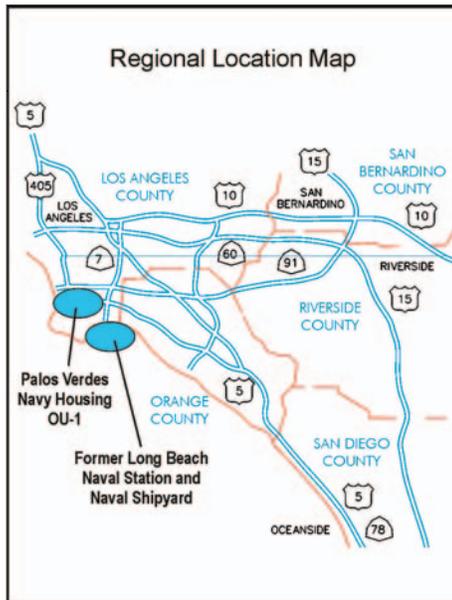


FIVE-YEAR REVIEW FOR INSTALLATION RESTORATION PROGRAM

SITES 1-6A AND 14 AT LONG BEACH NAVAL COMPLEX AND OU-1 FORMER PALOS VERDES NAVY HOUSING



February 2005



INTRODUCTION

The Department of Navy completed a five-year review of environmental cleanup actions (remedies) at the former Long Beach Naval Station and the former Palos Verdes Navy Housing, San Pedro. The five-year review evaluates the implementation and performance of remedies throughout the installation in order to determine whether the remedies are protective of human health and the environment. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires a review of cleanup remedies that leave any contaminants on a site at levels

greater than those allowed for residential use. The five-year review began five years after the initiation of the first response action and will continue in perpetuity or until each site can be used for unrestricted residential use. The former Long Beach Naval Station Sites 1, 2, 3, 4, 5, 6A, 14, and Operable Unit 1 (OU-1) located at the former Palos Verdes Navy Housing in San Pedro, were included in the five-year review process. The Long Beach Naval Station, Palos Verdes Housing in San Pedro, and Long Beach Naval Shipyard are collectively referred to as the Long Beach Naval Complex.

FIVE-YEAR REVIEW PROCESS

(1) Document Review

In the document review process, key documents identifying the accepted remedial action, how it is being carried out, legal requirements influencing the response actions, impacts of the response action on human health and the environment, and community concerns were gathered and analyzed. Documents providing this information at Long Beach Installation Restoration Program (IRP) sites and former Palos Verdes Navy Housing include but were not limited to the Record of Decision (ROD) documents, Engineering Evaluation/Cost Analysis (EE/CA) documents, Remedial Assessment/Remedial Design documents, remedial system and groundwater monitoring reports, and annual site inspection reports.

(2) Site Inspection

In the site inspection process, each site was inspected and the condition of each

site and its surrounding area was documented. During the site inspections, the availability of site records such as health and safety plans (at active remediation sites), access controls such as fences, and site features such as soil covers were checked to determine their presence and integrity.

(3) Site Interviews

Site interviews were conducted to seek community input regarding the implementation of the response action. Community members can identify problems, such as vandalism or trespassing, that need to be addressed and can identify other concerns regarding the impacts of the remedial actions as they progress. Interviews were conducted with site managers, site personnel, state/local authorities, community groups, and neighboring businesses.

(4) Assessment of Protectiveness

In the assessment of protectiveness, the information gathered during the document review, site inspection, and site interviews were used to answer the following questions:

- *Is the response action functioning as intended?*
- *Are the exposure assumptions, toxicity data, cleanup levels and Remedial Action Objectives (RAOs) on which the response action was based valid?*
- *Is any new information available which would call into question the protectiveness of the remedy?*

The five-year review was not intended to reconsider the remedies agreed upon in the RODs and the Action Memoranda. Instead, it evaluated each remedy's performance, and recommended improvements if the remedy was not performing as designed.

SELECTED REMEDIES

The remedies for each site were selected based on comments from state regulatory agencies and the public. All agreed these remedies would: (1) reduce the amount of contamination to standards that would protect public health and the environment; (2) keep the chemical plumes to within the former Naval Station Long Beach property boundary; and (3) ensure there was no unacceptable risk to the health of personnel working at these facilities. The originally scheduled review dates for Sites 1, 2, and 14 were moved up so that those sites would be on the same five-year cycle as Sites 3, 4, 5, 6A, and OU-1 former Palos Verdes Navy Housing. This consolidation of five-year reviews meets requirements of Navy policy and is intended to gather all IRP sites at Long Beach Naval Complex into a single five-year review cycle.

Site 1

The remedy for **IRP Sites 1** (former Mole Solid Waste Operations) and **Site 2** (former Chemical Materials and Waste Storage Area) as selected in the Record of Decision (ROD) consists of institutional controls in the form of covenants restricting land and groundwater use, groundwater monitoring to ensure that contamination does not migrate to the marine ecosystem at concentrations exceeding water quality objectives (WQOs) of the California Ocean Plan, excavation of potentially contaminated surface and vadose zone soils, and operation of an in situ air sparging/soil vapor extraction (IAS/SVE) system at areas of potential concern (AOPCs) 1 and 4 to reduce groundwater contaminant concentrations. The IAS/SVE system was operated at AOPCs 1 and 4 from April 2001 to August 2003, and removed approximately 1,270 kg of volatile organic compounds from the groundwater. The system achieved system performance goals in August 2003 and was temporarily shut down for confirmatory groundwater monitoring and long-term monitoring, which is currently ongoing.

Sites 3-6A

The remedy for **IRP Sites 3** (former Industrial Waste Disposal Pits), **Site 4** (former Mole Extension Operations), **Site 5** (former Skeet Range Solid Waste Fill Area), and **Site 6A** (former Boat Disposal Locations) as selected in the ROD consists of institutional controls in the form of covenants restricting land and groundwater use, as well as groundwater monitoring (only at Sites 3 and 6A), to ensure that groundwater contamination does not migrate to the marine ecosystem at concentrations exceeding WQOs of the California Ocean Plan. Sites 3 and 6A were

granted conditional no further action (NFA) status in July 2003 and March 2000, respectively, pending a final groundwater sampling event to be performed with this review. A groundwater sampling report was submitted to the Los Angeles Regional Water Quality Control Board and California Department of Toxic Substances Control in September 2004. The groundwater investigation did not detect any significant increases of contaminants that would threaten human health or the adjacent marine environment. Sites 4 and 5 were closed immediately after the ROD for Sites 3-6A was signed (April 29, 1999) and therefore did not require post-ROD groundwater monitoring.

Site 14

The remedy for **IRP Site 14** (former Building 46) consists of excavation of potentially contaminated soils, injection of Hydrogen Release Compound (HRC[®]) solution to reduce groundwater contamination through enhanced anaerobic biodegradation, and monitored natural attenuation. An HRC[®] solution was injected at 32 injection points at Site 14 to enhance natural biodegradation processes. The removal action at Site 14 is ongoing; the Navy will evaluate the results of groundwater monitoring and evaluate the effectiveness of the remediation efforts accordingly. The Navy is developing a transition plan for Site 14 to demonstrate that the removal actions performed are final remedies satisfying compliance with the CERCLA process.

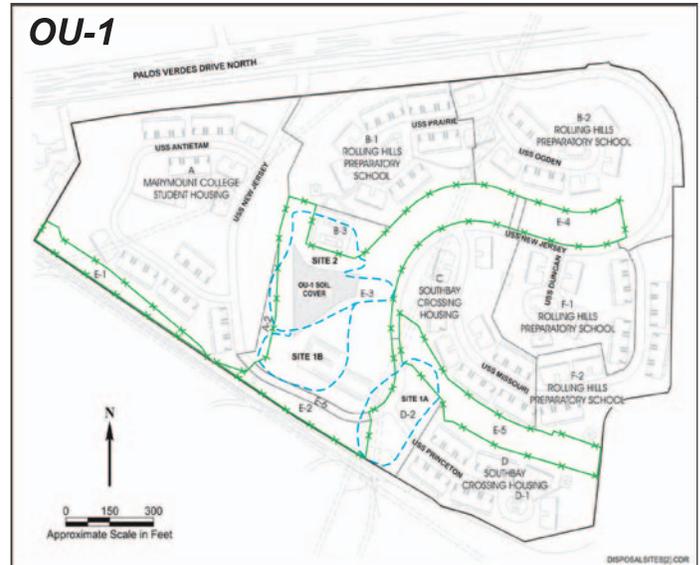
OU-1

The remedy for **OU-1 former Palos Verdes Navy Housing** consists of limited “hot spot” excavation of contaminated shallow soil, construction of an engineered soil cover, revegetation and restoration of the disturbed area, construction of a drainage structure, and installation and monitoring of groundwater monitoring wells in order to assess impacts to groundwater from contaminants remaining in shallow soils. Annual inspections of the soil cover indicate that it is intact and protective of human health. Groundwater monitoring at OU-1 indicates that contaminants have not leached into the groundwater below and that the soil cover is performing as intended. Groundwater monitoring at OU-1 will occur every three years. The Navy is developing a transition plan for OU-1 former Palos Verdes Navy Housing to demonstrate that removal actions performed are final remedies that satisfy the nine CERCLA compliance criteria.

CONCLUSIONS

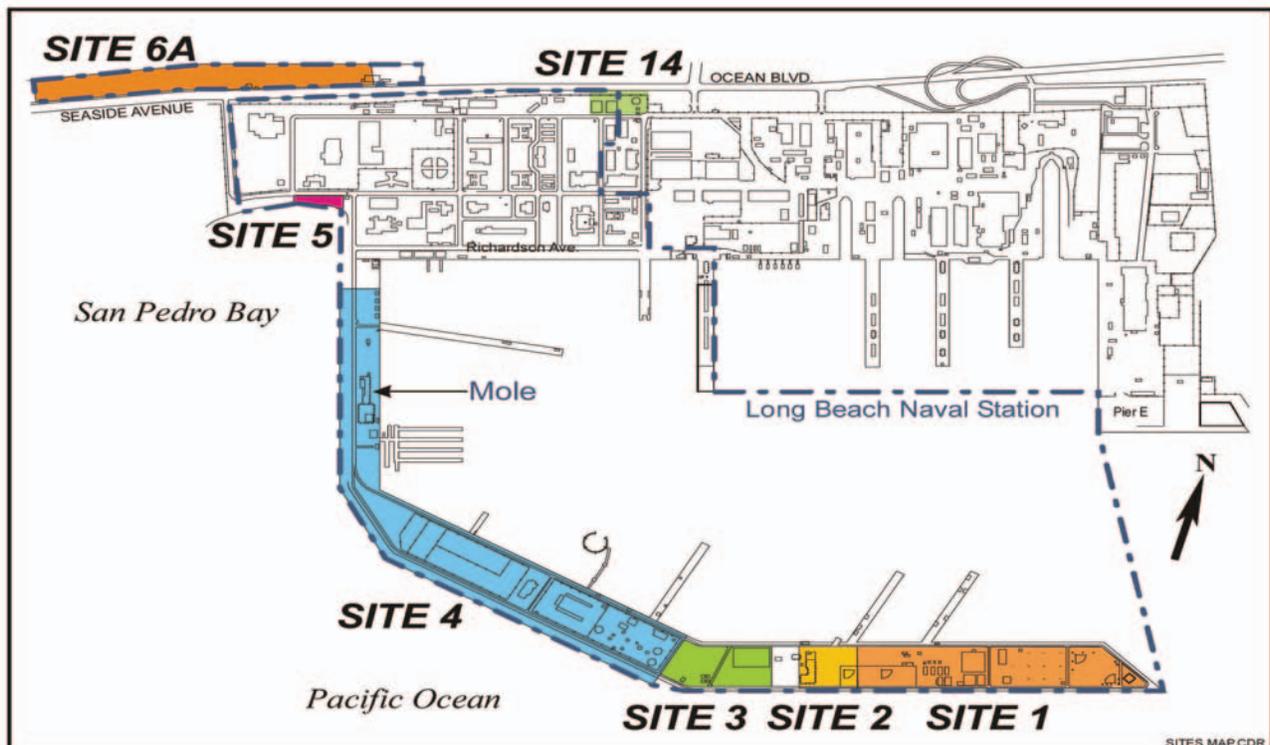
The results of this five-year review indicate that the intent of the remedies for Sites 1-6A and 14, and OU-1 former Palos Verdes Navy Housing—namely, protection of human health and the environment—has been achieved with the implementation of institutional controls (at Sites 1-6A), groundwater monitoring (at Sites 1, 2, 3, 6A, and 14, and OU-1), operation of groundwater remediation systems (at Sites 1 [AOPCs 1 and 4] and 14), contaminated soil removal (at Sites 1,2, and 14) and limited “hot spot” excavation and construction of a soil cover (OU-1).

No changes to exposure assumptions, toxicity data, or regulatory cleanup levels have occurred that would affect the protectiveness of the remedies at Sites 1-6A and 14 and OU-1 former Palos Verdes Navy Housing. The RAOs determined for these sites are still valid, and either already have been met (Sites 3, 4, 5, 6A, and OU-1) or are in the process of being met (Sites 1, 2, and 14). Industrial use is the most reasonable anticipated land use scenario for Sites 1-6A and 14 based on assessments by the City of Long Beach Local Redevelopment Authority. Sites 1-6A have been integrated into POLB and Port of Los Angeles shipping depot operations. A portion of Site 1 (Gull Park) is used as a bird sanctuary and will remain so following groundwater remediation activities at the site. OU-1 former Palos Verdes Navy Housing consists of open space that includes a small parking lot, tennis court, and an access road surrounded by approximately 300 housing units.



An endangered species, the Palos Verdes Blue butterfly (PVB), occupies OU-1. OU-1 is secured within a fenced area to protect the PVB habitat and eliminate human access to the area. The fenced area is intended to remain as open space.

The overall effectiveness of the selected remedies is discussed in more detail in the enclosed Protectiveness Statements, which are taken from the five-year review report. The next five-year review is scheduled to be concluded by summer 2009.



GLOSSARY

Administrative Record – A collection of all documents used to select and justify remedial alternatives and selected actions at Long Beach Naval Shipyard. Documents are available for public review.

Background Level – Naturally occurring level of a chemical in the environment. The term is typically used to describe ambient concentrations of trace metals (e.g., arsenic) in the environment that have not been influenced by humans.

California Ocean Plan – Guidelines established by the State of California to protect ocean water and the marine ecosystem from pollutants.

California Ocean Plan Limit – Specific, numeric limits set forward in the California Ocean Plan established by the State of California to protect ocean water and the marine ecosystem from pollutants.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) – Commonly referred to as Superfund, authorizes federal action to respond to the release, or threat of release, into the environment of hazardous substances, pollutants, or contaminants that may present an imminent or substantial danger to public health or welfare.

Groundwater – Water beneath the ground surface that fills spaces between soil particles. Groundwater at Long Beach Naval Complex is not potable due to high, naturally occurring mineral content.

Groundwater Monitoring – Repeated, periodic sampling and analysis of groundwater.

Information Repository – The physical location where a collection of site information is maintained. It contains copies of documents available for public review.

Installation Restoration (IR) Site – Areas designated under the Navy's program to identify, investigate, assess, char-

acterize, clean up, or control past releases of hazardous substances.

Institutional Control – A legal or institutional mechanism that limits access to or use of property, or warns of a hazard (i.e., land use restrictions imposed by the property owner contained in a property deed).

No Further Action – The conclusion that no additional site environmental activities, beyond the Remedial Investigation/Feasibility Study, are necessary. Used as a baseline for comparison with site alternatives identified in the Feasibility Study.

Record of Decision – A report that documents how a site will be cleaned up and why the cleanup method was selected.

Remedial Action – The final action taken at a site to implement a permanent remedy. It may take an extended period of time and may allow a certain level of contamination to remain on site.

Remedial Action Objective – A brief description of what the proposed site cleanup under CERCLA is expected to accomplish.

Remediate/Remediation – Any active or passive environmental activity that results in the reduction of toxicity, mobility, or volume of contaminants at a site.

ACRONYMS

AOPC	area of potential concern
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EE/CA	Engineering Evaluation/ Cost Analysis
EPA	(United States) Environmental Protection Agency
HRC®	Hydrogen Release Compound
IAS	in situ air sparging
IRP	Installation Restoration Program
NFA	no further action
OU	Operable Unit
POLB	Port of Long Beach
PVB	Palos Verdes Blue butterfly
RAO	remedial action objectives
ROD	Record of Decision
SVE	soil vapor extraction
WQO	water quality objective

INFORMATION REPOSITORY AND ADMINISTRATIVE RECORD

An information repository and administrative record are provided for the community to review the five-year review for IRP sites 1-6A, 14, and OU-1 former Palos Verdes Navy Housing. Questions about the five-year review may be directed to Ms. Jennifer Valenzia at (619) 532-0919.

Information Repository
Long Beach Public Library
Government Publications Dept.
101 Pacific Avenue
Long Beach, CA 90822
(562) 570-7500
Mon. (10 a.m.-8 p.m.)
Tu.-Sat. (10 a.m.-5:30 p.m.)
Sun. (12 noon-5 p.m.)

Administrative Record
Ms. Diane Silva
Naval Facilities Engineering
Command
Southwest Division
1220 Pacific Highway, Bldg. 129
San Diego, CA 92132
(614) 532-3676
Mon.-Fri. (7 a.m.-3:30 p.m.)

PROTECTIVENESS STATEMENTS

Statement for IR Sites 1 and 2

A review of documents, site inspections, and interviews of station personnel knowledgeable about the sites indicate that the remedy for IR Sites 1 and 2 (Areas of Potential Concern [AOPCs] 1 and 4) is functioning to protect human health and the environment through implementation of remedial actions and institutional controls.

Although contamination remains in groundwater at the sites, it does not pose unacceptable risk under an industrial land use scenario. The remedial actions consisted of soil/debris excavation of soil contamination and operation of an in situ air sparging/soil vapor extraction (IAS/SVE) system to reduce contaminant concentrations in the groundwater. Quarterly groundwater monitoring is conducted to ensure that groundwater contaminants do not migrate from the site to the surrounding marine environment at concentrations in excess of California Ocean Plan criteria.

Institutional controls were implemented to ensure an industrial land use scenario and limit exposure pathways to contamination.



Recently Planted Trees at IR Site 1 (Gull Park)

Statement for IR Sites 3-6A

A review of documents, site inspections, and interviews of station personnel knowledgeable about the sites indicate that the remedy for IR Sites 3-6A is functioning to protect human health and the environment through groundwater

monitoring and institutional controls.

Although residual contamination remains in groundwater and soils at the sites, it does not pose unacceptable risk under an industrial land use scenario. Quarterly groundwater monitoring was conducted at IR Sites 3 and 6A (following approval of the ROD for IR Sites 3-6A) to ensure that groundwater contaminants did not migrate from the site to the surrounding marine environment at concentrations in excess of California Ocean Plan criteria.

Institutional controls were implemented to ensure an industrial land use scenario at each site and limit exposure pathways to contamination.



Uninhabited Land at the Southwestern Border of IR Site 5

PROTECTIVENESS STATEMENTS



Fencing and Monitoring Wells (in yellow) at IR Site 14

Statement for IR Site 14

A review of documents, site inspections, and interviews of station personnel knowledgeable about the site indicate that the remedy for IR Site 14 is functioning to protect human health and the environment through implementation of remedial actions and groundwater monitoring.

Contaminated surface and vadose zone soil and debris were removed from the site and replaced with clean fill. Groundwater remediation at the site is ongoing to reduce contaminant concentrations to levels acceptable under an industrial land use scenario. The selected groundwater remedy was enhanced biodegradation through injection of HRC® in the source zone coupled with monitored natural attenuation (MNA).

Groundwater monitoring is performed on a quarterly basis to determine the effectiveness of HRC® and MNA processes.

Statement for OU-1

The protectiveness determination is based on the review of the selected remedy, consisting of “hotspot” removal and construction of an engineered soil

cover over waste materials remaining at the site. The soil cover was designed to address the surface and subsurface soils at Sites 1A, 1B, and 2, in order to protect the public from contamination in the deeper soils by preventing future erosion of surface soils and off-site migration of contamination. The grading and landscaping of the soil cover also helped to prevent migration of contamination to deeper soils.

Field investigations conducted at the site indicate that landfill contamination is limited to a depth of approximately 33 feet. According to the data reviewed

and the site inspection, the soil cover is functioning as designed and remains protective of human health and the environment.

Five wells installed at OU-1 have been monitored frequently to assess groundwater quality at the site. Groundwater

quality data indicates that contaminants from sites 1A, 1B, and 2 have not leached into the groundwater below OU-1. Low levels of petroleum-hydrocarbon contamination found in the groundwater likely are unrelated to disposal activities at OU-1.

Regular operation and maintenance activities are performed to keep the soil cover, the surface water drainage system, and the vegetative layer in operating condition. Engineering and institutional controls are in place at OU-1 to prevent disturbance of the soil cover and maintain the site for open space land use.



View of the Soil Cover and Refinery to the East of OU-1