



Draft

Hazardous Materials and Environmental Assessment Report

Destruction Island, Washington

Prepared for

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EXECUTIVE SUMMARY

In September and October 1999 EA Engineering visited Destruction Island to survey potential hazardous materials and conduct an environmental assessment. This work was performed in response to the results of a previous investigation by Foster Wheeler in 1996 which identified several areas of where potential contamination could and did exist. The following is a summary of conditions as found at Destruction Island:

1) Elevated concentrations of lead are present in soil around each of the buildings or former building sites tested. The results indicate that lead concentrations are highest in surface soils and decrease with depth (approximately one foot), but may occur laterally over a significant area.

2) Elevated cadmium concentrations were encountered at the following locations:

- beneath the Fog Signal drainpipe,
- in front of the Paint Locker and Oil House buildings,
- the former AST locations,
- demolished housing in the Water Tower and Heliport areas,
- the Lighthouse building area.

3) Elevated arsenic concentrations were found in the following areas:

- Soils adjacent to the former fuel pipeline near the Fog Signal building
- In and adjacent to the burn barrel; and
- Former AST locations near the Paint Locker.

4) Elevated levels of petroleum hydrocarbons are found at the following locations:

- Behind the Fog Signal Building
- Around the Paint Locker and Oil House buildings
- Along the fuel pipeline
- In and adjacent to the burn barrel
- Adjacent to the valve box at the former Fuel
- bunker
- Beneath the former AST locations

No asbestos containing building materials were found at the site.

1. INTRODUCTION

EA Engineering, Science, and Technology (EA) is pleased to present the following Hazardous Materials and Subsurface Environmental Assessment Report for Destruction Island, Washington. This work was completed under US Forest Service regional contract 53-04HL-7-8383.

2. BACKGROUND

Destruction Island is located approximately three and one-half miles off the Washington state coast and occupied by seabirds, shorebirds, and marine mammals. The 25 acre island is part of the Quillayute Needles National Wildlife Refuge (NWR), which provides protection for endangered and threaten species and habitats. The lighthouse was built in 1907 and included residential housing for the lighthouse keepers and additional facilities that occupied the western portion of the island. These facilities included a landing dock for supplies, a water collection and distribution system, a diesel fuel distribution system, and a tram car system for moving materials and supplies. Currently the lighthouse is automated and visited every three months by Coast Guard personnel. The previously mentioned housing has been burned or demolished except for a few small buildings and abandoned structures.

3. PURPOSE AND AREAS OF CONCERN

The purpose of this report is to provide additional assessment for the areas of concern identified in the Site and Debris Characterization Report by Foster and Wheeler (1997) as presented below. These areas of concern included the following:

<u>Area</u>	<u>Structures</u>	<u>Specific concern</u>
Lighthouse Area	Lighthouse, Foghorn Signal building, Oil House building and Paint Locker Building	Leaded paint, solvents fuel lines and fuel storage, other metals
Water Tower	Water Tower, Tram Car Shed, Demolished Housing, and Pump House	Leaded paint, debris, fuel lines and storage, other metals
Helipad	Helipad, Concrete Fuel Bunker, and Demolished Housing	Leaded paint, debris, fuel lines and fuel storage, other metals
Landing Dock	Wooden Dock structure and debris	Debris

These areas of concern are restricted to the western portion of Destruction Island and are shown on Figure 1. Specific areas of concern are detailed on Figures 2a and b, 3a and b, and 4a and b.

4. METHODS

This assessment was carried out according to the EA's workplan dated August 1999 which detailed the work and sampling plans at Destruction Island. Two trips to Destruction Island were necessary to complete the proposed workplan. The first trip on September 9, 1999 was

performed in conjunction with the Coast Guards maintenance flight to the island. The second visit was completed by contract OSA helicopter on October 27, 1999 during a period of high winds and rain that limited fieldwork.

4.1 ASBESTOS SURVEY

An asbestos survey was performed on all site structures and demolished housing debris. Bulk samples were collected of suspected asbestos containing materials (ACM) to document the form and concentration of asbestos. For each homogeneous material noted, at least one representative sample or multiple samples were collected. Samples were collected in accordance with the requirements of 40 CFR 763.86. Collecting tools were wiped clean to prevent cross contamination of subsequent samples after each sample was obtained. Samples were placed in puncture-proof sample collection bags, immediately sealed and labeled. Time, date, sample location, and sample conditions were recorded for each sample.

Bulk samples were sent to NVL Laboratories, Inc. (NVL) in Seattle, Washington for laboratory analyses. Samples were examined under a stereoscopic microscope, and fibrous materials were analyzed for content and morphology. Analysis of the samples was conducted using polarized light microscopy by comparing the quantity of non-asbestos material with the asbestos fibers. A copy of the sampler's current certification as an AHERA building inspector is presented in Appendix A.

4.2 LEAD-BASED PAINT SURVEY

Samples were collected by removing paint layers down to the substrate with hand tools such as razor blades and scraping knives. Approximately one square inch of paint was removed for each sample. Samples were collected in puncture proof plastic bags and labeled appropriately. Samples were analyzed for Total Lead by EPA Method 7420 by NVL. Initially a hand held X-Ray fluorescence spectrum analyzer manufactured by Niton was to check for the presence of lead. However, the equipment malfunctioned during the investigation and none of the data collected was valid.

4.3 SURFACE SOIL SAMPLES

Samples were collected from the upper 6 inches of soil at the four areas of concern. These samples were collected utilizing either hand auger techniques or a trowel. All sampling equipment was cleaned between each sampling location by washing with detergent, followed by bottled water and distilled water rinses to prevent cross contamination.

4.4 SUBSURFACE SOIL SAMPLES

Subsurface soil samples were collected from approximately five feet below ground surface around the former fuel storage bunker utilizing manually operated hand auger equipment. The auger was decontaminated as described above between each boring location.

5. RESULTS

5.1 ASBESTOS SURVEY

None of the twelve suspect asbestos samples (A-1 through A-12) collected were reported to contain greater than one-percent asbestos. Only material containing greater than 1 percent asbestos is regulated as ACM. Locations of the asbestos samples are shown on Figures 2b, 3b, and 4b. Fewer than expected asbestos samples were collected because of the brick and wood construction of the buildings. In addition, the Fog Signal Building had also been remodeled and older sections of the building were inaccessible. Table 1 summarizes the results of the laboratory analyses. Laboratory analytical results are presented in Appendix A.

5.2 LEAD-BASED PAINT SURVEY

Results of the lead based paint survey indicate six of the seven samples contained lead concentrations above HUD regulatory guidelines for residential housing of 5,000 parts per million (ppm). Samples that exceeded HUD guidelines include:

- Sample L-20 from the Pump House
- Sample L-23 from the Lighthouse interior
- Sample L-24 and L-25 from the Water Tower
- Sample L-26 from the Tram Car Shed

Laboratory-reported lead analyses for paint samples are summarized in Table 1. Locations of paint samples are shown on Figures 2b, 3b, and 4b. Analytical results are presented in Appendix A.

5.3 SURFACE SOIL SAMPLES

5.3.1 Lighthouse Area

The Lighthouse Area is at the extreme western portion of Destruction Island. This area consists of the lighthouse tower, Fog Signal building, Paint Locker, and Oil House building. A three-inch fuel line (reportedly) connects to the Landing Dock area and a 2-inch fuel line connects to the concrete bunker in the Helipad area. The remnants of two former above ground storage tanks (reportedly) were observed to the north of the Oil House building. The Oil House building now contains a generator for lighthouse use. The former Paint Locker is now used for Coast Guard storage, and the former Fog Signal building is now utilized as a crew quarters for maintenance visits by Coast Guard personnel. A concrete catch basin presently contains a large steel barrel for burning debris and a loosely constructed brick barbecue.

Soil sample locations for the Lighthouse Area are presented on Figure 2a, and analytical laboratory data is summarized on both Table 2 (numerical sample list) and Table 3 (samples listed by area). State of Washington Model Toxics Control Act (MTCA) cleanup levels are also presented at the bottoms of Tables 2 and 3 for comparison with analytical data obtained from the site. Analytical laboratory reports are presented in Appendix B.

Fog Signal Building (Photographs 1 and 2)—Surface soil samples L-1, L-2, L-3, P-37, P-51, P-53 and P-54 contained levels of lead above MTCA Method A cleanup levels that ranged from

301 milligram per kilogram (mg/kg) (Sample P-53) to 4,910 mg/kg (Sample L-3). Samples P-36 and P-38 collected at a depth of 1-foot below ground surface had lower lead concentrations of 141 mg/kg and 29.5 mg/kg, respectively. Surface soil samples P-37 and P-39 collected approximately 6-feet from the Fog Signal building also had lead concentrations above state cleanup levels of 621 mg/kg and 463 mg/kg, respectively. The only other metal concentration above state cleanup levels in the Fog Signal Building Area was a cadmium concentration of 3.32 mg/kg detected in sample P-52.

Samples P-51 and P-54 were collected beneath the outlets of drainpipes behind the Fog Signal Building. Both samples contained lube oil-range petroleum hydrocarbons above state cleanup levels that were 5,930 mg/kg and 596 mg/kg, respectively. No obvious staining of soils or odors were noted in the field at either sample location. Samples P-51 and P-38 contained diesel range petroleum concentrations above state cleanup levels.

Paint Locker Building (Photograph 3)—Surface soil samples L-4, L-5, and P-6 collected around the Paint Locker Building contained 6,990 mg/kg, 1,500 mg/kg, and 692 mg/kg of lead, respectively. Sample P-7 collected at a depth of 1-foot below ground surface had a relatively low concentration of 238 mg/kg. The only other metal concentration in the Paint Locker Building Area above state cleanup levels was a cadmium concentration of 2.65 mg/kg in sample P-6.

Samples P-6 and P-7 were collected at depths of 0.5 and 1.0 feet, respectively, and contained diesel- and lube oil-range petroleum above state cleanup levels. Sample P-6 was collected near the southwest corner of the building and had a diesel-range petroleum concentration of 271 mg/kg and a lube oil range concentration of 256 mg/kg. Sample P-7 was collected on eastside of the building beneath a drainpipe and had a diesel range petroleum concentration of 280 mg/kg and a lube oil range concentration of 884 mg/kg.

Oil House Building (Photograph 3)—Surface soil samples L-9 and P-5 collected around the Oil House Building contained lead concentrations above state cleanup levels of 1,730 mg/kg and 755 mg/kg, respectively. The only other metal concentration above state cleanup levels in the Oil House Building Area was a cadmium concentration of 2.66 mg/kg in sample P-5.

Samples P-4 and P-5 collected at depths of 1.0 and 0.5 feet, respectively, contained diesel- and lube oil-range petroleum hydrocarbons above state cleanup levels.

Lighthouse Building and Area (Photograph 4)—Surface soil samples L-6, L-7, P-1, P-3, P-40, P-41, P-42, P-43, P-44, and P-45 collected around the Lighthouse House Building contained lead concentrations above state cleanup levels that ranged from 600 mg/kg (Sample P-1) to 14,700 mg/kg (Sample P-3). Arsenic concentrations above state cleanup levels were found in samples P-1, P-40, and P-41 that ranged from 45.5 mg/kg to 162 mg/kg. Cadmium concentrations above state cleanup levels were found in samples P-3, P-40, and P-41 at concentrations that ranged from 2.04 mg/kg to 20.2 mg/kg. Sample P-40 consisted of burned debris found inside the burn barrel (Photograph 5).

Samples P-1, P-3, P-40, P-41, P-48 and P-49 had diesel- and/or lube oil-range petroleum above state cleanup levels (Photograph 6). Sample P-1 was collected at the end of the 3-inch fuel line and had a diesel-range petroleum concentration of 277 mg/kg. Sample P-3 was collected along the fuel pipeline across from the Oil House and had a diesel range petroleum concentration of

1,360 mg/kg and a lube oil range concentration of 529 mg/kg. Samples P-48 and P-49 were collected along the fuel line that connected the Lighthouse Area to the concrete fuel bunker in the Heliport Area had levels of lube oil-range petroleum above state cleanup levels. Sample P-40 was collected in the burn barrel and had a diesel-range petroleum concentration of 1,030 mg/kg and a lube-oil range petroleum concentration of 5,490 mg/kg. Sample P-41 was collected along the fuel pipeline across from the Oil House and had a diesel range petroleum concentration of 1,110 mg/kg and a lube oil range concentration of 507 mg/kg.

Former AST Locations (Photograph 2)—Surface soil sample P-46 collected around what appears to be a former AST foundation contained lead above state cleanup levels of 1,530 mg/kg. Arsenic was also above state cleanup levels in samples P-8 and P-46 and ranged from 22 mg/kg to 450 mg/kg, respectively. Cadmium was found in sample P-46 above state cleanup levels (3.23 mg/kg). Surface soil sample P-46 contained diesel- and lube-oil range petroleum above state cleanup levels.

5.3.2 Water Tower Area

The Water Tower area is on the eastern portion of the site and consists of the Water Tower, demolished housing, the Tram Car Shed, footing for a former AST and the Pump House. Two fuel lines were observed that connected the AST to the former housing area and another larger fuel line was observed that connected the AST to the concrete fuel bunker in the Helipad area. The pump house was located over a spring at the base of the bluff north of the Water Tower area and presumably pumped spring water up to Water Tower and cisterns located in the area. An area identified on the Foster Wheeler report as a garbage dump area was located west of the pump house along the bluff.

Soil sample locations for the Water Tower Area are presented on Figure 3a, and analytical laboratory data is summarized on both Table 2 (numerical sample list) and Table 3 (samples listed by area). State of Washington Model Toxics Control Act (MTCA) cleanup levels are also presented at the bottoms of Tables 2 and 3 for comparison with analytical data obtained from the site. Analytical laboratory reports are presented in Appendix B.

Tram Car Shed (Photograph 7)—Surface soil samples L-10, L-11 and P-31 collected around the Tram Car Shed contained lead above state cleanup levels ranging from 2,140 mg/kg to 5,080 mg/kg.

Demolished Housing Area (Photograph 8)—Surface soil samples L-14, L-15, L-16, P-15, P-16, P-18, and P-20 collected in and around the Demolished Housing Area contained lead above state cleanup levels that ranged from 312 mg/kg (Sample P-20) to 51,200 mg/kg (Sample P-15). Cadmium above state levels was found in samples P-15 and P-16 at concentrations of 12.6 mg/kg to 3.9 mg/kg, respectively.

Former AST Area (Photograph 9)—Surface soil samples L-17, P-22, and P-24 collected around a former AST area contained lead above state cleanup levels that ranged from 1,040 mg/kg (Sample P-22) to 2,100 mg/kg (Sample L-17). Cadmium above state cleanup levels was found in samples P-23 and P-24 at concentrations of 2.31 mg/kg to 2.43 mg/kg, respectively.

Surface soil sample P-14 contained diesel-range concentration above state cleanup levels of 1,160 mg/kg.

Water Tower Building Area (Photograph 10)—Surface soil samples L-12, L-13, P-27, P-28, and P-29 collected around Water Tower Building area contained lead above state cleanup levels that ranged from 265 mg/kg (Sample P-28) to 4,450 mg/kg (Sample L-13). Arsenic, cadmium and petroleum hydrocarbon analyses were not conducted on soils in the water tower building area.

Pump House Building Area (Photograph 12)—A surface soil sample (P-55) from the pump house building contained a lead concentration of 554 mg/kg, which is above state cleanup levels. Arsenic, cadmium and petroleum hydrocarbon analyses were not conducted on soils in the pump house building area.

5.3.3 Heliport Area (Photograph 11)

The Heliport Area consists of interlocking metal grating used as a landing zone, a concrete fuel bunker for storing fuel for heating and generator use, and two demolished buildings. A fuel line from the landing dock connects to the fuel bunker and an out going line splits and connects to the Oil House (generator) in the Lighthouse area and an AST near the demolished housing in the Water Tower Area.

Soil sample locations for the Heliport Area are presented on Figure 4a, and analytical laboratory data is summarized on both Table 2 (numerical sample list) and Table 3 (samples listed by area). Analytical laboratory reports are presented in Appendix B.

Demolished Housing—Surface soil samples L-18, L-19, and P-33 collected around demolished housing contained elevated lead concentrations of 32,200 mg/kg, 3,380 mg/kg, and 6,140 mg/kg, respectively. Sample P-35 contained a lead concentration of 126 mg/kg. Arsenic and cadmium concentrations in sample P-33 were 6.43 mg/kg and 6.08 mg/kg, respectively.

Analytical results for petroleum hydrocarbons indicate that surface soil samples P-33 and P-34 contained diesel-range petroleum concentrations of 88.7 mg/kg and 105 mg/kg, respectively. Lube oil-range petroleum concentrations for sample P-33 and P-34 were ND and 29.9 mg/kg.

Fuel Bunker Area—Subsurface soil samples P-11, P-12 and P-50 collected at depths of approximately 4.5 feet contained diesel-range petroleum concentrations of 143 mg/kg, 171 mg/kg and 1,520 mg/kg, respectively. Lube oil-range petroleum concentrations for samples P-11, P-12 and P-50 were ND, 25.5 mg/kg and 159 mg/kg. No metals analyses were conducted on these samples.

Fuel Pipeline Samples—Surface soil sample P-10 collected along the fuel pipeline in the Heliport Area contained arsenic, cadmium and lead concentrations of 3.74 mg/kg, 0.669 mg/kg, and 41.7 mg/kg, respectively. Analytical results for petroleum hydrocarbons indicate that surface soil samples P-10, P-13, and P-32 contained diesel range petroleum concentrations of ND, 29.6 mg/kg and ND, respectively. Lube oil-range petroleum concentrations for samples P-10, P-13, and P-32 were 25.8 mg/kg, 188 mg/kg and ND, respectively. In general, the fuel pipeline at the site is either at or just below ground surface. The fuel pipeline that formerly connected the fuel bunker and the Lighthouse area was observed to still contain diesel fuel.

6. DISCUSSION

6.1 LIGHTHOUSE AREA

Lead

Elevated levels of lead found in surface soils in the Lighthouse area are presumably the result of weathering leaded paint. Intense winter storms at this location have probably washed or blown lead-based paint chips off building walls a considerable distance from the building. To delineate the extent of elevated lead, additional samples were collected farther away and deeper than the previous sample location. For instance at the Fog Signal Building, surface soil sample L-2 contained a lead concentrations of 845 mg/kg, and in the same location at one foot in depth, sample P-36 contained a lead concentration of 141 mg/kg. Surface soil sample P-37 was collected six feet away from sample location L-2 and contained a lead concentration of 621 mg/kg. This relationship suggests that lead is concentrated in the upper foot of soil in the vicinity of the buildings. Samples P-1 and P-3 contained elevated lead levels and are approximately 200 feet and 75 from the lighthouse, respectively, which indicates that lead paint may have impacted at relatively large area.

Cadmium

The elevated cadmium concentration detected in sample P-51 was from a soil sample collected beneath a 2-inch PVC drainpipe outlet from the Fog Signal Building. Additional samples would have to be collected and analyzed to assess the limit of cadmium contamination in this area. Other areas such as the Paint Locker, Oil House Building, the Burn Barrel, the Fuel line near the lighthouse and the former AST location all contained elevated levels of cadmium which may be due to past disposal practices.

Arsenic

Areas such as the Burn Barrel, the Fuel line near the Lighthouse and the former AST location contained elevated levels of arsenic that may be due to past agricultural practices on the island. Additional samples would be required to ascertain to lateral and vertical limits of arsenic in soils in these areas.

Other Metals

No elevated levels of silver, barium, chromium, mercury, or selenium were found in the Lighthouse Area.

Diesel and Lube Oil Range Petroleum

Elevated levels of either diesel and /or lube oil range petroleum were detected at the Fog Signal, Paint Locker, Oil House buildings, and along the fuel line in the Lighthouse Area. The petroleum hydrocarbon contaminated soil may be due to past leaks or spills in the fuel line and/or poor fuel handling practices.

Lead-based Paint

An elevated concentration of lead was present in paint sample L-23 collected from the Lighthouse interior. Two other samples (L-21 and L-22) did not contain elevated levels of lead in paint samples collected from the Lighthouse interior.

Asbestos

No ACM was detected in the Lighthouse area.

6.2 WATER TOWER AREA

Lead

Elevated lead concentrations were found in surface soil samples around the tramcar shed. Samples collected at a depth of one foot contained much lower lead concentrations indicating the lead may be restricted to surface soils. Surface soil sample P-31 collected six feet from the tramcar shed also contained elevated concentrations of lead suggesting that weathered lead paint chips from the tramcar shed and other buildings in the area have been mechanically removed to at least that distance. Another building probably existed in the tram car shed area. Surface soil sample L-10 was collected adjacent to a former concrete foundation and contained an elevated concentration of lead.

Elevated levels of lead were also detected in samples from the demolished housing in the Water Tower Area. The samples consisted of burned wood, brick and other debris inside the former house foundations. There is probably a concrete bottom to each former house that acts as containment for the debris. However, we did not detect the floor of the foundation. Sample P-15 contained a lead concentration of 51,200 mg/kg and was collected in native soil at a depth of one foot just west of the demolished building foundation. The soil in the vicinity of the former AST Area, the Pump House, and the Water Tower contained elevated lead concentrations. Samples P-26 and P-28 collected at a depth of one foot near the water tower suggest that lead concentrations may be restricted to surface soils in this area.

Arsenic

No elevated levels of arsenic were found in the Water Tower Area.

Cadmium

Elevated levels of cadmium were detected in samples from the demolished housing debris and the former AST Area and may be related to building material composition and past fuel handling practices.

Diesel and Lube Oil Range Petroleum Hydrocarbons

An elevated level of diesel range petroleum was found in sample P-14 at the former AST location in the Water Tower area. This contamination may be due to past fuel handling and storage practices.

Other Metals

No elevated levels of other metals were found in the Water Tower Area.

Lead-based Paint.

Elevated concentrations of lead in paint samples were present on the Water Tower, Tram Car Shed, and Pump Station. This suggests that lead-based paint was applied to these structures.

Asbestos

No asbestos containing building materials were found in housing debris samples in the Water Tower area.

Former Garbage Dump

Island residents previously used an area north of the Water Tower as a garbage dump. Household wastes and other debris were reportedly dumped on the steep slope above the beach for disposal (Foster and Wheeler, 1997). This area is now covered with thick, hummocks of grass covering loose soils and is very unstable. No samples were collected at this area due to slope instability and lack of observable wastes. Further inspection of the area should include additional safety precautions such as ropes and harnesses for field personnel.

6.3 HELIPORT AREA

Lead

Elevated levels of lead were detected in demolished housing debris in the Heliport Area. An elevated concentration of lead was not present in surface soil sample P-35 that was collected adjacent to a former house location. Additional lead testing of surface soils around the former house locations will be necessary to determine the extent of lead impact in this area.

Cadmium

Sample P-33 collected in housing debris contained an elevated cadmium concentration of 6.08 mg/kg. Additional cadmium testing of demolition debris is necessary to determine the extent of cadmium impact in this area.

Arsenic and other metals

No elevated levels of arsenic or other metals were found in housing debris or surface soil samples in the Heliport Area.

Diesel and Lube Oil Range Petroleum

An elevated level of diesel range petroleum was found only in sample P-50 at the Fuel Bunker location at a depth of approximately 4.5 feet. Additional petroleum impacted soil may be underneath the fuel bunker but the hand auger was inadequate to reach a depth below the bottom to the fuel bunker. Machine-operated auger equipment would be necessary to drill 10 to 15 feet below ground surface to completely assess subsurface conditions in this area.

Lead-based Paint

Paint samples were not collected in the Heliport area.

Asbestos

No asbestos containing building materials were found in housing debris samples in the Heliport area.

Liquid-phase petroleum Hydrocarbons

Liquid-phase petroleum hydrocarbons (LPH) were observed in the concrete bunker which appeared to have an estimated 0.1-inch of diesel fuel floating on approximately one foot of water. The approximately 500 gallons of diesel fuel in the concrete bunker could most efficiently be treated in place with commercially available bioremediation compounds such as Aquazyme or similar off-the-shelf treatment compounds. In addition, LPH was observed inside a small hole drilled in the fuel line that formerly connected the Lighthouse and fuel. A screw was used to plug the hole afterwards.

6.4 LANDING DOCK AREA

No samples were collected from Landing Dock area materials. Wood planking, pipes, cables and other debris were observed and represent a physical hazard (Photographs 14 and 15).

7. SUMMARY AND CONCLUSIONS

This assessment has the following conclusions:

Elevated concentrations of lead are present in soil around each of the buildings or former buildings at the site. Further, the results indicate that lead concentrations decrease with depth but may occur laterally over a significant area away from the structures.

Elevated cadmium concentrations were encountered at the following locations:

- beneath the Fog Signal drainpipe,
- in front of the Paint Locker and Oil House buildings,
- the former AST locations,
- demolished housing in the Water Tower and Heliport areas,
- the Lighthouse building area.

These elevated levels suggest the weathering of cadmium-rich paint or that the disposal of cadmium containing substances occurs in these areas.

Elevated arsenic concentrations were found in the following areas:

- The fuel pipeline near the Fog Signal building
- In and adjacent to the burn barrel; and
- Former AST locations near the Paint Locker

These elevated levels of arsenic suggest that that the locations may have been utilized in the past to store or dispose of arsenic containing substances such as herbicides.

Elevated levels of petroleum hydrocarbon concentrations were found at the following locations:

- Behind the Fog Signal Building
- Around the Paint Locker and Oil House buildings
- Along the fuel pipeline
- In and adjacent to the burn barrel
- Adjacent to the valve box at the former Fuel Bunker
- Beneath the former AST locations

These elevated levels of diesel and lube oil-range petroleum hydrocarbons suggest that past leaks or spills may have occurred in the fuel lines, AST locations, or the former fuel bunker. Elevated levels of petroleum hydrocarbons at the Fog Signal, Paint Locker and Oil House buildings as well as the burn barrel suggest that these locations may have been utilized in the past to store or dispose of petroleum containing substances.

8. RECOMMENDATIONS

The elevated concentrations of lead, cadmium, arsenic and petroleum hydrocarbons detected in the soil were compared to Washington State Model Toxics Control Act (MTCA) Method A Cleanup Levels which are the standards for routine sites and are based on a variety of protection factors including human health and the environment. Recent proposed amendments to the MTCA Cleanup Regulation (WAC 173-340) contain ecological indicator concentrations for various hazardous substances are considered protective of wildlife and plants. If these values were applied to this site the petroleum hydrocarbon-contaminated soil would not exceed the cleanup threshold values. Although lead, cadmium, and arsenic concentrations would exceed each of the respective threshold values in many instances.

Additional investigation to determine the ecological risk to wildlife relative to lead, cadmium, arsenic, and petroleum hydrocarbon contamination found at the site is advisable to assess remedial alternatives. It would be prudent to conduct additional sampling and analyses to delineate the lateral extent of metals in soils in the vicinity of existing buildings and former building areas. Also, if available, a detailed historic map of the island should be obtained to insure that all former structures or facilities have been assessed.

9. REMEDIATION AND REMOVAL COSTS

A preliminary cost estimate for remediation and removal of hazardous materials and demolition debris is provided below. These costs are based on information from this assessment and should be considered as only a first order approximation if hazardous materials and debris were cleaned up at this time. Additional investigation and analyses (especially ecological risk assessment) may greatly reduce or eliminate the need to remediate soils at the site, however; demolished housing and other structural debris remain for disposal. Approximate costs for each of the remedial approaches are provided in Appendix C.

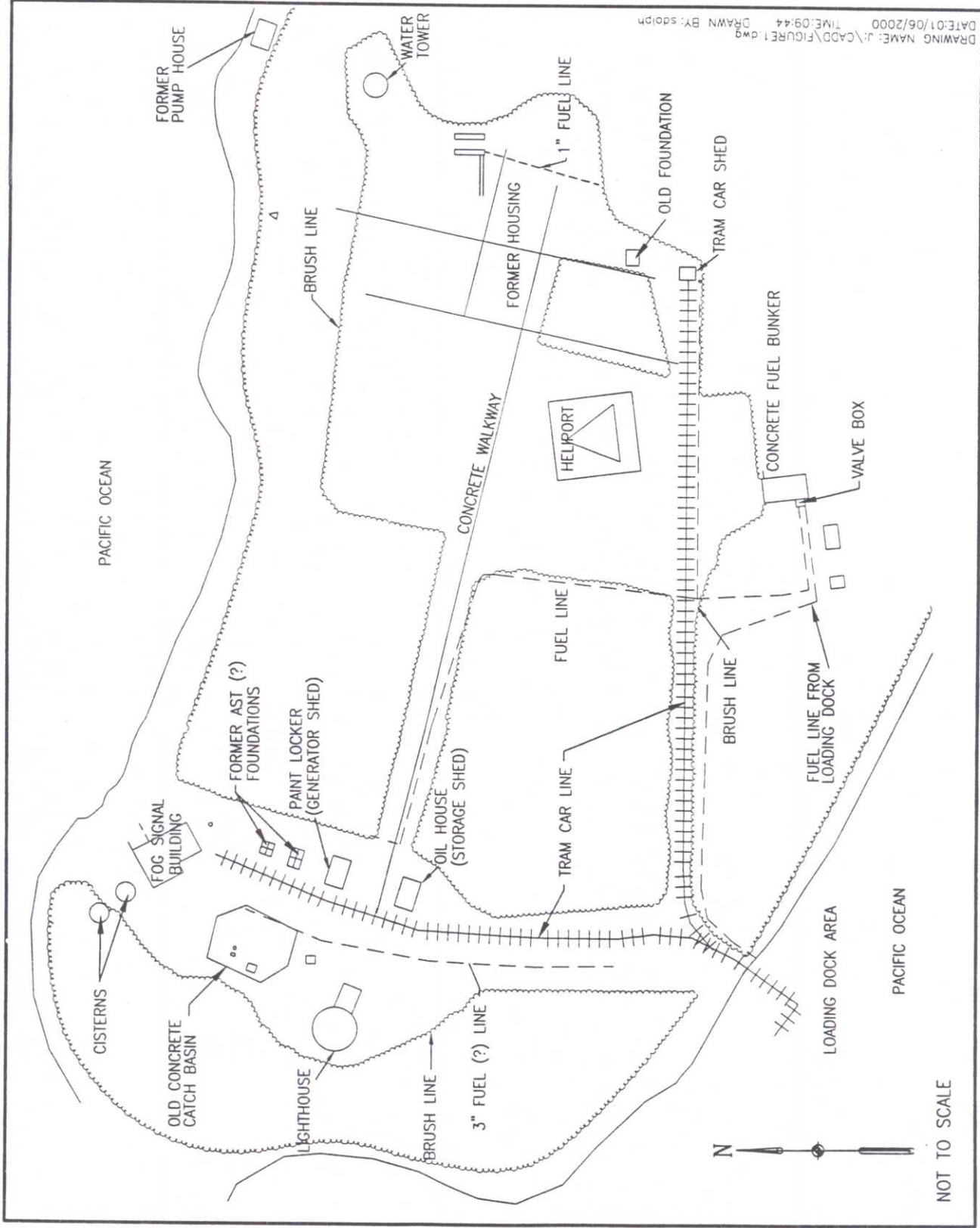
<u>Remedial Approach</u>	<u>Duration</u>	<u>Approximate Cost</u>
1) Soil and Debris Removal	30 days	\$829,000
2) Soil and Debris Burial	45 days	\$426,000
3) Lead-Based Paint Abatement (Existing buildings)	45 days	\$250,000
4) Building Demolition	30 days	\$150,000

10 REFERENCES

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 DATE: 01/06/2000
 TIME: 09:44
 DRAWN BY: sdolpn

Figure 1. Western Portion of Destruction Island, Washington



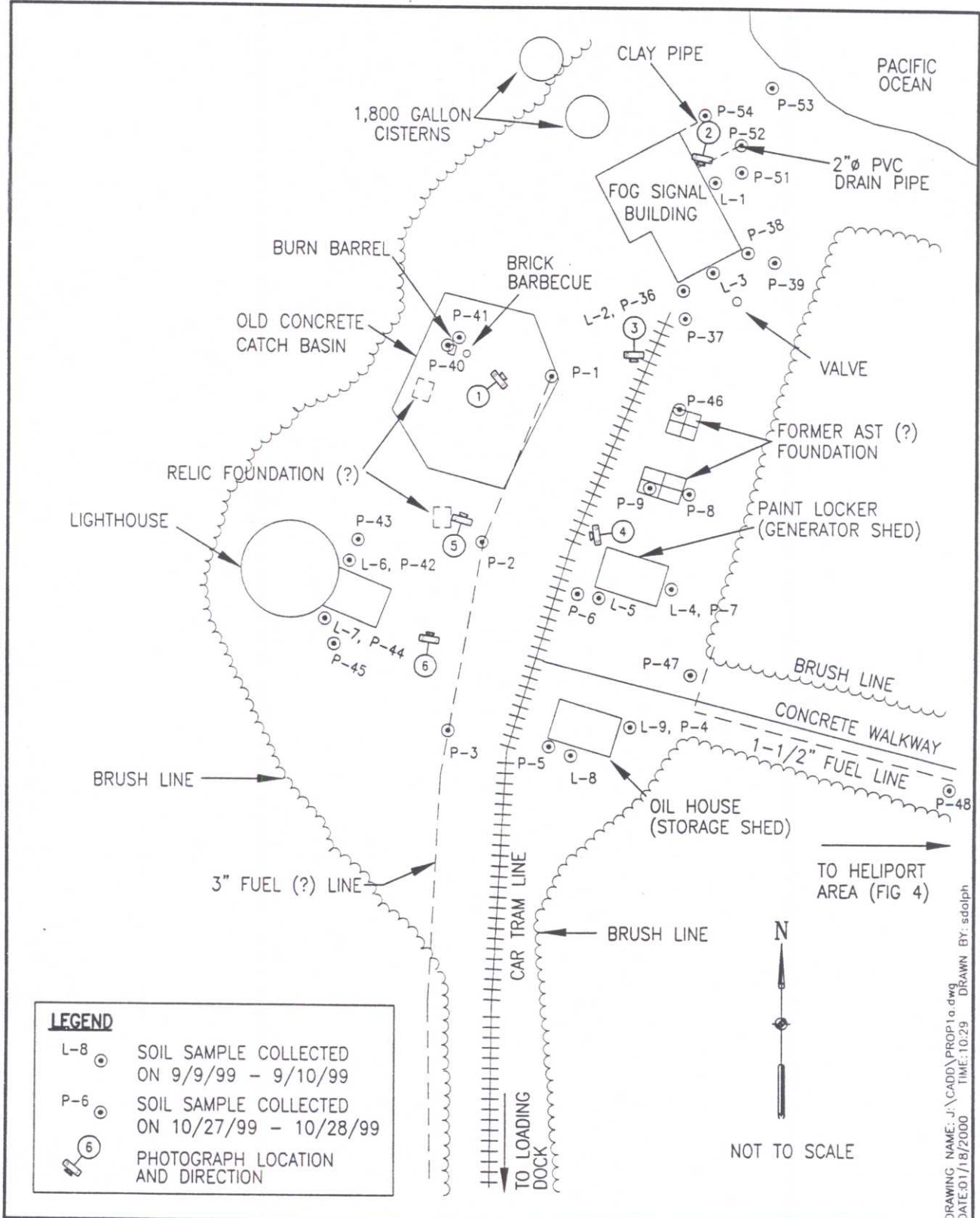
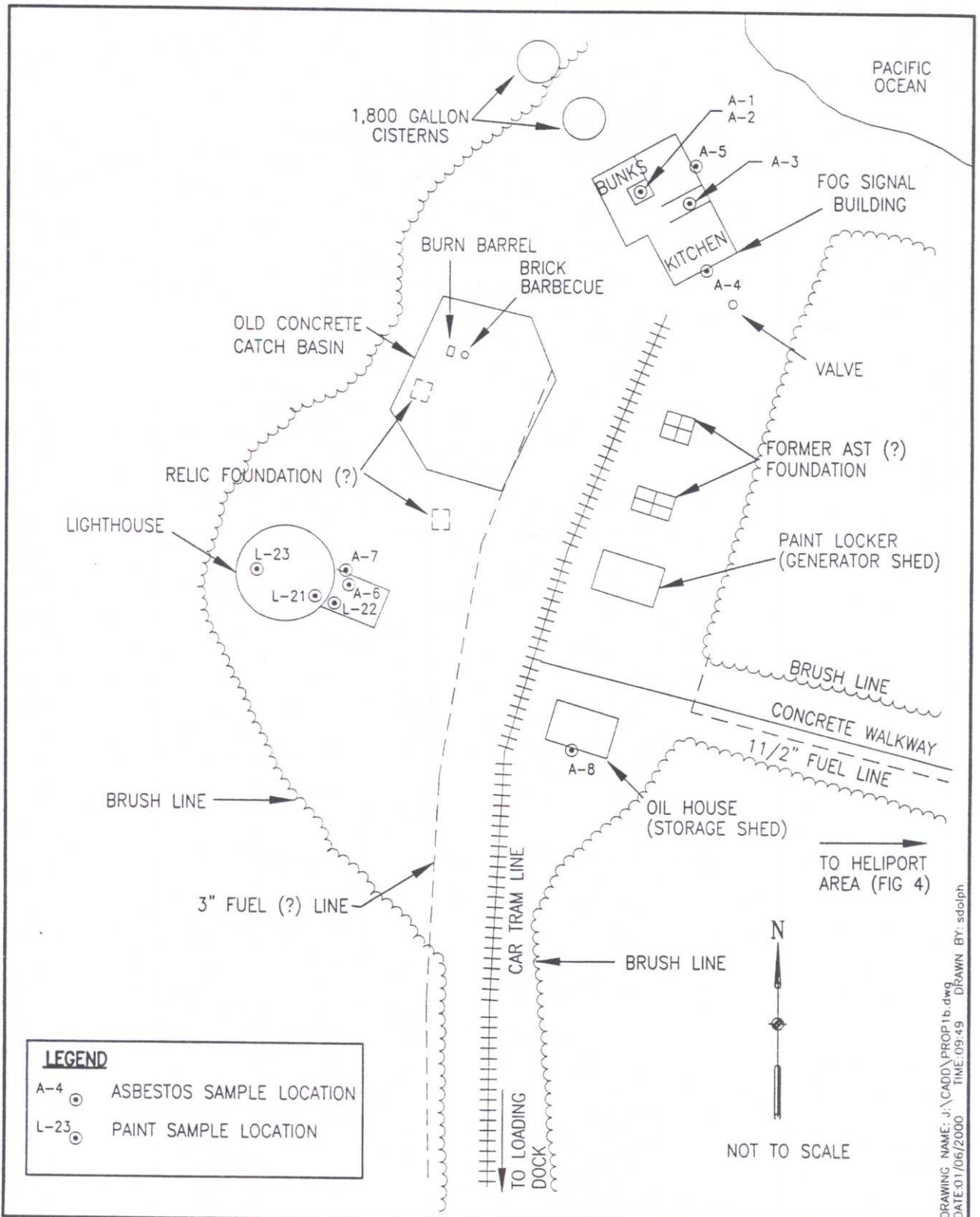


Figure 2a. Soil Sample Locations - Lighthouse Area





DRAWING NAME: j:\CADD\PROP1.b.dwg
 DATE: 01/06/2000
 TIME: 09:49
 DRAWN BY: sdolph

Figure 2b. Asbestos and Paint Sample Locations - Lighthouse Area



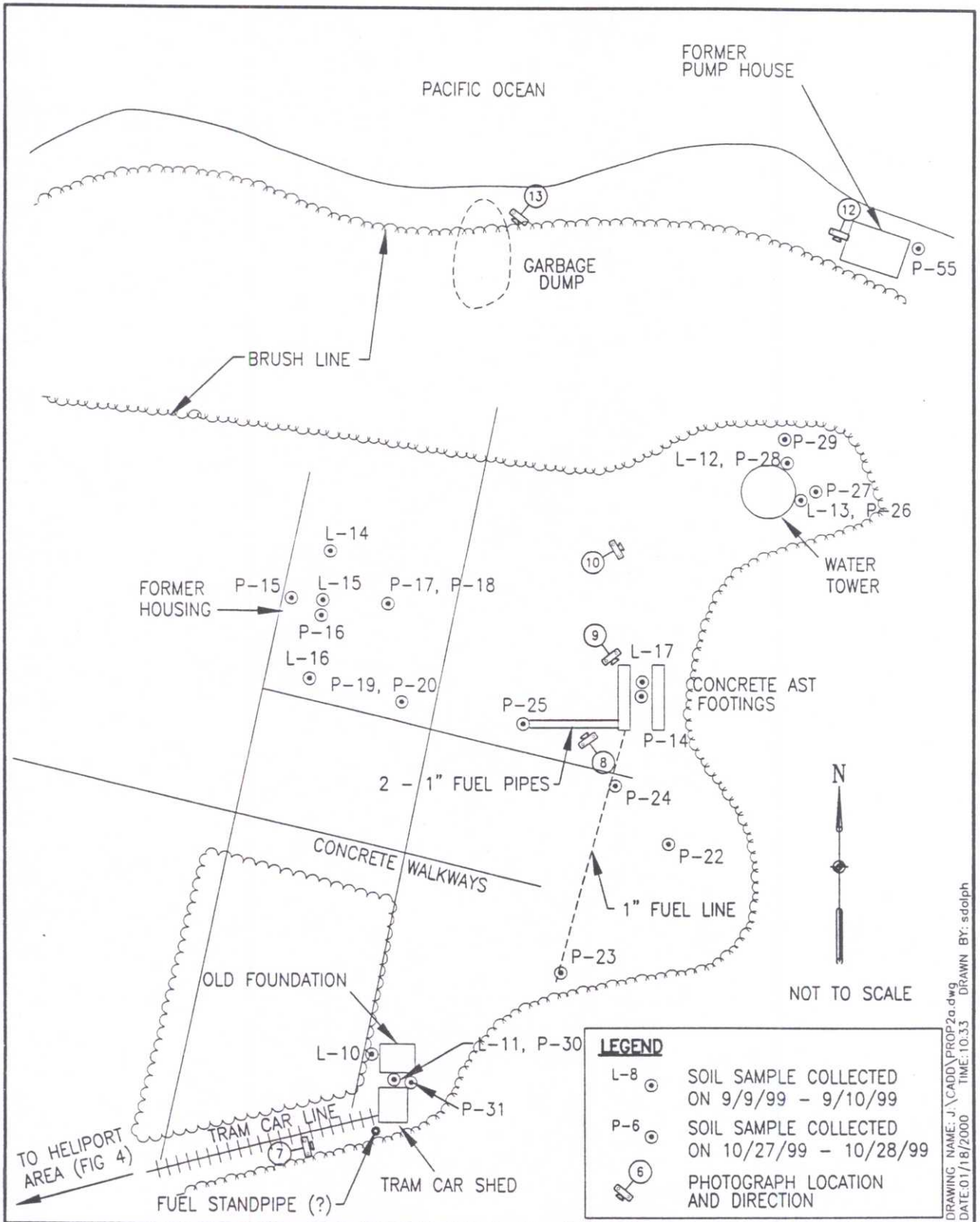
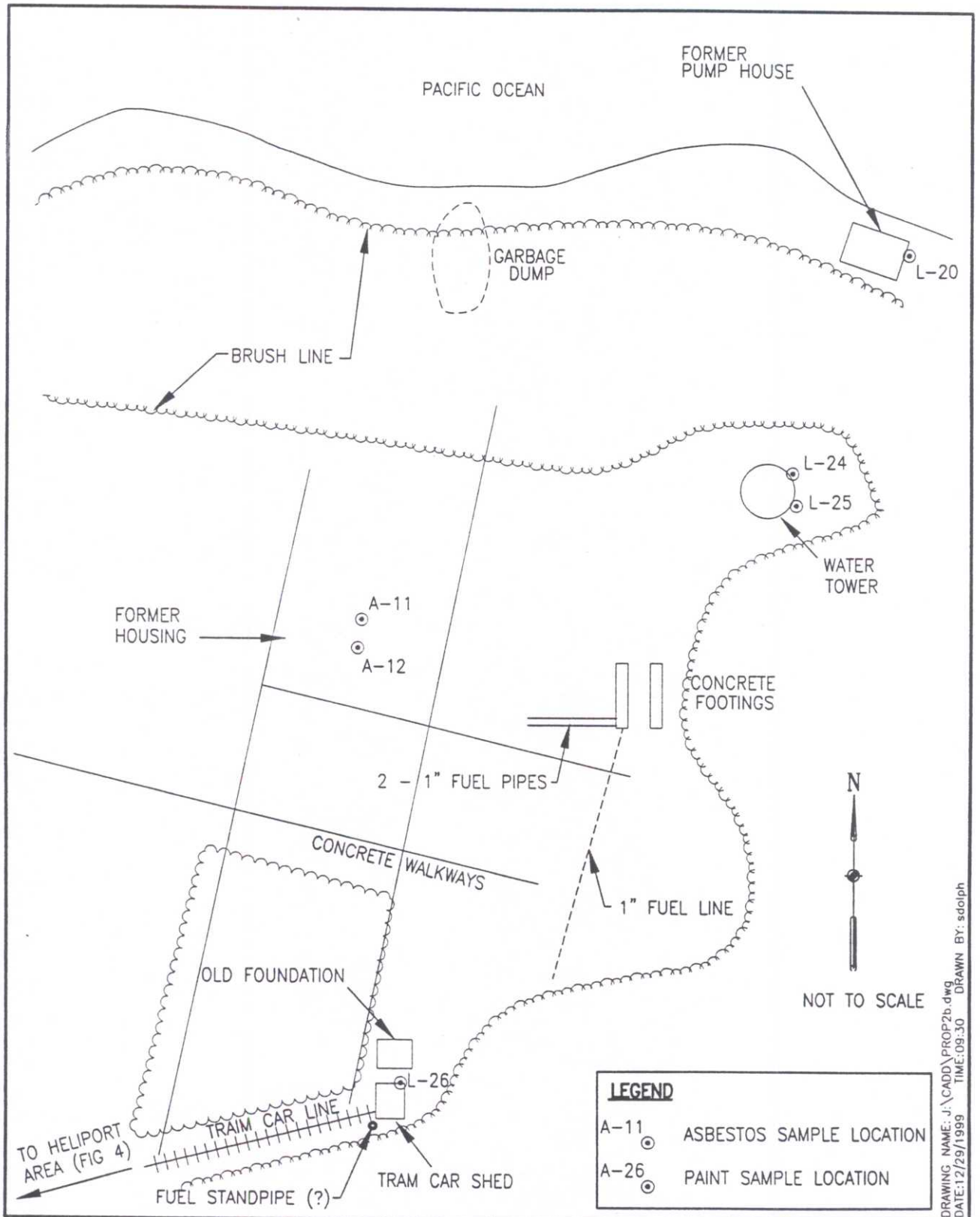


Figure 3a. Soil Sample Location - Water Tower Area



DRAWING NAME: J:\CADD\PROP2a.dwg
 DATE: 01/18/2000
 TIME: 10.33
 DRAWN BY: sdolph



DRAWING NAME: J:\CADD\PROP2b.dwg
 DATE: 12/29/1999
 TIME: 09:30
 DRAWN BY: sdolph

Figure 3b. Asbestos and Paint Sample Locations - Water Tower Area



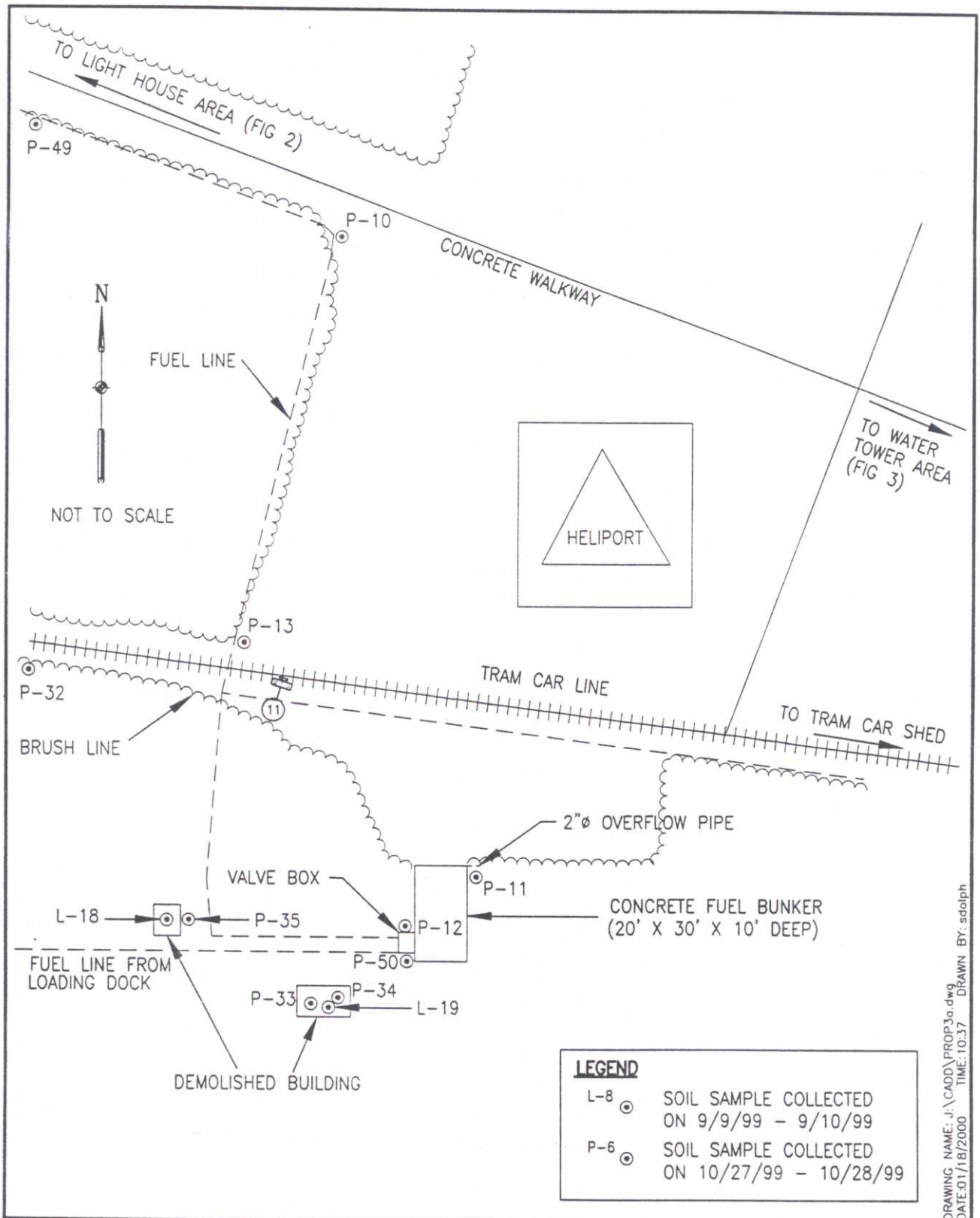


Figure 4a. Soil Sample Locations - Heliport Area



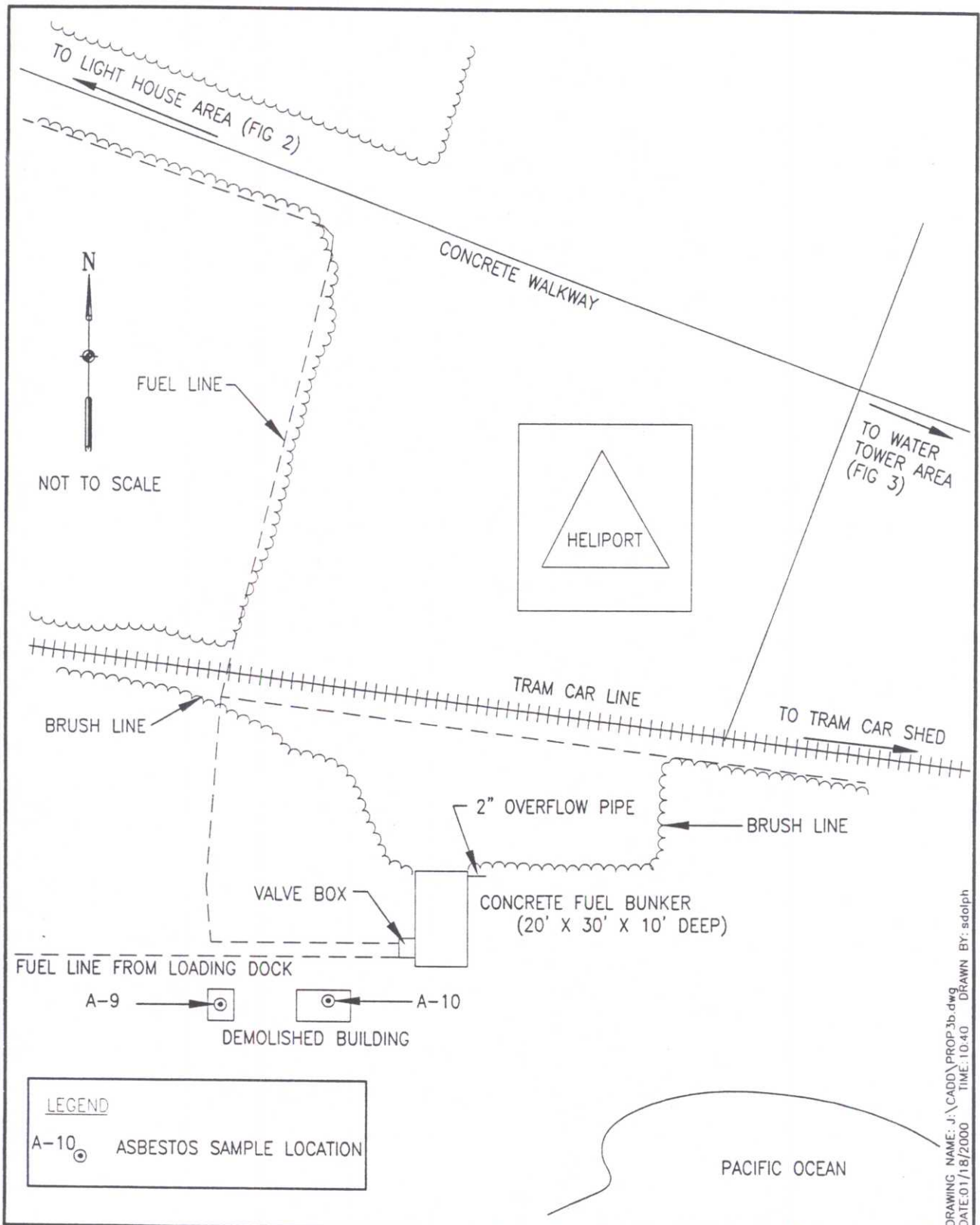


Figure 4b. Asbestos and Paint Sample Locations – Heliport Area



Table 1

**Analytical Results: Paint and Suspect Asbestos Containing Materials Samples
Destruction Island, Washington
EA # 61074.21**

Sample No.	Date	Asbestos (%)	Lead (ppm)	Location
L-20	9-Sep-99	-	27,000	Pump Station
L-21	9-Sep-99	-	610	Lighthouse-interior
L-22	9-Sep-99	-	<80	Lighthouse-interior
L-23	9-Sep-99	-	39,000	Lighthouse-interior
L-24	9-Sep-99	-	130,000	Water Tower
L-25	9-Sep-99	-	150,000	Water Tower-Door
L-26	9-Sep-99	-	230,000	Tram Car Shed
A-1	8-Sep-99	ND	-	Fog Signal Bldg.
A-2	8-Sep-99	ND	-	Fog Signal Bldg.
A-3	8-Sep-99	ND	-	Fog Signal Bldg.
A-4	8-Sep-99	ND	-	Fog Signal Bldg.
A-5	8-Sep-99	ND	-	Fog Signal Bldg.
A-6	8-Sep-99	ND	-	Lighthouse-interior
A-7	8-Sep-99	ND	-	Lighthouse-interior
A-8	8-Sep-99	ND	-	Storage Building
A-9	8-Sep-99	ND	-	Helipad Area
A-10	8-Sep-99	ND	-	Helipad Area
A-11	8-Sep-99	ND	-	Water Tower Area
A-12	8-Sep-99	ND	-	Water Tower Area
HUD-Regulatory Limit		1%	5,000	N/A

Notes:

ppm=parts per million

- = not analyzed

Table 2
Analytical Results: Soil Samples
Destruction Island, Washington
EA # 61074.21

Sample No.	Date	Depth (feet)	NWTPH-Dx		Silver (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Mercury (mg/kg)	Lead (mg/kg)	Selenium (mg/kg)	Location
			Diesel (mg/kg)	Lube Oil (mg/kg)									
L-1	9-Sep-99	0.5	-	-	-	-	-	-	-	-	1,840	-	FS-LH
L-2	9-Sep-99	0.5	-	-	-	-	-	-	-	-	845	-	FS-LH
L-3	9-Sep-99	0.5	-	-	-	-	-	-	-	-	4,910	-	FS-LH
L-4	9-Sep-99	0.5	-	-	-	-	-	-	-	-	6,990	-	PL-LH
L-5	9-Sep-99	0.5	-	-	-	-	-	-	-	-	1,500	-	PL-LH
L-6	9-Sep-99	0.5	-	-	-	-	-	-	-	-	3,870	-	LH
L-7	9-Sep-99	0.5	-	-	-	-	-	-	-	-	5,010	-	LH
L-8	9-Sep-99	0.5	-	-	-	-	-	-	-	-	223	-	OH-LH
L-9	9-Sep-99	0.5	-	-	-	-	-	-	-	-	1,730	-	OH-LH
L-10	9-Sep-99	0.5	-	-	-	-	-	-	-	-	2,140	-	TCS-WT
L-11	9-Sep-99	0.5	-	-	-	-	-	-	-	-	5,080	-	TCS-WT
L-12	9-Sep-99	0.5	-	-	-	-	-	-	-	-	3,930	-	WT
L-13	9-Sep-99	0.5	-	-	-	-	-	-	-	-	4,450	-	WT
L-14	9-Sep-99	0.5	-	-	-	-	-	-	-	-	9,050	-	DH-WT
L-15	9-Sep-99	0.5	-	-	-	-	-	-	-	-	9,160	-	DH-WT
L-16	9-Sep-99	0.5	-	-	-	-	-	-	-	-	5,910	-	DH-WT
L-17	9-Sep-99	0.5	-	-	-	-	-	-	-	-	2,100	-	AST-WT
L-18	9-Sep-99	0.5	-	-	-	-	-	-	-	-	32,200	-	DH-HP
L-19	9-Sep-99	0.5	-	-	-	-	-	-	-	-	3,380	-	DH-HP
P-1	27-Oct-99	0.5	277	101	ND	45.5	116	1.77	41.5	0.126	600	1.3	LH
P-2	27-Oct-99	0.5	ND	25.2	-	-	-	-	-	-	-	-	LH
P-3	27-Oct-99	0.5	1,360	529	ND	10.8	224	20.2	30.1	0.166	14,700	1.34	LH
P-4	27-Oct-99	1	561	305	ND	4.79	33.1	0.57	25.1	0.162	206	1.16	OH-LH
P-5	27-Oct-99	0.5	231	1,530	ND	19.1	1,150	2.66	28	0.189	755	1	OH-LH
MTCA Method A or B			200	200	400	20	5,600	2	100	1	250	400	N/A

see notes on page 3

Table 2 (continued)

Sample No.	Date	Depth (feet)	NWTPH-Dx		Silver (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Mercury (mg/kg)	Lead (mg/kg)	Selenium (mg/kg)	Location
			Diesel (mg/kg)	Lube Oil (mg/kg)									
P-6	27-Oct-99	0.5	271	256	ND	8.36	179	2.65	2.65	0.153	692	0.595	PL-LH
P-7	27-Oct-99	1	280	884	ND	4.74	29.7	ND	25.9	0.193	238	1.4	PL-LH
P-8	27-Oct-99	0.5	87.7	110	ND	22	218	1.65	40.7	0.301	117	1.35	AST-LH
P-9	27-Oct-99	0.5	39.1	29.3	ND	5.3	40.4	ND	34.8	0.15	38.1	1.62	AST-LH
P-10	27-Oct-99	0.5	ND	25.8	ND	3.74	55.8	0.669	20	0.127	41.7	1.15	HP
P-11	27-Oct-99	4.5	143	ND	-	-	-	-	-	-	-	-	CC-HP
P-12	27-Oct-99	4.5	171	25.5	-	-	-	-	-	-	-	-	CC-HP
P-13	27-Oct-99	0.5	29.6	188	-	-	-	-	-	-	-	-	HP
P-14	27-Oct-99	0.5	1,160	124	-	-	-	-	-	-	-	-	AST-WT
P-15	27-Oct-99	0.5	-	-	1	14.8	586	12.6	27.8	0.17	51,200	3.08	DH-WT
P-16	27-Oct-99	0.5	ND	ND	1	17.4	1,690	3.9	34.8	ND	2,530	2.53	DH-WT
P-17	27-Oct-99	0.5	ND	ND	ND	3.97	53.7	ND	26.2	0.132	211	1.32	DH-WT
P-18	27-Oct-99	0.5	-	-	0.399	5.16	1.52	0.709	456	ND	1,380	1.22	DH-WT
P-19	27-Oct-99	0.5	ND	ND	ND	4.01	30.7	ND	34.6	0.246	10.9	1.61	DH-WT
P-20	27-Oct-99	0.5	-	-	ND	12.5	136	1.32	38.5	ND	312	0.963	DH-WT
P-21	27-Oct-99	0.5	-	-	-	-	-	-	-	-	-	-	DH-WT
P-22	27-Oct-99	0.5	11.2	ND	ND	5.65	291	1.29	25.3	0.161	1,040	1.11	DH-WT
P-23	27-Oct-99	0.5	ND	ND	ND	4.34	69.7	2.31	31.6	0.159	101	2.06	DH-WT
P-24	27-Oct-99	0.5	27	25.2	ND	2.91	790	2.43	19.2	0.154	1,670	1.09	DH-WT
P-25	27-Oct-99	0.5	11.7	45.5	ND	3.05	38.9	1.73	25.5	0.145	55.9	1.07	AST-WT
P-26	27-Oct-99	1	-	-	-	-	-	-	-	-	112	-	WT
P-27	27-Oct-99	0.5	-	-	-	-	-	-	-	-	1,000	-	WT
P-28	27-Oct-99	1	-	-	-	-	-	-	-	-	265	-	WT
P-29	27-Oct-99	0.5	-	-	-	-	-	-	-	-	609	-	WT
P-30	27-Oct-99	0.5	11.8	ND	ND	4.55	45.9	1.66	33	0.247	184	1.54	TCS-WT
P-31	27-Oct-99	0.5	-	-	-	-	-	-	-	-	4,200	-	TCS-WT
P-32	27-Oct-99	0.5	ND	ND	-	-	-	-	-	-	-	-	HP
P-33	27-Oct-99	0.5	88.7	ND	ND	6.43	561	6.08	14.3	ND	6,140	0.645	DH-HP
P-34	27-Oct-99	0.5	105	29.9	ND	11.7	402	5.98	27.7	ND	6.04	0.905	DH-HP
MTCA Method A or B			200	200	400	20	5,600	2	100	1	250	400	N/A

see notes on page 3

Table 2 (continued)

Sample No.	Date	Depth (feet)	NWTPH-Dx		Silver (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Mercury (mg/kg)	Lead (mg/kg)	Selenium (mg/kg)	Location
			Diesel (mg/kg)	Lube Oil (mg/kg)									
P-35	27-Oct-99	0.5	-	-	-	-	-	-	-	-	126	-	DH-HP
P-36	28-Oct-99	1	47.8	40.3	-	-	-	-	-	-	141	-	FS-LH
P-37	28-Oct-99	0.5	-	-	-	-	-	-	-	-	621	-	FS-LH
P-38	28-Oct-99	1	1,040	135	-	-	-	-	-	-	29.5	-	FS-LH
P-39	28-Oct-99	0.5	-	-	-	-	-	-	-	-	436	-	FS-LH
P-40	28-Oct-99	0.5	1,030	5,440	0.43	162	1,110	4.13	2.63	0.181	2,130	1.84	LH
P-41	28-Oct-99	0.5	1,110	507	0.49	118	170	2.04	236	ND	1,150	1.15	LH
P-42	28-Oct-99	1	-	-	-	-	-	-	-	-	2,720	-	LH
P-43	28-Oct-99	0.5	-	-	-	-	-	-	-	-	985	-	LH
P-44	28-Oct-99	1	-	-	-	-	-	-	-	-	3,130	-	LH
P-45	28-Oct-99	0.5	-	-	-	-	-	-	-	-	4,670	-	LH
P-46	28-Oct-99	0.5	1,520	2,450	0.789	450	299	3.23	37.3	ND	1,530	1.55	AST-LH
P-47	28-Oct-99	0.5	11.1	30.4	-	-	-	-	-	-	-	-	OH-LH
P-48	28-Oct-99	0.5	66.6	358	-	-	-	-	-	-	-	-	LH
P-49	28-Oct-99	0.5	44	274	-	-	-	-	-	-	-	-	LH
P-50	28-Oct-99	4.5	1,520	159	-	-	-	-	-	-	-	-	CC-HP
P-51	28-Oct-99	0.5	1,080	5,930	ND	15.8	70.7	1.59	39.5	0.188	350	0.387	FS-LH
P-52	28-Oct-99	0.5	-	-	ND	4.93	8.9	3.32	27.6	0.219	87.2	1.01	FS-LH
P-53	28-Oct-99	0.5	23.8	108	ND	5.16	41.2	1.47	23.9	0.271	301	1.07	FS-LH
P-54	28-Oct-99	0.5	103	596	ND	4.34	117	1.09	20.5	0.236	316	0.951	FS-LH
P-55	28-Oct-99	0.5	-	-	-	-	-	-	-	-	554	-	PH-WT
MTCA Method A or B			200	200	400	20	5,600	2	100	1	250	400	N/A

Notes:

mg/kg=milligrams per kilogram

- = not analyzed

N/A=not applicable

NWTPH-Dx = Northwest Total Petroleum Hydrocarbons Diesel Extended with Acid/Silica Gel Clean-up

Lead, Cadmium, Arsenic by EPA Method 6000/7000 Series Methods (reported detections above state clean-up levels)

Location abbreviations: FS= Fog Signal Bldg.; LH= Lighthouse Area ; PL= Paint Locker; OH= Oil House (Generator Shed);

TCS= Tram Car Shed; WT= Water Tower Area; DH= Demolished Housing;

AST= Above Ground Storage Tank; HP= Helipad Area; PH= Pump House

Table 3
Analytical Results: Soil Samples By Area
Destruction Island, Washington
EA # 61074.21

Sample No.	Date	Depth (feet)	NWTPH-Dx		Arsenic (mg/kg)	Cadmium (mg/kg)	Lead (mg/kg)
			Diesel (mg/kg)	Lube Oil (mg/kg)			
Lighthouse Area-Fog Signal Building							
L-1	9-Sep-99	0.5	-	-	-	-	1,840
L-2	9-Sep-99	0.5	-	-	-	-	845
L-3	9-Sep-99	0.5	-	-	-	-	4,910
P-36	28-Oct-99	1	47.8	40.3	-	-	141
P-37	28-Oct-99	0.5	-	-	-	-	621
P-38	28-Oct-99	1	1,040	135	-	-	29.5
P-39	28-Oct-99	0.5	-	-	-	-	436
P-51	28-Oct-99	0.5	1,080	5,930	15.8	1.59	350
P-52	28-Oct-99	0.5	-	-	4.93	3.32	87.2
P-53	28-Oct-99	0.5	23.8	108	5.16	1.47	301
P-54	28-Oct-99	0.5	103	596	4.34	1.09	316
Lighthouse Area-Paint Locker Building							
L-4	9-Sep-99	0.5	-	-	-	-	6,990
L-5	9-Sep-99	0.5	-	-	-	-	1,500
P-6	27-Oct-99	0.5	271	256	8.36	2.65	692
P-7	27-Oct-99	1	280	884	4.74	ND	238
Lighthouse Area-Oil House Building							
L-8	9-Sep-99	0.5	-	-	-	-	223
L-9	9-Sep-99	0.5	-	-	-	-	1,730
P-4	27-Oct-99	1	561	305	4.79	0.57	206
P-5	27-Oct-99	0.5	231	1,530	19.1	2.66	755
P-47	28-Oct-99	0.5	11.1	30.4	-	-	-
Lighthouse Building and Area							
L-6	9-Sep-99	0.5	-	-	-	-	3,870
L-7	9-Sep-99	0.5	-	-	-	-	5,010
P-1	27-Oct-99	0.5	277	101	45.5	1.77	600
P-2	27-Oct-99	0.5	ND	25.2	-	-	-
P-3	27-Oct-99	0.5	1,360	529	10.8	20.2	14,700
P-40	28-Oct-99	0.5	1,030	5,440	162	4.13	2,130
P-41	28-Oct-99	0.5	1,110	507	118	2.04	1,150
P-42	28-Oct-99	1	-	-	-	-	2,720
P-43	28-Oct-99	0.5	-	-	-	-	985
P-44	28-Oct-99	1	-	-	-	-	3,130
MTCA Method A Cleanup Level			200	200	20	2	250

Notes:

mg/kg= milligrams per kilogram

- = not analyzed

 Exceeds MTCA Method A or B Cleanup Levels

NWTPH-Dx =Semivolatile Petroleum Products by Northwest Total Petroleum Hydrocarbons

Diesel Extended with Acid/Silica Gel Clean-up

Lead, Cadmium, Arsenic by EPA Method 6000/7000 Series Methods

Table 3 (continued)

Sample No.	Date	Depth (feet)	NWTPH-Dx		Arsenic (mg/kg)	Cadmium (mg/kg)	Lead (mg/kg)
			Diesel (mg/kg)	Lube Oil (mg/kg)			
P-45	28-Oct-99	0.5	-	-	-	-	4,670
P-48	28-Oct-99	0.5	66.6	358	-	-	-
P-49	28-Oct-99	0.5	44	274	-	-	-
Lighthouse Area-Former AST Locations							
P-8	27-Oct-99	0.5	87.7	110	22	1.65	117
P-9	27-Oct-99	0.5	39.1	29.3	5.3	ND	38.1
P-46	28-Oct-99	0.5	1,520	2,450	450	3.23	1,530
Water Tower Area-Tram Car Shed							
L-10	9-Sep-99	0.5	-	-	-	-	2,140
L-11	9-Sep-99	0.5	-	-	-	-	5,080
P-30	27-Oct-99	1	11.8	ND	4.55	1.66	184
P-31	27-Oct-99	0.5	-	-	-	-	4,200
Water Tower Area-Demolished Housing							
L-14	9-Sep-99	0.5	-	-	9.6	-	9,050
L-15	9-Sep-99	0.5	-	-	11.2	-	9,160
L-16	9-Sep-99	0.5	-	-	10.7	-	5,910
P-15	27-Oct-99	1	-	-	14.8	12.6	51,200
P-16	27-Oct-99	1	ND	ND	17.4	3.9	2,530
P-17	27-Oct-99	1	ND	ND	3.97	ND	211
P-18	27-Oct-99	0.5	-	-	5.16	0.709	1,380
P-19	27-Oct-99	1	ND	ND	4.01	ND	10.9
P-20	27-Oct-99	0.5	-	-	12.5	1.32	312
Water Tower Area-AST Area							
L-17	9-Sep-99	0.5	-	-	-	-	2,100
P-14	27-Oct-99	0.5	1,160	124	-	-	-
P-22	27-Oct-99	0.5	11.2	ND	5.65	1.29	1,040
P-23	27-Oct-99	0.5	ND	ND	4.34	2.31	101
P-24	27-Oct-99	0.5	27	25.2	2.91	2.43	1,670
P-25	27-Oct-99	0.5	11.7	45.5	3.05	1.73	55.9
Method A Cleanup Level			200	200	20	2	250

Notes:

mg/kg= milligrams per kilogram

- = not analyzed

 Exceeds MTCA Method A or B Cleanup Levels

NWTPH-Dx =Semivolatile Petroleum Products by Northwest Total Petroleum Hydrocarbons

Diesel Extended with Acid/Silica Gel Clean-up

Lead, Cadmium, Arsenic by EPA Method 6000/7000 Series Methods

Table 3 (continued)

Sample No.	Date	Depth (feet)	NWTPH-Dx		Arsenic (mg/kg)	Cadmium (mg/kg)	Lead (mg/kg)
			Diesel (mg/kg)	Lube Oil (mg/kg)			
Water Tower Building Area							
L-12	9-Sep-99	0.5	-	-	-	-	3,930
L-13	9-Sep-99	0.5	-	-	-	-	4,450
P-26	27-Oct-99	1	-	-	-	-	112
P-27	27-Oct-99	0.5	-	-	-	-	1,000
P-28	27-Oct-99	1	-	-	-	-	265
P-29	27-Oct-99	0.5	-	-	-	-	609
Water Tower Area-Pump House							
P-55	28-Oct-99	0.5	-	-	-	-	554
Heliport Area-Demolished Housing							
L-18	9-Sep-99	0.5	-	-	-	-	32,200
L-19	9-Sep-99	0.5	-	-	-	-	3,380
P-33	27-Oct-99	0.5	88.7	ND	6.43	6.08	6,140
P-34	27-Oct-99	0.5	105	29.9	-	-	-
P-35	27-Oct-99	0.5	-	-	-	-	126
Heliport Area-Fuel Bunker							
P-11	27-Oct-99	4.5	143	ND	-	-	-
P-12	27-Oct-99	4.5	171	25.5	-	-	-
P-50	28-Oct-99	4.5	1,520	159	-	-	-
Heliport Area-Fuel Pipeline							
P-10	27-Oct-99	0.5	ND	25.8	3.74	0.669	41.7
P-13	27-Oct-99	0.5	29.6	188	-	-	-
P-32	27-Oct-99	0.5	ND	ND	-	-	-
Method A Cleanup Level			200	200	20	2	250

Notes:

mg/kg= milligrams per kilogram

- = not analyzed

 Exceeds MTCA Method A or B Cleanup Levels

NWTPH-Dx = Semivolatile Petroleum Products by Northwest Total Petroleum Hydrocarbons

Diesel Extended with Acid/Silica Gel Clean-up

Lead, Cadmium, Arsenic by EPA Method 6000/7000 Series Methods

Table 4: Proposed MTCA Changes

Compound	Present MTCA*	Proposed MTCA*		
		Plants	Soil Biota	Wildlife
Arsenic	20	10	60	132
Barium	5,600	500	-	102
Cadmium	2	4	20	14
Chromium	100	42	42	67
Lead	250	50	500	118
Mercury	1	0.3	0.1	5.5
Selenium	400	1	70	0.3
Silver	400	2	-	-

Notes:

* = all levels in mg/kg

Reference: Proposed Amendments; The Model Toxics Control Act; Cleanup Regulation; Chapter 173-340 WAC
Washington state Register Issue 99-22; Table 749-3; pp. 209-211.



Photograph 1: Fog Signal Building.



Photograph 2: Drain Line in Back of Fog Signal Building.



Photograph 3: Former AST Foundations, Paint Locker and Oil House (in background).



Photograph 4: Lighthouse.



Photograph 5: Burn Barrel (on left) in Old concrete Catch Basin.



Photograph 6: Fuel Line(?) in Lighthouse Area.



Photograph 7: Tram Car Shed.



Photograph 8: Former Housing Area.



Photograph 9: Concrete Footings for Former AST.



Photograph 10: Water Tower.



Photograph 11: Helipad Area.



Photograph 12: Pump House.



Photograph 13: Debris on Beach Below Garbage Dump Area.



Photograph 14: Landing Dock Area.



Photograph 15: Landing Dock Area.