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U.S. Environmental Protection Agency
Superfund Program

Five-Year Review Report

First Five-Year Review Report
for

Harbor Island

Seattle
King County. Washington
WAD980722839

September 2000

Prepared by:

U.S. Environmental Protection Agency
Region 10
Seattle, Washington

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Office of Environmental Cleanup

Date:

28 Sept. 2000

Harbor Island

First Five-Year Review Report

I. Introduction

The U.S. Environmental Protection Agency (EPA), Region 10, has conducted the first five-year review of the remedial actions implemented at the Harbor Island Superfund site (Site) located in Seattle, King County, Washington. This review was conducted from February through August 2000. This report documents the results of the review. The purpose of five-year reviews is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify deficiencies found during the review, if any, and identify recommendations to address them.

This review is required by statute. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Plan (NCP). CERCLA Section 121(c), as amended, states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP part 300.430(f)(4)(ii) of the Code of Federal Regulations (CFR) states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the first five-year review for the Harbor Island site. The triggering action for this review is the initiation of construction on July 31, 1995, at the Lockheed Operable Unit (OU) within the Harbor Island site. Due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unrestricted use and unlimited exposure, a five-year review is required.

Harbor Island Superfund Site
5-Year Review Sep 2000

CONCURRENCES						
Initials:						
Name:	Schwarz	Willamson	Cohen			
Date:	9/27/00	9/27/00	9/27/00			

II. OU Identification/Site Chronology

Operable Unit (OU) Identification

The Harbor Island Site began as an investigation of a secondary lead smelter located on the island site. Because of the distribution of lead and other metals over the entire island, the investigation became island wide. After the investigation began it was realized that creating separate operable units (OUs) would be advantageous for managing the cleanup processes. Investigations began site-wide for soil and groundwater contamination. The Lockheed OU was established to facilitate a cleanup of a particular land parcel on a separate time and management schedule. The investigation of contaminated sediments both near shore and in Elliott Bay were separated and added as new OUs. Part of the island investigation was at petroleum tank farms and management of these parcels was given to Ecology as the Tank Farms OU. The following is a list of the operable units in current use:

OU#	Description
00	Initial Harbor Island sitewide (island) investigation
01	Soil and Groundwater Operable Unit (S&GOU1)
02	Tank Farms OU (TFOU2)
03	Lockheed Upland OU (LockheedOU3)
04,05,06	No longer considered as operable units
07	Lockheed Shipyard Sediment OU (LSSOU7)
08	West Water Sediments OU (West Waterway OU8)
09	Todd Shipyards Sediments OU (TSSOU9)
*	East Waterway Sediments OU (East Waterway OU10)

*No official OU determination made. It is assigned as OU10 for this report

Activities are occurring at the different operable units concurrently. In addition there are several PRPs that have interests in particular land parcels on the island and are involved in more than one OU.

Chronology

The following is a listing of significant events that occurred at the Site:

Date	Event
	Soil and Groundwater OU
01/01/80	Initial discovery of site under CERCLA
03/01/80	Preliminary Assessment, Site Investigation

09/08/83	NPL Listing, Sitewide
09/07/88	RI/FS start for Island Wide Soil and Groundwater OU (S&GOU1)
09/14/90	Administrative Order RI/FS, with Lockheed, OU3
09/30/93	ROD for S&GOU1
06/28/94	ROD for Lockheed Property, OU3
09/30/94	RD/RA start at Lockheed Property, OU3
02/27/95	Consent Decree for Cleanup of Lockheed Property, OU3
12/27/95	Completion of Construction for Lockheed Property, OU3
08/06/96	Consent Decree with rest of PRPs, for RD/RA, S&GOU1
11/07/96	Partial Delisting for Lockheed Property, OU3

Sediment OUs

09/07/88	RI/FS start for Lockheed Sediments, OU7
09/07/88	RI/FS start for West Waterway, OU8
09/07/88	RI/FS start for East Waterway, OU10
11/27/96	ROD for Lockheed Sediments, OU7
06/30/97	Administrative Order on Consent (AOC) with Todd Shipyard for RD/RA, Sediments, OU9
07/16/97	AOC with Lockheed Shipyard for RD/RA , Sediments, OU7
11/26/97	ROD for Lockheed Sediments, OU7
11/1999	Proposed Plan for West Waterway OU8
12/27/99	Todd Shipyard Sediment OU established by ESD, OU9

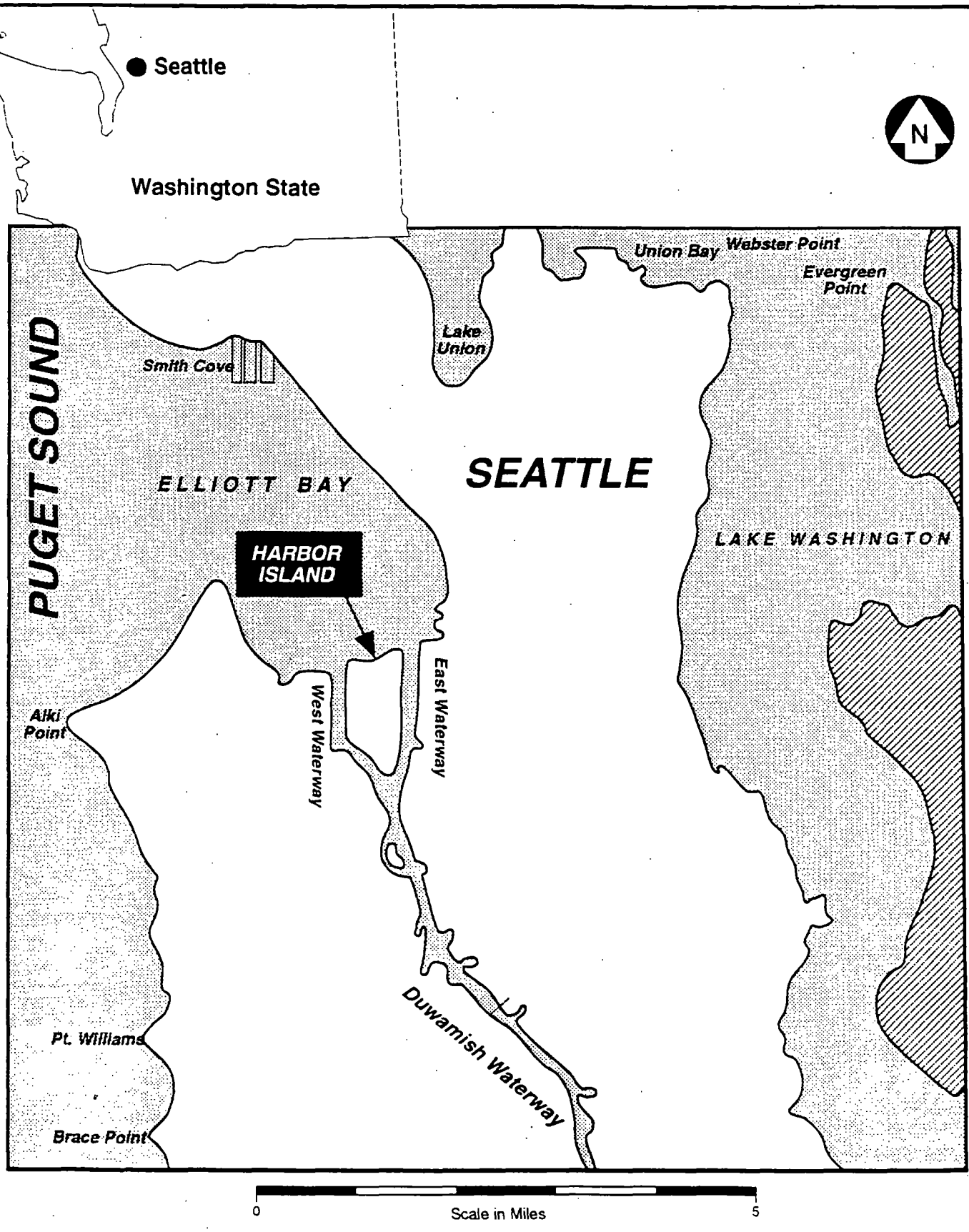
Tank Farms OU (Ecology lead)

1994	RI/FS start for Tank Farms
1997	Completion of RI/FS
11/98	CAP* issued for Equilon
12/99	CAP* issued for GATX
01/00	CAP* issued for ARCO

*Cleanup Action Plan (CAP) is the Ecology equivalent to an EPA ROD

III. Background

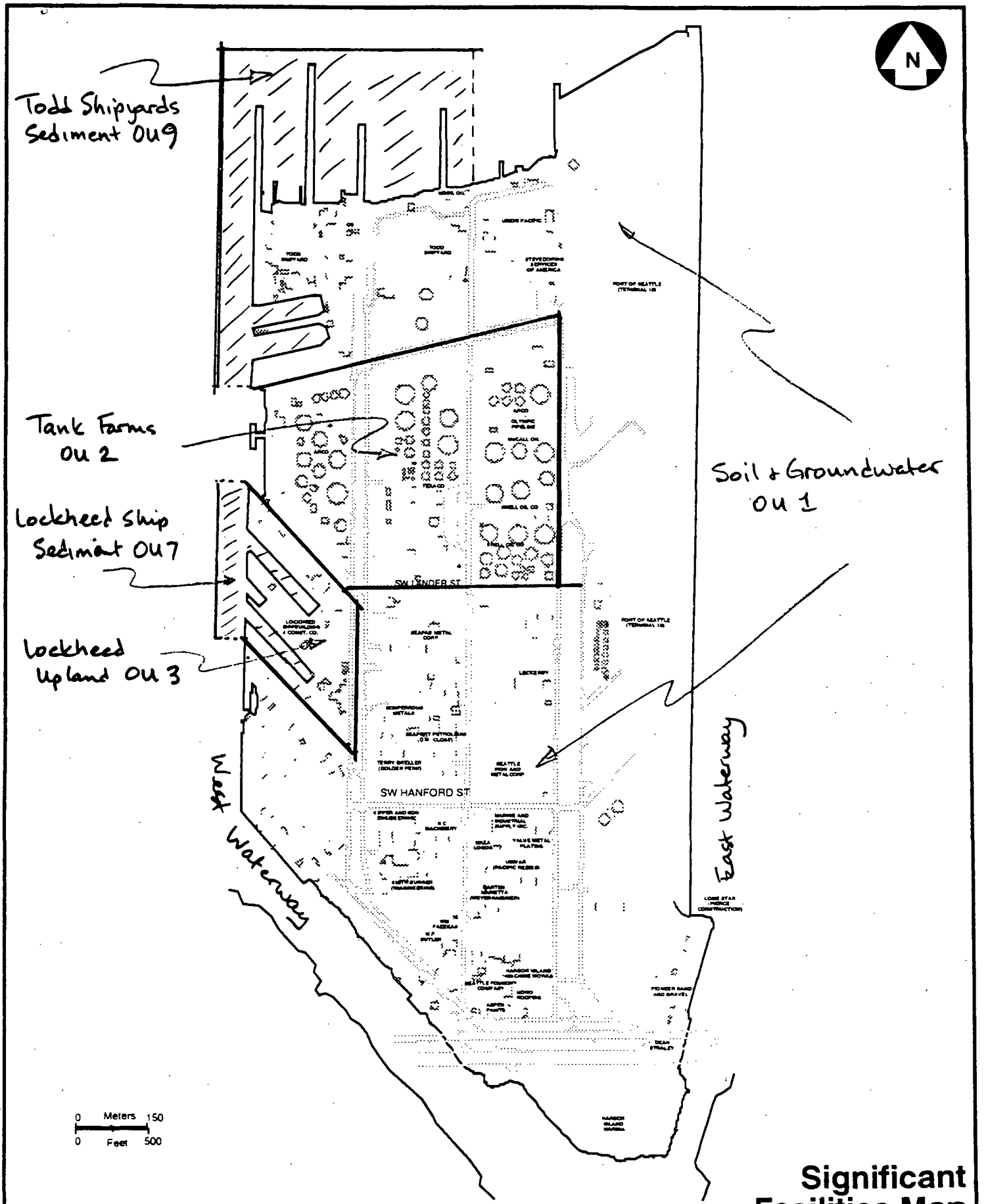
Harbor Island is among the largest man-made islands in the United States and is located approximately one mile southwest of downtown Seattle in King County, Washington. It lies at the mouth of the Duwamish River on the southern edge of Elliott Bay, in Puget Sound. The 430-acre island was created during the dredging of the lower Duwamish River between 1903 and 1905. The dredge spoil was deposited across the island. Subsequent bulkhead construction and filling has brought the island into its current configuration (Figures 1 and 2). The island is currently over 70%



Vicinity Map

FIGURE 1

JOB NUMBER: 4000-02-46-0017 DATE: February 1993



Significant Facilities Map

FIGURE 2

WESTON MANAGERS DESIGN & ENGINEERING CONSULTANTS

Project Number: 4000-02-46-0017 Date: February 1993

covered with impervious surfaces and the paving will increase with the ongoing Port of Seattle, Terminal 18 Expansion. The island is within the Seattle City Limits.

The island was primarily used for commercial and industrial activities including ocean and rail transport operations, bulk fuel storage and transfer, secondary lead smelting, lead fabrication, shipbuilding, and metal plating. Warehouses, laboratories, and offices also existed historically on the island. The land use on the island is changing from a variety of smaller businesses to large operations: Port of Seattle shipping container handling and storage, bulk fuel storage, shipbuilding and repair, and a flour milling operation.

The Site has been investigated on numerous occasions beginning in 1980. Based on these studies, Harbor Island was listed on the National Priorities List (NPL) on September 8, 1983, due to elevated concentrations of lead in soil, associated with the former lead smelter operations, as well as elevated concentrations of other inorganic and organic substances.

IV. Remedial Actions

Remedy Selection and Implementation

The EPA-lead remedial investigation (RI) for the island-wide S&GOU1 was started in 1988 and was completed in 1990. A Phase II RI and feasibility study (FS) was completed in February 1993. The RI characterized the soil and groundwater and presented a baseline risk assessment. The FS evaluated various remedial alternatives for the Site.

During the RI/FS two Lockheed Operable Units were established to allow the Lockheed Company to proceed with the cleanup of their property on a different schedule from the rest of the Site. The Lockheed Upland, OU3, RI/FS was begun in 1990 and completed in with a ROD signed in 1994. The RI/FS for the Lockheed Sediments, OU7, was started in 1988 and completed in 1996, and the ROD was signed in 1997.

The Todd Shipyards Sediments, OU9, was established by issuing an Explanation of Significance Difference (ESD) in 1999. This allows a separate management tool and time frame to be established for this part of the site.

The petroleum bulk storage facilities on the Site have been studied and are being cleaned up under the State of Washington, Department of Ecology's (Ecology) lead. This work is described as the Tank Farm OU. Ecology Cleanup Action Plans (CAPs) have been issued for ARCO, Equilon, and GATX. Each company has a large

bulk petroleum storage facility in the operable unit. The Ecology CAP is equivalent to the EPA ROD for Superfund work. Cleanup actions have begun at each of these facilities. Product and contaminated soil were found in several locations.

The sediment OUs for the West Waterway, OU8, and East Waterway, OU10, were also added to the Site area. The RI/FS process has started for each of these areas. Although there has been no official delineation or establishment of an East Waterway OU, the RI/FS studies that were done on the West Waterway were duplicated in the East Waterway. A Proposed Plan has been issued for the West Waterway OU8 recommending no further action be taken.

Soil and Groundwater

The remedial action Record of Decision (ROD) for the S&GOU1 was signed on September 30, 1993. The ROD was subsequently amended on January 25, 1996. The primary remedial components of the ROD are listed below:

- Cap Exposed Areas Exceeding Soil Cleanup Goals,
- Excavate Hot Spot Soil Followed by Off-Site Disposal and/or Treatment,
- Invoke Specified Institutional Controls,
- Remove and Treat Floating Petroleum Product,
- Development of a Long-term Groundwater Monitoring program.

A Consent Decree for the S&GOU1 was signed on August 6, 1996, which lists the Settling Defendants responsible for implementing the remedies described in the ROD. Work is underway by the principal responsible parties (PRPs) to implement the ROD. All of the Hot Spot Soil, those soils which had contaminants of concern above on-site containment concentrations, have been removed and disposed of off-site or properly treated. A large project to expand the Port's shipping container operation is effectively capping much of the area that was not already paved. The capping design is established in the ROD as a three inch asphalt cap with a permeability of 1×10^{-5} cm/sec, or a cap of 12 inches of clean fill (especially for railroad track bedding). Work on the floating petroleum product is underway at Todd Shipyards with removal projects and an extraction system in one area. Additional petroleum removals and containment are being studied and will be implemented in the Tank Farms OU. Work in the Tank Farms OU is hampered by the extensive piping and above ground structures.

The Port of Seattle's (Port's) $100,000,000 Terminal 18 Expansion project (T-18) which covers about 200 acres is expected to be completed by the year 2003. The petroleum recovery and soil cleanup at Todd Shipyard will take longer because there is contaminated soil under operating facilities which will be using air enhanced bioventing to reduce the soil contamination to accepted cleanup criteria.

Sediments

In November 1996, EPA finalized its ROD for the Shipyard Sediment Operable Unit (OU7, OU9) on Harbor Island. This ROD outlined the cleanup remedy for both the Lockheed Martin No.1 Shipyard and the Todd Shipyard. The essential elements of the selected remedy are summarized below:

- All sediments in the open water area exceeding the chemical Cleanup Screening Level (CSL) and shipyard waste must be dredged, including the sediments and shipyard waste in the shipways at Lockheed Shipyard.
- Dredged sediments must be disposed in appropriate confined near shore (CND) or confined aquatic disposal (CAD) facilities. If no CND or CAD facilities are identified, dredged sediments must be taken to an appropriate upland disposal facility. Any dredged material which is predominately shipyard waste (e.g., sandblast grit, tires, chains, etc.) must be disposed in a solid waste disposal facility. Sandblast grit may be recycled.
- Any remaining areas which exceed the chemical and/or biological Sediment Quality Standards (SQS) must be capped with a minimum two feet of clean sediment in order to isolate the remaining contaminants. The cap may require armoring based on information obtained during remedial design.
- Dredging and capping must be conducted with the objective of creating a flat surface out to the boundary of the Shipyard Sediment OU to minimize the potential for recontamination of the cap by resuspended contaminated sediments from other sources.
- Long-term monitoring of contaminant concentrations and cap thickness must be conducted.
- Ensure source control prior to remedial action.

The ROD also identifies significant elements to be determined during remedial design:

- The extent of dredging contaminated sediments and waste under piers at the shipyards will be determined based on cost, benefit and technical feasibility. If the benefit gained is disproportionate to the cost of dredging under piers, EPA may select an alternate method for achieving the cleanup standard in the under pier sediments.
- That source control is adequately implemented to eliminate, or reduce to the extent practicable, the release of contaminants to the marine sediments.
- Characterization of the dredged sediments to predict sediment behavior during dredging and disposal and to support the design of a CND or CAD facility.

- The potential for cap erosion from prop wash, dry dock activity, or natural forces and determine the appropriate method of armoring, if necessary.
- Conduct a habitat inventory to serve as a baseline to ensure that cleanup activities do not cause additional adverse impacts to the habitat in the Shipyard Sediment OU.

Administrative Orders on Consent (AOC) were signed with Lockheed Shipyard and Todd Shipyard on July 16, 1997, and June 30, 1997, respectively. The Lockheed Shipyard AOC addressed all of the activities necessary to complete remedial design. The Todd Shipyard AOC addressed only sampling activities to assist with future remedial design. The Todd Shipyard AOC was essentially completed in February 1999, and a second AOC for the remainder of remedial design was signed on April 26, 2000.

In addition to these legal orders, an Explanation of Significant Differences (ESD) was signed by EPA on December 27, 1999 which redefined the site boundary identified in the 1996 ROD for Todd Shipyards and established Todd Shipyards as an independent operable unit identified as the Todd Shipyards Sediment Operable Unit (TSSOU09).

The remedy selected for both operable units is still expected to be protective of human health and the environment upon completion of the remedial action. At this time, EPA does not know of any additional threats that will not be addressed by the selected remedy or the elements to be determined during the remedial design process. There are no new immediate threats that should be addressed sooner than the selected remedies for these site will be implemented.

The final remedy for the Lockheed Shipyard Sediment Operable Unit (LSSOU07) will be identified in an ESD in Summer 2001. Remedial Action (RA) Consent Decree negotiations will begin in Winter 2001.

The final remedy for the TSSOU07 will be determined in an ESD in approximately Spring 2001. RA Consent Decree negotiations will begin in Fall 2001.

Tank Farms

The RI/FS work for each of the three tank farm properties in the OU was begun in 1994 and completed in 1997. Cleanup Action Plans (CAPs), which are Washington State Department of Ecology ROD equivalents, were issued to Equilon, GATX, and ARCO, in 11/1998, 12/1999, and 01/2000 respectively. The RD and RA actions have begun for all three properties in the OU.

VI. Five-Year Review Process

The Harbor Island five-year review was led by Neil Thompson, Project Manager for the Soil and Groundwater Operable Unit. The following team members assisted in this review:

- Piper Peterson-Lee, EPA RPM, Sediment OUs
- Karen Keeley, EPA RPM, Waterway Sediment OUs
- Nnamdi Madakor, Ecology Project Manager
- Curt Black, EPA Hydrogeologist
- Bob Stamnes, EPA Engineer

Construction to implement the S&GOU1ROD and Tank Farms OU CAPs are ongoing. EPA oversight is being done to insure compliance with the Consent Decree and approved Work Plans. For the Soil and Groundwater OU, this five-year review evaluates the operations and maintenance of completed Hot Spot Removal remedial actions; however, it is primarily a review of the ongoing work to verify that construction of the remedy remains protective. Because construction work is occurring in locations which have contamination, the Health and Safety Plan includes air, soil, and groundwater monitoring and use of personal protective clothing where necessary.

There is an ongoing effort to keep the community appraised of changes occurring on Harbor Island. The Port has an ongoing community relations program for their large construction project and EPA issues Fact Sheets to keep the community up-to-date on cleanup progress. The latest EPA Fact Sheet was in the Spring 2000.

VI. Five-Year Review Findings

A. Interviews/Contacts

The following individuals were contacted specifically as part of this five-year review:

- Nnamdi Madakor, Ecology, Project Manager
- Anita Lovely, Consultant, Harbor Island PRP Steering Committee
- Kathy Bahnick, Port of Seattle, Project Manager
- Bryan Stone, ThermoRetec, Consultant, representing Port of Seattle

The five-year review began with a general review of the overall site with the various EPA Site Managers in March 2000. There are basically four different investigations and cleanup operations underway at Harbor Island: the uplands, near-shore sediments, marine sediments, and petroleum tank farms. The first three are managed by EPA and the tank farms OU2 is being managed by Ecology. Some of

these activities are further subdivided into multiple operable units; such as: uplands into Soil and Groundwater OU1 and Lockheed Shipyard OU3; sediment parcels into Todd Shipyards Sediment OU9 and Lockheed Shipyards Sediment OU7; marine segments into East and West Waterways OU8&10.

Each of the Site Managers utilizes different levels of oversight depending on where the operable unit is in its development of the remedy. The Lockheed Shipyard upland site OU3 is completed and has been delisted (partial delisting from the entire Site), the Soil and Groundwater OU is mostly in the construction phase. The sediment OUs are in various stages of investigation and remedy development. And the designated Hot Spot Removal areas are currently subject to annual cap inspections. Several of the Hot Spots will eventually be included in the Ports T-18 redevelopment project. The Tank Farms OU2 have cleanup actions currently underway.

During the multi-year construction project, environmental problems are encountered and are dealt with by the review processes built into the construction management activities. EPA has a continued responsibility to make sure that the construction activities do not compromise the protectiveness that the remedy is designed to achieve. One environmental issue developed when an construction management environmental review step was not performed according to the technical specifications.

On April 18, 2000, EPA Superfund was notified by EPA and Ecology investigators that potentially contaminated soil was removed by the construction contractor from Harbor Island, S&GOU1, without the Suspect Soil evaluation step (part of T-18 project technical specifications) or any other project owner's authority and was taken to a topsoil mixing operation as clean soil. Fortunately the Harbor Island soil was stockpiled at the topsoil mixing site and had not been mixed or redistributed. The stockpile was sampled with an emphasis on locating the section of the stockpile where the Harbor Island soil was believed to have been dumped. The off-site analysis of the Harbor Island soil was completed on July 24, 2000, including quality assured data. The results indicated that the soil removed from Harbor Island was not contaminated and actually could be used as residential topsoil. This failure to utilize the Suspect Soil screening process that was put into the T-18 redevelopment specifications caused additional work and the development and implementation of an off-site sampling program. The T-18 contractor, who transported the unscreened soil off-site, submitted a sample and analysis plan for the off-site sampling of the Suspect Soil to EPA for review and comment prior to field sampling. EPA was an active participant in the field oversight of the sampling, field analytical review, and laboratory Quality Assurance/Quality Control review of this specific off-site sampling.

After the soil removal incident, a closer review of construction contractor performance was made by the Port and EPA. Even with the multiple layers of oversight

present during the construction phases, some inconsistencies with the approved Health and Safety Plan were found (The Health and Safety Plan had been reviewed by EPA for consistency with the ROD, Consent Decree, and Remedial Action Work Plan). Several project supervisors needed to complete their training requirements, additional truck wash areas needed to be established, old petroleum tank removal actions failed to test the soil for tank leakage, and a denaturing process released untested water to a drain. These problems were addressed by the PRPs and their contractor.

Construction management process have been reevaluated by EPA and the Port to determine if the contact specifications required any changes. It appears that the specifications are sufficient to protect human health and the environment, but additional oversight implemented by the project owner was added because of the contractor problems. A review of this construction management process was done during this Five-Year Review. None of these actions will affect the overall effectiveness of the final remedy once construction is complete.

B. Site Inspection

Representatives from EPA, Port of Seattle, and the S&GOU Steering Committee took part in a Site inspection on August 22, 2000. The following individuals participated in the Site inspection:

Name	Representing
Neil Thompson	EPA, Project Manager
Curt Black	EPA, Hydrogeologist
Robert Stamnes	EPA, Engineering Support
Nnamdi Madakor	Ecology, Project Manager
Anita Lovely	Harbor Island S&GOU Steering Committee
Kathy Bahnick	Port of Seattle, Project Manager
Bryan Stone	ThermoRetec, Consultant for Port, Project Manager
Al Rainsberger	Todd Pacific Shipyards, Project Manager
Bill Enkeboll	Landau Associates, Consultant for Todd
Mark Bryant	Exponent, Consultant for Mobil
Andrew Doherty	Olympic Barge and Tug, Manager

Ongoing construction activities were evident throughout the 420-acre island. Most of the major construction was related to the Port's T-18 expansion which reroutes roads, railroads, and other major utility services. The remedial actions for those areas under construction will not be completed until the final paving of the surface creating an environmental cap over much of the remaining site that was not capped prior to the T-18 expansion. Low permeability and dermal contact barriers are incorporated into the paving design.

One of the purposes of this site visit was to inspect specific areas which required special cleanup remedial actions during the construction phase because they were not previously cleaned up under the Hot Spot remediation efforts that occurred over the last several years. Another was to revisit areas that underwent Hot Spot Removals.

The weather was 80 °F, sunny, and dry during the inspection. It had not rained for three days prior to the inspection and had been dry for the previous two weeks. Even with the dry conditions, fugitive dust was not noticed. There did not appear to be much construction ongoing activity for the size of the T-18 expansion project. However the Port's Terminal 18 was very active moving shipping containers on and off the island. The truck traffic is routed and detoured on paved roadways that exist throughout the site. The tide was high enough so that none of the sediment areas were exposed. No oil sheens were seen on the waterways.

During the various construction activities, buried tanks and suspect soil was encountered. Cleanup actions are typically removal of the contaminated soil using the Site cleanup criteria to identify the limits of these newly identified Hot Spot projects. Several of these cleanup actions were inspected to verify field reports. It is expected that more of these small soil excavation actions will occur throughout the construction phases.

The areas of the Site that had Hot Spot removals were revisited to evaluate their condition. Most of these areas were cleaned up by removing soil with elevated concentrations of contaminants, backfilling the excavation with clean fill, and capping with asphalt concrete paving. The only currently active Hot Spot removal is at Todd Shipyards where petroleum product is being pumped from the groundwater/soil interface. The five extraction wells are functioning as designed and receive the periodic maintenance as required. The amount of product being recovered averages about 400 gal/mo and has not dropped off during the last 20 months of operation. This is an indication that significant product still remains to be extracted before the soil can be treated to reduce the residual soil concentration of TPH to less than the required 10,000 ppm (1%).

The exception to the asphalt cap was at the former site of Seattle Iron and Metal. The Hot Spot removal action removed contaminated soil but left a 12 inch thick clean barrier layer as an interim cap. The structures on this property have since been demolished and the scrap relocated to their new operation off the island. The Seattle Iron and Metal property will be brought up to final grade with additional clean fill and then be completely located under the paved working deck of the new container storage area, T-18 expansion.

C. Risk Information Review

The applicable or relevant and appropriate requirements (ARARs) that were part of the Site ROD still remain protective to human health and the environment. A review of the ARARs indicated that there were no changes in the ARARs for any of the contaminants of concern found on Harbor Island.

D. Data Review

Implementation of the ROD required that a long-term monitoring program be established. This plan development is on schedule to be implemented after the completion of remedy construction; i.e. Hot Spot Removals and major capping. There has not been any coordinated site-wide groundwater monitoring since 1993, so establishing a groundwater monitoring network is important to evaluating the effectiveness of the remedy. The delisted Lockheed Shipyard, OU3, has completed five years of semi-annual groundwater monitoring for their portion of the Site. This monitoring program will be evaluated and the results integrated into the site-wide long-term monitoring program development and implementation. Several pockets of total petroleum hydrocarbon (TPH); i.e. petroleum products, have been identified for further cleanup as Hot Spots. These are being addressed in the Todd Shipyard (S&GOU1) and the Tank Farm OU2. Part of the investigation in the Lockheed and Todd sediment OUs are to determine if there are any contaminated discharges from the uplands to the sediments.

VII. Assessment

The following conclusions support the determination that the remedy at Harbor Island is expected to be protective of human health and the environment upon completion of the remedial actions.

A. Is the remedy functioning as intended by the decision documents?

The remedy for the S&GOU1 is under construction at the present time. The remedial actions are directed by a signed Consent Decree with 39 PRPs; an EPA approved Work Plan; and approved design and technical specification documents. The Health and Safety Plans that are a part of the Work Plan and construction deliverables are sufficient to control risks during the short term construction period when properly implemented.

No early indicators of potential remedy failure have been noted during the review. Health and safety of construction workers was compromised when the Health and Safety Plan was not being fully implemented by one of the construction contractors. This problem has been rectified and controls put into place to insure that the Health and Safety Plans are implemented across the entire site at all times.

B. Are the assumptions used at the time of the remedy selection still valid?

The cleanup criteria developed the ROD utilized health and environmental risk evaluation criteria. There have been no changes to the health or risk based standards since the ROD was signed. No changes in the risk exposure pathways were identified. No new contaminants, sources, routes of exposure were identified as part of this five-year review.

Toxicity and other contaminant characteristics for the contaminants of concern have not changed in ways that would call into question the protectiveness of the remedy. There have been no changes in the risk assessment methodologies since the ROD was signed that would question the protectiveness of the remedy.

C. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedy.

VIII. Deficiencies

No deficiencies were noted that would effect the protectiveness of the remedy. There are the usual disruptions caused by the construction activities, but none has increased the short-term or long-term human or environmental risks.

IX. Recommendations and Follow-up Actions

Once the T-18 construction is completed, most of the site will be capped and secured. Until construction of the remedy is completed, the final institutional controls, such as: fencing, security, long-term monitoring, etc., cannot be fully implemented. The construction activities do create some exposure pathways to contaminated soil, but procedures are in place to protect workers from this exposure. It is recommended that review of the construction oversight by EPA, Port, and PRPs be vigilant to prevent violations of environmental technical specifications such as the Suspect Soil evaluations.

X. Protectiveness Statement

None of the remedies have been completed for the Harbor Island Superfund site except for the Lockheed upland parcel, OU3. Construction of the remedy for the Soil &

Groundwater Operable Unit (S&GOU1) is underway. The remedy is still protective and the short-term construction impacts are not reducing that protectiveness. Some limited Cleanup Actions under the oversight of Ecology has begun at the Tank Farms OU2. Construction has not started at any of the other operable units. The cleanup plans for the East and West Waterways have not been finalized by EPA at this time. The remedies that have been developed for this site are expected to be protective of human health and the environment.

XII. Next Review

This is a statutory site that requires ongoing five-year reviews. The next review will be conducted within five years of the completion of this five-year review report. The completion date of this report is the signature date on the front cover.