HAZARDOUS INGREDIENT HIGHEST CONCENTRATION: PETROLEUM DISTILLATES

	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE	2	2	20	20			365	B 1 4	3.1 6.3	0008006-61-[illegible]

2 - NEW; 2 - NO LONGER REPORTABLE

STORAGE LOCATIONS AT SITE: UNDER PARKING LOT, IN FRONT OF WAREHOUSE

UN/NA NO. (IF KNOWN): 1203

COMMON NAME/TRADE NAME: LUBRICATING OIL
HAZARDOUS INGREDIENT IN HIGHEST CONCENTRATION: REFINED MINERAL OIL

	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE	2	2	30	30			365	B 1 4	4.5	0064742-6[illegible]

1 - NEW; 2 - NO LONGER REPORTABLE

STORAGE LOCATIONS AT SITE: U/G TANK UNDER PARKING LOT, IN FRONT OF WAREHOUSE

UN/NA NO. (IF KNOWN): 1970

CITY OF PORTLAND, OREGON
BUREAU OF FIRE — FIRE PREVENTION DIVISION
55 S. W. Ash Street
Oil Burner and L. P. Gas Permit Application

Date 8-6 1979

Permit No. 0473
Fee $3.00 for Oil, ~~$10.00, $20.00~~ or $100.00 for L.P. Gas must accompany application. Make check payable to City Treasurer.

Address 9030 NW ST HELENS RD. Occupancy
Installed for KNAPPTON TUG BOAT CO Kind of Heating Plant: Warm Air Steam
Applicant PET. EQUIPMENT MAINT CO Tel 288 75 41 Hot Water

Fuel Tank — Capacity and Location

(2) Underground
Street
20,000 GAL Yard
Basement

Exposed
Integral
Detached
Basement

OIL BURNER
Name Certificate of Approval No.
Type Model
Inspected by Conventional Unit
Horz. Unit Circ.
Floor Furnace Conv.
Date Fuel Oil Pac. Spec.

TOTAL 40,000 GAL DIESEL FUEL

FIRE INSPECTOR'S REPORT

Tank and Piping
Piping Fill 4" Vent 2" Suction 2½" Return
Valves Wall Tank Thermostatic RE.
Inspected by M. [signature] Date 1-83

L. P. Gas
Vapor Liquid Transfer
Withdrawal Pressure Pump
Inspected by Date

Installation to be in conformance with Ordinance No. 130872 and under supervision of the Fire Marshal. NOTE: Before any portion of the street is used, owner of property must apply to City Engineer for permit to use street. Notify Fire Marshal for inspection before tank or pipes are covered. 248-4363

FMO 15 I

7328

CITY OF PORTLAND, OREGON
BUREAU OF FIRE — FIRE PREVENTION DIVISION
55 S. W. Ash Street
Oil Burner and L. P. Gas Permit Application

Date 8-6 1979

Permit No. 0472
Fee $3.00 for Oil, $10.00, $20.00 or $100.00 for L.P. Gas must accompany application. Make check payable to City Treasurer.

Address 9030 NW ST HELENS RD Occupancy
Installed for KNAPPTON TUG BOAT CO Kind of Heating Plant: Warm Air Steam
Applicant PET EQUIPMENT CO Tel 288-7541 Hot Water

Fuel Tank — Capacity and Location

2 Underground
6,000 GAL ~~Street~~
X Yard
Basement

Exposed
Integral
Detached
Basement

OIL BURNER
Name Certificate of Approval No.
Type Model
Inspected by Conventional Unit
Horz. Unit Circ.
Floor Furnace Conv.
Date Fuel Oil Pac. Spec.

TOTAL 12,000 GAL LUB OIL

FIRE INSPECTOR'S REPORT

Tank and Piping
Piping Fill 4 Vent 2 Suction 2 Return
Valves Wall Tank Thermostatic RE.
Inspected by M. [signature] Date 1-83

L. P. Gas
Vapor Liquid Transfer
Withdrawal Pressure Pump
Inspected by Date

Installation to be in conformance with Ordinance No. 130872 and under supervision of the Fire Marshal. NOTE: Before any portion of the street is used, owner of property must apply to City Engineer for permit to use street. Notify Fire Marshal for inspection before tank or pipes are covered. 248-4363

FMO 15 I

7328

Permit No. [illegible]
Date 8-6 1979

GASOLINE AND MOTOR FUEL TANK AND PUMP APPLICATION

[illegible] accompany application. Make check payable to City Treasurer.

Address 9030 NW ST. HELENS RD.
Installed for KNAPPTON TUGBOAT CO. Occupancy
Applicant PET. EQUIPMENT MAINT CO. Phone 288-7541

TANK	LOCATION	PUMP	LOCATION
Capacity 1	Street ___ Private Property X	Type	Make [redacted] WYANE
2000 Gal.	New X Replacement ___	Sub. ___ Model	In Bldg. ___ On Island X
	Total No. Tanks on Premises Including This Permit 5	In-Dispenser SIREG 5 Model	Replacement ___ Addition ___
✓ U.L Lab Req.	Total Gallons on Premises Including This Permit 2000 GAL 40,000 DIE 12000 LUB OIL		Total No. Pumps on Premises 1

TANK-PIPING — FIRE INSPECTOR'S REPORT — PUMP

[redacted] 1-2000 GAL
1 PUMP 25.

Inspected By [signature] Date 1-83

Inspected By ___ Date ___

Installation to be in conformance with Orindance No. 130672 and under supervision of the Fire Marshal. NOTE: Before any portion of street area is used, owner of property must apply to City Engineer for permit to use street. Notify Fire Marshal for inspection before tank or pipes are covered.

F.B. 300.148 248-4363. 7328

City of Portland, Oregon
FIRE PREVENTION DIVISION
55 S.W. ASH - PORTLAND, OREGON 97204
GASOLINE AND MOTOR FUEL
TANK AND PUMP APPLICATION

PERMIT NO. 981285
DATE 10-13 1998

ADDRESS 9030 NW ST. HELENS ROAD
INSTALLED FOR FOSS MARITIME CO.
INSTALLER PACIFIC NW SERVICES

OCCUPANCY
PHONE (360) 425-6955

PERMIT CODE 19C

TANK
MATERIAL ___ (fiberglass - steel)
CAPACITIES ___
☐ UNDERGROUND ☐ ABOVE GROUND
___ STREET ___ INTEGRAL
___ YARD ___ DETACHED
___ UNDER BUILDING ___ INSIDE BUILDING

PUMP
TYPE
SUB. ___ Model
IN-DISPENSER ___ Model

LOCATION
MAKE ___
IN BUILDING ___ ON ISLAND ___
REPLACEMENT ___ ADDITION ___
TOTAL NO. OF PUMPS ON PREMISES ___

TANK - PIPING — FIRE INSPECTOR'S REPORT — PUMP

UPGRADE UST'S TO 1998 EPA STANDARDS (I.E. TANK LINING, SALL, OVERFILL, TANK MONITOR, DETECTORS, NEW PIANO

INSPECTED BY Doug Drum DATE 11/5/98 INSPECTED BY ___ DATE ___

DATE 1 1983

City of Portland Oregon
FIRE PREVENTION DIVISION
55 S.W. ASH PORTLAND, OREGON 97204

ADDRESS 9030 NW St Helens Rd
INSTALLED FOR Bell Maritime Company OCCUPANCY
APPLICANT Tom Allen Construction Company PHONE 257-9292

TANK
MATERIAL ___ (fiberglass - steel)
CAPACITIES ___
UNDERGROUND ___ ABOVE GROUND ___
STREET ___ INTEGRAL ___
YARD ___ DETACHED ___
UNDER BUILDING ___ INSIDE BUILDING ___

PUMP
TYPE
SUB. ___ Model
IN-DISPENSER ___ Model

LOCATION
MAKE ___
IN BUILDING ___ ON ISLAND ___
REPLACEMENT ___ ADDITION ___
TOTAL NO. OF PUMPS ON PREMISES ___

TANK - PIPING — FIRE INSPECTOR'S REPORT — PUMP

(Mike Bell)

INSPECTED BY [signature] DATE 2-25-83 INSPECTED BY ___ DATE ___

Installation to be in conformance with Ordinance No. 130672 and under supervision of the FIRE MARSHAL. NOTE: Before any portion of street area is used, owner of property must apply to City Engineer for permit to use street. Notify Fire Marshal for inspection before tank or pipes are covered.
Make checks payable to the City Treasurer. TELEPHONE 248-4363 FPB FORM 300.141 10-98

City of Portland, Oregon
FIRE PREVENTION DIVISION
55 S.W. ASH, PORTLAND, OREGON 97204

GASOLINE AND MOTOR FUEL TANK AND PUMP APPLICATION

PERMIT NO. 98/285

DATE 10-13-98

190(2)
PERMIT CODE

ADDRESS 9030 NW ST HELENS ROAD OCCUPANCY

INSTALLED FOR EGGS MARITIME CO PHONE (360) 425-6955

INSTALLER PACIFIC NW SERVICES

TANK MATERIAL (OVER) (fiberglass, steel)

CAPACITIES

☐ UNDERGROUND ☐ ABOVE GROUND

___ STREET ___ INTEGRAL

___ YARD ___ DETACHED

___ UNDER BUILDING ___ INSIDE BUILDING

PUMP LOCATION

TYPE

MAKE

SUB. ___ Model

IN BUILDING ___ ON ISLAND ___

REPLACEMENT ___ ADDITION ___

IN-DISPENSER

___ Model

TOTAL NO. OF PUMPS ON PREMISES

TANK - PIPING

FIRE INSPECTOR'S REPORT

PUMP

INSPECTED BY Doug Triant DATE 10/20/98

INSPECTED BY ___ DATE ___

TANK ABANDONMENT

EXACT LOCATION OF TANKS ON PROPERTY:

DECommission (1) 6,000 GAL (LUBE OIL)
& (1) 2,000 GAL (GASOLINE)

METHOD OF ABANDONMENT:

_____ TEMPORARILY OUT OF SERVICE

_____ ABANDONED IN PLACE

✓ REMOVAL OF TANK

IN ACCORDANCE WITH USUAL REQUIREMENTS:

✓ YES _____ NO

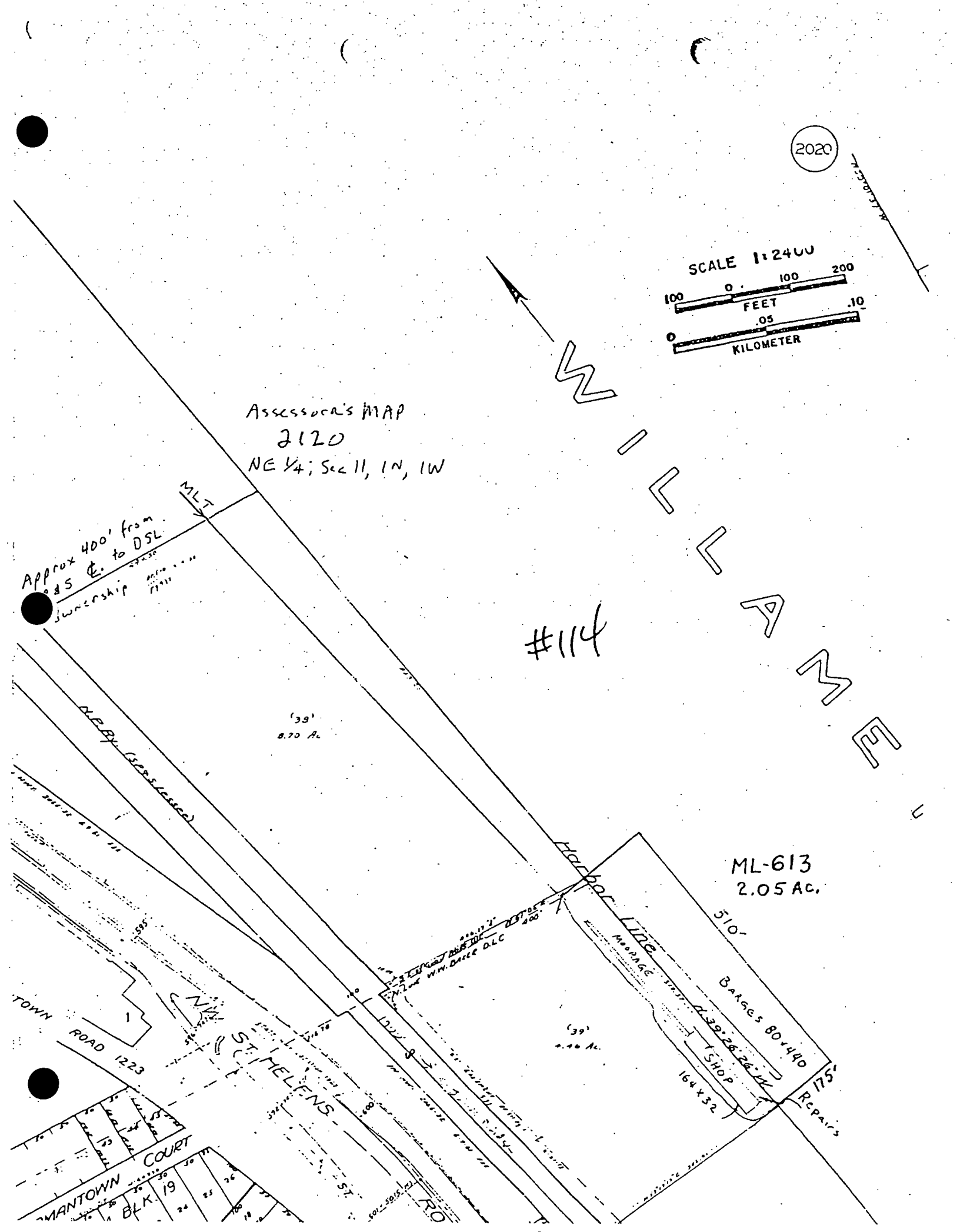
IF "NO" EXPLAIN: _____

10/16/98 Doug Ancart

DATE INSPECTOR

APPENDIX J

State Submersible Submerged Land Leases


2020
SCALE 1:2400
100 0 100 200
FEET
0 .05 .10
KILOMETER
WILLAMETTE
Assessor's MAP
2120
NE 1/4; Sec 11, 1N, 1W
MLT
Approx 400' from
S ℄ to DSL
Ownership
#114
(39)
8.70 Ac
N.P.Ry. (Spgs Lessee)
Harbor Line
ML-613
2.05 Ac.
510'
Barges 80x440
Moorage
N 39°26'26" W
Shop
164x32
175'
Repairs
(39)
4.46 Ac.
W.W. Baker D.L.C.
TOWN ROAD 1223
NW ST. HELENS
ST.
COURT
BLK. 19

STATE OF OREGON

DIVISION OF STATE LANDS
775 SUMMER STREET NE
SALEM, OR 97310

DATE: 04/13/98

***** INVOICE *****

#114 Linnton Property

TO: FOSS MARITIME COMPANY
C/O SEIFRIED COMPANY
PO BOX 83018
PORTLAND OR 97283

LEASE NUMBER	DUE DATE	PERIOD	CHARGES	AMOUNT DUE
ML 9230	05/01/98	One Year	4,453.00	4,453.00
		Credit from 1997		-17.00
		TOTAL		4,436.00

ALL PAST DUE ACCOUNTS WILL BE CHARGED INTEREST AT THE RATE OF 9% PER ANNUM

:e: Rates have been redetermined at 1996 rates for the years 1997 - 1998.

Return One Copy Of This Form With Your Remittance To:

DIVISION OF STATE LANDS
775 SUMMER STREET NE
SALEM, OR 97310

Multnomah

INVOICE CODING FORM

Voucher No [ ] Approved By: DOB

Vendor No. 104096 Inv No ML 9230

Gross Amt 443600 Inv Date 04/13/98 Co # [ ] G/L Date [ ]

PO/Ref # [ ] CK # [ ] Due Date 04/30/98 Tax Amt [ ]

Taxable Amt [ ] Tax Code [ ] Tax Area [ ]

Center (Job)	Object (Cost Type)	Subsidiary (Cost Code)	Subledger/ JDE Workorder	Typ	Amount	Explanation 2
21	14410		misc	Z	445300	LSE 114-1998
BL525	52715				<1700>	CREED for 97

BATCH NO

ENTERED

DATE INITIALS

POSTED

DATE INITIALS

cc mas file

F4 (Fold Area)
FM 1564 (5/97)

Alt Payee # [ ] Units [ ] UM [ ] Taxable (Y/N) [ ]

CHECK REQUEST / INVOICE CODING FORM

☐ FOSS ☐ PSW ☐ CSR ☐ OTHER

REQUESTED BY: STEVE BRANCH APPROVED BY: DPB

VENDOR NO X04096 INV NO M292301999 GROSS AMT 445300

DISC AMT INV DATE 04/20/99 CO NO G/L DATE

TAX AMT TAXABLE AMT TAX CODE TAX AREA

CHECK NUMBER CHECK DATE 04/24/99 VOUCHER NO

CHECK TO BE: ☒ MAILED ☐ RETURN TO REQUESTOR ☐ BANK DEPOSIT

INVOICE DISTRIBUTION

Center (Job)	Object (Cost Type)	Subsidary (Cost Code)	Subledger / JDE Workorder	Type	Amount
~~06525~~	~~55200~~				4453.00
21	14410		MISC	2	
C C Mas					

BATCH NO

ENTERED DATE INITIALS

POSTED DATE INITIALS

PAY TO: OREGON DIVISION OF STATE LANDS

VENDOR NAME 775 SUMMER STREET NE

STREET ADDRESS

SALEM ORE 97310

CITY STATE ZIP

REASON FOR REQUESTED DISBURSEMENT

LAWTON DOCK LEASE FILE 114 / LE 9230

STATE OF OREGON
DIVISION OF STATE LANDS
SUBMERGED AND SUBMERSIBLE LAND LEASE

ML-613

1. PARTIES

The parties to this Lease are the STATE OF OREGON, acting by and through the Division of State Lands, ("STATE") and Seigfried Company, ("LESSEE").

2. LEASED PREMISES

STATE, for the consideration and upon the terms and conditions herein mentioned, does hereby lease to the LESSEE the following property:

All state-owned submerged lands in the Willamette River in Section 11, Township 1 North, Range 1 West, Willamette Meridian. Multnomah County, Oregon, more particularly described as follows:

Commencing at a point on the intersection of the Northwest line of Tax Lot 39 (Multnomah County Assessor's Map Number 2120 and the line of Ordinary High Water on the left bank of the Willamette River;

thence riverward along a line perpendicular to the thread of the stream to the line of Ordinary Low Water and the TRUE POINT OF BEGINNING;

thence continuing riverward along said perpendicular line a distance of 175 feet;

thence upstream and 175 feet parallel to said line of Ordinary Low Water a distance of 510 feet, more or less, to a point which lies 175 feet riverward from the line of ordinary Low Water as extended perpendicular to the thread of the stream from a point which is the intersection of the southeast line of Tax Lot 39 (Multnomah County Assessor's Map Number 2120) and the line of Ordinary High Water;

thence shoreward along said perpendicular line a distance of 175 feet to the line of Ordinary Low Water;

thence downstream along said line of Ordinary Low Water a distance of 510 feet, more or less, to the TRUE POINT OF BEGINNING, containing 2.05 acres, more or less.

hereinafter referred to as the "Leased Premises."

3. PURPOSE

LESSEE shall have exclusive possession of the Leased Premises for the sole purpose of barge and workboat moorage and for no other purpose without prior written consent of STATE.

4. TERM OF LEASE

The LESSEE, subject to compliance with the terms and provisions of this Lease, shall have and hold the Leased Premises for the purposes stated above from May 1, 1990, through April 30, 2000.

5. LEASE PAYMENT

The lease payment to be paid by LESSEE to STATE shall be $4,128.00 per year subject to redetermination at any time after the first anniversary date of the Lease. Receipt of the first year's lease payment is hereby acknowledged. Lease payments shall be payable annually and shall be due on the 1st day of May in advance. Payments shall be sent to the Division of State Lands, 775 Summer Street NE, Salem Oregon 97310-0230.

6. REDETERMINATION

Redeterminations shall be made in accordance with the lease rate provisions of the Oregon Administrative Rules applying to state-owned submerged and submersible lands which are in effect at the time of redetermination. In the event that STATE redetermines the annual lease payment in accordance with those rules and LESSEE does not agree to the redetermined annual lease payment, LESSEE may request a review by STATE of the redetermined lease payment amount. Such review request shall be made in writing within 14 days of delivery by STATE of written notice to LESSEE of the lease payment redetermination.

7. ACCESS TO PROPERTY AND RECORDS

STATE shall have access to the Leased Premises at all reasonable times for the purpose of assuring compliance with the terms and conditions of this Lease. STATE shall have the right to examine pertinent records of LESSEE for the purpose of assuring compliance with the Lease and for the purpose redetermining the lease payment rate.

8. RESERVATIONS

The interest of LESSEE under this Lease shall at all times be subject to STATE's right to grant rights-of-way in and over said property or a portion of the property for other purposes, including, but not limited to, railroads, telegraph and telephone lines, pipelines, irrigation or other water canals and ditches, and to STATE's right to lease all or part of the property for the exploration, discovery, development and production of oil, gas or minerals of any nature whatsoever, provided the right-of-way or lease does not unreasonably interfere with the purpose of this Lease.

9. RESTRICTIONS/REQUIREMENTS

N/A

10. COMPLIANCE WITH LAW

LESSEE shall comply with all applicable federal, state, and local statutes, ordinances, rules and regulations in its use of the Leased Premises. This Lease does not give LESSEE permission to conduct any use on the Leased Premises which is not in conformance with applicable land use requirements, and it is the LESSEE's responsibility to determine and comply with all other requirements.

11. TAXES, LIENS, ASSESSMENTS, CHARGES

LESSEE shall pay as they become due all taxes, assessments, penalties, fines, charges, rates or liens of any nature whatsoever that may be levied, assessed, charged, imposed or claimed on or against the Leased Premises or any improvements or fixtures thereon or appurtenances thereto. If LESSEE fails to pay any taxes, assessments, penalties, fines, charges, rates or liens, within ten (10) days after notice that such sums are due, STATE may pay such sums. Any such sums paid by STATE shall bear interest at the maximum legal rate pursuant to ORS 82.010 from the date of expenditure by STATE until paid.

12. PREVENTION OF WASTE, DAMAGE AND INJURY

LESSEE shall exercise reasonable diligence in its operation on and from said Leased Premises; shall carry on all operations hereunder in a good and workmanlike manner having due regard for public safety and the prevention of waste and for the restoration and conservation of said Leased Premises for future use, and shall take all reasonable steps to avoid unnecessary damage to soil, timber, fish and fish habitat, wildlife and wildlife habitat and water quality of both ground water and surface water; shall make all reasonable efforts to minimize interference with existing navigational and recreational activities and scenic values; shall insofar as possible restore the Leased Premises to its former condition except as otherwise may be approved or ordered by STATE; and shall do all things reasonably necessary to minimize erosion.

13. EXCLUSIVITY

The rights and privileges granted under this Lease are exclusive.

14. PUBLIC SAFETY

The LESSEE may restrict entry to any portion of the Leased Premises as may be necessary to protect persons and property from harm arising from or in connection with the LESSEE's activities upon the Leased Premises.

15. ASSIGNMENT OR SUBLEASE

The LESSEE shall not assign this Lease, or any interest therein, nor sublet or grant any right of use in said Leased Premises, or any portion thereof, without the prior written consent of STATE. Any assignment, or attempted assignment, subletting, or attempted subletting, or grant of right of use or attempted grant of right of use without such consent, shall be absolutely null and void and shall, at the option of STATE, terminate all rights of the LESSEE under or by virtue of this Lease.

STATE may, in its discretion, consent to an assignment or sublease provided the following conditions are satisfied:

a. A fee of $50 is prepaid to cover administrative costs, and

b. LESSEE has satisfied all conditions of the Lease precedent to assignment or sublease, and

c. LESSEE and its assignee have completed a standard assignment form provided by STATE and assured the STATE that the assignee has the capability to perform on the Lease, and

d. STATE determines such assignment or sublease is in the best interest of the STATE.

16. ALTERATIONS AND IMPROVEMENTS

LESSEE shall obtain the written consent of STATE prior to making any alterations to the property or improvements upon the property.

17. DEFAULT

The following shall be events of default:

a. Failure of LESSEE to pay any lease payment or any other charge within ten (10) days after the lease payment or other charge is due.

b. Failure of LESSEE to comply with any term or condition or to fulfill any obligation of the Lease other than the payment of lease payments or other charges within twenty (20) days or other period specified in writing by STATE after written notice by STATE specifying the nature of the default with reasonable particularity.

c. Insolvency of LESSEE; an assignment by LESSEE for the benefit of creditors; the filing by LESSEE of a voluntary petition in bankruptcy; an adjudication that LESSEE is bankrupt or the appointment of a receiver of the properties of LESSEE; the filing of any involuntary petition of bankruptcy and the failure of LESSEE to secure a dismissal of the petition within thirty (30) days after filing; attachment of or the levying of execution on the leasehold interest and failure of LESSEE to secure discharge of the attachment or release of the levy of execution within ten (10) days.

18. TERMINATION

In the event of a default, the lease may be terminated at the option of STATE by notice in writing to LESSEE. If the Lease is terminated by option of STATE or otherwise, STATE shall be entitled to recover damages from LESSEE for the default. If the Lease is terminated, LESSEE'S liability to STATE for damages shall survive such termination. LESSEE shall have thirty (30) days after date of termination to remove all fixtures and property which are not subject to STATE's option under paragraph 20 (a) below or for which STATE has chosen not to exercise said option, from the Leased Premises. Failure to remove the above items within the thirty (30) day period will be considered to be abandonment by the LESSEE and the STATE shall take title to the property after the expiration of thirty (30) days. STATE may reenter, take possession of the Leased Premises and remove any persons or property by legal action or by self help with the use of reasonable force and without liability for damages.

Following reentry, STATE may relet the Leased Premises and in that connection make any suitable alteration to the said premises or change the character or use of the said premises but STATE shall not be required to relet for any use or purpose (1) which is different from that specified in the Lease, or (2) which STATE may reasonably consider injurious to the premises, or (3) to any lessee which STATE may reasonably consider objectionable. STATE may relet all or part of the Leased Premises, alone or in conjunction with other properties, for a term longer or shorter than the term of this Lease, upon any reasonable terms and conditions.

In the event of termination on default, STATE shall be entitled to recover immediately without waiting until the due date of any future rent or until the date fixed for expiration of the lease term, the following amounts as damages:

a. The loss of reasonable rental value from the date of default until a new lessee has been, or with the exercise of reasonable efforts could have been, secured.

b. The reasonable costs of reentry and reletting included without limitation the cost of any cleanup, refurbishing, removal of LESSEE's property and fixtures, or any other expense occasioned by LESSEE's failure to quit the Leased Premises upon termination and to leave them in the required condition, and any restoration cost, attorneys fees, court costs and advertising costs.

This lease may also be terminated by mutual written consent of LESSEE and STATE.

19. DELIVERY OF PREMISES: SURRENDER

In the event the lease is terminated, or upon expiration, LESSEE shall immediately vacate the premises and shall surrender the Leased Premises in substantially the original condition. STATE may require LESSEE to restore the Leased Premises to the original condition or STATE may itself restore the property and recover its restoration costs from LESSEE.

20. FIXTURES AND PERSONAL PROPERTY

a. All fixtures placed upon the Leased Premises during the term shall, upon expiration or at termination by any method, at STATE's option, become the property of STATE. If STATE so elects, LESSEE shall remove any or all fixtures which would otherwise remain the property of the STATE and shall repair any physical damage resulting from the removal. If LESSEE fails to remove such fixtures, STATE may do so and charge the cost to LESSEE with interest at the maximum legal rate pursuant to ORS 82.010 from the date of expenditure by STATE.

b. Within 30 days after receipt of written notice from STATE, LESSEE shall remove all personal property and/or fixtures which remain its property and are not subject to STATE's option under paragraph 20 (a) above, or for which STATE has chosen not to exercise said option. If LESSEE fails to do so, this shall constitute an abandonment of the property, and STATE may retain the property and all rights of LESSEE with respect to it shall cease.

21. HOLDOVER

If LESSEE does not vacate the Leased Premises at the time required, STATE shall have the option to treat LESSEE as a tenant from month to month, subject to all of the provisions of this Lease except the provisions for term. Failure of LESSEE to remove fixtures, equipment and/or other property which LESSEE is required to remove under this Lease shall constitute a failure to vacate to which this paragraph shall apply if the property not removed will substantially interfere with occupancy of the premises by another lessee or with occupancy by STATE for any purpose including preparation for a new lessee.

If a month to month tenancy results from a holdover by LESSEE under the above paragraph, the tenancy shall be terminable at the end of any monthly lease payment period on written notice from STATE given not less than ten (10) days prior to the termination date which shall be specified in the notice. LESSEE waives any notice which would otherwise be provided by law with respect to a month to month tenancy.

22. PRORATION OF RENT

In the event of termination of this Lease at a time other than the end of a specified lease payment period, the lease payment shall be prorated as of the date of termination and in the event of termination for reasons other than default, any excess advance annual lease payment shall be refunded to LESSEE or paid on its account.

23. STATE'S RIGHT TO CURE DEFAULTS

If LESSEE fails to perform any obligation under this Lease, STATE shall have the option to do so after thirty (30) days' written notice to LESSEE unless otherwise specified in this Lease. All of STATE's expenditures to correct the default shall be reimbursed by LESSEE on demand with interest at the maximum legal rate pursuant to ORS 82.010 from the date of expenditure by STATE until paid.

In the event any violation or breach of the provisions of this lease is causing damage to the Leased Premises or the LESSEE is utilizing the Leased Premises in a manner not permitted by the provisions of this Lease, or in any case damages are occurring to the Leased Premises, STATE may immediately enter upon the Leased Premises and take such action as necessary to cease such damages or use. LESSEE shall be liable to STATE for all costs reasonably incurred in correcting such violations.

24. RIGHT TO SUE MORE THAN ONCE

STATE may sue periodically to recover damages for the period corresponding to the remainder of the lease term and no action for damages shall bar later action for damages subsequently accruing.

25. REMEDIES CUMULATIVE

The remedies contained in this Lease shall be in addition to and shall not exclude any other remedy available to STATE under applicable law.

26. INTEREST ON RENTS AND OTHER CHARGES

Any lease payments or other sum due from LESSEE under the terms of this Lease shall, if not paid within ten (10) days after it is due, bear interest at the maximum legal rate pursuant to ORS 82.010 from the due date until paid.

27. BOND

LESSEE shall, prior to the issuance of this Lease, furnish to STATE a bond in the amount of $ N/A which bond shall be conditioned upon the prompt and faithful performance of all terms of the Lease. The bond shall be issued by a surety acceptable to STATE.

28. INSURANCE

The LESSEE agrees to maintain during the term of this Lease, comprehensive or commercial general liability insurance covering personal injury and property damage, naming the STATE as additional insured. This insurance shall include contractual liability coverage for the indemnification provided under this Lease. Coverage limits shall not be less than the limits of liability set forth in the provisions of ORS 30.270(1) as now in effect or as hereafter amended. ORS 30.270(1) currently requires that the coverage limits shall not be less than $500,000.00 combined single limit per occurrence. The insurance shall be in a form and with companies acceptable to STATE. Such insurance may be evidenced by certificates or by copies of policies. Such evidence shall be provided to STATE prior to the commencement of any operations or activity under this Lease.

29. INDEMNIFICATION

LESSEE agrees to indemnify, defend and hold STATE, its officers, employes, and its agents harmless from any and all damages, claims, actions, costs and expenses arising in whole or in part out of acts or omissions related to this Lease. STATE shall have no liability to LESSEE for any loss or damage caused by third parties or by any condition of the LEASED PREMISES.

30. ATTORNEY FEES

If suit or action is instituted in connection with any controversy arising out of or in connection with this Lease, the prevailing party shall be entitled to recover all costs and disbursements incurred, including such sum as the court may adjudge reasonable as attorney fees.

31. MODIFICATION

This agreement may be changed, altered or amended only by mutual written consent of the parties.

32. MERGER

This Lease constitutes the entire agreement between the parties, and no oral statement, representation or agreement not herein expressed shall be binding upon any party.

33. NON WAIVER

Failure of STATE to demand rigid adherence to any of the terms of this Lease on any occasion shall not be construed as a waiver of any of the terms of this Lease and such conduct shall not deprive STATE of the right thereafter to insist on strict compliance with any of the terms of this Lease.

34. PARTNERSHIP

STATE is not a partner nor a joint venturer with LESSEE in connection with the business carried on under this Lease and shall have no obligation with respect to LESSEE's debts or other liabilities.

35. NOTICES

Any notices required or permitted under this Lease shall be in writing and deemed given three (3) days after deposited, postage prepaid, in the United States mail as regular mail and directed to the address provided below or to such other address as may be specified from time to time by either of the parties in writing.

For STATE:

DIVISION OF STATE LANDS
775 Summer Street NE
Salem, OR 97310

For LESSEE:

Brix Maritime Co.
Name (Print)

PO Box 83018
Current Mailing Address

Portland, OR 97283
City State Zip

36. EXHIBITS

All exhibits hereto are expressly incorporated herein by reference and made a part hereof.
IN WITNESS WHEREOF the parties have executed this Lease.

LESSEE

7-30-90
Date

Signature

Sr. V.P. - Finance
Title

(Corporate)
STATE OF Oregon)
) ss
County of Multnomah)

The foregoing instrument was acknowledged before me this 30th day of July, 1990 by Robert A. Hindman (officer or agent of corporation), the Sr. VP Finance (title of officer or agent) of Brix Maritime Co. corporation, a Del. (state or place of incorporation) corporation, on behalf of the corporation.

Signature

My Commission Expires 11/9, 1990.

STATE OF OREGON, DIVISION OF STATE LANDS

8-2-90
Date

Janet C. Neuman
Assistant Director

APPENDIX K

1993 Subsurface Investigation

SUBSURFACE INVESTIGATION

Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

August 12, 1993

Prepared for:

Brix Maritime Company
Portland, Oregon

Prepared by:

Hahn and Associates, Inc.
Portland, Oregon

Project #2289

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1
1.0 INTRODUCTION 2
2.0 SCOPE OF WORK 2
3.0 BACKGROUND 3
3.1 Site Description 3
3.2 Discovery of Oil Release 3
3.3 Previous HAI Activities 4
3.4 Tracer Research Corporation Activities 4
4.0 FIELD ACTIVITIES 5
5.0 ANALYTICAL TESTS 5
6.0 RESULTS AND DISCUSSION 6
6.1 Subsurface Conditions 6
6.2 Soil Cleanup Standard 6
6.3 Soil Impacts 7
7.0 CONCLUSIONS AND RECOMMENDATIONS 9
8.0 LIMITATIONS 12
GLOSSARY OF ABBREVIATIONS

TABLE OF CONTENTS
(continued)

TABLES

1 Summary of Analytical Results for Soil Samples - Previous Investigation
2 Summary of Analytical Results for Soil Samples

FIGURES

1 Location Map
2 Facility Map
3 Soil Analytical Results Map - Excavation Samples
4 Soil Boring Location Map
5 Soil Analytical Results Map - 10.5 Feet bgs
6 Soil Analytical Results Map - 15.5 Feet bgs
7 Soil Analytical Results Map - 20.5 Feet bgs

APPENDICES

A Field Methods
B Soil Boring Logs
C Laboratory Results and Chain-of-Custody Documentation for Soil Samples
D Soil Cleanup Standard Matrix Worksheet

SUBSURFACE INVESTIGATION

Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

August 12, 1993

EXECUTIVE SUMMARY

The Brix Maritime Company retained the environmental management firm of Hahn and Associates, Inc., to perform a subsurface investigation relating to previously detected petroleum products in the subsurface soils at their facility located at 9030 NW St. Helens Road in Portland, Oregon. The subsurface investigation was designed to determine the lateral and vertical extent of oil petroleum contamination previously detected at the subject site and to determine the potential for a diesel release.

Soil samples were obtained from thirteen subsurface soil borings that were installed in the vicinity of previously detected petroleum contamination at the subject site in April 1993. Groundwater was encountered at approximately 26 feet below ground surface in all borings that were drilled to that depth. Based on local topography, it is estimated that the flow direction for the local shallow groundwater beneath the site is to the north towards the Willamette River.

Two areas of petroleum contaminated soils were identified during the investigative activities. Gasoline contamination was detected in excess of the Oregon Department of Environmental Quality Level 2 cleanup standard south of the underground storage tanks in boring B-7. In addition, oil and diesel contamination of soils was previously identified along the oil and fuel lines adjacent to the Maintenance Building. The oil detected in boring B-13 in this area did not exceed the Level 2 cleanup standard for diesel or oil petroleum contaminants. Petroleum hydrocarbons were neither detected nor observed at the water table at the subject site.

Recommendations for additional activities at the site are presented in the report.

1.0 INTRODUCTION

The Brix Maritime Company ("Brix") has retained the environmental management firm of Hahn and Associates, Inc., (HAI) to perform a subsurface investigation relating to the presence of petroleum hydrocarbons in the subsurface soils at their facility located at 9030 NW St. Helens Road in Portland, Oregon (Figure 1). Oil contamination of soil was previously detected in the vicinity of an underground oil line that is used to service Brix's maintenance barge. In addition, diesel petroleum hydrocarbons were detected in several soil samples that were previously collected near the oil line. The subsurface investigation was designed to determine the lateral and vertical extent of the detected oil contamination of soils and to determine potential sources for the detected diesel release.

Soil samples were obtained by HAI from 13 subsurface soil borings that were installed in April 1993. Selected soil samples were analyzed for the presence of total petroleum hydrocarbons (TPH).

2.0 SCOPE OF WORK

The scope of work for the subsurface investigative activities included the following tasks:

1) Drilling, field screening, and soil sampling of thirteen subsurface soil borings in the vicinity of the oil pipeline and underground storage tank (UST) areas

2) Laboratory analysis of selected soil samples for the presence of petroleum hydrocarbons

3) Data synthesis and report preparation.

3.0 BACKGROUND

3.1 Site Description

The subject property is the location of the Brix main headquarters and a tug boat service and fueling facility (Figure 2). The site is situated between St. Helens Road to the south and borders the Willamette River immediately to the north (Figure 1). Topographically, the site dips gently to the north and lies at an elevation of approximately 25 feet above mean sea level (MSL). A 20-foot high embankment separates the northern property boundary and the Willamette River. The subject site is covered with either buildings or asphalt (Figure 2).

Currently there are five USTs located in one nested area at the subject site including two 20,000-gallon diesel fuel USTs, two 6,000-gallon lubrication oil USTs, and one 2,000-gallon gasoline UST. The UST area lies adjacent to the Maintenance Building to the west. The diesel and oil USTs are connected via three underground product transfer lines to the maintenance barge adjoining the property to the north in the Willamette River.

3.2 Discovery of Oil Release

On January 13, 1993, lubrication oil was observed to be coming up through a seam between asphalt and concrete paved areas near the UST nest. Subsequently, dispensing operations from the lubrication oil USTs were ceased, and the release was reported by Brix to the Oregon Department of Environmental Quality (DEQ). The reported release was given file number 26-93-009 by the agency. Following the discovery of the release, the oil line was repaired in January 1993 and is currently in service.

3.3 Previous HAI Activities

In January 1993, HAI was retained by Brix to conduct an investigation of the observed oil release, the results of which are detailed in the HAI report entitled *Underground Storage Tank System Investigation, Brix Maritime Company, 9030 NW St. Helens Road, Portland, Oregon,* (HAI project #2279) dated February 26, 1993. The investigative activities included the excavation of accessible oil-contaminated soil in the vicinity of the oil pipeline to a depth of approximately 3 feet below ground surface (bgs). Following the excavation of approximately 45 cubic yards of petroleum contaminated soil, one test pit was excavated to a depth of 12 feet bgs in an attempt to determine the vertical extent of the contamination. Although soil contamination was observed in the floor of the test-pit, excavation was discontinued due to instability of the native soils adjacent to the Maintenance Building. Soil samples collected from the excavation detected diesel and oil at concentrations ranging from 49 to 53,000 parts per million (ppm)(Table 1; Figure 3). The report concludes that petroleum hydrocarbons remain in-place in the vicinity of the oil pipeline. It was speculated that a possible source of the detected diesel petroleum hydrocarbons was the two 20,000-gallon diesel fuel USTs.

3.4 Tracer Research Corporation Activities

In May 1993, Tracer Research Corporation ("Tracer") conducted a soil-tracer survey of the subsurface soils in the vicinity of the two 20,000-gallon diesel USTs. The results of the investigations are detailed in the Tracer report entitled *Tracer Tight Test of 2 Underground Storage Tanks at the Brix Maritime, 9030 NW St. Helens Road, Portland, Oregon*, dated March 15, 1993. Based on the results of the Tracer investigations, no tracer was detected at any of the areas sampled, indicating that the two diesel USTs and their pipelines were within tolerance.

Subsequent to the Tracer investigations, HAI was retained by Brix to conduct a subsurface investigation in the vicinity of the oil release and the UST nest area. The results of the HAI subsurface investigatory activities are the subject of this report.

4.0 FIELD ACTIVITIES

Thirteen soil borings were installed by HAI on April 15 and 16, 1993, the locations of which are shown on Figure 4. The soil borings ranged in depths from 5 to 26.5 feet bgs. In total, 50 soil samples were collected, 18 of which were selected for laboratory analyses.

Details of the field methods employed to install the soil borings and details of the soil sampling are included in Appendix A. Boring logs for each of the subsurface soil borings, which describe the soils encountered, are included in Appendix B.

5.0 ANALYTICAL TESTS

The soil samples were shipped with chain-of-custody documentation in sealed and chilled containers to Oregon Analytical Laboratory of Beaverton, Oregon.

The soil samples collected during the April 1993 investigation were analyzed for a hydrocarbon identification (HCID) of total petroleum hydrocarbons (TPH) by DEQ Method TPH-HCID. Soil samples from the soil borings were selected for laboratory analyses based on the field-screening (visual, olfactory and vapor headspace) results and the reported depth of contamination based on the previous HAI investigations. In cases where gasoline was detected, the sample was analyzed by DEQ Method TPH-G. If oil was detected, then the sample was analyzed by DEQ Method TPH 418.1M.

The results of the analytical testing for soils are summarized on Table 2. The laboratory reports and chain-of-custody documentation for the soil sampling and analyses are included in Appendix C.

6.0 RESULTS AND DISCUSSION

6.1 Subsurface Conditions

The shallow soils encountered in all of the borings during drilling were composed of a silty gravel with some sand (Gravel Unit) from the surface to approximately 4 feet bgs, the depth varying depending on boring location. Underlying the Gravel Unit, a sand (Sand Unit) was observed to a depth of 20 to 25 feet bgs where a silty clay (Clay Unit) was encountered to the maximum depth of this investigation at approximately 26.5 feet bgs. Concrete and gravel fill material was observed in boring B-1 and B-8, both of which were attempted to be installed inside the Maintenance Building. The fill material precluded drilling to greater depths below the a Maintenance Building foundation.

Groundwater was encountered at approximately 25 feet bgs in all borings that were drilled to that depth. Based on local topography, it is estimated that the flow direction for the local shallow groundwater beneath the site is to the north towards the Willamette River.

6.2 Soil Cleanup Standard

The cleanup standards for soils contaminated with petroleum hydrocarbons from UST systems are determined by use of a matrix evaluation as defined in Oregon Administrative Rules (OAR) 340-122-305 to 340-122-360 and administered by the DEQ. If soil contamination extends to the level of groundwater, the DEQ is not required to use the matrix cleanup standards but may determine cleanup standards on a case-by-case basis.

For comparison purposes, a calculation of the matrix parameters suggests that the subject property may be considered a Level 2 site. Therefore, an 80 ppm cleanup standard may apply to any gasoline contamination, and a 500 ppm cleanup standard may apply to any diesel or oil contamination at the subject site (Appendix D).

6.3 Soil Impacts

Based on the results of the laboratory analyses, petroleum hydrocarbons were detected only in two soil borings, B-7 and B-13 (Figures 5, 6, and 7). Oil contamination was detected in boring B-13 at a concentration of 200 ppm at a depth of 10.5 feet bgs. Since B-13 was installed by hand auger, deeper samples could not be collected. Although soil samples from boring B-2 displayed oil contaminant characteristics based on field indicators, laboratory analyses did not detect any contamination. Gasoline petroleum hydrocarbons were detected in B-7 at concentrations of 270 ppm at 10.5 feet bgs, 2,000 ppm at 15.5 feet bgs, and 13 ppm at 20.5 feet bgs. A petroleum-like odor was observed in B-6 at the depths of 10.5, 15.5, and 20.5 feet, although contaminants were not detected.

The gasoline contamination detected in B-7 at concentrations of 270 and 2,000 ppm (15.5 and 20.5 feet bgs, respectively) exceeds the DEQ Level 2 cleanup standard of 80 ppm for gasoline. The oil detected in boring B-13 at a concentration of 200 ppm (10.5 feet bgs), did not exceed the DEQ Level 2 cleanup standard of 500 ppm for diesel or oil petroleum contaminants.

The results of the soil sampling and analytical testing from this investigation and the previous investigation indicate that there are probably two areas of subsurface petroleum contamination at the subject site. One area of subsurface contamination is present along the oil and fuel pipelines adjacent to the Maintenance Building. This area of soil contamination is likely the result of the lubrication oil pipeline release and possibly other sources that have not been determined at this time. Due to fill material that precluded hollow stem auger advancement inside the Maintenance Building, the presence of the detected oil contamination under the structure could not be determined. In addition, the vertical extent of the oil contamination could not be determined at the point of release since drilling in the pipeline trench was not possible. Further characterization of the subsurface soils in the vicinity of the oil release could not be conducted based on the presence of underground utilities, the location of UST piping, and the nearby structure. Based on the previous investigatory activities, the oil and diesel contamination was determined to be at least 12 feet directly below the pipeline leak.

A second area of soil contamination was detected south of the UST nest and consists of gasoline petroleum hydrocarbons. The lateral extent of the gasoline contamination appears to have been defined to the north, west, and south, but could not be defined to the east due to the neighboring structure. The vertical extent of the gasoline contamination appears to have been defined, extending no deeper than approximately 20.5 feet bgs. The source of the gasoline contamination may be the 2,000-gallon gasoline UST, associated piping and/or dispenser.

In no case were petroleum hydrocarbons detected by analytical testing or observed by field screening at the depth of the observed water table at the subject site.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Soil samples were obtained from thirteen subsurface soil borings that were installed in the vicinity of previously detected petroleum contamination at the subject site in April 1993. The shallow soils encountered in all of the borings during drilling were composed of gravels and sands to a depth of 20 to 25 feet bgs where a clay was encountered to the maximum depth of this investigation at approximately 26.5 feet bgs.

Groundwater was encountered at approximately 26 feet bgs in all borings that were drilled to that depth. Based on local topography, it is estimated that the flow direction for the local shallow groundwater beneath the site is to the north towards the Willamette River.

Two areas of petroleum contaminated soils were identified during the investigative activities. Gasoline contamination was detected in excess of the DEQ Level 2 cleanup standard south of the USTs in boring B-7. In addition, oil and diesel contamination of soils was previously identified along the oil and fuel lines adjacent to the Maintenance Building. The oil detected in boring B-13 in this area did not exceed the DEQ Level 2 cleanup standard for diesel or oil petroleum contaminants. Further characterization by traditional methods of the subsurface soils in the vicinity of the oil release could not be conducted based on the presence of underground utilities, the location of UST piping, and the nearby structure. Petroleum hydrocarbons were neither detected nor observed at the water table at the subject site.

Based on the data gathered during this subsurface investigation, it is recommended that the 2,000-gallon capacity gasoline UST and associated ancillary piping be tested for integrity. It is further recommended that the remaining oil and detected gasoline contaminated soils be removed subsequent to future UST removal and upgrading at the subject site. Since UST removal is not currently scheduled, it is recommended that an UST maintenance plan be developed regarding the USTs present at the subject site. Current removal of contaminated soils does not appear practicable or warranted for the following reasons:

1) Removal operations would be prohibitively expensive at this time due to the presence of underground utilities, tanks, and nearby structures

2) The two contaminated soil zones appear to have been generally characterized

3) The soil contamination does not appear to extend to the depth of the water table

Any questions regarding the information presented in this report are welcome and should be referred to the undersigned. Thank you for the opportunity to be of service to Brix Maritime Company.

Hahn and Associates, Inc.

Prepared by:

Guy H. Tanz
Project Manager/
Hydrogeologist

Date August 12, 1993

Reviewed by:

Roger E. Brown, Jr.
Associate

8.0 LIMITATIONS

Analytical results presented in this report document only the concentrations of the target analytes in the particular sample and not the property as a whole. We have taken samples from those areas we have identified as having the greatest risk of contamination. Unless a comprehensive statistical sampling program is conducted, however, one cannot conclude with confidence that contaminants may not be found in significantly higher or lower concentrations in other parts of the property. The scope of this investigation was dictated by the client's determination of an appropriate balance between cost and the increased certainty that flows from comprehensive investigation.

(HAI 10/90)

GLOSSARY OF ABBREVIATIONS

B-1	soil boring
bgs	below existing ground surface
Brix	Brix Maritime Company
DEQ	Oregon Department of Environmental Quality
HAI	Hahn and Associates, Inc.
HCID	hydrocarbon identificaiton
ID	inside diameter
MSL	mean sea level
OAR	Oregon Administrative Rules
OD	outside diameter
ppm	parts per million
SPT	Standard Penetration Test
TPH	total petroleum hydrocarbons
USCS	Unified Soil Classification System
UST	Underground Storage Tank

TABLE 1
Summary of Analytical Results for Soil Samples - Previous Investigation

Subsurface Investigation
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

Project #2289

Sample Number	Date Sampled	Sample Location	Depth	Analytical Results in mg/kg (ppm)			
				Oregon DEQ Methods			
				TPH-HCID			TPH-418.1 M
				Gasoline	Diesel	Oil	Diesel/Oil
2279-01	26-Jan-93	Test Pit (east wall)	6.0	ND>20	Detected	Detected	451
2279-02	26-Jan-93	Test Pit (floor)	12.0	ND>20	Detected	Detected	39,700
2279-03	27-Jan-93	Test Pit (north wall)	6.0	-	-	-	10,800
2279-04	27-Jan-93	Test Pit (west wall)	6.0	-	-	-	161
2279-05	27-Jan-93	Test Pit (south wall)	6.0	ND>20	Detected	Detected	58
2279-06	27-Jan-93	Trench (at dispenser)	3.0	ND>20	Detected	Detected	6,290
2279-07	27-Jan-93	Trench (20 feet north of dispenser)	3.0	ND>20	Detected	Detected	26,100
2279-08	27-Jan-93	Trench (40 feet north of dispenser)	3.0	ND>20	ND>50	Detected	53,400
2279-09	27-Jan-93	Trench (60 feet north of dispenser)	3.0	ND>20	ND>50	Detected	49

NOTE: - - not analyzed
DEQ - Oregon Department of Environmental Quality
mg/kg - milligrams per kilogram
ND - not detected above detection limit indicated
ppm - parts per million
TPH - total petroleum hydrocarbons

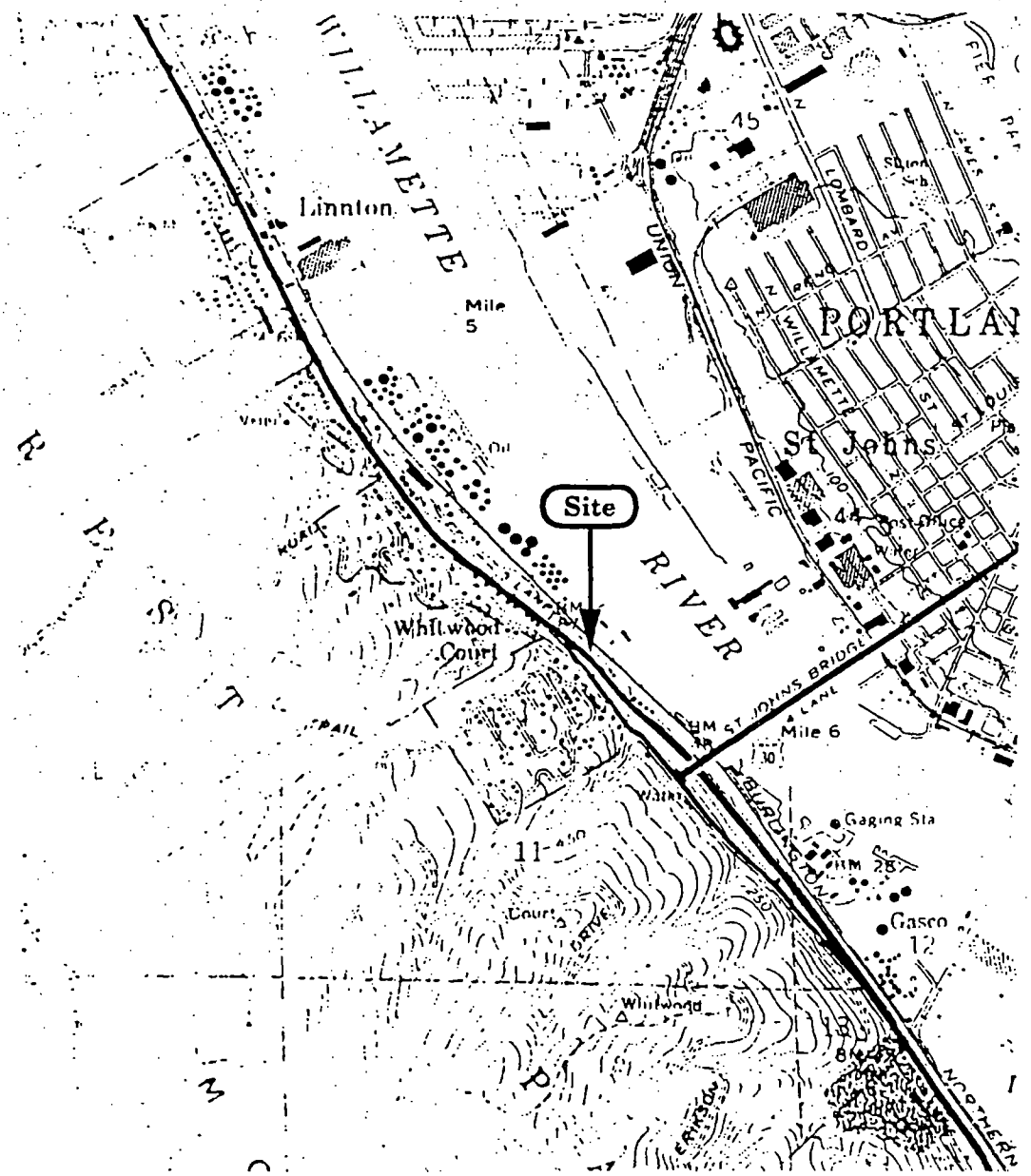
TABLE 2
Summary of Analytical Results for Soil Samples

Subsurface Investigation
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

Project #2289

Soil Boring Number	Sample Number *	Date Sampled	Depth (feet)	Analytical Results in mg/kg (ppm)				
				Oregon DEQ Methods				
				TPH-HCID			TPH-G	TPH-418.1 M
				Gasoline	Diesel	Oil	Gasoline	Oil
B-2	15-003	15-Apr-93	10.5	ND>20	ND>50	ND>100	-	-
B-2	15-005	15-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-2	15-006	15-Apr-93	25.5	ND>20	ND>50	ND>100	-	-
B-3	15-010	15-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-3	15-011	15-Apr-93	25.5	ND>20	ND>50	ND>100	-	-
B-4	15-015	15-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-5	15-018	15-Apr-93	10.5	ND>20	ND>50	ND>100	-	-
B-5	15-020	15-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-6	15-022	15-Apr-93	10.5	ND>20	ND>50	ND>100	-	-
B-6	15-023	15-Apr-93	15.5	ND>20	ND>50	ND>100	-	-
B-7	15-027	15-Apr-93	10.5	Detected	ND>50	ND>100	270	-
B-7	15-028	15-Apr-93	15.5	Detected	ND>50	ND>100	2,000	-
B-7	15-029	15-Apr-93	20.5	-	-	-	13	-
B-9	16-004	16-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-10	16-008	16-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-11	16-011	16-Apr-93	15.5	ND>20	ND>50	ND>100	-	-
B-12	16-016	16-Apr-93	15.5	ND>20	ND>50	ND>100	-	-
B-13	16-020	16-Apr-93	10.5	ND>20	ND>50	Detected	-	200

NOTE: - - not analyzed
DEQ - Oregon Department of Environmental Quality
mg/kg - milligrams per kilogram
ND - not detected above detection limit indicated
ppm - parts per million
TPH - total petroleum hydrocarbons
* - sample number prefix 2289-9304



0 2000 4000

Scale in Feet

N

Source: Linton, Oregon USG.S 7.5 Minute Quadrangle Map

HAI Project #2289 May 1993	**HAHN & ASSOCIATES** **INCORPORATED** ENVIRONMENTAL MANAGEMENT 434 NW SIXTH AVENUE, SUITE 203 PORTLAND, OREGON 97209 503/796-0717	**Location Map** Subsurface Investigation Brix Maritime Company 9030 NW St. Helens Road Portland, Oregon	**FIGURE** **1**

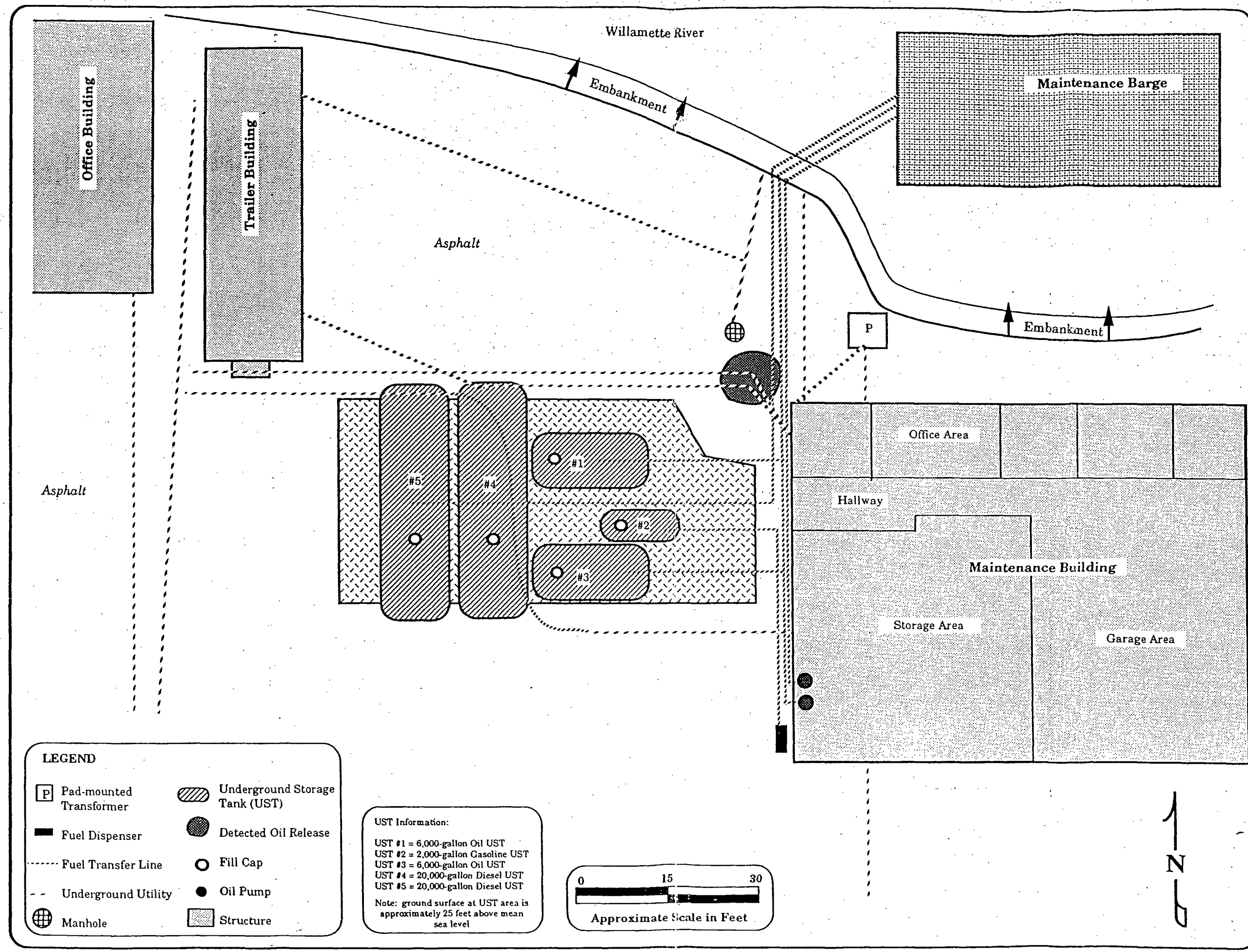


Figure 2

Facility Map

Subsurface Investigation
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES
INCORPORATED
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

May 1993

Project #2289

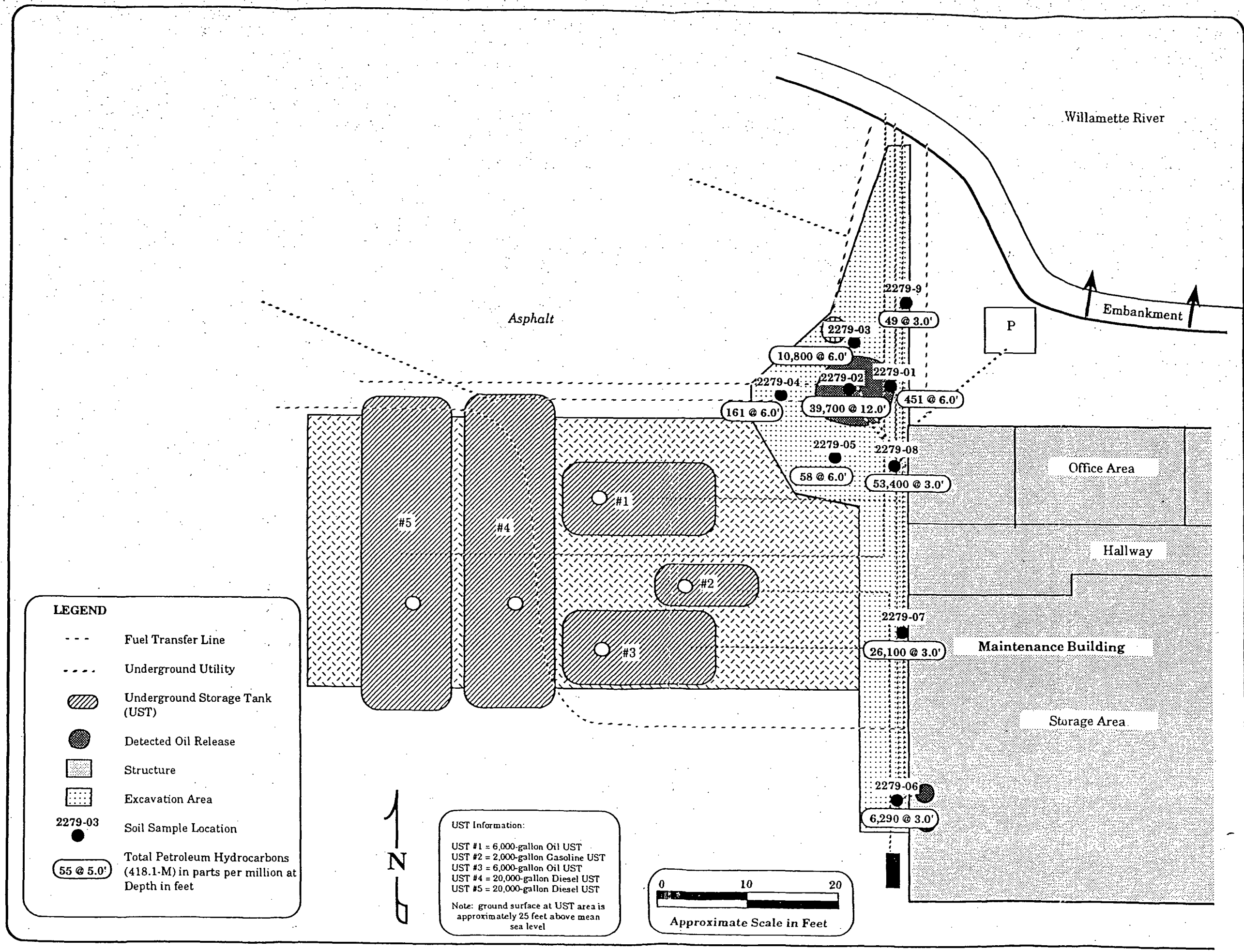


Figure 3

Analytical Results for Soil Samples - Excavation Samples

Subsurface Investigation
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES
INCORPORATED
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

June 1993

Project #2289

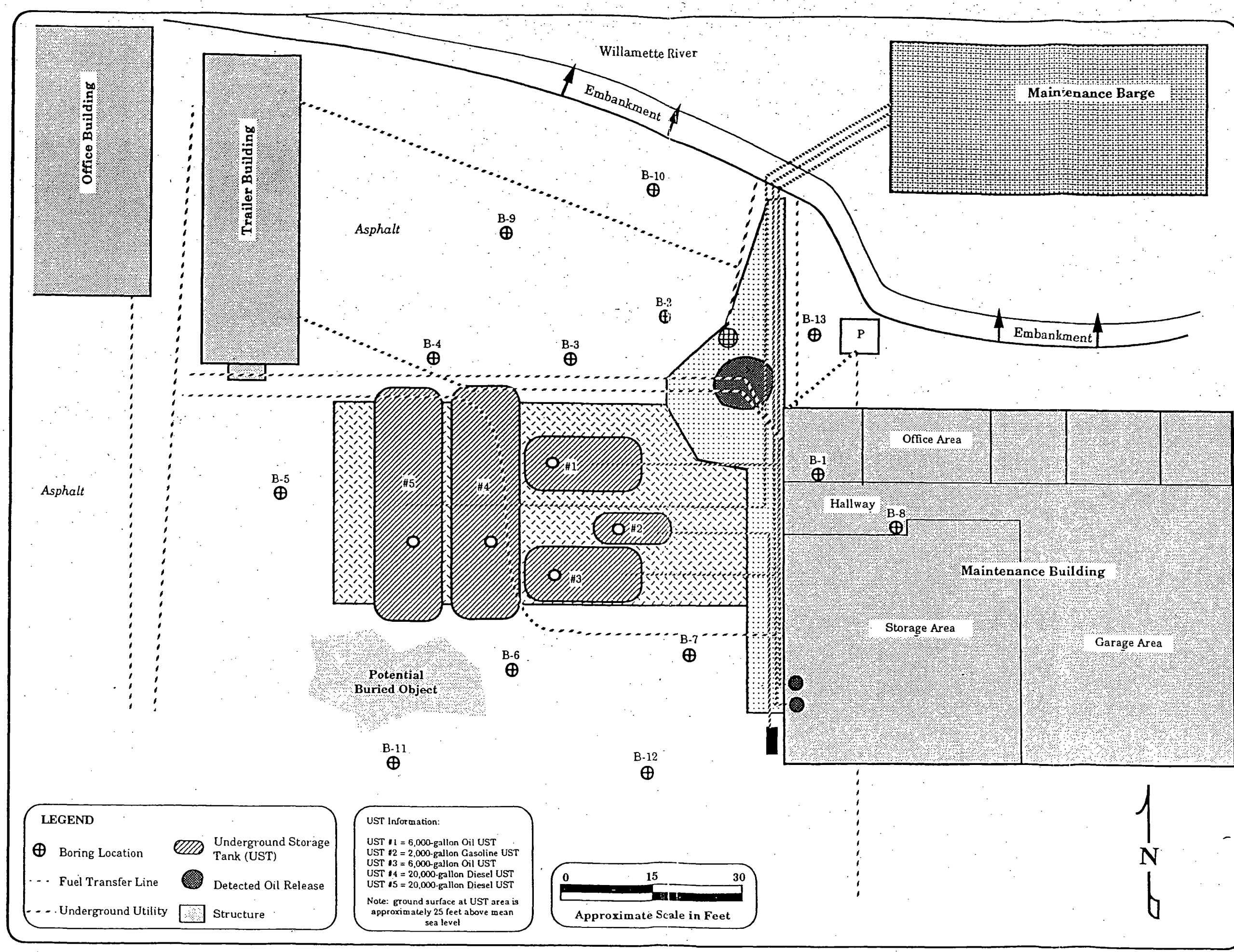


Figure 4

Soil Boring Location Map

Subsurface Investigation
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES
INCORPORATED
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

May 1993

Project
#2289

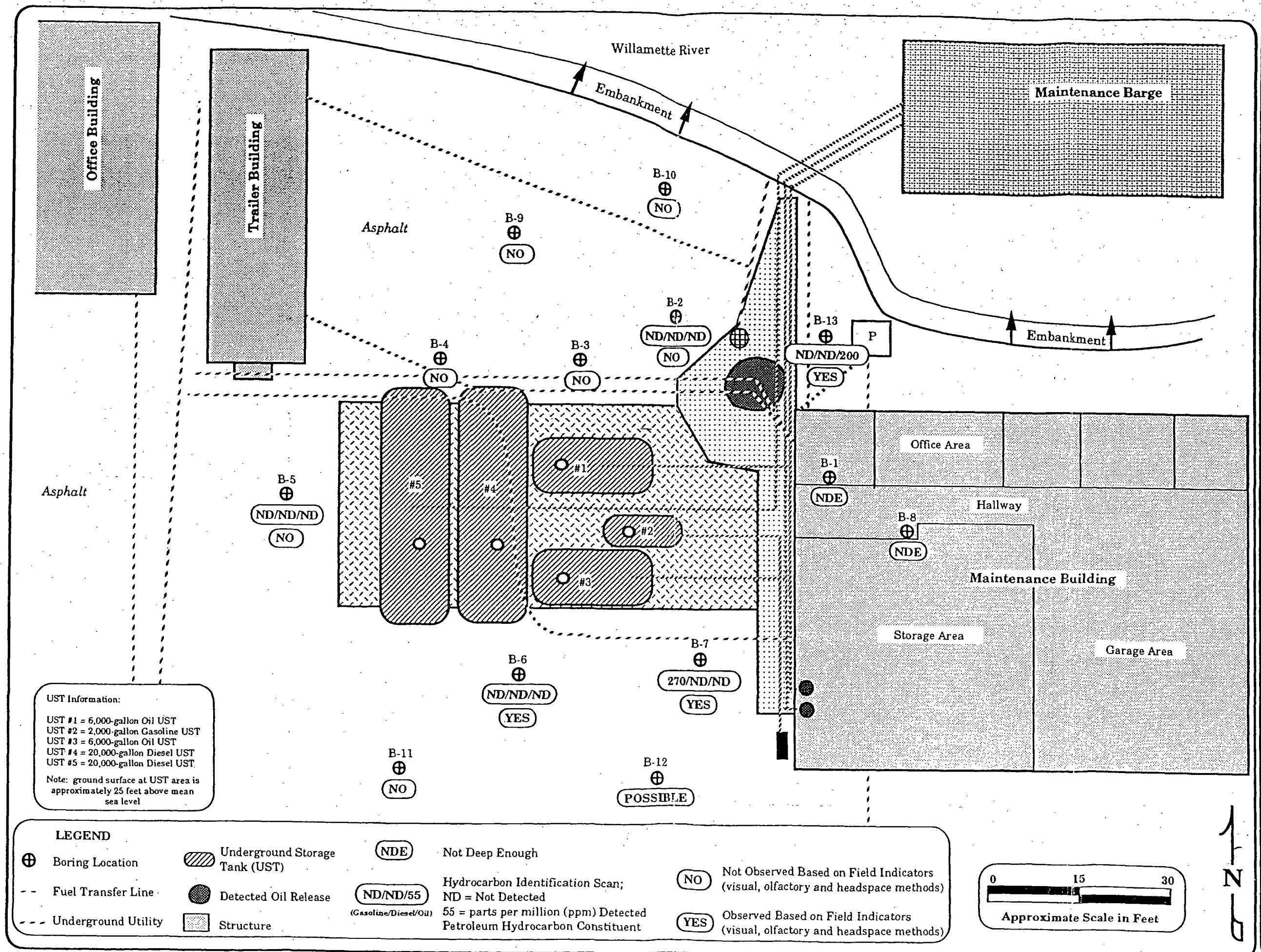


Figure 5

Soil Analytical Results Map
10.5 Feet bgs

Subsurface Investigation
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES
INCORPORATED
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

April 1993

Project
#2289

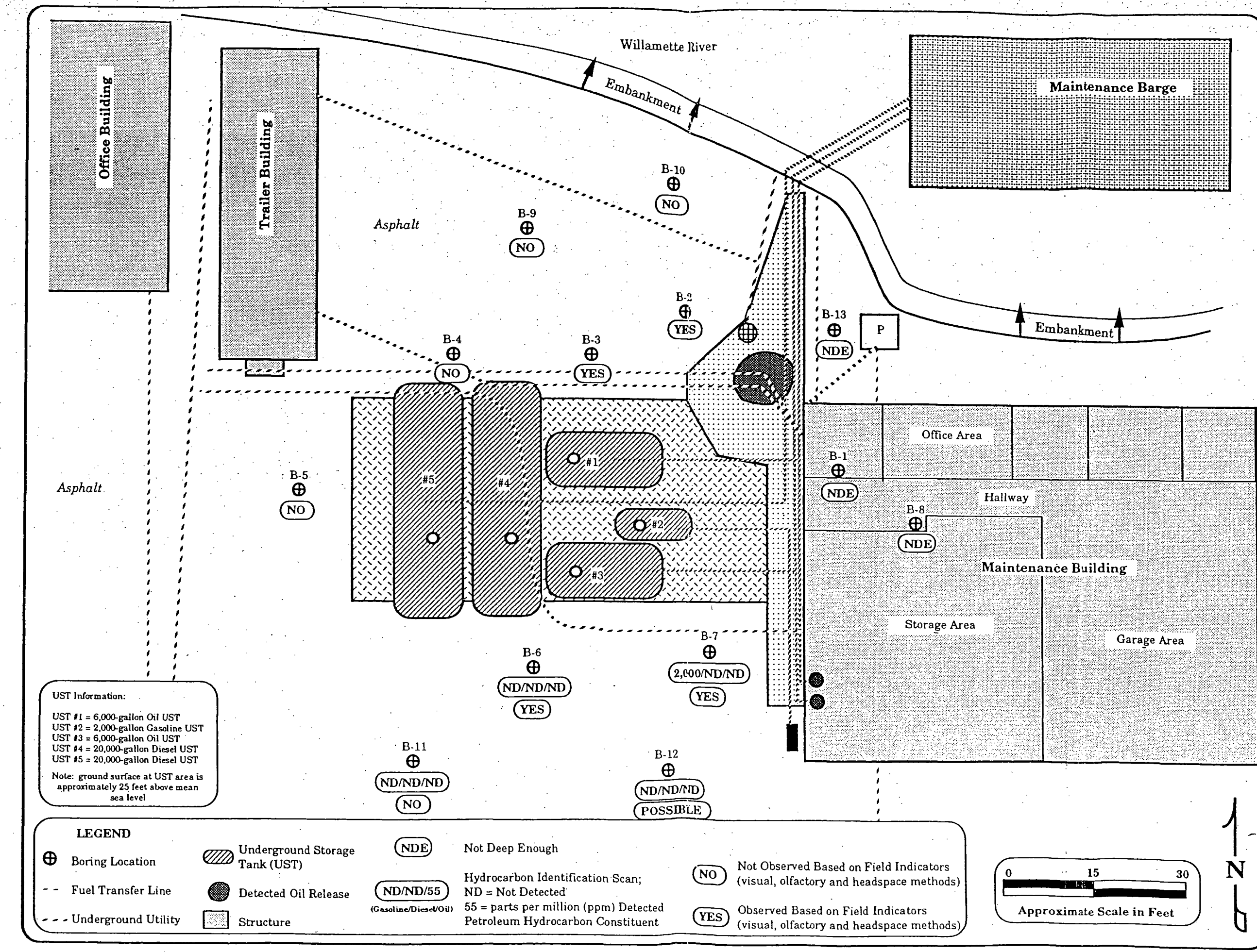


Figure 6

Soil Analytical Results Map
15.5 Feet bgs

Subsurface Investigation
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES
INCORPORATED
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

April 1993

Project
#2289

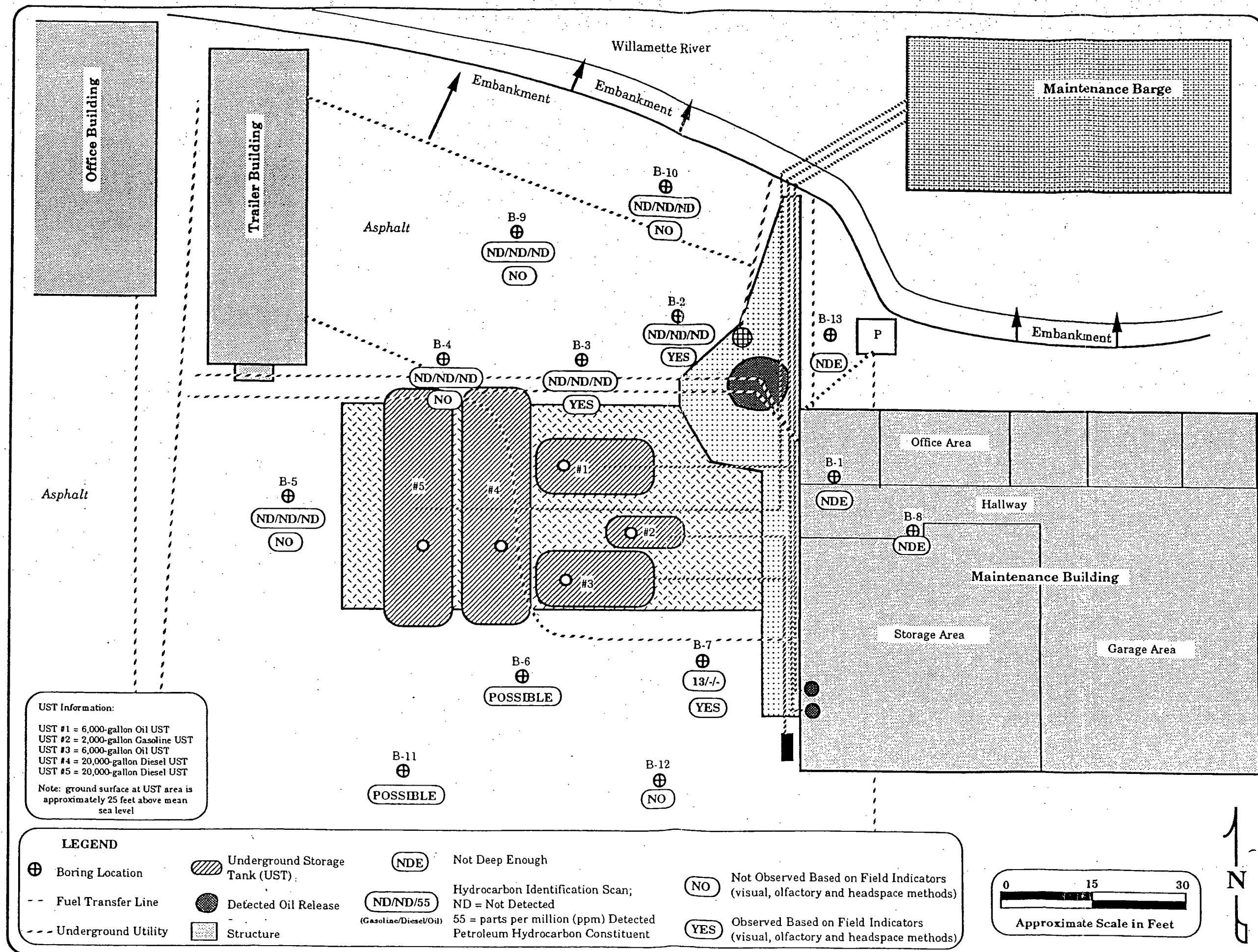


Figure 7

Soil Analytical Results Map 20.5 feet bgs

Subsurface Investigation
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES
INCORPORATED
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

April 1993

Project #2289

APPENDICES

APPENDIX A

Field Methods

APPENDIX A

FIELD METHODS

SUBSURFACE INVESTIGATION
Brix Maritime Company
9030 St. Helens Road
Portland, Oregon

August 12, 1993

Drilling Procedures

Thirteen subsurface soil borings were drilled with either a hollow stem auger drilling rig, a portable Minuteman drilling rig, or a hand auger at the subject site on April 15 and 16, 1993. Ten of the borings, B-2 through B-7, and B-9 through B-12, were installed outside the Maintenance Building at the site with a Canterra Model CT-250 drilling rig on April 15 and 16, 1993. The drilling rig was equipped with 3 3/4-inch inside diameter (ID) hollow stem augers. Geo-Tech Explorations, Inc., of Tualatin, Oregon, was the drilling contractor for the soil borings installed with hollow stem auger.

Two additional soil borings (B-1 and B-8) were attempted inside the Maintenance Building with a portable Minuteman drilling rig equipped with 2-inch ID hollow stem augers. Crisman Drilling of Oregon City, Oregon, was the drilling contractor for the soil borings attempted inside the Maintenance Building. The last boring, B-13, was installed by HAI with a hand auger equipped with a 2 1/4-inch ID stainless steel drum bit.

The soil borings were drilled and sampled to the depths of between 5.0 and 26.5 feet below ground surface (bgs). The soil borings were abandoned by filling with bentonite chips to within two feet of the ground surface and then filling the borehole to grade with concrete. The soil cuttings generated during drilling were placed on and covered by plastic sheeting for appropriate disposal at a later date.

Soil Sampling Procedures – Soil Borings

Generally, soil sampling was attempted for descriptive purposes at 2.5 or 5-foot intervals in the soil borings. The soil samples were collected with a 2-inch outside diameter (OD) split spoon sampling device. The split spoon was driven into the undisturbed soils 1.5 feet ahead of the augering bit using the Standard Penetration Test (SPT).

Upon being brought to the surface, a portion of the soil sample was immediately placed in a pre-cleaned, 9-ounce sample jar and capped with a teflon-lined lid. The sample jars were then labeled and transferred to a chilled container for shipment to the analytical laboratory. A portion of the soil sample was also transferred to a one-quart, plastic bag for a headspace analysis for the presence of petroleum hydrocarbon vapors. Standard sampling protocols, including the use of chain-of-custody documentation, were followed for all sampling procedures.

The properties of each soil sample were noted by an HAI geologist in the field. Boring logs, which describe the soils encountered, are included in Appendix B for each of the subsurface soil borings. An estimate of the Unified Soil Classification System (USCS) soil type designation is also shown on the boring logs. The USCS designation was a field estimate only and was not confirmed by laboratory analyses. Visual or olfactory evidence of petroleum hydrocarbon occurrence in the samples, if present, was also noted on the boring logs.

Most of the soil samples were field-screened for the presence of hydrocarbon vapors by the headspace method using a portable gas analyzer. The gas analyzer used was a MicroTIP Model MP-1000 equipped with a photoionization detector (PID) and a 10.6 electron volt (eV) lamp. Immediately following the collection of the sample, approximately 8 ounces of soil was placed in a one-quart, plastic bag and sealed. The sample was then set aside for a 20-minute stabilization period, whereupon the instrument probe was inserted through the seal into the bag. The results of the headspace hydrocarbon screening are recorded on the boring logs in parts per million (ppm). The headspace method results should be considered qualitative and should be used for comparison purposes only.

Decontamination Procedures

All drilling and sampling equipment was steam-cleaned between drilling locations to prevent cross-contamination between borings. In addition, sampling equipment was decontaminated after each sample by using a pre-rinse of potable water, a detergent (Alconox) solution wash, and two potable water rinses.

Investigative Derived Wastes

Soil cuttings produced during drilling operations were placed with the soil stockpile generated during the January 1993 pipeline investigation activities. All stockpiled soils from the HAI investigations were treated and disposed at Oregon Hydrocarbon, Inc., on May 26, 1993.

APPENDIX B

Soil Boring Logs

KEY TO BORING LOGS

Soil classification in this report is based upon visual and manual field observations which include moisture, consistency, plasticity and grading estimates and should not be construed to imply field or laboratory testing unless presented herein. Soils are classified in accordance with the Unified Soil Classification System. Stratigraphic boundaries are approximate representations only. No warranty is provided as to the continuity of soil strata between borings

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS				TYPICAL NAMES
COARSE GRAINED SOILS (MORE THAN HALF IS LARGER THAN # 200 SIEVE)	GRAVELS (MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE)	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS (MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIZE SIEVE)	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN HALF IS < #200 SIEVE)	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50%		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

LEGENDS

- BLANK CASING
- SCREENED CASING
- CEMENT GROUT
- CONCRETE
- BENTONITE
- SAND PACK
- FILL MATERIAL

ABBREVIATIONS

NS	Not Sampled
NA	Not Analyzed
N/A	Not Applicable
NR	No Recovery
ND	Not Detected above the detection limit parts per million
TPH	Total Petroleum Hydrocarbons as per EPA Method 418.1
SPT	Standard Penetration Test
USCS	Unified Soil Classification System
▽	Measured water level in well
▼	Estimated water level during drilling

HAHN & ASSOCIATES, INC. [illegible] NW Sixth Avenue [illegible]and, Oregon (503) 796-0717	SOIL BORING NUMBER	B-1		
	HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	1 5/8-inch Split Spoon		
Brix Maritime Company	DRILLING METHOD:	2-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	2-inch ID Minuteman	1730	1830
Portland, Oregon	DRILLER:	R. Crisman	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Crisman Drilling	14-Apr-93	15-Apr-93

BORING DIAMETER:	5-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Surveyed

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS (ppm)	SPT (blows/0.5 feet)	SAMPLE INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete									Concrete	Concrete
							1		GP	Silty GRAVEL - Brown, moist, loose, non-plastic, poorly graded, no petroleum odor or stain
Bentonite Chips							2			
							3			
							4		SP	SAND - brown, moist, moderately dense, non-plastic, poorly graded, no petroleum odor or stain (concrete fill)
							5			
							6			
							7			Boring abandoned due to auger refusal - concrete fill was observed in sand to 5.0 feet bgs
							8			Boring terminated at 5.0 feet - 4/14/93 Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							9			
							10			Materials: 3/4 bags 3/4-inch Bentonite Chips
							11			
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B - 2		
[illegible] NW Sixth Avenue				
[illegible]nd, Oregon				
(503) 796-0717	HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	930	1030
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	15-Apr-93	15-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2			
							3		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							4			
							5			
					4	100				
	15-001	945	3.7	NA	9	100	6		SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
					19	100	7			
					9	80	8			SAND - as above, no petroleum odor or stain
	15-002	950	3.8	NA	12	100				
					12	100	9			
							10			
Bentonite Chips					7	80				
	15-003	1005	3.9	ND	7	100	11		SP	SAND - as above, no petroleum odor or stain
					5	100	12			
							13			
							14			
							15			
					3	100				
	15-004	1010	4.1	NA	4	100	16		SP	SAND - as above, strong petroleum odor and black stain
					6	100	17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC. 4[illegible] NW Sixth Avenue [illegible]nd, Oregon (503) 796-0717	SOIL BORING NUMBER	B - 2		
	HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	930	1030
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	15-Apr-93	15-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					8	100				
	15-005	1020	4.1	ND	13	100	21		SP	SAND - brown, moist, medium dense, non-plastic, slightly graded, strong petroleum odor and black stain
					11	100				
							22			
							23			
Bentonite Chips							24	4/15/93		
							25			
					4	100			CL	
	15-006	1030	4.2	ND	5	100	26			Silty CLAY - gray, wet, stiff, medium plastic, poorly graded, no petroleum odor or stain
					8	100				
							27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/15/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							31			
							32			Materials: 12 bags 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER B - 3			
[illegible] NW Sixth Avenue				
P[illegible]nd, Oregon				
(503) 796-0717	HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1030	1115
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	15-Apr-93	15-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2			
							3		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							4			
							5			
					4	80			SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	15-007	1030	4.3	NA	8	100	6			
					20	100	7			
							8			
							9			
Bentonite Chips							10			
					4	100			SP	SAND - as above, no petroleum odor or stain
	15-008	1035	3.4	NA	5	100	11			
					5	100	12			
							13			
							14			
							15			
					4	20			SP	SAND - as above, strong petroleum odor and black stain
	15-009	1040	4.5	NA	4	100	16			
					8	100	17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER B - 3			
	HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1030	1115
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	15-Apr-93	15-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					10	100				
	15-010	1050	4.2	ND	10	100	21		SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, strong petroleum odor and black stain
					5	100				
							22			
							23			
							24			
Bentonite Chips							25	4/15/93		
					2	100			CL	
	15-011	1100	4.1	ND	3	100	26			Silty CLAY - gray, wet, stiff, medium plastic, poorly graded, no petroleum odor or stain
					5	100				
							27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/15/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							31			
							32			Materials: 12 bags 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue P[illegible]nd, Oregon (503) 796-0717	SOIL BORING NUMBER	B - 4		
PROJECT:	HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
Brix Maritime Company	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
9030 NW St. Helens Road	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1130	Time: 1220
Portland, Oregon	EQUIPMENT TYPE	Canterra CT-250		
	DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 15-Apr-93
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					4	20			SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	15-012	1130	3.7	NA	10	100	6			
					10	100	7			
							8			
							9			
Bentonite Chips							10			
					8	100			SP	SAND - as above, no petroleum odor or stain
	15-013	1140	3.5	NA	9	100	11			
					9	100	12			
							13			
							14			
							15			
					12	100			SP	SAND - as above, no petroleum odor or stain
	15-014	1150	3.9	NA	13	100	16			
					12	100	17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER B - 4			
PROJECT: Brix Maritime Company 9030 NW St. Helens Road Portland, Oregon	HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1130	Time: 1220
	EQUIPMENT TYPE	Canterra CT-250		
	DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 15-Apr-93
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					10	20				
	15-015	1158	4.4	ND	11	100	21		SP	SAND - brown/gray, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
					9	100				
							22			
							23			
							24	4/15/93		
Bentonite Chips							25			
					0	100			CL	
	15-016	1205	3.7	NA	1	100	26			Silty CLAY - gray, wet, soft, medium plastic, poorly graded, no petroleum odor or stain
					1	100				
							27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/15/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							31			
							32			Materials: 12 bags 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue [illegible]nd, Oregon (503) 796-0717	SOIL BORING NUMBER	B - 5		
	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1315	1405
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	15-Apr-93	15-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					4	0			SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	15-017	1327	2	NA	6	80	6			
					6	100	7			
							8			
							9			
Bentonite Chips							10			
					6	0			SP	SAND - as above, no petroleum odor or stain
	15-018	1333	1.8	ND	11	100	11			
					14	100	12			
							13			
							14			
							15			
					6	0			SP	SAND - as above, no petroleum odor or stain
	15-019	1339	2.2	NA	8	100	16			
					12	100	17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER B - 5			
	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1315	1405
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	15-Apr-93	15-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					4	20				
	15-020	1345	2.1	ND	6	100	21		SP	SAND - brown/gray, medium dense, non-plastic, slightly graded, no petroleum odor or stain
					7	100				
							22			
							23			
							24			
							25			
							26			Boring terminated at 20.0 feet - 4/15/93 Sampled to 21.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							27			
							28			Materials: 10 bags 3/4-inch Bentonite Chips
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER B - 6			
[illegible] NW Sixth Avenue				
[illegible]and, Oregon				
(503) 796-0717	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1420	1515
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	15-Apr-93	15-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					2	0			SP	SAND - brown, moist, very loose, non-plastic, poorly graded, no petroleum odor or stain
	15-021	1425	2.7	NA	1	20	6			
					1	100	7			
							8			
Bentonite Chips							9			
							10			
					2	0			SP	SAND - as above, gray, petroleum odor and stain
	15-022	1431	2.4	ND	1	100	11			
					2	100	12			
							13			
							14			
							15			
					9	0			SP	SAND - as above, medium dense, petroleum odor and stain
	15-023	1437	2.5	ND	11	20	16			
					15	100	17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER B - 6			
1[illegible] NW Sixth Avenue				
P[illegible]nd, Oregon				
(503) 796-0717	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1420	1515
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	15-Apr-93	15-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					3	0				
	15-024	1445	2.3	NA	3	100	21		SP	SAND - gray, moist, loose, non-plastic, poorly graded, slight petroleum odor and stain
					4	100				
							22			
							23	4/15/93		
							24			
							25			
					3	0				
	15-025	1456	2.2	NA	4	100	26		CL	Silty CLAY - gray, wet, firm, medium plastic, poorly graded, possible petroleum odor and stain
					4	100				
							27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/15/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							31			
										Materials: 12 bags 3/4-inch Bentonite Chips
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

Bentonite Chips

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue [illegible]nd, Oregon (503) 796-0717	SOIL BORING NUMBER	B - 7		
	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1530	900
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	15-Apr-93	16-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS TPH-G (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					5	0			SP	SAND - gray, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	15-026	1535	7.9	NA	6	100	6			
					5	100	7			
							8			
							9			
Bentonite Chips							10			
					12	0			SP	SAND - as above, dense, petroleum odor and stain
	15-027	1543	53	270	20	80	11			
					18	100	12			
							13			
							14			
							15			
					7	0			SP	SAND - as above, petroleum odor and stain
	15-028	1550	755	2,000	8	100	16			
					11	100	17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER B - 7			
4[illegible] NW Sixth Avenue				
Po[illegible]nd, Oregon				
(503) 796-0717	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1530	900
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	15-Apr-93	16-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS TPH-G (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					3	80				
	15-029	1555	183	13	3	100	21		SP	SAND - gray, moist, medium dense, non-plastic, poorly graded, slight petroleum odor and stain
					5	100				
							22		CL	Silty CLAY - gray, wet, stiff, medium plastic, poorly graded, possible petroleum odor and stain
							23	4/15/93		
							24			
							25			
					3	0			CL	Silty CLAY - as above, no petroleum odor and stain
	15-030	1605	NS	NA	5	0	26			
					6	100				
							27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/15/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/16/93
							31			
							32			Materials: 15 bags 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

Bentonite Chips

HAHN & ASSOCIATES, INC. 4[illegible] NW Sixth Avenue [illegible]and, Oregon (503) 796-0717	SOIL BORING NUMBER B-8			
PROJECT:	HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
Brix Maritime Company	SAMPLING METHOD:	1 5/8-inch Split Spoon		
9030 NW St. Helens Road	DRILLING METHOD:	2-inch ID Hollow Stem Auger	Time: 1830	Time: 1930
Portland, Oregon	EQUIPMENT TYPE	2-inch ID Minuteman		
	DRILLER:	R. Crisman	Date: 15-Apr-93	Date: 15-Apr-93
PROJECT #: 2289	DRILLING CONTRACTOR:	Crisman Drilling		

BORING DIAMETER:	5-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Surveyed

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS (ppm)	SPT (blows/0.5 feet)	SAMPLE INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Concrete	Concrete
Bentonite Chips							2		GP	Silty GRAVEL with some Sand - Brown, moist, loose, non-plastic, poorly graded, no petroleum odor or stain (concrete fill)
							3			
							4			
							5			
							6			Boring abandoned due to auger refusal - concrete fill was observed in sand to 4.5 feet bgs
							7			Boring terminated at 4.5 feet - 4/15/93 Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							8			
							9			Materials: 3/4 bags 3/4-inch Bentonite Chips
							10			
							11			
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue I[illegible]nd, Oregon (503) 796-0717	SOIL BORING NUMBER	B - 9		
PROJECT: Brix Maritime Company 9030 NW St. Helens Road Portland, Oregon	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 942	Time: 1035
	EQUIPMENT TYPE	Canterra CT-250		
	DRILLER:	M. Reniker	Date: 16-Apr-93	Date: 16-Apr-93
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
Bentonite Chips					8	0			SP	SAND - brown, moist, dense, non-plastic, poorly graded, no petroleum odor or stain
	16-001	954	6.2	NA	14	40	6			
					19	100	7			
							8			
							9			
							10			
					13	20			SP	SAND - as above, no petroleum odor or stain
	16-002	1004	4.8	NA	17	100	11			
					20	100	12			
							13			
							14			
							15			
					12	100			SP	SAND - as above, no petroleum odor or stain
	16-003	1012	6.7	NA	12	100	16			
					13	100	17			
							18			
Bentonite Chips							19			
							20			

HAHN & ASSOCIATES, INC. 4[illegible] NW Sixth Avenue P[illegible]and, Oregon (503) 796-0717	SOIL BORING NUMBER B - 9			
PROJECT: Brix Maritime Company 9030 NW St. Helens Road Portland, Oregon PROJECT #: 2289	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 942	Time: 1035
	EQUIPMENT TYPE	Canterra CT-250		
	DRILLER:	M. Reniker	Date: 16-Apr-93	Date: 16-Apr-93
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					9	20				
	16-004	1022	4.7	ND	8	100	21		SP	SAND - brown, moist to wet, dense, non-plastic, poorly graded, no petrloeum odor or stain
					8	100				
							22			
							23			
							24			
							25			Boring terminated at 20.0 feet - 4/16/93 Sampled to 21.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/16/93
							26			Materials: 10 bags 3/4-inch Bentonite Chips
							27			
							28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B - 10		
NW Sixth Avenue				
nd, Oregon				
(503) 796-0717	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1048	1138
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	16-Apr-93	16-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown/gray, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					11	0			SP	SAND - brown/gray, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	16-005	1055	NS	NA	9	0	6			
					9	50	7			
							8			
							9			
Bentonite Chips							10			
					10	20			SP	SAND - as above, brown, no petroleum odor or stain
	16-006	1102	4.5	NA	13	100	11			
					14	100	12			
							13			
							14			
							15			
					11	20			SP	SAND - as above, no petroleum odor or stain
	16-007	1110	4.9	NA	13	100	16			
					14	100	17			
							18			
Be e Chips							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue [illegible]nd, Oregon (503) 796-0717	SOIL BORING NUMBER	B - 10		
	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1048	1138
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	16-Apr-93	16-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					10	50				
	16-008	1118	5.1	ND	13	100	21		SP	SAND - brown/gray, moist to wet, medium dense, non-plastic, slightly graded, no petroleum odor or stain
					11	100				
							22			
							23			
							24			
							25			Boring terminated at 20.0 feet - 4/16/93 Sampled to 21.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/16/93
							26			
							27			Materials: 11 bags 3/4-inch Bentonite Chips
							28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue P[illegible]nd, Oregon (503) 796-0717	SOIL BORING NUMBER	B - 11		
	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1150	1245
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	16-Apr-93	16-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown/gray, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					1	100				
	16-009	1200	5.1	NA	2	0	6		SP	SAND - gray, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
					9	20	7			
							8			
							9			
Bentonite Chips							10			
					8	100				
	16-010	1207	6.2	NA	10	100	11		SP	SAND - as above, gray, no petroleum odor or stain
					10	100	12			
							13			
							14			
							15			
					8	0				
	16-011	1213	5.7	ND	8	20	16		SP	SAND - as above, possible petroleum odor and stain
					7	100	17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER B - 11			
434 NW Sixth Avenue				
Portland, Oregon				
(503) 796-0717	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1150	1245
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	16-Apr-93	16-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					6	100				
	16-012	1219	4.4	NA	4	100	21		SP	SAND - gray, moist, medium dense, non-plastic, poorly graded, slight petroleum odor and stain
					5	100				
							22		CL	Silty CLAY - gray, moist, stiff, medium plastic, poorly graded, no petroleum odor or stain
							23			
							24	4/16/93		
Bentonite Chips							25			
					3	0			CL	
	16-013	1227	4.8	NA	4	100	26			Silty CLAY - as above, wet, no petroleum odor or stain
					4	100				
							27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/16/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/16/93
							31			
							32			Materials: 12 bags 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 424 NW Sixth Avenue [illegible]and, Oregon (503) 796-0717	SOIL BORING NUMBER	B - 12		
	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1304	1345
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	16-Apr-93	16-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					4	20			SP	SAND - gray, moist, loose, non-plastic, poorly graded, no petroleum odor or stain
	16-014	1310	4.8	NA	5	100	6			
					5	100	7			
							8			
							9			
Bentonite Chips							10			
					10	0			SP	SAND - as above, medium dense, possible petroleum odor and stain
	16-015	1317	7	NA	13	100	11			
					12	100	12			
							13			
							14			
							15			
					8	100			SP	SAND - as above, slight petroleum odor and stain
	16-016	1325	7.1	ND	11	100	16			
					13	100	17			
							18			
Bentonite Chips							19			
							20			

HAHN & ASSOCIATES, INC. [illegible] NW Sixth Avenue [illegible]and, Oregon (503) 796-0717	SOIL BORING NUMBER	B - 12		
	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
Brix Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1304	1345
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	16-Apr-93	16-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					1	100				
	16-017	1333	5.3	NA	4	100	21		CL	Silty CLAY - gray/brown, moist to wet, stiff, non-plastic, poorly graded, no hydrocarbon odor or stain
					8	100				
							22			
							23			
							24			
							25			Boring terminated at 20.0 feet - 4/16/93 Sampled to 21.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/16/93
							26			Materials: 11 bags 3/4-inch Bentonite Chips
							27			
							28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.
4[illegible] NW Sixth Avenue
1[illegible]and, Oregon
(503) 796-0717

SOIL BORING NUMBER B-13

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 1/4-Inch OD Hand Auger		
DRILLING METHOD:	2 1/4-Inch OD Hand Auger	Time:	Time:
EQUIPMENT TYPE	2 1/4-Inch OD Hand Auger	1345	1440
DRILLER:	Jeff W. Doss	Date:	Date:
DRILLING CONTRACTOR:	Not Applicable	16-Apr-93	16-Apr-93

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	2 1/4 Inches
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Surveyed

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS 418.1M (ppm)	SPT (blows/0.5 feet)	SAMPLE INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete									Asphalt	Asphalt
							1			
							2			
							3		GP	Silty GRAVELS - Brown, moist, loose, non-plastic, moderately graded, possible fill
							4			
							5			
Bentonite Chips	16-018	1402	4.5	NA			6		CL	Silty CLAY - gray, moist to wet, stiff, non-plastic, poorly graded, no petroleum odor or stain, sheen noticed on auger bit
							7			
	16-019	1415	6	NA			8			
							9		SM	Silty SAND - gray, moist, loose, non-plastic, poorly graded, no petroleum odor or stain, sheen still exists on auger bit
							10			
	16-020	1435	10.3	200			11			
							12			Boring terminated at 11.0 feet - 4/16/93 Sampled to 11.0 feet Boring abandoned with 3/4-inch Bentonite Chips- 4/16/93
							13			
							14			Materials: 3/4 bags 3/4-inch Bentonite Chips
							15			
							16			
							17			
							18			
							19			
							20			

APPENDIX C

Laboratory Results and Chain-of-Custody Documentation

OAL

HAHN & ASSOCIATES, INC.
434 N.W. 6TH AVE.
SUITE 203
PORTLAND, ORE. 97209-3600
GUY TANZ
796-0717 FAX 227-2209
JOB#2289

REVIEWED BY: RJ

REVIEW DATE: 4.23.93

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	2289-930415-003
OAL ID: 25-0127-	10934
SAMPLE DATE:	4/15/93
MATRIX:	SOIL
EXTRACTION DATE:	4/22/93
ANALYSIS DATE:	4/22/93
HCID:	ND
.	.
SURR.RECOVERY %	85.
ANALYST:	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-644-5300 • Fax 503-671-1404

ID ON RECYCLED PAPER

OAL

HAHN & ASSOCIATES, INC.
434 N.W. 6TH AVE.
SUITE 203
PORTLAND, ORE. 97209-3600
GUY TANZ
796-0717 FAX 227-2209
JOB#2289

REVIEWED BY: RJ

REVIEW DATE: 4.23-93

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	2289-930415-005	2289-930415-006	2289-930415-010
OAL ID: 25-0127-	10856	10857	10858
SAMPLE DATE:	4/15/93	4/15/93	4/15/93
MATRIX:	SOIL	SOIL	SOIL
EXTRACTION DATE:	4/21/93	4/21/93	4/21/93
ANALYSIS DATE:	4/21/93	4/21/93	4/21/93
HCID:	ND	ND	ND
.	.	.	.
SURR.RECOVERY %	82.	85.	80.
ANALYST:	RJ	RJ	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

ON RECYCLED PAPER

OAL

HAHN & ASSOCIATES, INC.
434 N.W. 6TH AVE.
SUITE 203
PORTLAND, ORE. 97209-3600
GUY TANZ
796-0717 FAX 227-2209
JOB#2289

REVIEWED BY: RJ

REVIEW DATE: 4.23.93

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	2289-930415-011	2289-930415-015	2289-930415-018	2289-930415-020
OAL ID: 25-0127-	10859	10860	10861	10862
SAMPLE DATE:	4/15/93	4/15/93	4/15/93	4/15/93
MATRIX:	SOIL	SOIL	SOIL	SOIL
EXTRACTION DATE:	4/21/93	4/21/93	4/21/93	4/21/93
ANALYSIS DATE:	4/21/93	4/21/93	4/21/93	4/21/93
HCID:	ND	ND	ND	ND
.	.	.	.	.
SURR.RECOVERY %	89.	68.	89.	88.
ANALYST:	RJ	RJ	RJ	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-644-5300 • Fax 503-671-1404

ED ON RECYCLED PAPER

OAL

HAHN & ASSOCIATES, INC.
434 N.W. 6TH AVE.
SUITE 203
PORTLAND, ORE. 97209-3600
GUY TANZ
796-0717 FAX 227-2209
JOB#2289

REVIEWED BY: SMM

REVIEW DATE: 4/26/93

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	2289-930415-022	2289-930415-023	2289-930415-027	2289-930415-028
OAL ID: 25-0127-	10863	10864	10865	10866
SAMPLE DATE:	4/15/93	4/15/93	4/15/93	4/15/93
MATRIX:	SOIL	SOIL	SOIL	SOIL
EXTRACTION DATE:	4/21/93	4/21/93	4/21/93	4/21/93
ANALYSIS DATE:	4/21/93	4/21/93	4/21/93	4/21/93
HCID:	ND	ND	GASOLINE	GASOLINE
.	.	.	.	.
SURR.RECOVERY %	89.	89.	90.	90.
ANALYST:	RJ	RJ	RJ	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

D ON RECYCLED PAPER

OAL

HAHN & ASSOCIATES, INC.
434 N.W. 6TH AVE.
SUITE 203
PORTLAND, ORE. 97209-3600
GUY TANZ
796-0717 FAX 227-2209
JOB#2289

REVIEWED BY: SPM

REVIEW DATE: 4/26/93

TOTAL PETROLEUM HYDROCARBONS - GASOLINE
BY OREGON DEQ TPH-G

SAMPLE ID:	2289-930415-022	2289-930415-023	2289-930415-027	2289-930415-028
OAL ID: 25-0127-	10863	10864	10865	10866
SAMPLE DATE:	4/15/93	4/15/93	4/15/93	4/15/93
MATRIX:	NA	NA	SOIL	SOIL
EXTRACTION DATE:	.	.	4/22/93	4/22/93
ANALYSIS DATE:	.	.	4/26/93	4/26/93
GASOLINE MG/KG	.	.	270.	2000.
SURR.RECOVERY %	.	.	109.	130.
ANALYST:	.	.	RJ	RJ

BROMOFLUOROBENZENE WAS USED AS THE SURROGATE
MG/KG = PPM
ND = NONE DETECTED (REPORTING LIMIT IS 10 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY
NA = NOT ANALYZED

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503 644 5300 • Fax 503 671 1404

D ON RECYCLED PAPER

OAL

HAHN & ASSOCIATES, INC.
434 N.W. 6TH AVE.
SUITE 203
PORTLAND, ORE. 97209-3600
GUY TANZ
796-0717 FAX 227-2209
JOB#2289

REVIEWED BY: SMA
REVIEW DATE: 4/26/93

TOTAL PETROLEUM HYDROCARBONS - GASOLINE
BY OREGON DEQ TPH-G

SAMPLE ID:	2289-930415-029
OAL ID: 25-0127-	10933
SAMPLE DATE:	4/15/93
MATRIX:	SOIL
EXTRACTION DATE:	4/22/93
ANALYSIS DATE:	4/26/93
GASOLINE MG/KG	13.
SURR.RECOVERY %	83.
ANALYST:	RJ

BROMOFLUOROBENZENE WAS USED AS THE SURROGATE
MG/KG = PPM
ND = NONE DETECTED (REPORTING LIMIT IS 10 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY
NA = NOT ANALYZED

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-644-5300 • Fax 503-671-1404

ED ON RECYCLED PAPER

OAL

HAHN & ASSOCIATES, INC.
434 N.W. 6TH AVE.
SUITE 203
PORTLAND, ORE. 97209-3600
GUY TANZ
796-0717 FAX 227-2209
JOB#2289

REVIEWED BY: RJ

REVIEW DATE: 4.23.93

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	2289-930416-004	2289-930416-008
OAL ID: 25-0127-	10867	10868
SAMPLE DATE:	4/16/93	4/16/93
MATRIX:	SOIL	SOIL
EXTRACTION DATE:	4/21/93	4/21/93
ANALYSIS DATE:	4/21/93	4/21/93
HCID:	ND	ND
.	.	.
SURR.RECOVERY %	92.	77.
ANALYST:	RJ	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-644-5300 • Fax 503-671-1404

ED ON RECYCLED PAPER

OAL

HAHN & ASSOCIATES, INC.
434 N.W. 6TH AVE.
SUITE 203
PORTLAND, ORE. 97209-3600
GUY TANZ
796-0717 FAX 227-2209
JOB#2289

REVIEWED BY: SM
REVIEW DATE: 4/23/93

HYDROCARBON IDENTIFICATION (HCID)
BY OREGON DEQ TPH-HCID

SAMPLE ID:	2289-930416-011	2289-930416-016	2289-930416-020
OAL ID: 25-0127-	10869	10870	10871
SAMPLE DATE:	4/16/93	4/16/93	4/16/93
MATRIX:	SOIL	SOIL	SOIL
EXTRACTION DATE:	4/21/93	4/21/93	4/21/93
ANALYSIS DATE:	4/21/93	4/21/93	4/21/93
HCID:	ND	ND	OIL
.	.	.	.
SURR.RECOVERY %	90.	90.	85.
ANALYST:	RJ	RJ	RJ

ORTHO-TERPHENYL WAS USED AS THE SURROGATE
NA = NOT ANALYZED
GASOLINE REGION (C6 THRU C10)
DIESEL REGION (C10 THRU C28)
OIL AND BUNKER C REGION (BEYOND C28)
ND = NONE DETECTED (GASOLINE < 20 MG/KG, DIESEL < 50 MG/KG)
MI = MATRIX INTERFERENCE WITH SURROGATE RECOVERY

OREGON ANALYTICAL LABORATORY
A Division of Portland General Electric
14855 S.W. Old Scholls Ferry Road
Beaverton, OR 97007
Phone 503-644-5300 • Fax 503-671-1404

ON RECYCLED PAPER

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
34 NW 6th Ave., Suite 203 • Portland, Oregon 97209-3600
503/796-0717 Office • 503/227-2209 FAX

LABORATORY ORIGON ANALYTICAL LABORATORY

Lab Project No.

CHAIN OF CUSTODY

☐ Please bill the Port of Portland
☒ Please bill Hahn and Associates, Inc.

Project Manager GUY H. TANZ
Project No. 2289
Project Name BRXSVB
Collected by JWO

LIQUID WITH SEDIMENT SAMPLE
___ Test Filtrate ___ Test Sediment ___ Test Both
MULTI-PHASE SAMPLE (___)
___ Test one (which) ___ Test Separately ___ Shake

Samples Received at 4°C ☒ YES ☐ NO
Appropriate Containers Used ☒ YES ☐ NO
Provide Verbal Results ☐ YES ☒ NO
Provide Preliminary FAX Results ☒ YES ☐ NO

COMMENTS
If 2289-930415-015 Detects HCID, then run 2289-930415-016.

LAB I.D.	SAMPLE I.D.	DATE	TIME	SAMPLE DESCRIPTION	MATRIX: Soil	MATRIX: Water	MATRIX: Other	Number of Containers	TPH-HCID (OAR/DEQ)	Quantify HCID (if detected)	TPH-G (OAR/DEQ)	TPH-D (OAR/DEQ)	TPH-418.1 Mod. (OAR/DEQ)	TPH (EPA 418.1)	BTEX (EPA 8020)	PAHs (EPA 8310-OAR/DEQ)	PAHs (GC/MS SIM Mode)	Halo.-Volatiles (EPA 8010)	Volatiles (EPA 8240)	Semivolatiles (EPA 8270)	TCLP (3) Metals	TCLP (8) Metals	Pesticides (EPA 8080)	PCBs (EPA 8080)				RUSH	REMARKS
9	2289-930415-011	4/15/93	1100	25'-B3	X			1	X																				
	2289-930415-012	"	1130	5'-B4	X			1																					
	2289-930415-013	"	1140	10'-B4	X			1																					
	2289-930415-014	"	1150	15'-B4	X			1																					
10	2289-930415-015	"	1158	20'-B4	X			1	X																				
	2289-930415-016	"	1205	25'-B4	X			1																					
	2289-930415-017	"	1327	5'-B5	X			1																					
1	2289-930415-018	"	1333	10'-B5	X			1	X																				
	2289-930415-019	"	1339	15'-B5	X			1																					
2	2289-930415-020	"	1345	20'-B5	X			1	X																				

Relinquished by	Company	Date	Time	Received by	Company
[signature]	HAHN & ASSOCIATES	130Pm	4-20-93	[signature]	ANDYS
[signature]	—	4-20-93	4:15	Denice Ward	OAL

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
4 NW 6th Ave., Suite 203 • Portland, Oregon 97209-3600
503/796-0717 Office • 503/227-2209 FAX

LABORATORY OREGON ANALYTICAL LAB.

Lab Project No.

CHAIN OF CUSTODY

☐ Please bill the Port of Portland
☒ Please bill Hahn and Associates, Inc.

Project Manager GUY H. TANZ
Project No. 2289
Project Name BRXSUB
Collected by JWD

LIQUID WITH SEDIMENT SAMPLE
___ Test Filtrate ___ Test Sediment ___ Test Both
MULTI-PHASE SAMPLE ( )
___ Test one (which) ___ Test Separately ___ Shake

Samples Received at 4°C ☒ YES ☐ NO
Appropriate Containers Used ☒ YES ☐ NO
Provide Verbal Results ☐ YES ☒ NO
Provide Preliminary FAX Results ☒ YES ☐ NO

MMENTS	Sample I.D.	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	TPH-HCID (OAR/DEQ)	Quantify HCID (if detected)	TPH-G (OAR/DEQ)	TPH-D (OAR/DEQ)	TPH-418.1 Mod. (OAR/DEQ)	TPH (EPA 418.1)	BTEX (EPA 8020)	PAHs (EPA 8310-OAR/DEQ)	PAHs (GC/MS SIM Mode)	Halo.-Volatiles (EPA 8010)	Volatiles (EPA 8240)	Semivolatiles (EPA 8270)	TCLP (3) Metals	TCLP (8) Metals	Pesticides (EPA 8080)	PCBs (EPA 8080)				RUSH	Remarks
	2289-930416-001	4/16/93	954	5'-B9	X			1																					
	2289-930416-002	"	1004	10'-B9	X			1																					
	2289-930416-003	"	1012	15'-B9	X			1																					
07	2289-930416-004	"	1022	20'-B9	X			1	X																				
	2289-930416-005	"	1055	5'-B10	X			1																					
	2289-930416-006	"	1102	10'-B10	X			1																					
	2289-930416-007	"	1110	15'-B10	X			1																					
8	2289-930416-008	"	1118	20'-B10	X			1	X																				
	2289-930416-009	"	1200	5'-B11	X			1																					
	2289-930416-010	"	1207	10'-B11	X			1																					

Relinquished by	Company	Date	Time	Received by	Company
[signature]	HAHN & ASSOCIATES	4-20-93	1:30pm	[signature]	ANDY'S
[signature]		4-20-93	4:15	D. Ward	OAL

APPENDIX D

Soil Cleanup Standard Matrix Worksheet

SOIL CLEANUP STANDARD MATRIX WORKSHEET

INTRODUCTION: This worksheet is intended to be used to determine the soil cleanup standard for the remediation of motor fuel and heating oil releases from underground storage tanks (USTs). OAR 340-122-301 to 340-122-360

EVALUATION PARAMETERS:

1. **DEPTH TO GROUNDWATER:** Vertical distance (to nearest foot) from the surface of the ground to the highest seasonal elevation of the saturated zone.

Depth:	>100'	51-100'	25-50'	<25'	POINTS: 10
Points:	1	4	7	**10**	

Source: Field Observation

2. **MEAN ANNUAL PRECIPITATION:** From nearest appropriate weather station.

Inches:	<20"	20-45"	>45"	POINTS: 5
Points:	1	**5**	10	

Source: National Weather Service

3. **NATIVE SOIL OR ROCK TYPE:**

Permeability:	Low	Moderate	High	POINTS: 10
Points:	1	**5**	**10**	

Source: Field Observation

4. **SENSITIVITY TO THE UPPERMOST AQUIFER:**

Sensitivity:	Unusable	Potable not used	Potable	Sole Source	POINTS: 4
Points:	1	**4**	7	10	

Source: Estimate

5. **POTENTIAL RECEPTORS:** Distance to nearest well that draws water from aquifer of concern and the number of people at risk.

Nearest Well:	<1/2 mile	1/2 - 2 miles	>2 mile
Description:	**Near**	Medium	Far

POINTS: 10

Number of People:	>3,000	100-3,000	<100
Description:	Many	**Medium**	Few

Sources: Worst Case Estimate

TOTAL POINTS: 39

SOIL CLEANUP STANDARD MATRIX WORKSHEET

TOTAL POINTS: 39
Level 2 Cleanup Standard

If the Matrix Score evaluated is

A) Greater than 40, the site must be cleaned up to at least the Level 1 standard

B) From 25 to 40, inclusive, the site must be cleaned up to at least Level 2 standards

C) Less than 25, the site must be cleaned up to at least the Level 3 standard

NUMERIC SOIL CLEANUP STANDARDS

	Level 1	Level 2	Level 3
TPH (Gasoline)	40 ppm	**80 ppm**	130 ppm
TPH (Diesel)	100 ppm	**500 ppm**	1,000 ppm

NUMERIC SOIL CLEANUP STANDARDS FOR THIS SITE

Level 2 Cleanup Standard

Total Petroleum Hydrocarbons (TPH):
< 80 parts per million (ppm) for gasoline
< 500 ppm for diesel fuel and heavier petroleum hydrocarbons

(12/91)