

Final

# **First Five-Year CERCLA Review of Seven Naval Computer and Telecommunications Area Master Station Pacific National Priorities List Sites**

**JOINT BASE PEARL HARBOR-HICKAM, LUALUALEI  
ANNEX AND WAHIAWA ANNEX, OAHU, HAWAII**

**NCTAMS PAC National Priorities List Site**

February 2015

Department of the Navy  
Naval Facilities Engineering Command, Hawaii  
400 Marshall Road  
JBPHH HI 96860-3139



**Comprehensive Long-Term Environmental Action Navy  
Contract Number N62742-03-D-1837, CTO HC38**



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**February 2015**

**Prepared for:**



**Department of the Navy  
Naval Facilities Engineering Command, Hawaii  
400 Marshall Road  
JBPHH HI 96860-3139**

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**Prepared under:**

**Comprehensive Long-Term Environmental Action Navy  
Contract Number N62742-03-D-1837, CTO HC38**



**: JbU First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

**Executive Summary and Introduction**



## EXECUTIVE SUMMARY

This five-year review evaluates whether the remedies implemented for seven sites at Joint Base Pearl Harbor Hickam (JBPHH), Wahiawa Annex and Lualualei (LLL) Annex, Oahu, Hawaii remain protective of human health and the environment.

This five-year review has been completed in accordance with the United States Environmental Protection Agency *Comprehensive Five-Year Review Guidance* (EPA 2001) and the Department of the Navy *Policy for Conducting Five-Year Reviews* (DON 2011). The Navy is the lead agency in this five-year review and is responsible for conducting the five-year review, preparing the five-year review report, and submitting the report for regulatory review and comment. The Navy will ensure that recommendations and any actions or follow-up identified during the five-year review are addressed. This five-year review report is consistent with Navy procedures and reviews, and has been executed by the Navy.

The due date for this five-year review is driven by the signature date of the earliest Record of Decision (ROD) for the seven sites. The Old Incinerator Site (OIS) ROD received final authorizing signature on February 17, 2010, triggering the completion date for this five-year review. The next five-year review will be due five years from the Navy's signature date for this report in accordance with Navy policy (DON 2011).

### SITES REVIEWED

The seven sites under five-year review in this report are located at two locations of the Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS PAC) National Priorities List (NPL) site (United States Environmental Protection Agency [EPA] identification: HI0170090054): NCTAMS PAC, Wahiawa Branch (the location is now named JBPHH Wahiawa Annex) and the Naval Radio Transmitting Facility (NRTF) LLL (the location is now named JBPHH LLL Annex). Of the seven sites, five are transformer sites that were addressed together in a single ROD; the other two sites were addressed in individual RODs. The seven sites are undergoing their first five-year review in this report; they are reviewed collectively here to synchronize the process for five-year reviews for NCTAMS PAC NPL sites. The seven sites are listed in Table ES-1.

**Table ES-1: Seven NCTAMS PAC NPL Sites Undergoing Five-Year Review**

Site Name Used in This Report	Navy Site Location	Navy Site Number	Navy Site Name	EPA OU Number	EPA OU Name
Old Incinerator Site	JBPHH Wahiawa Annex	00002	Old Incinerator Site	01	OIS
Old Wahiawa Landfill	JBPHH Wahiawa Annex	00001	Old Wahiawa Landfill	04	OWLF
<b>Five Transformer Sites</b>					
Building 3	JBPHH Wahiawa Annex	00014 - 00020	Transformer Sites	03	Transformer Sites
Building 106					
S-17					
Building 81	JBPHH Lualualei Annex				
S-26					

OU operable unit  
OWLF Old Wahiawa Landfill

For each site, all relevant activities that have been performed, as well as data and documents that have been generated since implementing the various remedial actions, have been reviewed. This five-year review is based on all inspections/evaluations/reports conducted at the site prior to

November 2014. Five-year review inspections were performed at the five transformer sites. The fourth annual LUC inspections for the OIS and Old Wahiawa Landfill (OWLF) were completed in October 2014 and were used in the evaluation for the five-year review inspections. Interviews with relevant personnel have also been conducted as part of the five-year review process.

Documents provided prior to November 2014 were evaluated for this five-year review report. Documents produced after November 2014 will be included in the next five-year review. The risk evaluation was conducted using EPA (2014) regional screening levels, the most current screening criteria available as of 17 November 2014.

**Table ES-2: Overview of Seven NCTAMS PAC NPL Sites Undergoing Five-Year Review**

Description	Signature Date of ROD/ Decision Document	COCs Remaining on Site at Issuance of ROD		Selected Remedy	Previous Five-Year Review
		Medium	Constituent		
<b>Five Transformer Sites</b>					
<p>Five transformers used for the NCTAMS PAC electrical power distribution networks. Previous investigations identified PCB contamination in surrounding soil and/or concrete; a removal action was performed at each site, but contamination exceeding cleanup standards remained at concentrations above that allowing for unrestricted use/unlimited exposure. The five sites were addressed collectively in a single ROD:</p> <ul style="list-style-type: none"> <li>• Building 3: An active transformer site located in the south-central section of JBPHH Wahiawa Annex near the intersection of Center Street and Tarawa Drive. This site includes the area outside Building 3, consisting of concrete and grass.</li> <li>• Building 106: An active transformer site located southeast of and adjacent to Building 106 along Saipan Drive on the western side of JBPHH Wahiawa Annex. The site includes Building 106 and the surrounding asphalt.</li> <li>• S-17: An inactive site formerly located in a mostly level, grassy field along the south side of Polaris Drive, near the center of JBPHH Wahiawa Annex. The site included an underground vault where access was provided by a subsurface tunnel located near Polaris Drive. The vault has been filled with concrete.</li> <li>• Building 81: An active transformer site located near the center of JBPHH LLL Annex, north of Edison Street. The site includes Building 81 and the surrounding grass, concrete, and asphalt.</li> <li>• S-26: An active transformer site located near a former residential area in the west-central portion of JBPHH LLL Annex. The site includes a fenced area and surrounding concrete.</li> </ul>	March 30, 2011	Soil and Concrete	PCBs	LUCs	None
<b>Old Incinerator Site</b>					
<p>A 0.14-acre plot of currently unused vacant land situated on the southern flank of a steep gulch in the south-central portion of JBPHH Wahiawa Annex. The site comprises steps, a landing, and the foundation of a former incinerator in which controlled documents and possibly other materials were burned. Metals (primarily arsenic and lead) present in the subsurface soil pose unacceptable risks to human health for the residential and industrial land use setting.</p>	February 17, 2010	Soil	Metals, PAHs, Dioxins	Long-term monitoring and maintenance and LUCs	None
<b>Old Wahiawa Landfill</b>					
<p>A remote, densely wooded 8-acre former landfill site located near the eastern perimeter of JBPHH Wahiawa Annex that served as the primary disposal area for wastes (mostly municipal) generated on base. The site was leveled and capped with a 3-foot soil layer in 1978. Contaminated media placed in the landfill render the site unsuitable for unlimited use/unrestricted exposure.</p>	February 18, 2010	Soil	PAHs, Metals, PCBs, and Cyanide	Long-term monitoring and maintenance and LUCs	None

COC chemical of concern  
 LUC land use control  
 PAH polynuclear aromatic hydrocarbon  
 PCB polychlorinated biphenyl

## REVIEW RESULTS

For all seven sites undergoing review, the Technical Assessment evaluated whether:

- The remedy is functioning as intended.
- The assumptions used at the time of remedy selection remain valid, and the remedial action objectives are still appropriate.
- Any other information was identified that calls into question the protectiveness of the remedy.

Recommendations are provided where necessary to close any data gaps and improve the effectiveness of the remedial actions in protecting human health and the environment. The Issues, Recommendations and Follow-up Actions, and Protectiveness Statements for each site are summarized in the Five-Year Review Summary Form, which follows this Executive Summary.

## FACILITY NAME CHANGES

Location names changed with the base merger that formed JBPHH in October 2010. The location of the operational area of NCTAMS PAC Wahiawa Branch is now named JBPHH Wahiawa Annex. The location of the operational area of NRTF LLL is now named JBPHH LLL Annex.

## REPORT FORMAT

The five-year review of the seven sites addressed in this report are presented in parallel format with equivalent section and page numbering to maintain site-specific continuity while following the outline defined in the *Comprehensive Five-Year Review Guidance* (EPA 2001, Appendix E). The five-year review of each site or site group (the five transformer sites are addressed together) follows an identical outline.

A single Introduction section is presented at the beginning of this report, following the Acronyms and Abbreviations list. The Introduction includes general information regarding the five-year review, an explanation of the report structure, a physiographic description of the two JBPHH annexes, and a section addressing the Next Review for the seven sites. An overview location map of the seven sites is included in the Introduction.

The main report presents site reviews for the seven sites in three parts:

- Five Transformer Sites (Building 3, Building 106, and S-17 at JBPHH Wahiawa Annex; Building 81 and S-26 at JBPHH LLL Annex)
- Old Incinerator Site (JBPHH Wahiawa Annex)
- Old Wahiawa Landfill (JBPHH Wahiawa Annex)

Each site is reviewed by the headings recommended in the EPA (2001) guidance that are not included in the Introduction section:

- Site Chronology
- Background
- Remedial Actions

- Progress Since the Last Five-Year Review
- Five-Year Review Process
- Technical Assessment
- Issues, Recommendations, and Follow-up Actions
- Protectiveness Statement

Site-specific location maps are presented under each site's review. Attachments to each site's review present the Five-Year Review Site Inspection Checklist, Site Photographs, and Interview Forms. Page headers and title pages identify the site(s) under review.

The final part of this five-year review report presents the Certification of Protectiveness for the seven sites.



## Five-Year Review Summary Form

SITE IDENTIFICATION		
<b>Site name:</b> Naval Computer and Telecommunications Area Master Station Pacific (includes: Building 3, Building 106, S-17, Building 81, S-26, Old Incinerator Site, and Old Wahiawa Landfill)		
<b>EPA ID:</b> HI0170090054		
<b>Region:</b> 9	<b>State:</b> HI	<b>City/County:</b> Honolulu/Honolulu
SITE STATUS		
<b>NPL status:</b> <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify):		
<b>Remediation status</b> (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete		
<b>Multiple OUs?</b> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<b>Construction completion date (most recent):</b> —	
<b>Has site been put into reuse?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
<b>Lead agency:</b> <input type="checkbox"/> EPA State Tribe <input checked="" type="checkbox"/> Other Federal Agency: Department of the Navy		
<b>Author name:</b> NAVFAC Hawaii		
<b>Author title:</b> —	<b>Author affiliation:</b> Navy CLEAN Contractor	
<b>Review period:</b> November 2014		
<b>Date(s) of site inspection:</b> November 6, 2014 (Building 3, Building 106, S-17, Building 81, S-26)		
<b>Type of review:</b> <input checked="" type="checkbox"/> <u>Statutory, NPL Remedial Action Site</u> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span><input type="checkbox"/> Post-SARA</span> <span><input type="checkbox"/> Pre-SARA</span> <span><input type="checkbox"/> NPL-Removal only</span> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span><input type="checkbox"/> Non-NPL Remedial Action Site</span> <span><input type="checkbox"/> NPL State/Tribe-lead</span> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span><input type="checkbox"/> Regional Discretion</span> </div>		
<b>Review number:</b> <input checked="" type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify):		
<b>Triggering action:</b> <input type="checkbox"/> Actual RA Onsite Construction at OU # _____ Actual RA Start at OU# _____ <input type="checkbox"/> Construction Completion Previous Five-Year Review Report <input checked="" type="checkbox"/> Other (specify): Signature date of earliest Record of Decision (February 17, 2010, Old Incinerator Site)		
<b>Triggering action date:</b> February 17, 2010		
<b>Due date (five years after triggering action date):</b> February 17, 2015		



**Summary of Five-Year CERCLA Review of Seven NCTAMS PAC NPL Sites**

Issues	Recommendations and Follow-up Actions	Anticipated Date of Implementation	Protectiveness Statement
<b>Five Transformer Sites</b>			
The S-17 LUC area is located in an open field and is difficult to find among the tall grass and shrubs.	Permanent signage, posts, or similar landmark should be installed to make the LUC area more visible for future annual and five-year review site inspections.	Spring 2016	The remedy at the Five Transformer Sites, a NCTAMS PAC NPL site on Oahu, Hawaii, is protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. No changes in land use are expected in the foreseeable future.
<b>Old Incinerator Site</b>			
Trespassers may access the site as evidenced by discarded waste items found at the site.	Contact number for the Navy Environmental Office should be verified annually and updated as appropriate when LUC signs are replaced or installed.	As needed	The remedy at the OIS is currently protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. The soil cover should be maintained to prevent future exposure. No changes in land use are expected in the foreseeable future.
Damaged perimeter fence near Sign S-9.	Replace damaged fence near Sign S-9.	No later than the subsequent LTM event	
If feral pig rooting were to occur within the OIS LUC boundary, subsurface soil may become exposed.	Update the LTM Inspection list to include surface soil disturbances resulting from feral pig activities.	No later than the subsequent LTM event	
<b>Old Wahiawa Landfill</b>			
Trespassers continue to access the southern portion of the OWLF LUC area.	Three additional LUC warning signs will be placed around the area where trespassing was previously observed.	No later than the subsequent LTM event	The remedy at the OWLF site is currently protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. The soil cover should be maintained to prevent future exposure. No changes in land use are expected in the foreseeable future.
	Contact number for the Navy Environmental Office should be verified annually and updated as appropriate when LUC signs are replaced or installed.	As needed	
If feral pig rooting were to occur within the OWLF LUC boundary, subsurface soil may become exposed.	Update the LTM Inspection list to include surface soil disturbances resulting from feral pig activities.	No later than the subsequent LTM event	
LTM      long-term monitoring OWLF    Old Wahiawa Landfill			



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## CONTENTS

Executive Summary	iii
Five-Year Review Summary Form	ix
Acronyms and Abbreviations (Executive Summary and Introduction Section Only)	xv
I. Introduction	I-i
I.1 Purpose of the Review	I-i
I.2 Authority for Conducting the Five-Year Review	I-i
I.3 Who Conducted the Five-Year Review	I-ii
I.4 Other Review Characteristics	I-ii
I.5 Report Structure	I-ii
I.6 General Physical Characteristics	I-ii
I.6.1 JBPHH Wahiawa Annex	I-iii
I.6.2 JBPHH LLL Annex	I-iv
I.7 Next Review	I-v
I.8 References (Executive Summary and Introduction Section Only)	I-ix

### INDIVIDUAL SITES FIVE-YEAR REVIEW FORMS

Five Transformer Sites  
Old Incinerator Site  
Old Wahiawa Landfill

### CERTIFICATION OF PROTECTIVENESS

### INTRODUCTION FIGURE

I-1 Location of Seven NPL Sites	I-vii
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### INTRODUCTION TABLE

I-1 Seven NCTAMS PAC NPL Sites Undergoing Five-Year Review	I-i
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**ACRONYMS AND ABBREVIATIONS  
(EXECUTIVE SUMMARY AND INTRODUCTION SECTION ONLY)**

°F	degree Fahrenheit
§	Section
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DOH	Department of Health, State of Hawaii
EPA	Environmental Protection Agency, United States
JBPHH	Joint Base Pearl Harbor-Hickam
LLL	Lualualei
NAVFAC	Naval Facilities Engineering Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NCTAMS PAC	Naval Computer and Telecommunications Area Master Station Pacific
NRTF	Naval Radio Transmitter Facility
NPL	National Priorities List
OU	operable unit



## I. Introduction

This report presents a five-year review of seven sites within the Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS PAC) National Priorities List (NPL) site on Oahu, Hawaii. Operable units (OUs) of the NCTAMS PAC NPL site are at two locations: Joint Base Pearl Harbor-Hickam (JBPHH) Wahiawa Annex in central Oahu, and JBPHH Lualualei (LLL) Annex in southwest Oahu. The seven sites are listed in Table I-1.

**Table I-1: Seven NCTAMS PAC NPL Sites Undergoing Five-Year Review**

Site Name Used in This Report	Navy Site Location	Navy Site Number	Navy Site Name	EPA OU Number	EPA OU Name
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<b>Five Transformer Sites</b>					
Building 3	JBPHH Wahiawa Annex	00014 - 00020	Transformer Sites	03	Transformer Sites
Building 106					
S-17					
Building 81	JBPHH Lualualei Annex				
S-26					

EPA Environmental Protection Agency, United States  
 JBPHH Joint Base Pearl Harbor-Hickam  
 OIS Old Incinerator Site  
 OWLF Old Wahiawa Landfill

NCTAMS PAC is identified on the NPL as United States Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Information System Number HI0170090054. NCTAMS PAC was listed on the NPL on May 31, 1994. In 2009, the EPA, State of Hawaii, and the Navy entered into a Federal Facilities Agreement (FFA) for NCTAMS PAC (EPA, State of Hawaii, and DON 2009). The NCTAMS PAC FFA specifies the CERCLA environmental response procedural requirements that will be implemented at the NCTAMS PAC NPL site. The Navy served as the lead agency for the investigations conducted at NCTAMS PAC. Throughout these investigations, oversight and additional support were provided by the EPA and the State of Hawaii Department of Health (DOH). The general location of the seven sites is shown on Figure I-1.

### I.1 PURPOSE OF THE REVIEW

This five-year review has been conducted to evaluate whether the response actions at the seven sites are protective of human health and the environment. This review is required to address the media that remain with contamination above the levels that allow for unrestricted use and unlimited exposure at these sites. In addition, the report identifies issues found during the review, if any, and recommendations to address them.

### I.2 AUTHORITY FOR CONDUCTING THE FIVE-YEAR REVIEW

The EPA and Navy policies require a five-year review of remedial actions for sites that do not meet unrestricted use and unlimited exposure in compliance with CERCLA. The Department of the Navy must implement five-year reviews consistent with CERCLA Section (§)121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] 300). CERCLA §121, 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 each 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. In addition, if upon such review it is the judgment of the President that action is appropriate at such Site in accordance with [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The requirement was further interpreted in the NCP; 300.430(f)(4)(ii) of Title 40 of the CFR, which 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.

### **I.3 WHO CONDUCTED THE FIVE-YEAR REVIEW**

Naval Facilities Engineering Command (NAVFAC), Hawaii conducted this five-year review of the remedies implemented at the seven sites. The review was conducted at the request of NAVFAC Hawaii under contract task order number HC38 of contract number N62742-03-D-1837.

### **I.4 OTHER REVIEW CHARACTERISTICS**

The trigger date for this five-year review was February 17, 2010, the date on which the first Record of Decision (for the Old Incinerator Site) was signed into effect. This five-year review started in November 2014 and includes data collected during November 2014 when the interviews and site inspections were completed. Depending on the site, earlier data pertinent to trend analysis or contained in reports examined for this review were also considered.

### **I.5 REPORT STRUCTURE**

The following subsections in this Introduction present a description of the general physical characteristics of the locations of the seven sites. This description is followed by a Next Review subsection. The individual sites five-year reviews are addressed after that section.

Following the Introduction, each site or site group (i.e., the Five Transformer Sites) is reviewed separately and in parallel by the nine site-specific section headings used in the EPA (2001) *Comprehensive Five-Year Review Guidance* template that are not included in this Introduction. Site-specific references and attachments (Inspection Checklist, Photographs, and Interview Forms) are included at the end of each site's review.

### **I.6 GENERAL PHYSICAL CHARACTERISTICS**

The seven sites addressed in this five-year review are located at Joint Base Pearl Harbor-Hickam (JBPHH) Wahiawa Annex in central Oahu (location of the main telecommunications station and receiver facility), and JBPHH LLL Annex in southwest Oahu (location of the transmitting facility). JBPHH Wahiawa Annex was first established as a temporary Naval Radio Station and Naval Radio Direction Finder Station in 1940 and was expanded after the December 7, 1941 attack on Pearl Harbor. The main NRTF Lualualei antennas at JBPHH LLL Annex were completed in 1935, and the transmitting facility was activated in 1936.

### **I.6.1 JBPHH Wahiawa Annex**

JBPHH Wahiawa Annex is located on Schofield Plateau at an elevation of approximately 1,300 feet above mean sea level. The plateau, which forms central Oahu between the Koolau and Waianae Ranges, was created when Koolau lava flows overlapped the flanks of the older Waianae Range. Near the 700-acre annex, the plateau slopes gently westward, corresponding to the dip of the underlying lava beds. The eastern boundary of the annex adjoins the western flanks of the Koolau Range. A thick layer of surface soil covering most of the annex is dissected by a system of narrow, steep-sided gullies formed by erosion. Land bordering the annex is largely agricultural. The nearest urban area is the town of Wahiawa, located about 1 mile south of the annex.

The climate at the annex is mild, with moderate rainfall, northeasterly trade winds, and a mean annual temperature of approximately 75 degrees Fahrenheit (°F). Average daily air temperatures vary only slightly during the year; the mean temperature difference between the coldest and warmest months is 6.5°F. Daily temperature fluctuates normally between 10° and 20°F. Rainfall averages approximately 50 inches per year (NEESA 1986).

Three stratigraphic units overlie the deep Waianae Volcanics beneath JBPHH Wahiawa Annex (Earth Tech 2006):

- The upper unit is silty clay or clayey silt laterite (ranging from 8 to 13 feet thick), a reddish soil formed by weathering of the Koolau Volcanics. In the gullies, the surface soil is silty clay or clayey silt alluvium deposited in the beds of intermittent streams.
- Below the upper unit is saprolite, ranging from 10 to 100 feet thick, formed by weathering of the Koolau Volcanics. Saprolite is distinguished from the overlying soil by its residual basaltic structure and texture, including fractures and vesicles.
- Unweathered to moderately weathered Koolau Volcanics deposited as lava and tuff flows underlie the saprolite. The lava and tuff flows crop out near the crest of the Koolau Range. Unweathered Koolau volcanic rocks are highly permeable, jointed, dense to very dense vesicular basalt.

Surface soil at the annex is predominantly part of the Helemano-Wahiawa association of laterite soils (highly weathered reddish soil rich in secondary oxides of iron). Derived from weathered basalt, these upland soils are generally level to moderately sloping, well drained, and moderately fine textured. Helemano silty clay soil occurs throughout the annex but is predominant in the southern region. On the gentler slopes (2–12 percent), this clay is moderately to highly permeable, has slow surface runoff, and is slightly susceptible to erosion. On the steeper slopes (30–90 percent), permeability is moderate, runoff medium to very rapid, and the erosion hazard is very severe. The surface soil in the flatter, northern portion of the annex is predominantly Paaloo silty clay, a moderately permeable upland soil with slow to medium surface runoff and 3–12 percent slopes. Manana silty clay loam, moderately permeable upland soil containing more than 10 percent sand with medium surface runoff, also occurs in this area (Earth Tech 2003).

No permanent surface water exists within the boundaries of the annex, apart from two eroded potholes on the floor of an intermittent stream (Earth Tech 2006). Storm drainage follows the topography of the land. Two large streams and a system of gullies direct drainage to the intermittent stream, which flows west and eventually drains into Poamoho Stream. The flow of the intermittent streams changes seasonally because of variations in rainfall and the height of the water table. The normally dry streams may fill with surface water within hours of rainfall in the mountains. The small pools of water that remain after the rain stops eventually drain or evaporate.

Poamoho Stream, the nearest perennial stream and located 300–600 feet north of the annex, merges with Kaukonahua Stream 7 miles northwest of the annex. About 1 mile beyond the confluence, the stream empties into Kaiaka Bay on the north shore of Oahu.

Groundwater of the Schofield High-Level Aquifer lies within the fractured basalt of the Koolau Volcanic Series and, possibly at greater depths, within the Waianae Volcanics. Basalt dikes form relatively impermeable barriers in the permeable volcanic rock. The dikes divert groundwater to successively lower compartments, creating step-like breaks in the water table. Perched water occurs locally where less-permeable strata impede the downward flow of surface water. Groundwater flows westward. The aquifer is recharged by infiltration of rainfall in the Koolau Range and by rainwater and streamflow infiltration on the Schofield Plateau (Earth Tech 2003). The potentiometric surface of the Schofield Aquifer downgradient of JBPHH Wahiawa Annex is 800–900 feet below ground surface (bgs), based on initial water level measurements in a municipal well located 500 feet east of Transformer 234. The 960-foot-deep well has supplied municipal water to NCTAMSPAC Wahiawa Branch since April 1997; it is sampled quarterly by DOH (Earth Tech 2003).

Perched groundwater occurs locally where less permeable strata impede the downward flow of surface water. The perched water is not used for drinking water and is distinct from the regional water supply, the Schofield Aquifer, which occurs at an approximate depth of 900 feet (Earth Tech 2006).

### **1.6.2 JBPHH LLL Annex**

NRTF LLL at JBPHH LLL Annex occupies 1,700 acres in LLL Valley, a large valley between the leeward coast and the crest of the Waianae Mountain Range near the southwest shore of Oahu. Surrounding communities in the District of Waianae include Nanakuli, Maili, and Waianae. Naval Magazine Lualualei shares a common border to NTRF LLL at JBPHH LLL Annex. The Waianae Range forms the eastern boundary of the LLL Annex, and agricultural and conservation lands lie to the north and south. The nearest urban areas are the towns of Maili (1 mile west) and Nanakuli (2 miles south); the nearest residential community is located approximately 2,000 feet south of the site.

The climate in the Lualualei region is relatively warm and dry. Trade winds from the northeast occur much of the time, with occasional Kona winds. Temperature in this area typically varies between the lower 60s to the upper 80s (°F). Rainfall in the region is generally light, with a mean annual rainfall of approximately 26 inches near the sites.

The stratigraphy of Lualualei Valley consists of a thick sequence of calcareous and noncalcareous sedimentary rocks overlying basalts of the Waianae Volcanic series. The sedimentary sequence is thickest near the center of the valley; the youngest strata are unconsolidated, noncalcareous alluvial deposits derived from weathered volcanics or Pleistocene alluvium. The underlying calcareous sedimentary strata include coralline limestones and detrital limestones composed of broken shell fragments and beach sands. The basal Waianae Volcanic series, which include lower, middle, and upper basalt members with a total thickness of more than 6,000 feet, are exposed northwest and southeast of the annex. JBPHH LLL Annex is generally level; elevations range between 10 and 100 feet above mean sea level. Soils in the Lualualei area are included in the Lualualei-Fill land-Ewa Association, an assemblage of well-drained, fine-textured soils that occur in drainages and on alluvial fans in nearly level to moderately sloping layers. Surficial soils consist of 20–50 inches of silty clay loam. These surface soils overlie coralline limestone (Earth Tech 2003).

Surface runoff at the annex is generally in a northeast direction, toward the Pacific Ocean. The runoff is limited by the semiarid conditions, the flat to gently rolling topography, and the moderate

permeability of the surface soils. The annex is drained by the intermittent Mailiili Stream, which flows west through the northern section of the annex and along the northern boundary. Niulii Reservoir is located in the eastern area of the annex and consists of two wastewater stabilization ponds and one overflow pond. The reservoir was constructed in the early 1930s and functions as a system of three in-line sewage treatment oxidation ponds. The pond-treatment system received a National Pollutant Discharge Elimination System permit in the early 1970s. Niulii Reservoir is a tributary of Mailiili Stream but is believed to have overflowed only once from heavy rains. Reservoir water probably recharges shallow groundwater to a limited extent (Earth Tech 2006).

The occurrence of groundwater resources beneath the Waianae Coastal area is the result of precipitation infiltrating the ground surface and percolating downward into permeable rock materials. Groundwater occurs in the upland Waianae Range basalt lava flows, the Lualualei Valley alluvium, the coralline (reef) deposits, and the basaltic lava flows beneath Lualualei Valley. Groundwater at the annex exists within a shallow unconfined aquifer. Depth to groundwater is projected to be 60–80 feet bgs, with a gradient of approximately 1 foot per mile southwest (Earth Tech 2003).

## **I.7 NEXT REVIEW**

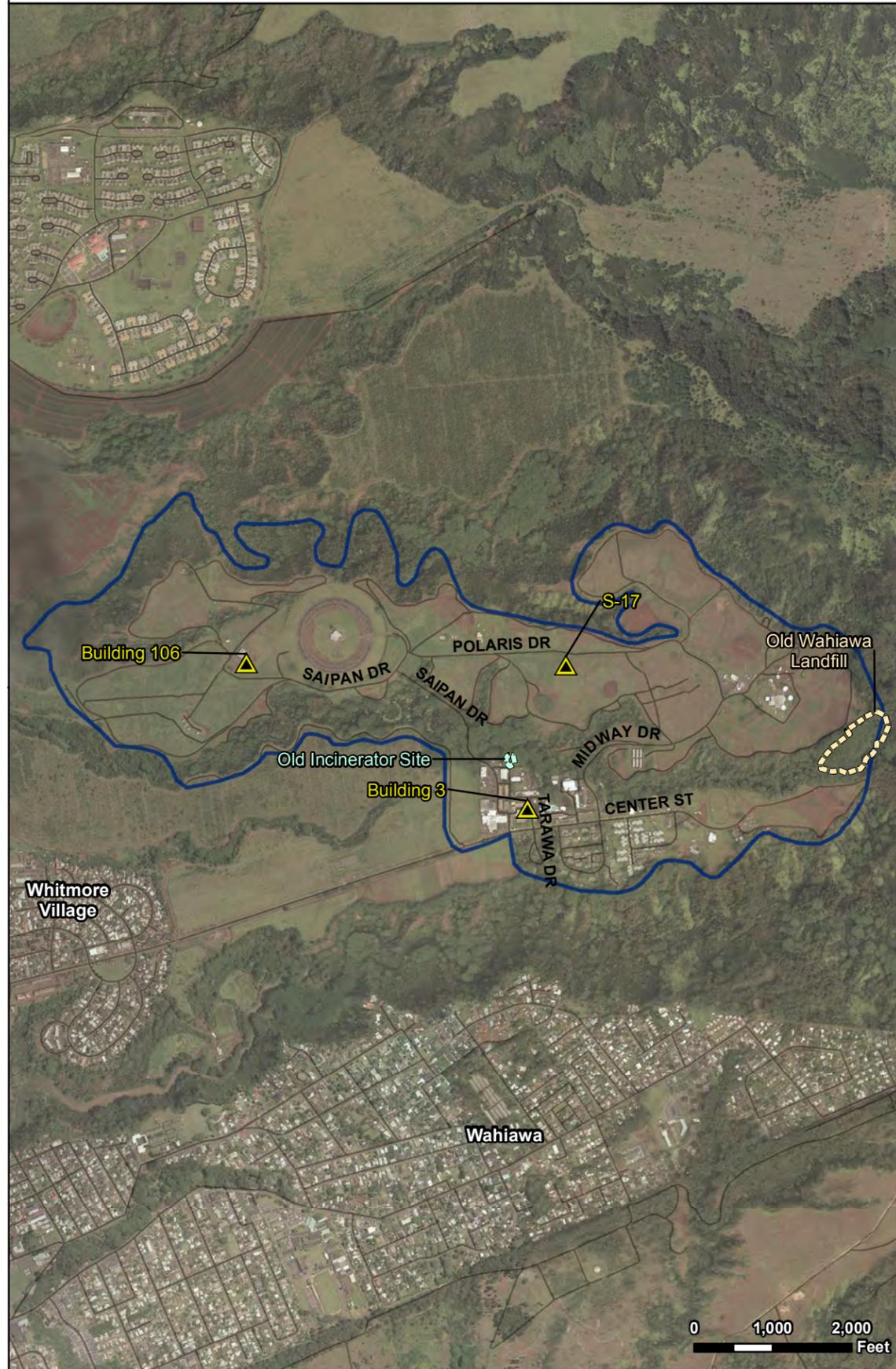
The next five-year review for the seven NCTAMS PAC NPL sites is required to be completed and signed out within five years from the signature date of the current five-year review report. The date will be finalized upon completion of this five-year review.



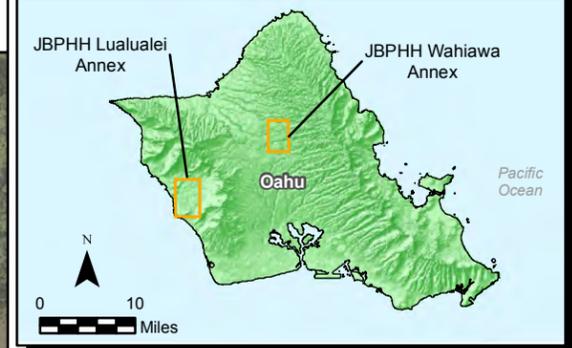
### NRTF LLL at JBPHH Lualualei Annex



### JBPHH Wahiawa Annex



#### LOCATION MAP



#### LEGEND

-  Transformer Site
-  JBPHH Wahiawa Annex Boundary
-  JBPHH Lualualei Annex Boundary
-  Former NRTF LLL Boundary
-  Road

#### NOTES

1. Acronyms and Abbreviations:
  - JBPHH Joint Base Pearl Harbor-Hickam
  - LLL Lualualei
  - NCTAMS Naval Computer and Telecommunications Area Master Station
  - NMC EAD DET PH Navy Munitions Command East Asia Division Detachment Pearl Harbor
  - NRTF Naval Radio Transmitting Facility
  - NPL National Priorities List
  - PAC Pacific
2. Basemap: <http://hawaii.wr.usgs.gov/oahu/earthdata.html> (USGS 1-foot orthoimagery).
3. Map Projection: NAD83 State Plane Hawaii Zone 3 (Feet).



**Figure I-1**  
**Location of Seven NPL Sites**  
**First Five-Year CERCLA Review of**  
**Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priority List Site**  
**JBPHH, Lualualei Annex and**  
**Wahiawa Annex, Oahu, Hawaii**



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**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

**Five Transformer Sites**

Old Incinerator Site

Old Wahiawa Landfill



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## CONTENTS

### Five Transformer Sites

Acronyms and Abbreviations	iii
1. Site Chronology	1-1
2. Background	2-1
2.1 Site Description	2-1
2.2 Land Use	2-2
2.3 History of Contamination	2-3
2.4 Initial Response	2-3
2.5 Basis for Taking Remedial Action	2-5
3. Remedial Actions	3-1
3.1 Remedial Action Objectives	3-1
3.2 Remedy Description	3-1
3.3 Remedy Implementation	3-2
3.4 Systems Operations and Maintenance	3-3
4. Progress Since the Last Five-Year Review	4-1
5. Five-Year Review Process	5-1
5.1 Administrative Components	5-1
5.2 Community Involvement	5-1
5.3 Document Review	5-1
5.4 Data Review	5-1
5.5 Five-Year Site Inspection	5-2
5.6 Interviews	5-3
6. Technical Assessment	6-1
7. Issues, Recommendations, and Follow-up Actions	7-1
8. Protectiveness Statement	8-1
9. References	9-1

### ATTACHMENTS

Attachment A: Five-Year Review Site Inspection Checklist

Attachment B: Site Photographs

Attachment C: Interview Forms

### FIGURE

2-1 Facility Location Map	2-7
2-2 Transformer Site Location Map, JBPHH Wahiawa Annex	2-9
2-3 Building 3 Land Use Control Area	2-11
2-4 Building 106 Land Use Control Area South of the Retaining Wall	2-13
2-5 Building 106 Land Use Control Area South of Building	2-15
2-6 S-17 and Land Use Control Area	2-17

2-7	Transformer Site Location Map, JBPHH Lualualei Annex	2-19
2-8	Building 81 Land Use Control Area	2-21
2-9	S-26 Land Use Control Area	2-23

**TABLES**

1-1	Chronology of Events at the Five Transformer Sites	1-1
2-1	Description of Current and Future Land Use at the Five Transformer Sites	2-2
2-2	Initial-Response Removal Actions at the Five Transformer Sites	2-4
5-1	Five-Year Review Team Members	5-1
6-1	Chemical ARAR Comparison	6-3
7-1	Issues and Recommendations	7-1

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## ACRONYMS AND ABBREVIATIONS

µg	microgram
AM	action memorandum
Bldg.	building
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm <sup>2</sup>	square centimeter
cy	cubic yard
DOH	Department of Health, State of Hawaii
EAL	environmental action level
EE/CA	engineering evaluation/cost analysis
EPA	Environmental Protection Agency, United States
ft <sup>2</sup>	square foot
HI	hazard index
IAS	initial assessment study
JBPHH	Joint Base Pearl Harbor-Hickam
LLL	Lualualei
LUC	land use control
MDC	maximum detected concentration
mg/kg	milligram/kilogram
NAS	Naval Air Station
NCTAMS PAC	Naval Computer and Telecommunications Area Master Station Pacific
NPL	National Priorities List
NRTF	Naval Radio Transmitter Facility
NTCRA	non-time critical removal action
O&M	operations and maintenance
PCB	polychlorinated biphenyl
PHNC	Pearl Harbor Naval Complex
RAB	restoration advisory board
RAO	remedial action objective
ROD	record of decision
RPM	remedial project manager
RSE	removal site evaluation
RVR	remediation verification report
SAL	soil action level
SI	site inspection
TSCA	Toxic Substances Control Act (1976) (15 U.S.C. s/s 2601 et seq.)



## 1. Site Chronology

Significant events relevant to the Five Transformer Sites at Joint Base Pearl Harbor-Hickam (JBPHH) Wahiawa Annex and Lualualei (LLL) Annex are presented in Table 1-1.

**Table 1-1: Chronology of Events at the Five Transformer Sites**

Event	Date	Transformer Site				
		JBPHH Wahiawa Annex			JBPHH LLL Annex	
		Bldg. 3	Bldg. 106	S-17	Bldg. 81	S-26
Naval Radio Transmitter Facility (NRTF) Lualualei (LLL) commences operations as a Navy transmitting station.	1936				•	•
Naval Radio Station, Wahiawa commences operations as a temporary radio and direction finder station, and is quickly expanded in the period leading up to World War II. The operation is later renamed to Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS PAC) Wahiawa Branch.	1940–1941	•	•	•		
Historical routine maintenance and/or leakage of PCB-containing dielectric fluid at the five transformers at JBPHH Wahiawa Annex and Joint Base Pearl Harbor-Hickam (JBPHH) LLL Annex resulted in contamination of surrounding soil and/or concrete.	1936–1970s	•	•	•	•	•
An initial assessment study conducted by the Navy identified 25 transformer locations requiring further investigation based on past maintenance practices; however, the IAS did not include sampling. Building (Bldg.) 3 and Bldg. 106 at JBPHH Wahiawa Annex and Bldg. 81 and S-26 at JBPHH LLL Annex were included in the initial assessment study (IAS) (NEESA 1986).	1986	•	•		•	•
A site inspection conducted for the NCTAMS PAC transformer sites identified in the IAS report collected soil samples from the transformer locations to assess the extent of polychlorinated biphenyl (PCB) contamination. Elevated PCB concentrations were detected in soil samples from all transformer locations. Bldg. 3, Bldg. 106, S-26, and Bldg. 81 were identified for further evaluation (HLA 1989).	1989	•	•		•	•
A removal action was conducted at 11 NCTAMS PAC transformer locations identified in the IAS report, including Bldg. 3 (PRC 1992). PCB-contaminated soil was removed from Bldg. 3 and disposed of in a United States Environmental Protection Agency (EPA)-approved landfill to receive Comprehensive Environmental Response, Compensation, and Liability Act wastes on the mainland. Following excavation, confirmation samples were collected to confirm the excavation results. Post-remedial data collected showed that PCB contamination was present above the Toxic Substances Control Act (TSCA) high-occupancy cleanup level (exceeding 1 milligram per kilogram [mg/kg], but less than 10 mg/kg). Confirmation resampling was conducted in 2004 due to legal action that was taken against one of the analyzing laboratories (Eureka Laboratories, Inc.), which raised concerns over the validity of post-remedial data collected for the 1991 removal action. In association with the removal action field effort for the 11 transformer locations at JBPHH Wahiawa Annex, further site characterization data was also obtained at Bldg. 106 and S-26.	1991	•	•			•
Three underground storage tanks (USTs) located adjacent to Bldg. 81 were removed. During the removal, PCBs were found in the soil at the site during waste characterization activities. Approximately 1,800 cy of PCB-impacted soil were stockpiled and further investigation was recommended to evaluate the PCB contamination at the site (OHM 1997).	1997				•	
The Navy Public Works Center identified four other locations where PCB transformers existed, including S-17 (Earth Tech 1998).	1991-1998			•		

*Final First Five-Year CERCLA Review of Seven NCTAMS PAC NPL Sites  
Five Transformer Sites, JBPHH, LLL Annex and Wahiawa Annex, Oahu, Hawaii*      *Chronology*

Event	Date	Transformer Site				
		JBPHH Wahiawa Annex			JBPHH LLL Annex	
		Bldg. 3	Bldg. 106	S-17	Bldg. 81	S-26
An engineering evaluation/cost analysis (EE/CA) evaluated removal action alternatives to address PCB contamination at seven transformers at NCTAMS PAC, including three addressed in this five-year review (Earth Tech 1998). The EE/CA recommended a removal action consisting of excavation of PCB-contaminated soil and concrete and disposal in an off-island landfill.	1998		•	•		•
Cleaning and sampling were conducted at the concrete underground vault at S-17. A field investigation and risk evaluation report recommended that the vault be filled with concrete and closed to eliminate the potential for water to infiltrate it and create a potential exposure pathway for human receptors (Earth Tech and TTEMI 1999).	1999			•		
An AM documented the Navy's decision to conduct non-time-critical removal actions (NCRAs) at multiple transformer sites (DON 1999).	1999		•	•		•
A NCRAs was conducted for Building 106, S-17, and S-26. A total of 1,628 cubic yards (cy) of PCB-containing soil was excavated from these sites. The TSCA soil cleanup level (10 mg/kg) was used for verification samples collected at Building 106 and S-17 at NCTAMS PAC Wahiawa Branch since these sites were classified as low-occupancy use areas. S-26 at JBPHH LLL Annex was located in a high-occupancy use area; therefore, the TSCA high-occupancy cleanup level (1 mg/kg) was originally used. The S-26 site was reclassified as a low-occupancy use area, however, after verification samples collected from soil directly above assumed bedrock (approximately 11 feet bgs) were determined to be above 1 mg/kg but below 10 mg/kg. Residents from base housing located adjacent to S-26 were relocated as a result of the reclassification in land use. In an effort to achieve the TSCA concrete cleanup levels, concrete cleaning (power-washing or solvent extraction) was conducted at S-17 and S-26. The cleanup of concrete was verified by comparing verification sample results with the TSCA low-occupancy action level of 10 µg/100 cm <sup>2</sup> at S-17 and S-26. The soil from the transformer sites was stockpiled at JBPHH LLL Annex until it could be transported to a thermal desorption unit for treatment in 2003 and 2004. The stockpiling of soil and concrete from JBPHH Wahiawa Annex and JBPHH LLL Annex was considered "on-site" as it was kept on the same NCTAMS PAC NPL site. In addition, the stockpiling was performed while the effort to consolidate soils for purposes of treatment was being clarified and established. The excavated areas were later backfilled with treated soil from the treatment system that met the unrestricted use cleanup level (1 mg/kg), compacted, and restored (such as landscaping, concrete and asphalt paving) (Earth Tech 2006).	1998– 2000		•	•		•
The Navy, in consultation with the EPA and DOH, determined that soil from multiple transformer sites within multiple naval facilities across Oahu could be consolidated for treatment and that this action could be considered an onsite action. Stockpiled soil excavated under previous removal actions at Bldg. 106, Bldg. 81, and S-26 was included in the determination. Based on this decision, an evaluation of treatment alternatives was conducted within a treatment EE/CA (Earth Tech 2000) for the combined sites. The EE/CA recommended consolidating soils from three facilities (former Naval Air Station [NAS] Barbers Point, Pearl Harbor Naval Complex [PHNC], and NCTAMS PAC) and treating the soil with thermal desorption. Prior to implementing the treatment process, soil that was already excavated was stockpiled at either former NAS Barbers Point or JBPHH LLL Annex. Once the treatment process began, these stockpiles were to be transported to the treatment unit located at former NAS Barbers Point.	2000		•		•	•

Event	Date	Transformer Site				
		JBPHH Wahiawa Annex			JBPHH LLL Annex	
		Bldg. 3	Bldg. 106	S-17	Bldg. 81	S-26
An AM (DON 2000) documented the Navy's decision to undertake removal actions at Building 106, Building 81 and S-26. In addition, the AM documented the Navy's proposal to excavate PCB-contaminated soil from various locations, consolidate soils from three facilities (former NAS Barbers Point, PHNC, and NCTAMS PAC) and treat the soil with thermal desorption.	2000		•		•	•
A Removal Site Evaluation (RSE) was conducted at Building 81 at JBPHH LLL Annex from January through October 2000 to delineate the nature and extent of soil contamination at Bldg. 81 and seven associated areas of concern: (1) the current UST, (2) the former aboveground storage tank (day tank) and UST, (3) the former grass-covered generator engine mound, (4) the transformer location, (5) the Bldg. 81 perimeter, (6) the underground concrete vault and associated discharge pipeline, and (7) grounding well sumps. The RSE also presented a risk evaluation based on site contaminants and proposed a response action based on appropriate cleanup criteria (Earth Tech 2001a). A NTCRA was recommended for Building 81 to remove 2,000 cy of PCB and benzo(a)pyrene contaminated soil.	2001				•	
An AM addendum (DON 2002) documented procedures for excavation, treatment, and final placement of PCB-contaminated soil and concrete from transformer sites that were not originally considered in the 2000 AM (DON 2000) or any of the previous EE/CAs or AMs prepared for former NAS Barbers Point, PHNC, and NCTAMS PAC. Building 81 was identified in this addendum to undergo a NTCRA for the contaminated soil delineated by the 2001 RSE (DON 2002). The AM addendum also proposed site selection criteria for new sites that would be remediated using excavation, treatment of contaminated soil, solvent extraction or removal of concrete, and final placement of treated materials in an on-island coral pit because the conditions are consistent with the previous site conditions in the referenced action memoranda (DON 1999). The AM addendum presented the general criteria for the inclusion of a site in the removal action; site-specific information regarding those sites would be included as an attachment to the AM addendum, and thereby "plugged in" to the document. This "plug-in" AM addendum would allow the selection of a protective, presumptive cleanup action (excavation, treatment, and placement) at future PCB transformer sites, provided that the sites meet the selection criteria.	2002				•	
A site inspection was conducted at various transformer locations at NCTAMS PAC, including a former transformer storage area at Bldg. 81 (Bldg. 81 Laydown Area) (Earth Tech 2001b). The Laydown Area was separate from the former transformer location on the east side of the building, and was used for the temporary storage of transformers following decommission or removal. It was not known how long the transformers were stored there, what condition they were in, or when they were removed (Earth Tech 2006). Based on sampling results that exceeded cleanup levels, Building 81 was recommended for further action (Earth Tech 2002).	2001				•	
In February 2002 and March 2003, a "plug-in" attachment to the AM addendum (DON 2003) was prepared recommending that additional sites, including Building 81 at NRTF Lualualei, undergo a NTCRA consisting of excavation followed by on-island thermal desorption treatment, and transport and placement of treated media back at the excavation sites.	2003				•	

*Final First Five-Year CERCLA Review of Seven NCTAMS PAC NPL Sites  
Five Transformer Sites, JBPHH, LLL Annex and Wahiawa Annex, Oahu, Hawaii*      *Chronology*

Event	Date	Transformer Site				
		JBPHH Wahiawa Annex			JBPHH LLL Annex	
		Bldg. 3	Bldg. 106	S-17	Bldg. 81	S-26
Preliminary sampling was conducted to support design efforts for the removal action at various transformer locations, including Buildings 81 at JBPHH LLL Annex. Pre-excavation sampling was conducted to define the lateral and vertical extent of PCB contamination in soils at concentrations that exceed the cleanup level (1 mg/kg) before soil excavation and treatment at former NAS Barbers Point (Earth Tech 2001c, 2003).	2002–2004				•	
An additional NTCRA was conducted for Building 81 from April through August 2004. A total of 7,147 cy of PCB-containing soil was excavated. The soil was transported directly to the thermal desorption unit for treatment. The excavated area was later backfilled with treated soil from the treatment system that met the unrestricted-use cleanup level (1 mg/kg), compacted, and restored (such as landscaping, concrete, and asphalt paving) (ECC 2007).	2004				•	
A laboratory data report documented confirmation resampling results (Earth Tech and TTEMI 2005). Based on statistical comparison, the analytical data from the 1991 removal action were valid, and the findings of the removal action were confirmed. The 2004 confirmation resampling results confirmed the findings of the 1991 removal action, which indicated PCB contamination remained at concentrations above the TSCA high-occupancy cleanup level (1 mg/kg but less than 10 mg/kg) in an area along the northwestern side of Building 3 adjacent to the concrete stairs and slab and beneath a clean, backfilled soil cap and vegetation.	2005	•				
Various RVRs for Navy transformer sites on Oahu were ultimately included in a consolidated RVR to document the removal and treatment activities at transformer sites included in the thermal desorption treatment system (Earth Tech 2008).	2008	•	•	•	•	•
New location names were implemented with the establishment of Joint Base Pearl Harbor-Hickam. The location of the NCTAMS PAC Wahiawa activity was named JBPHH Wahiawa Annex, and the location of the NRTF Lualualei activity was named JBPHH Lualualei Annex.	October 2010	•	•	•	•	•
A ROD for Five Transformer Sites issued by the Navy in December 2010 documented land use controls as the selected final remedy for the sites (DON 2011). The ROD became effective with receipt of the final authorizing signature on 30 March 2011.	March 30, 2011	•	•	•	•	•
A remedial action work plan issued by the Navy identified and discussed land use controls required to protect human health and the environment at eight JBPHH transformer sites, including the five sites addressed by this five-year review (AECOM 2011).	October 2011	•	•	•	•	•
A remedial action completion report formally documented completion of the remedial action to implement LUCs at eight JBPHH transformer sites, including the five sites addressed by this five-year review (AECOM 2012).	May 2012	•	•	•	•	•
Annual site inspections were conducted at the Five Transformer Sites to verify compliance with the LUCs specified in the ROD; LUC Compliance Certificates issued by the Navy documented the results of the inspections (NAVFAC Hawaii 2012, 2014).	2012–2014	•	•	•	•	•

## 2. Background

The Five Transformer Sites are included in the Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS PAC) National Priorities List (NPL) site as a part of Operable Unit 03 located at JBPHH, LLL Annex and Wahiawa Annex.

### 2.1 SITE DESCRIPTION

The Five Transformer Sites are located at JBPHH Wahiawa Annex in central Oahu and JBPHH LLL Annex in southwest Oahu (Figure 2-1). A general description of these facilities and their physical characteristics are presented in the Introduction, Section I.6.

Three transformer sites are located at JBPHH Wahiawa Annex (Figure 2-2).

- *Building (Bldg.) 3:* A transformer site located south-central section of the annex near the intersection of Center Street and Tarawa Drive. A 98-square-foot (ft<sup>2</sup>) area adjacent to Bldg. 3 on its northwest side requires land use controls (LUCs) to restrict land use to low-occupancy use (Figure 2-3). The area consists mostly of soil with vegetated cover. After a 1991 removal action, three soil re-verification samples collected in 2004 confirmed results of sampling performed immediately after the removal; the re-verification samples had total polychlorinated biphenyl (PCB) results of 1.05–6.07 milligrams per kilogram (mg/kg), which remained above the Toxic Substances Control Act (TSCA) high-occupancy cleanup level of  $\leq 1$  mg/kg and the State of Hawaii Department of Health (DOH) Tier 1 soil action level (SAL) of 1.1 mg/kg (DOH 2011). Confirmation resampling was conducted in 2004 due to legal action that was taken against one of the analyzing laboratories, which raised concerns over the validity of post-remedial data following the 1991 removal action. A clean, backfilled soil cap overlays the PCB-contaminated soil and was put into place to prevent further release of PCBs and to limit direct exposure to PCB concentrations in subsurface soil.
- *Bldg. 106:* A transformer site located southwest of and adjacent to Bldg. 106 along Saipan drive in the western part of the annex. The site includes two areas of concern:
  - A 50-ft<sup>2</sup> grassy area outside a 4-foot-high retaining wall, approximately 50 feet south of Bldg. 106, requires LUCs to restrict land use to low-occupancy use (Figure 2-4). After a 1999 removal action, one soil verification sample result of 2.6 mg/kg for total PCBs exceeded the TSCA high-occupancy cleanup level ( $\leq 1$  mg/kg for soil) and the DOH SAL (1.1 mg/kg).
  - A 447-ft<sup>2</sup> asphalt-covered area along the southwestern side of Bldg. 106 requires LUCs to restrict land use to low-occupancy use (Figure 2-5). After a 1999 removal action, one soil verification sample result of 7.73 mg/kg for total PCBs exceeded the TSCA high-occupancy cleanup level ( $\leq 1$  mg/kg for soil) and the DOH Tier 1 SAL (1.1 mg/kg).
- *S-17:* A transformer site located in a mostly level, grassy field along the south side of Polaris Drive, near the center of the annex. The site includes an underground vault where access was provided by a subsurface tunnel located near Polaris Drive (Figure 2-6). A concrete wipe sample collected from the interior vault wall was analyzed to contain a PCB concentration of 12 microgram ( $\mu\text{g}$ )/100 square centimeters (cm<sup>2</sup>), exceeding the cleanup goal for the site ( $\leq 10$   $\mu\text{g}/100$  cm<sup>2</sup>). The 118-ft<sup>2</sup> LUC area consists of the underground vault where LUCs are required to ensure the integrity and maintenance of the concrete vault and the concrete fill. The interior of the vault was cleaned, and one concrete wipe verification sample was collected. The concrete wipe verification sample result for total PCBs of 0.75  $\mu\text{g}$  per 100

cm<sup>2</sup> was well below the TSCA high-occupancy cleanup level for concrete ( $\leq 10 \mu\text{g}/100 \text{ cm}^2$ ). The results of field sampling indicated that PCB concentrations in soils do not exceed the cleanup goals established for the site, and the risk evaluation showed that PCB contamination in the surface and subsurface soil and within the surface concrete at S-17 does not pose a threat to human or ecological receptors. However, PCB concentrations in concrete within the underground vault (from results of wipe samples collected before the vault was cleaned) exceeded the cleanup goals and could pose a threat to human receptors. In addition, water and sediment could accumulate within the vault from infiltrating water and become contaminated with PCBs leached out of the concrete, which could pose a threat to human receptors. The vault was filled with 56 cubic yards of concrete to prevent access, limit direct exposure to PCBs, and eliminate the potential for water to continue to infiltrate the underground vault.

Two transformer sites are located at JBPHH LLL Annex (Figure 2-7).

- *Bldg. 81*: A transformer site located near the center of the installation, north of Edison Street. The site consists of an area of grass, concrete, and asphalt located northwest of Bldg. 18 where LUCs are required to restrict the site to low-occupancy use because PCB-contaminated soil exists beneath a clean, backfilled soil cap (Figure 2-8). During a 2004 removal action, not all impacted soil could be removed due to the proximity of underground fuel lines. After the removal action, four soil verification samples with total PCB results of 9.0–43.0 mg/kg exceeded the TSCA high-occupancy cleanup level ( $\leq 1 \text{ mg/kg}$  for soil) and the DOH Tier 1 SAL (1.1 mg/kg). The soil cap limits direct exposure to PCB concentrations in subsurface soil.
- *S-26*: A transformer site located near a former residential area and adjacent to the southeast end of Bldg. 404. The 4,288-ft<sup>2</sup> site includes a fenced area and surrounding concrete where LUCs are required for soil in an area north and east of an existing concrete transformer pad to restrict the site to low-occupancy use (Figure 2-9). The original cleanup level for this site was  $\leq 1 \text{ mg/kg}$  for high-occupancy use, because base housing was located adjacent to the site; however, the housing residents were relocated and the future use of the area is low-occupancy use. After 1999–2000 removal actions, 10 soil verification sampling results for total PCBs ranging from 1.2 mg/kg to 8.4 mg/kg exceeded the TSCA high-occupancy cleanup level of  $\leq 1 \text{ mg/kg}$  and the DOH Tier 1 SAL (1.1 mg/kg).

## 2.2 LAND USE

The current and potential future land use for each of the transformer sites is summarized in Table 2-1.

**Table 2-1: Description of Current and Future Land Use at the Five Transformer Sites**

Location	Site	Current Land Use	Future Land Use
JBPHH Wahiawa Annex	Bldg. 3	The site is a 98-ft <sup>2</sup> area of concrete and grass immediately adjacent to the north end of Bldg. 3. Bldg. 3 is currently a dining facility. Activities in the surrounding area include administrative buildings (Bldgs. 2 and 24) a storage facility (Bldg. 25), and a transformer (Bldg. 127).	No plans to change current land use.
	Bldg. 106	The site includes two areas; a 50 ft <sup>2</sup> grassy area southeast of Bldg. 106 and a 447 ft <sup>2</sup> asphalt paved area immediately adjacent to Bldg. 106. Bldg. 106 currently houses generators. The surrounding areas include open space, and Bldg. 105 located to the northwest of Bldg. 106, which is currently used for administrative activities.	No plans to change current land use.

Location	Site	Current Land Use	Future Land Use
JBPHH Wahiawa Annex (cont'd)	S-17	This site is an underground vault that formerly housed a transformer. The vault has been filled in with concrete. The area surrounding the vault is an open grassy field.	No plans to change current land use.
JBPHH LLL Annex	Bldg. 81	The site is a 1,409-ft <sup>2</sup> area northwest of Bldg. 81. Bldg. 81 is an emergency power plant facility. The site is surrounded by grass, concrete, and asphalt. The surrounding area includes a warehouse (Bldg. 64).	No plans to change current land use.
	S-26	The site is a 4,288-ft <sup>2</sup> area north of Bldg. S-26, and southeast of Bldg. 404. Bldgs. S-26 and 404 are part of an active transformer substation. Vacant residential housing is located to the south of the site. The housing residents were relocated and there are no future plans to use this area for residential use.	No plans to change current land use.

### **2.3 HISTORY OF CONTAMINATION**

Available historical records for JBPHH indicate PCBs were present in the dielectric fluid used in many of the former and existing transformers at JBPHH, Wahiawa Annex and LLL Annex for their electrical power distribution networks. The PCB-containing fluids may have been released to concrete surfaces or surface soil by leaking directly from the transformers or during regular transformer testing and maintenance. Periodic sampling was required to test the dielectric properties of the transformer fluid during their operation. Once testing was completed, the fluid was reportedly poured onto the adjacent area, such as grass, concrete pads, or along building walls. Use of PCBs was banned in the 1970s, and all the active transformers at JBPHH have since been replaced or filled with non-PCB-containing dielectric fluid.

Surface and subsurface soil samples and concrete wipe samples were collected as part of site inspection and removal action design support activities. PCBs in soil and concrete were detected above the TSCA high-occupancy cleanup level (1 mg/kg for soil and 10 µg/100 cm<sup>2</sup> for concrete) (40 CFR 761.61[a][4]) and the DOH Tier 1 SAL (1.1 mg/kg) for unrestricted use (DOH 2011).

Site investigations at the five sites are detailed in Table 1-1.

### **2.4 INITIAL RESPONSE**

After the investigations discovered and delineated PCB contamination in soil and/or concrete at multiple NCTAMS PAC transformer sites, action memoranda were prepared and removal actions were performed. As presented in Table 2-2, removal actions were performed at all five sites between 1992 and 2004.

**Table 2-2: Initial-Response Removal Actions at the Five Transformer Sites**

Summary of Removal Action	Transformer Site				
	JBPHH Wahiawa Annex			JBPHH LLL Annex	
	Bldg. 3	Bldg. 106	S-17	Bldg. 81	S-26
A 1991 removal action was conducted at 11 transformer locations at JBPHH Wahiawa Annex identified in the IAS report, including Bldg. 3. PCB-contaminated soil was removed from Bldg. 3 and disposed of in a mainland landfill that was EPA-approved to receive Comprehensive Environmental Response, Compensation, and Liability Act wastes. Following excavation, confirmation samples were collected to confirm the excavation results. Post-remedial data collected showed that PCBs were present at concentrations above the TSCA high-occupancy cleanup level (exceeding 1 mg/kg, but less than 10 mg/kg) (PRC 1992). Confirmation resampling was conducted in 2004 due to legal action that was taken against one of the analyzing laboratories (Eureka Laboratories, Inc.), which raised concerns over the validity of post-remedial data collected for the 1991 removal action. Based on statistical comparison, the 1991 removal action analytical data were valid and the findings of the RA report were confirmed; four original samples from the 1991 removal action were above the 1 mg/kg cleanup level (1.46-6.07 mg/kg).	•				
A NTCRA was conducted for Building 106, S-17, and S-26. A total of 1,628 cubic yards (cy) of PCB-containing soil was excavated from these sites. The TSCA soil cleanup level (10 mg/kg) was used for verification samples collected at Building 106 and S-17 at NCTAMS PAC Wahiawa Branch since these sites were classified as low-occupancy use areas. S-26 at JBPHH LLL Annex was located in a high-occupancy use area; therefore, the TSCA high-occupancy cleanup level (1 mg/kg) was originally used. The S-26 site was reclassified as a low-occupancy use area, however, after verification samples collected from soil directly above assumed bedrock (approximately 11 feet bgs) were determined to be above 1 mg/kg but below 10 mg/kg. Residents from base housing located adjacent to S-26 were relocated as a result of the reclassification in land use. In an effort to achieve the TSCA concrete cleanup levels, concrete cleaning (power-washing or solvent extraction) was conducted at S-17 and S-26. The cleanup of concrete was verified by comparing verification sample results with the TSCA low-occupancy action level of 10 µg/100 cm <sup>2</sup> at S-17 and S-26. The soil from the transformer sites was stockpiled at JBPHH LLL Annex until it could be transported to a thermal desorption unit for treatment in 2003 and 2004. The stockpiling of soil and concrete from JBPHH Wahiawa Annex and JBPHH LLL Annex was considered “on-site” as it was kept on the same NCTAMS PAC NPL site. In addition, the stockpiling was performed while the effort to consolidate soils for purposes of treatment was being clarified and established. The excavated areas were later backfilled with treated soil from the treatment system that met the unrestricted use cleanup level (1 mg/kg), compacted, and restored (such as landscaping, concrete and asphalt paving) (Earth Tech 2006).		•	•		•
An additional NTCRA was conducted for Bldg. 81 from April through August 2004. A total of 7,147 cy of PCB-containing soil was excavated. The soil was transported directly to the thermal desorption unit for treatment. The excavated area was later backfilled with treated soil from the treatment system that met the unrestricted use cleanup level (1 mg/kg), compacted, and restored (such as landscaping, concrete and asphalt paving) (ECC 2007).				•	

Post-excavation confirmation sampling results following the removal actions showed that residual PCB concentrations in soil and concrete at the five sites exceed the TSCA high-occupancy action level (1 mg/kg for soil and 10 µg/100 cm<sup>2</sup> for concrete) and the DOH Tier 1 SAL (1.1 mg/kg) for unrestricted use (DOH 2011). Through the removal actions at the transformer sites, the toxicity, volume, and mobility of PCBs were reduced by excavating the contaminated media, and then treating the excavated media by thermal desorption; however, some residual PCB contamination remains in place. As a result, a clean, backfilled soil cap and vegetation, asphalt surface, or concrete encapsulation was placed over any remaining PCB contamination where the removal actions did not achieve cleanup levels suitable for unrestricted use. Remediation verification reports (RVRs) were

ultimately included in a consolidated RVR to document the removal and treatment activities at all sites included in the treatment system (Earth Tech 2008). The removal actions are consistent with cleanup objectives to provide a permanent cost-effective remedy for contaminated soils and concrete, and permanently and significantly reduce the mobility of hazardous wastes, thereby reducing the risk to human health and the environment. The removal actions and treatment satisfy the statutory preference for removal and treatment as a principal element of the final remedy.

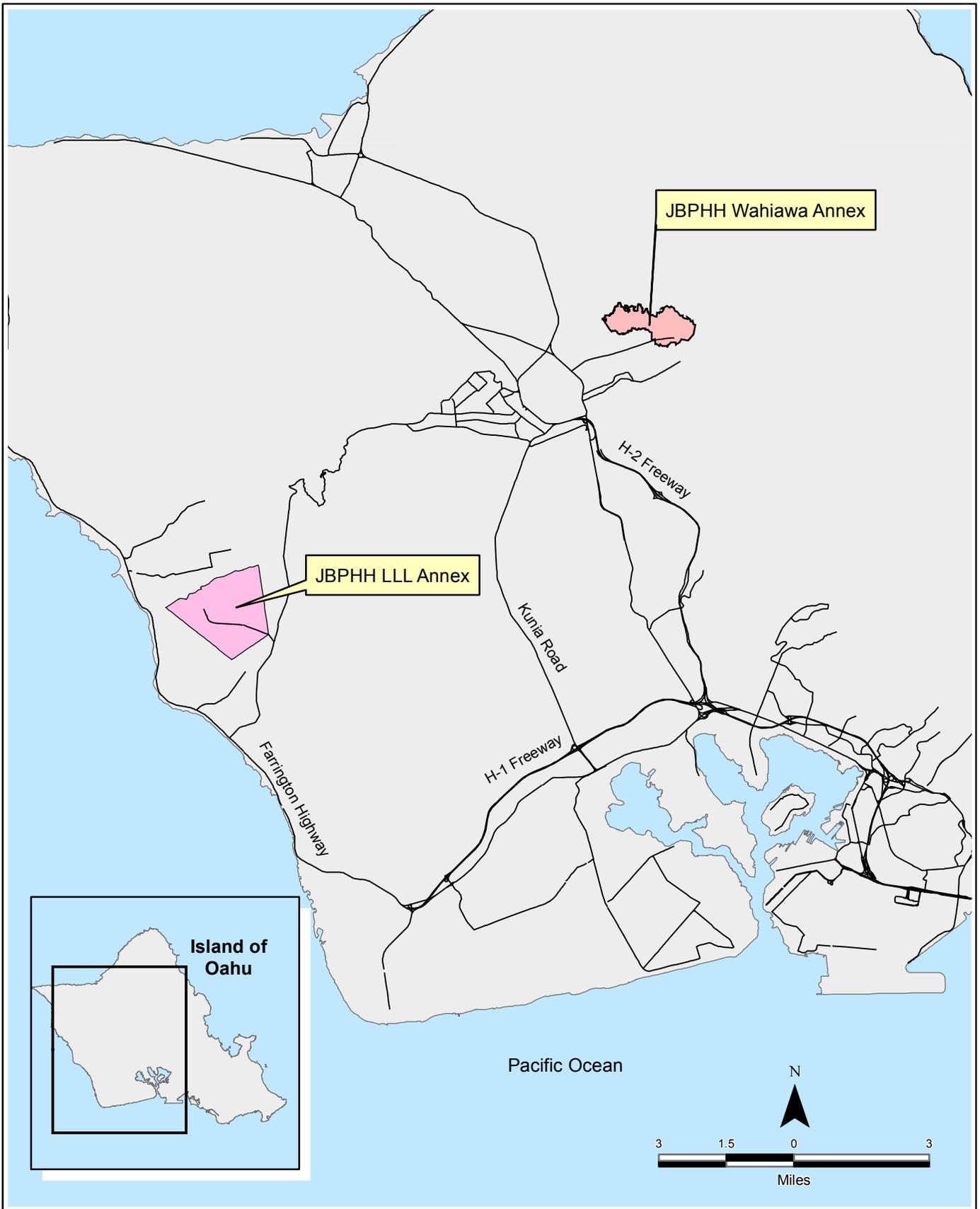
## **2.5     BASIS FOR TAKING REMEDIAL ACTION**

The record of decision (ROD) (DON 2010) determined that a response action is necessary to protect human health and the environment from actual or potential releases of hazardous substances present in surface and subsurface soils, and concrete at the Five Transformer Sites.

Previous investigations identified a potential for the Five Transformer Sites to impact the environment, resulting in unacceptable risk to human health and the environment. PCB-contaminated soil and concrete were found at elevated levels and needed to be removed. The threat of exposure to PCBs warranted action. Removal actions were performed prior to the ROD, but cleanup levels were not met after contaminated soil was excavated and concrete was encapsulated. Post-excavation confirmation sampling results after the removal actions showed that PCBs at the Five Transformer Sites remain in the soil and concrete at concentrations above TSCA high-occupancy cleanup levels and the DOH Tier 1 SAL that allow for unrestricted use. LUCs are necessary for protection of human health and the environment for the five NCTAMS PAC transformer sites.

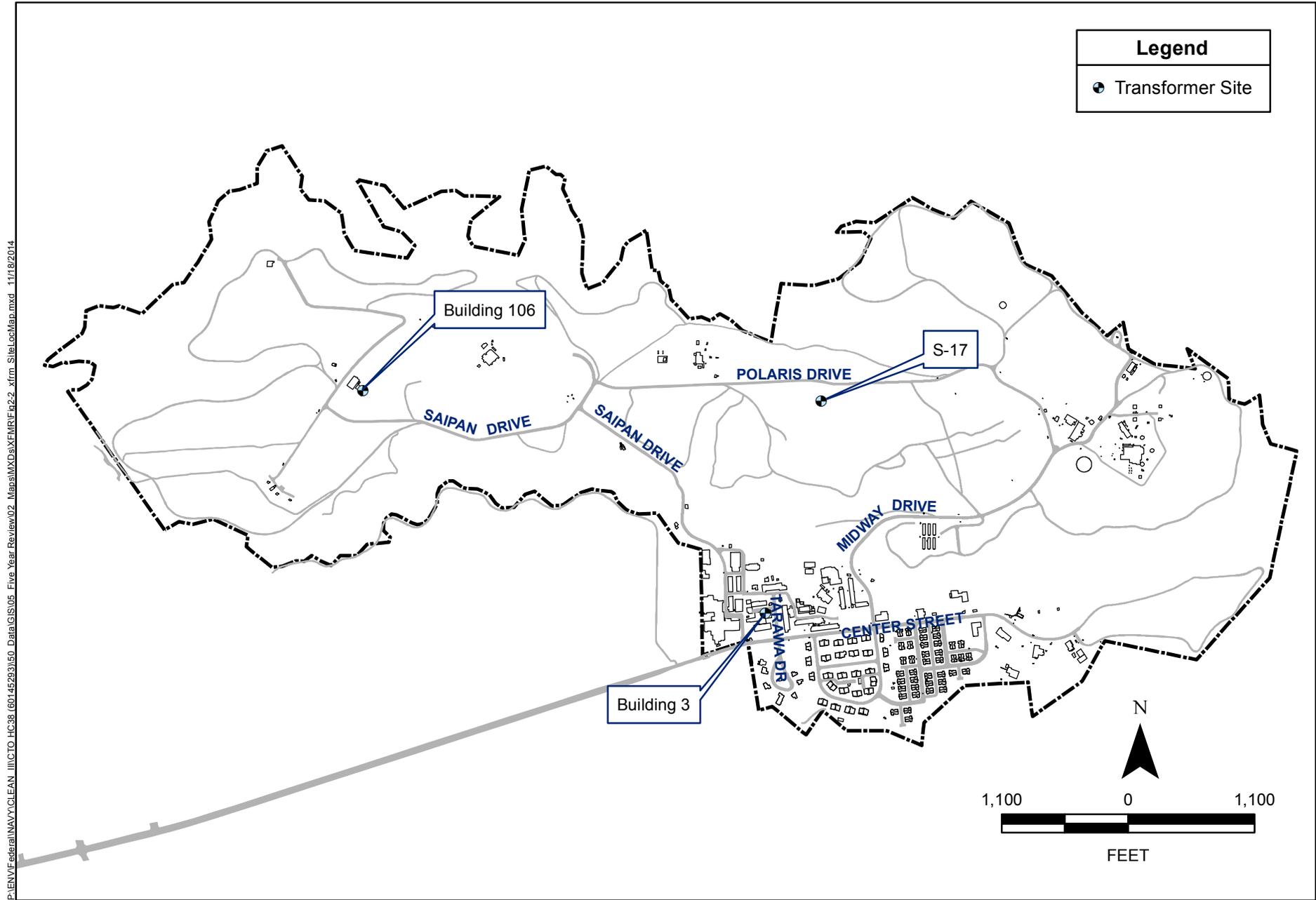


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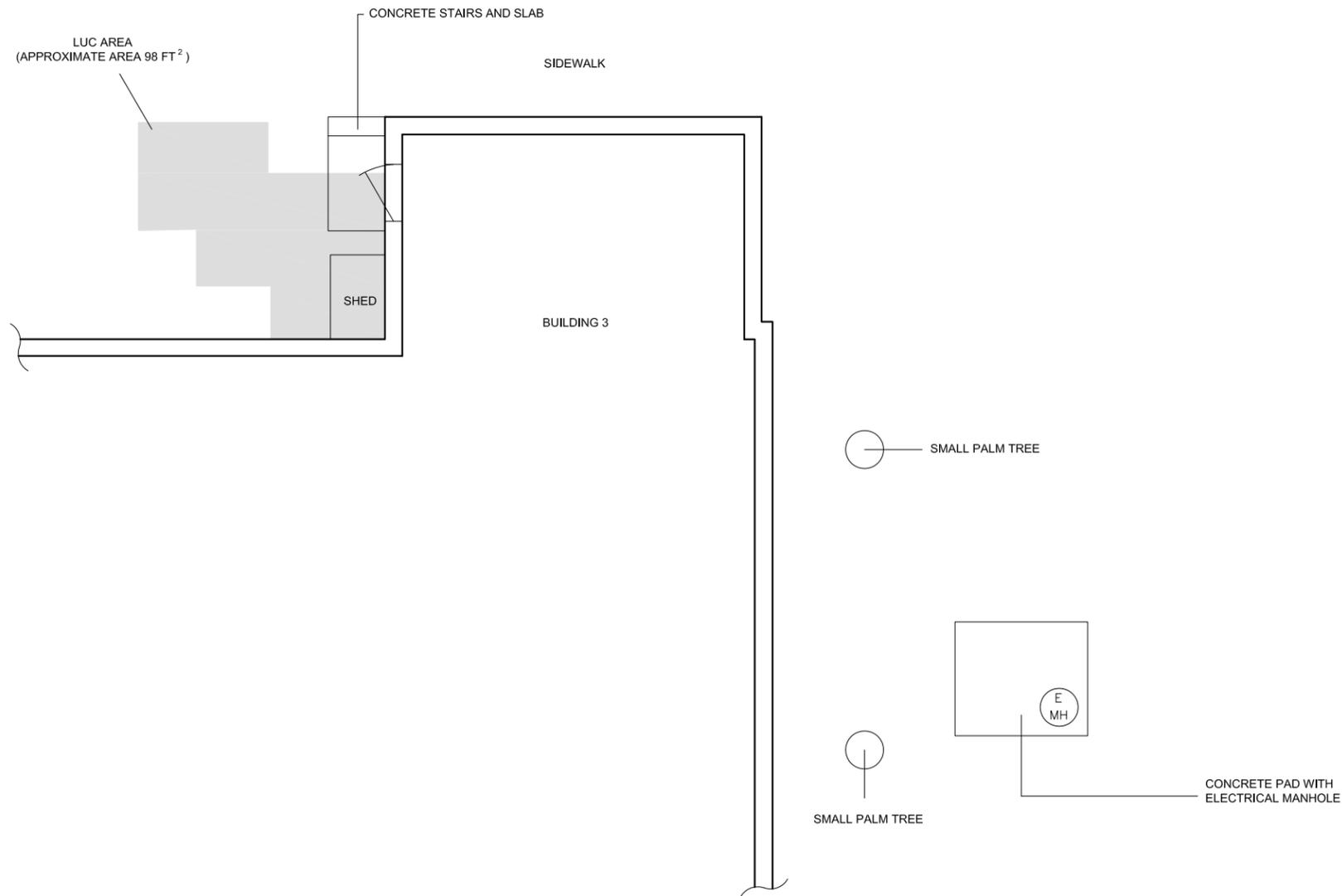
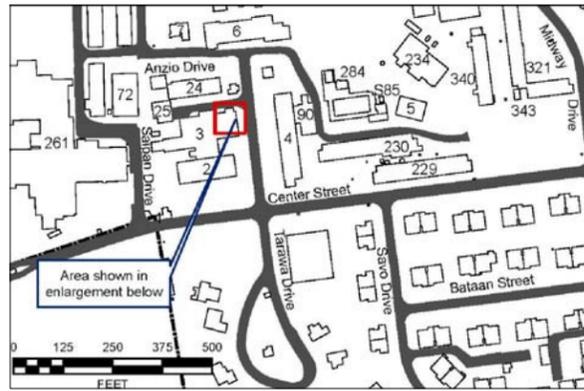
**Figure 2-1**  
**Facility Location Map**  
**First Five-Year CERCLA Review of Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPHH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**





**Figure 2-2**  
**Transformer Site Location Map, JBPBH Wahiawa Annex**  
**First Five-Year CERCLA Review of Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPBH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**





**LEGEND**

 Land Use Control (LUC) Area

**SOURCE**

PRC Environmental Management, Inc. 1992

Earth Tech, Inc. 2003

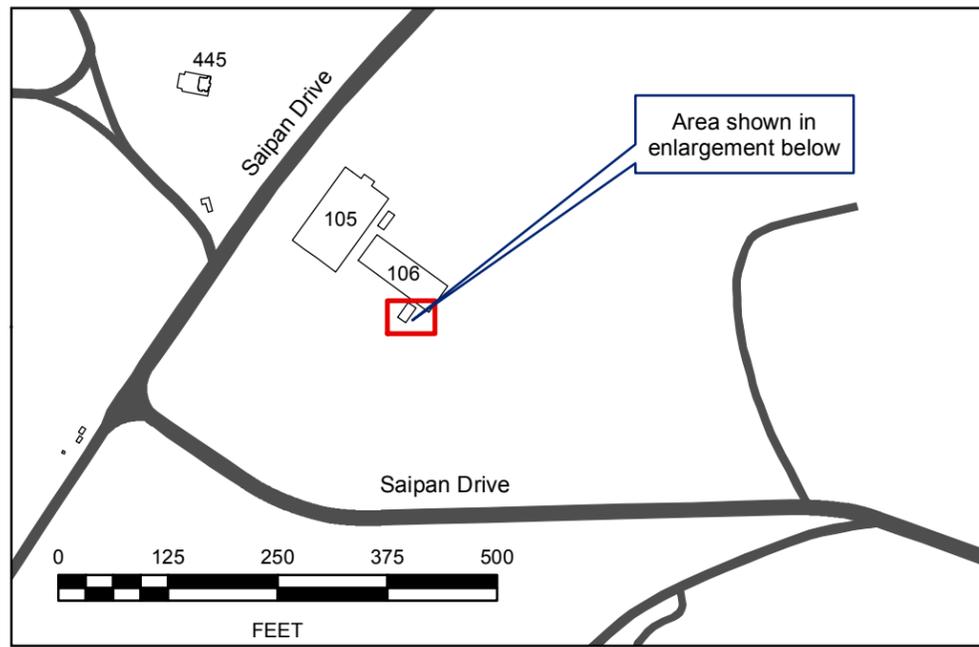
**N**

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Approximate Scale 1" = 8'

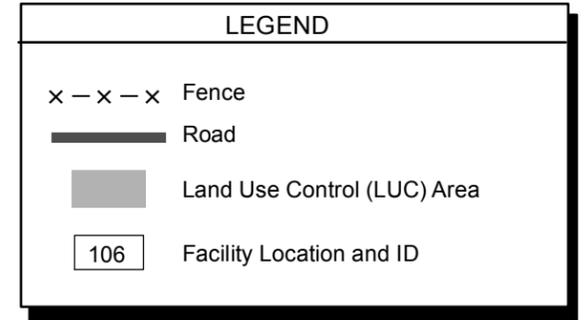
**Figure 2-3**  
**Building 3 Land Use Control Area**  
**First Five-Year CERCLA Review of**  
**Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPHH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**



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BUILDING 106



CONCRETE SLAB

CONCRETE SLAB

RETAINING WALL  
(APPROX. 4' HIGH)

LUC AREA  
(APPROXIMATELY 50 FT<sup>2</sup>)

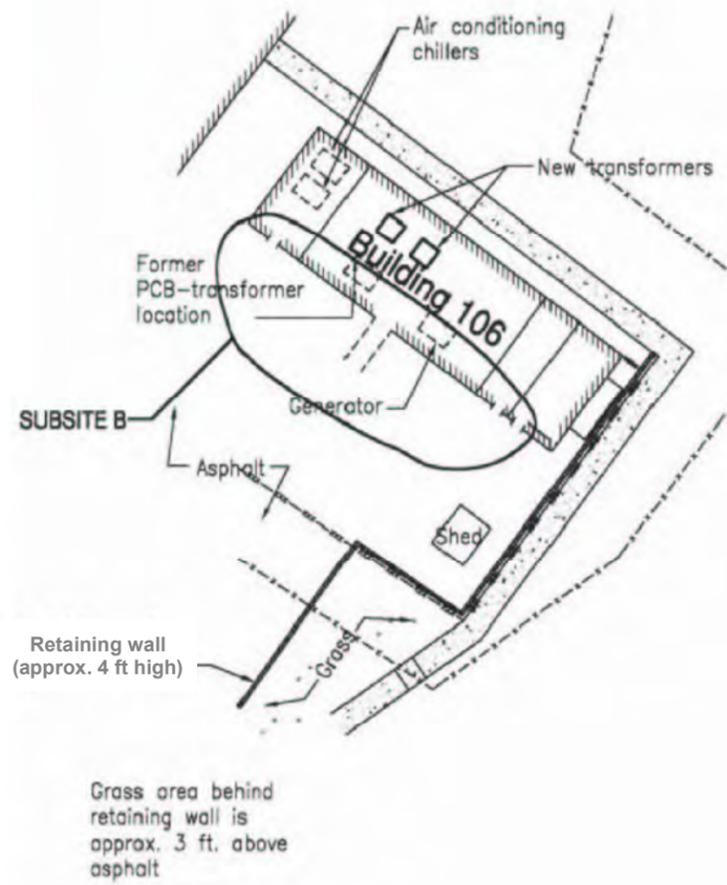
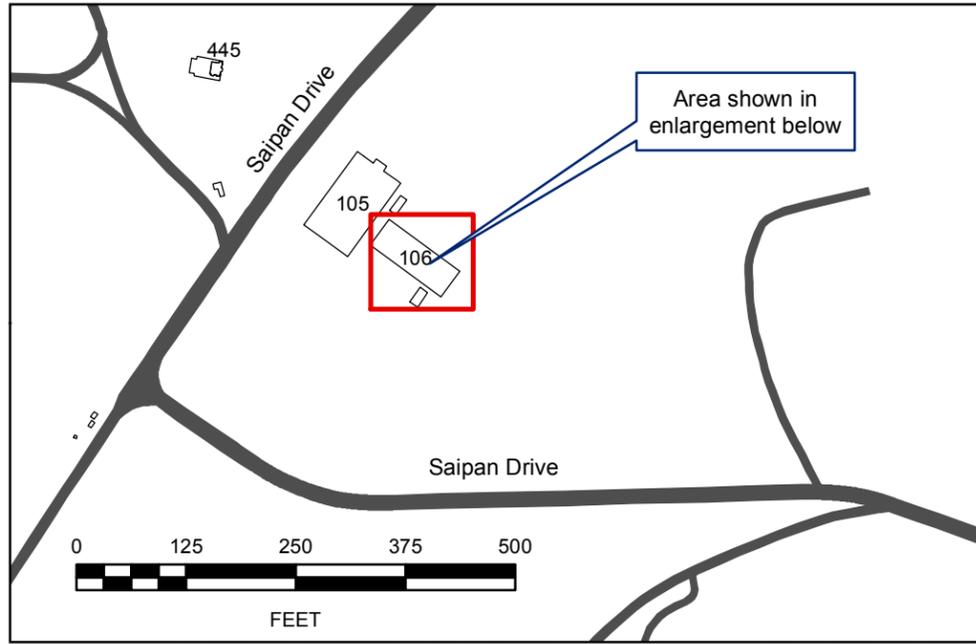
**SUBSITE A**

Approximate Scale  
1" = 5'

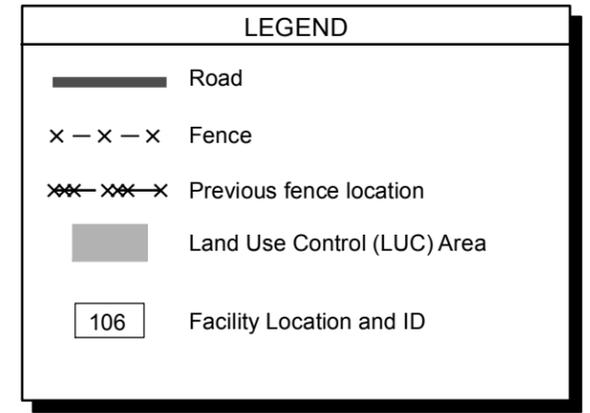
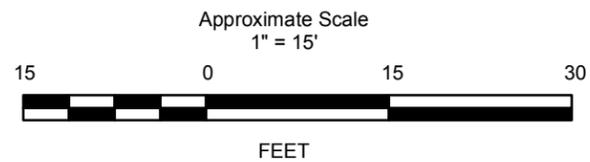
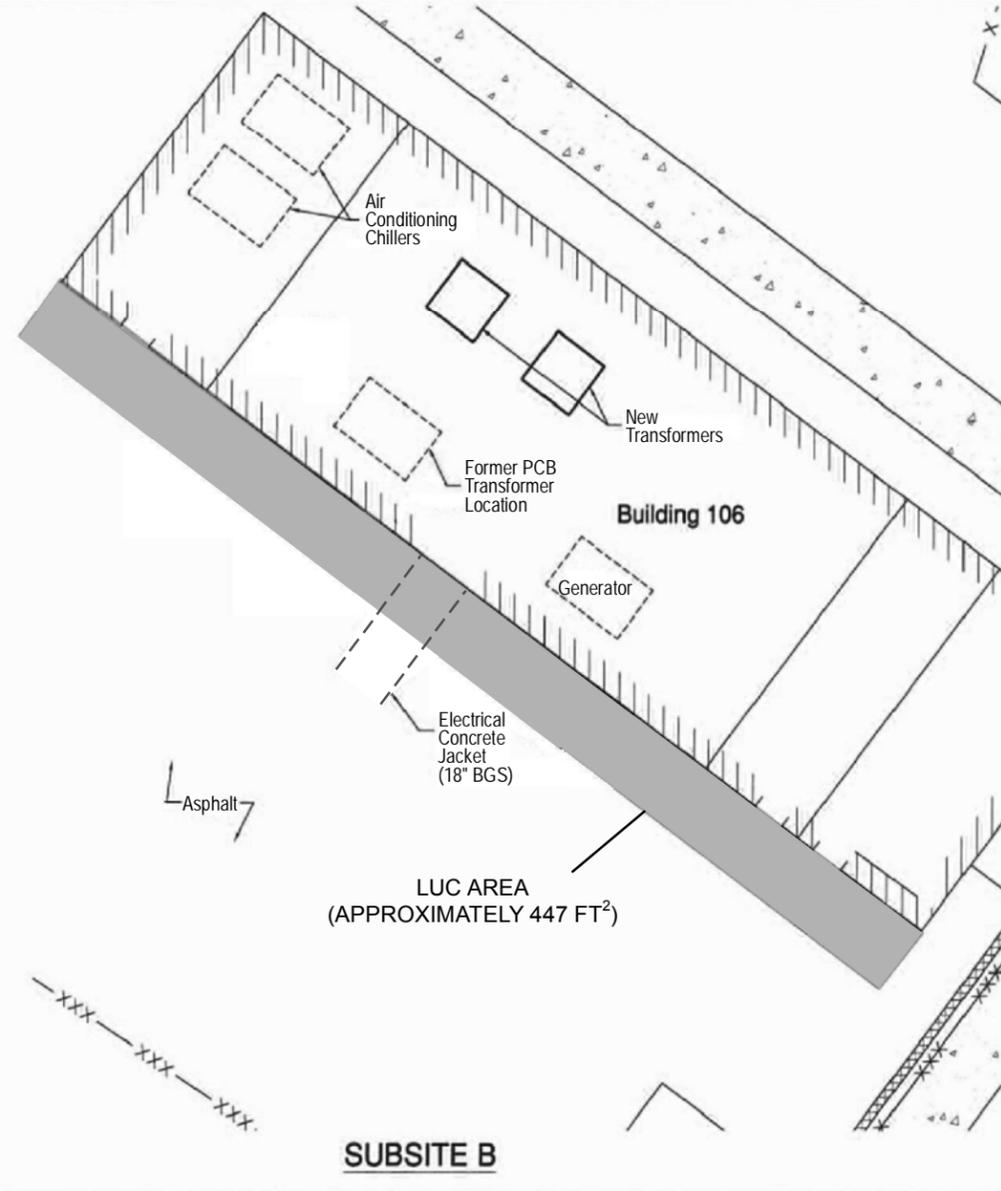
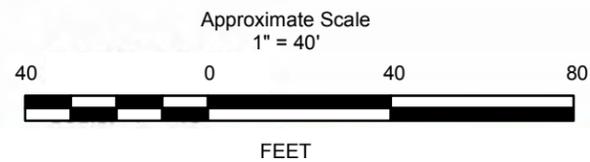


**Figure 2-4**  
**Building 106 Land Use Control Area**  
**South of the Retaining Wall**  
**First Five-Year CERCLA Review of**  
**Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPHH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**





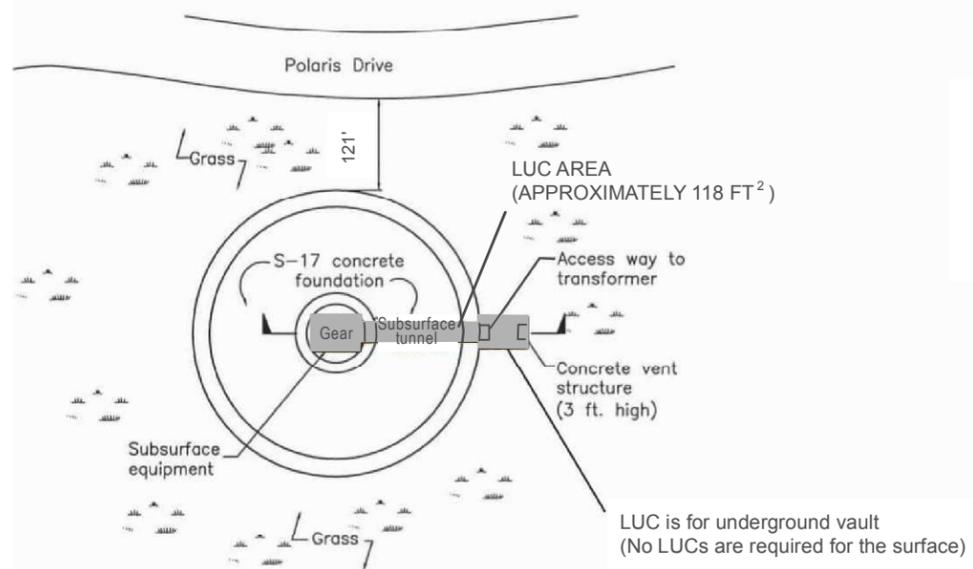
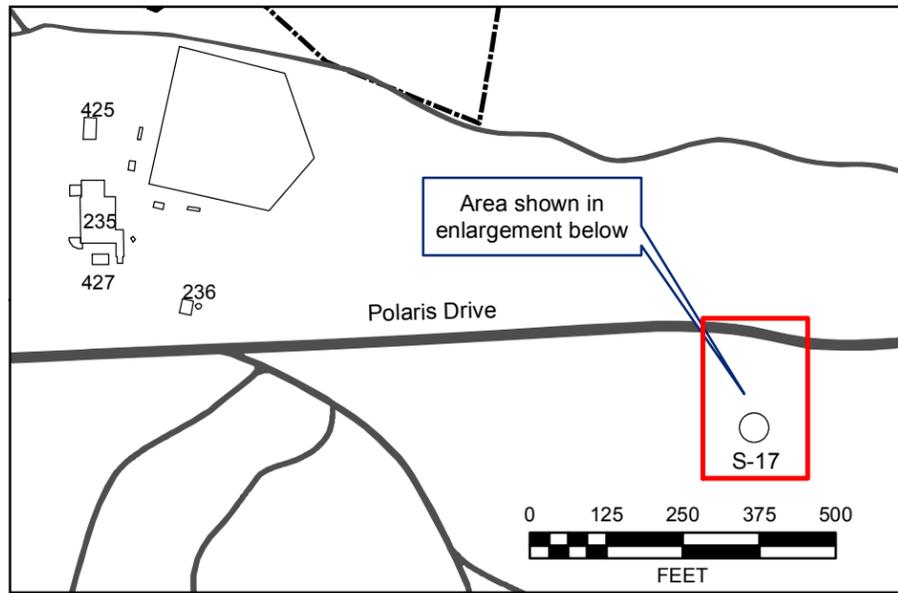
SITE PLAN



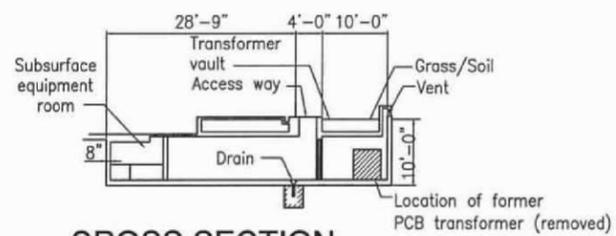
**Figure 2-5**  
**Building 106 and Land Use Control Area**  
**South of Building**  
**First Five-Year CERCLA Review of**  
**Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPHH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**



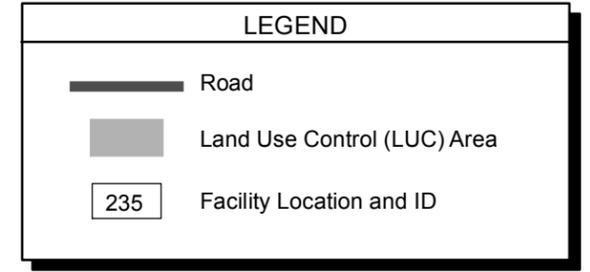
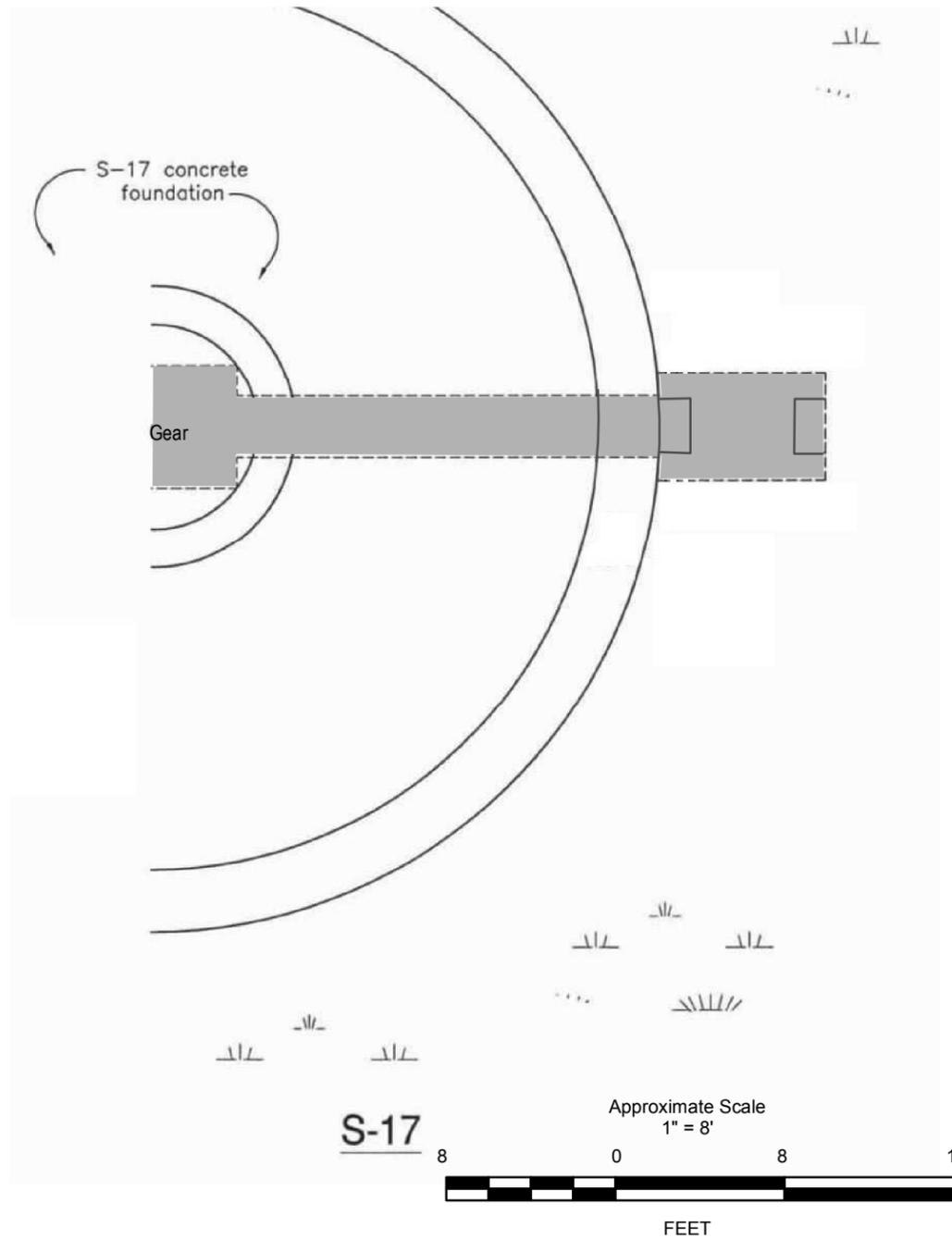
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**PLAN VIEW**  
Scale: 1"=30'

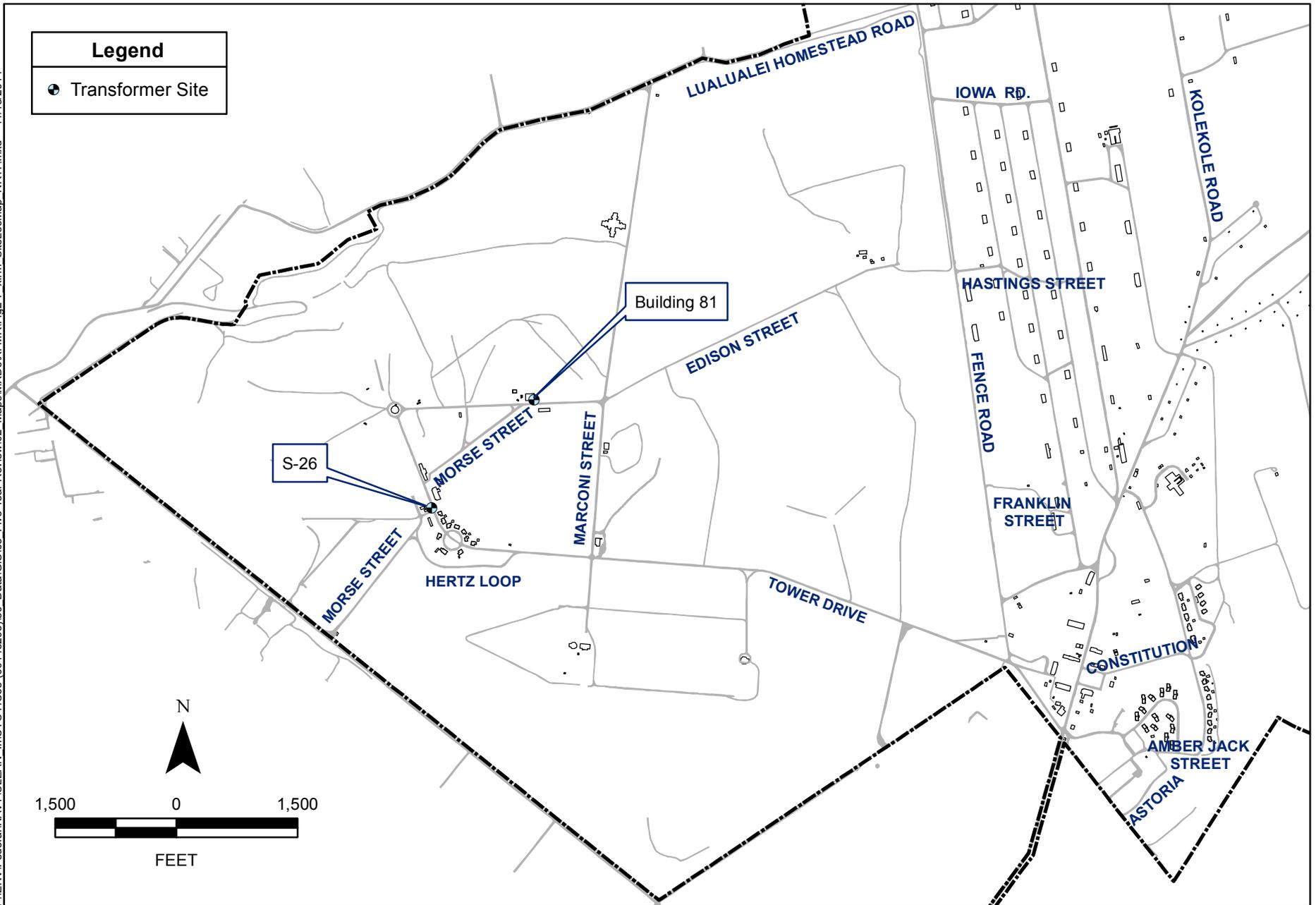


**CROSS SECTION**  
Scale: 1"=20'



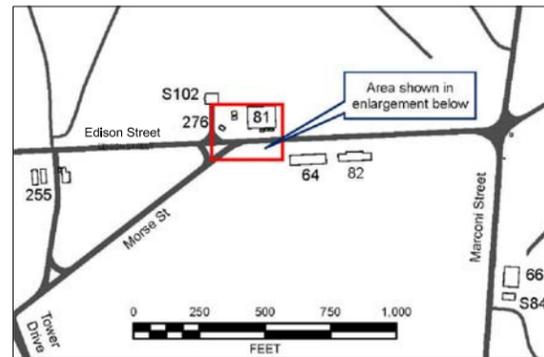
**Figure 2-6**  
**S-17 and Land Use Control Area**  
**First Five-Year CERCLA Review of**  
**Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPHH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**





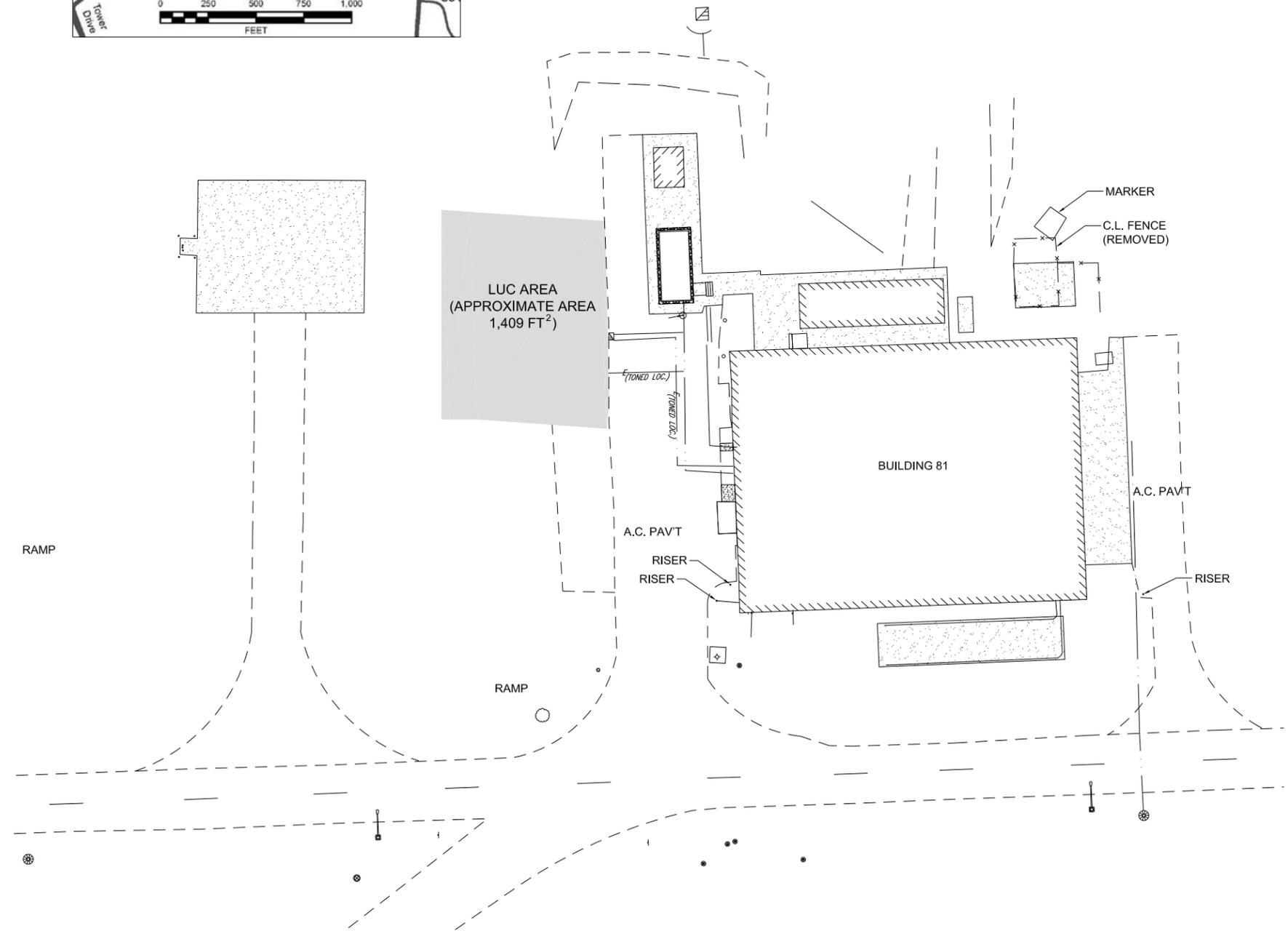
**Figure 2-7**  
**Transformer Site Location Map, JBPBH Lualualei Annex**  
**First Five-Year CERCLA Review of Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPBH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**





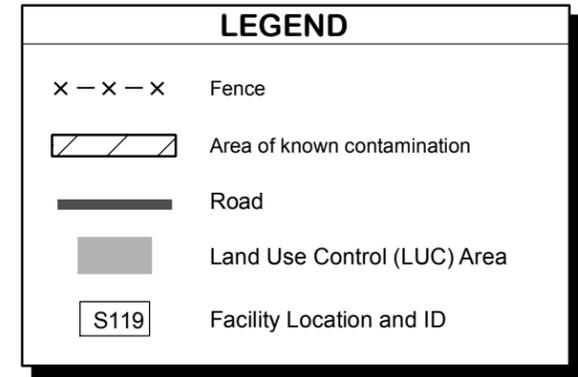
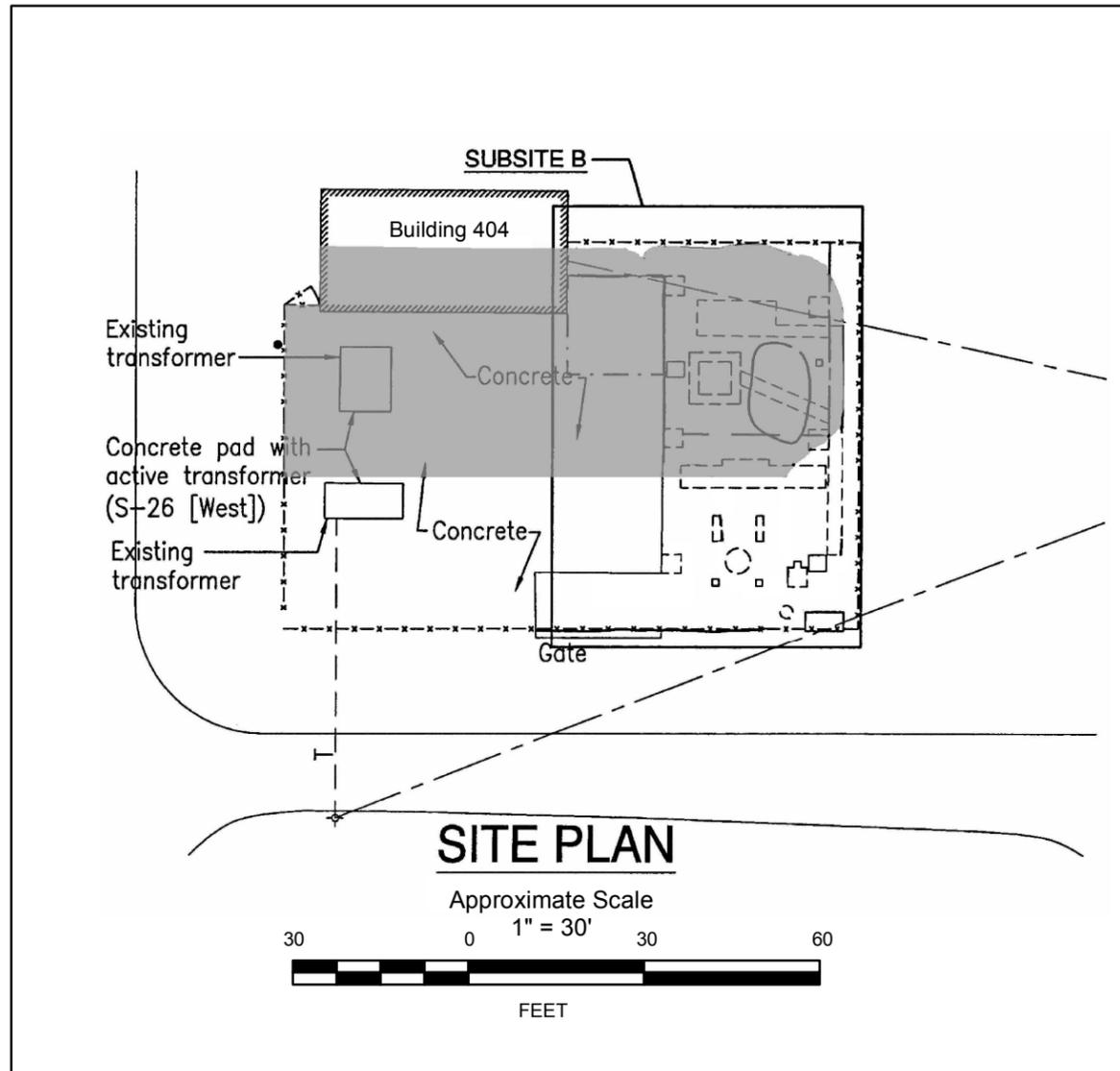
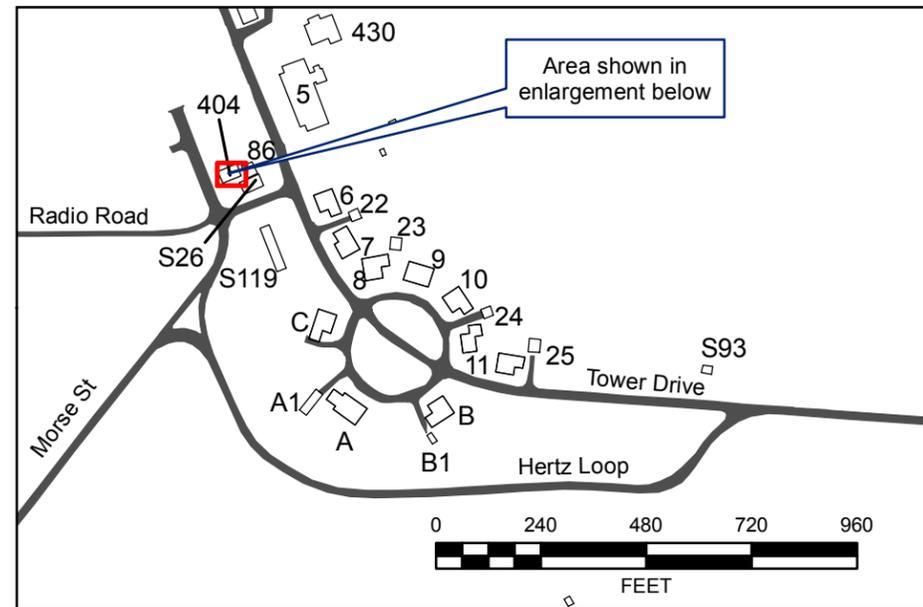
**LEGEND**

Land Use Control (LUC) Area



**Figure 2-8**  
**Building 81 Land Use Control Area**  
**First Five-Year CERCLA Review of**  
**Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPHH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**





**Figure 2-9**  
**S-26 Land Use Control Area**  
**First Five-Year CERCLA Review of**  
**Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPHH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**



### 3. Remedial Actions

A ROD documenting the final remedy selected to address PCB contamination at transformer sites Bldg. 3, Bldg. 106, S-17, Bldg. 81, and S-26 was signed in March 2011. The ROD specifies LUCs as the final remedy for the five JBPHH Wahiawa Annex and JBPHH LLL Annex sites (DON 2010).

#### 3.1 REMEDIAL ACTION OBJECTIVES

Action memoranda (AMs) prepared for the transformer sites recommended the removal of PCB-contaminated soil and concrete from the sites and consolidation of the material for on-island treatment using indirect thermal desorption treatment to reduce contaminant concentrations. The AMs concluded that should LUCs be required, they would be evaluated at a later date.

Upon completion of the 1999–2004 removal actions for PCB-contaminated soil and concrete, it was determined that LUCs would be required for these Five Transformer Sites for continued protection of human health and the environment. This action fulfills the applicable and relevant and appropriate requirements as required by 40 CFR 300.430(f) of the National Oil and Hazardous Substances Pollution Contingency Plan and 40 CFR 761.61(a) of the TSCA regulations. Therefore, the response action objectives for the Five Transformer Sites are as follows:

- Comply with local, state, and federal regulations.
- Implement LUCs to restrict the sites to low-occupancy use and provide long-term protection of human health and the environment.
- Prevent contact of future residents with PCB-contaminated soil and concrete at concentrations in excess of TSCA cleanup standards in 40 CFR 761.61(a)(4).

#### 3.2 REMEDY DESCRIPTION

The Navy and United States Environmental Protection Agency (EPA), with concurrence by DOH, have selected LUCs as the final remedy for the Five Transformer Sites at JBPHH Wahiawa Annex and JBPHH LLL Annex. The Navy has implemented LUCs at the Five Transformer Sites to restrict land use to low occupancy only. If the Navy transfers the property, the Navy will ensure that the deeds and deed notices comply with TSCA requirements for land use restrictions. LUCs will be maintained until the concentrations of hazardous substances in soil and concrete are at levels to allow for unrestricted land use and exposure. The boundaries of the LUCs for the Five Transformer Sites are shown on Figure 2-3 through Figure 2-6 (JBPHH Wahiawa Annex sites) and Figure 2-7 through Figure 2-9 (JBPHH LLL Annex sites).

The following LUCs apply to the affected areas at the Five Transformer Sites addressed in this five-year review.

- Restrict the land to low-occupancy (restricted) use only. The term “low-occupancy” means any use except high-occupancy use. “High occupancy” means occupancy by any individual not using proper dermal and respiratory protection in an area where PCB remediation waste has been disposed of on site where such occupancy by the individual during a year is 840 hours or more (an average of 16.8 hours or more per week) for non-porous surfaces and 335 hours or more (an average of 6.7 hours or more per week) for bulk PCB remediation waste. Examples of high-occupancy could include a residence, school, day care center, sleeping quarters, a single or multiple occupancy 40 hours per week work station, a school class room, a cafeteria in an industrial facility, a control room, and a work station at an assembly line.

- The Navy ensures that any land modifications (i.e., clearing vegetation, excavation, landscaping, and construction or demolition of any hardscape, defined as sidewalks, walls, fences, paved asphalt, and concrete pads); structural modifications (e.g., construction, renovation, or demolition of any structures); or maintenance or removal work to existing utility or fuel lines that affects these sites and that involves handling or disposal of potentially contaminated soil, will be in accordance with all applicable laws and regulations. Consistent with this obligation, the Navy will notify any party proposing to undertake any activity that will affect these sites that the soil on the sites is, or may be, contaminated. In addition, the Navy will require the party to handle or dispose of any contaminated soil in accordance with all applicable laws and regulations. Before the activities begin, the Navy will require the party to demonstrate to the Navy's satisfaction how contaminated soil will be handled or disposed of in accordance with all applicable laws and regulations. The Navy will discuss in its five-year review report any permitted land modifications and the manner the contaminated soil was handled or disposed of, to comply with all applicable laws and regulations.

### **3.3 REMEDY IMPLEMENTATION**

The following LUC performance objectives apply to the affected areas at all Five Transformer Sites:

- Limit transformer sites to low-occupancy use only.
- Protect human health by reducing rates of exposure to contaminated soils or concrete left in place at the transformer sites.
- Ensure that site soil and concrete are not disturbed, excavated, or removed unless done in accordance with special handling procedures and with the prior consent of the Navy and EPA, with concurrence from DOH.
- Ensure no unauthorized access, use, and development occurs at the site including excavation or uncontrolled soil removal, and building of schools, day care, or recreational facilities.
- Ensure that all future site users and environmental regulators are aware that contamination is present at the sites at concentrations that may pose a risk under certain exposure scenarios.
- Ensure that all future site users and environmental regulators are aware that land use restrictions are imposed on the sites to protect human health and the environment.
- Ensure that legal notice of site contamination and LUCs is provided at multiple locations or in multiple documents (or both) where a person would typically look for the notice.
- Ensure that legal and physical notices of LUCs are maintained in perpetuity, until they are no longer needed, or until a ROD amendment or other such documentation is prepared based on the intent to change land use.

The areas where LUCs are being implemented for the three JBPHH Wahiawa Annex sites are shown on Figure 2-3 through Figure 2-6, and for the two JBPHH LLL Annex sites on Figure 2-7 and Figure 2-9.

LUCs for these sites will remain in effect until a ROD amendment or other documentation is prepared based on an intention to change land use. The Department of Defense and the State of Hawaii have agreed that a LUC under the Uniform Environmental Covenants Act is not required until property transfer; however, the Navy has prepared an overall remedial action work plan

(DON 2011) that identifies all LUC remedies at these sites and provides specific information on implementation of these LUCs.

Engineering controls include a clean, backfilled soil cap, and vegetation, topsoil, or asphalt surface that has been placed over the areas of residual PCB-contaminated soil or concrete at the Five Transformer Sites to reduce the mobility of hazardous wastes, thereby reducing the risk to human health and the environment.

Institutional controls for the Five Transformer Sites include the following; the Navy is responsible for maintaining these LUCs:

- Navy LUC recording system (Navy Installation Restoration Information Solution)
- Navy permit and construction review/approval processes
- Deed restrictions (if the property is ever transferred to a non-federal entity)
- DOH environmental covenant registry (complies with Uniform Environmental Covenants Act – if the property is ever transferred to a non-federal entity)

### **3.4 SYSTEMS OPERATIONS AND MAINTENANCE**

The Navy is required to regularly inspect the property at a minimum of once every 12 months to ensure that LUCs are being maintained and remain effective, unless and until LUCs are terminated. The annual monitoring results are documented in a report that is provided to EPA and DOH (NAVFAC Hawaii 2012, 2014).

The inspection evaluates whether the following items are in compliance:

- No trespassers or indications of trespassing at the sites
- No unauthorized development or new structures at the sites
- No unauthorized excavation or uncontrolled removal of soils or concrete from the sites
- No signs of activity that would place a heavy load upon, puncture, cut, or otherwise disturb or damage the soil caps or encapsulated concrete
- Soil cap or concrete encapsulation is in good condition
- Vegetation, topsoil, or asphalt cover is complete and well maintained over the backfilled soil caps
- Trees or large vegetation whose roots could puncture the cap are not growing in the capped areas

The Navy also maintains records of the site to document the stability or changes at the site over the years.

The Navy provides the EPA and DOH with a five-year review report for the site as required by Comprehensive Environmental Response, Compensation, and Liability Act Section 120(c) and in accordance with Comprehensive Five-Year Review Guidance (EPA 2001). The report reviews site conditions, site uses and users, compliance with LUC objectives and restrictions, any mitigating and enforcement measures taken or required at the site, advances in scientific knowledge or changes in law that require re-evaluation of the remediation goals and final remedy identified in the ROD (DON 2011), and any conveyance of the property interests.



#### **4. Progress Since the Last Five-Year Review**

This is the first five-year review for the Five Transformer Sites at JBPHH, LLL Annex and Wahiawa Annex, Oahu, Hawaii. Consequently, there is no new progress to report from a previous five-year review.



## 5. Five-Year Review Process

### 5.1 ADMINISTRATIVE COMPONENTS

The five-year review team members are listed in Table 5-1.

**Table 5-1: Five-Year Review Team Members**

DOH	Regulatory Project Manager:	Maria Reyes
Navy	RPM for five-year review:	Robert Kaito
	RPM for specific site:	Jan Kotoshirodo
EPA	Regulatory Project Manager:	Mark Ripperda
AECOM	Project Manager:	Robin Boyd
	Project Support:	Louann Kromer
		Andrea VonBurg Hall Dustin Goto

AECOM AECOM Technical Services, Inc.  
 RPM remedial project manager

The team members established a review schedule of November 2014, during which they completed the following activities: reviewed relevant documents, performed data review, conducted a site inspection, and conducted interviews.

### 5.2 COMMUNITY INVOLVEMENT

The Central Oahu Restoration Advisory Board (RAB) holds two to three meetings per year to update the public on the Navy’s Environmental Restoration Program and status of Installation Restoration Program sites. The RAB helps increase community awareness of environmental restoration issues at current and former naval facilities. Information is provided through quarterly meetings of the RAB, by maintaining the public information repository, and by publishing various announcements, fact sheets, and public notices in the local newspaper.

As part of community involvement, the Navy announced the five-year review of the Five Transformer Sites via the meeting minutes for the September 17, 2014 RAB meeting held at the Aiea Public Library.

### 5.3 DOCUMENT REVIEW

This five-year review consists of a review of relevant documents including the ROD, risk assessments, remediation verification reports, remedial action completion report, and LUC inspection reports. The list of documents reviewed is provided in Section 9. Requirements (applicable and appropriate) and criteria (that may have changed since the ROD was completed) were evaluated. The ROD identified the DOH Tier 1 SAL of 1 mg/kg for PCBs as a to-be-considered criterion (DON 2011). The SAL is now known as an environmental action level and the current unrestricted use concentration for soil is 1.1 mg/kg. The TSCA action levels for PCBs have not changed, and the cleanup standard remains at 1.0 mg/kg for high-occupancy use.

### 5.4 DATA REVIEW

Two LUC Compliance Certificate inspections for the periods of November 1, 2011 through October 31, 2012, and November 1, 2012 through November 30, 2013, were reviewed. Both inspections noted that the Five Transformer Sites were in compliance in regards to ten criteria,

including development, excavation, and the condition of protective capping. Photos of the sites depicted them similar to their current use and configuration.

## 5.5 FIVE-YEAR SITE INSPECTION

A five-year review site inspection at the Five Transformer Sites was conducted on November 6, 2014 to assess the operations and effectiveness of the LUCs at each site. During the site visit, the weather was sunny and the temperature averaged 80 degrees Fahrenheit. As observations were made, a five-year review site inspection checklist was completed to document the status of each site (Attachment A).

No signage was observed at any of the sites. Signage was not required by the remedial action work plan (AECOM 2011), and is not necessary at sites with PCB concentrations in soil less than 50 mg/kg that are covered by a cap.

Results of the site inspections are summarized below; photographs are presented in Attachment B.

- *Bldg. 3:* The Bldg. 3 site consists of an area of landscaped grass located between Bldg. 3 and an asphalt-paved parking lot. No evidence of intrusive activities was observed within the LUC area, and a chain barrier prevents vehicles from driving onto the grass. The LUC area is not actively used, other than as an open landscaped space.
- *Bldg. 106:* No evidence of intrusive activities was observed at the Bldg. 106 LUC areas (Subsite A and Subsite B). Subsite A consists of 50-ft<sup>2</sup> area of landscaped grass; Subsite B includes part of the asphalt-paved driveway adjoining the southwest side of Bldg. 106. Both subsites are within a fenced area that encompasses Bldgs. 105 and 106.
- *S-17:* Site S-17 is located approximately 120 feet to the south of Polaris Drive within an unmaintained field. A faded yellow post approximately 3 feet high on the south side of Polaris Drive demarcates the direction of the S-17 site from the road. Tall grass and shrubs obstruct the view of the concrete structure, the majority of which is only slightly taller than the ground surface, from more than a few yards away. The concrete vent structure on the east side of the S-17 LUC area contains two steel riser pipes approximately 8 feet high. The pipes are a faded orange color, the result of weathered spray paint originally intended to make the pipes more visible. At the time of the site visit, much of the circular concrete structure was covered by vegetation (i.e., vines) which restricted the complete observation of the LUC area. No evidence of intrusive work or other construction activities were noted, and the surrounding area did not appear to have been disturbed for some time.
- *Bldg. 81:* The Bldg. 81 LUC area adjoins the Bldg. 81 driveway to the west and consists of a landscaped grass field. No evidence of intrusive activities was observed. A site worker indicated that the LUC area is regularly irrigated and mowed.
- *S-26:* The S-26 LUC area is located directly east of an active electrical substation. The substation and LUC area are within a 6-foot-high chain link fence topped with barbed wire. Four locked gates provide access into the area. At the time of the site visit, the coral gravel fill within the LUC area was exposed and no topsoil was present. Assuming that the excavation was backfilled to the surrounding grade of the existing concrete pavement adjoining the area to the north and west, the cap has settled approximately 6–10 inches since its construction.

## 5.6 INTERVIEWS

Interviews were conducted with the following personnel:

Name	Affiliation	Date
Maria Reyes	DOH, Regulatory Project Manager	November 13, 2014
Mark Ripperda	EPA, Regulatory Project Manager	November 7, 2014
Jan Kotoshirodo	NAVFAC Hawaii, RPM	November 10, 2014

NAVFAC Naval Facilities Engineering Command

The remedial project manager (RPM) and regulatory project managers indicated that the remedy for the Five Transformer Sites is functioning as expected. The RPM recommended permanent signage and posts be installed to make the S-17 LUC area more visible for future annual and five-year review site inspections.

Interview forms are presented in Attachment C.



## 6. Technical Assessment

Answers to the following three key technical questions are presented in tabular format below:

- A: Is the remedy functioning as intended by the decision documents?
- B: Are the assumptions used at the time of remedy selection still valid?
- C: Does any other information call into question the protectiveness of the remedy?

A review of the conceptual site model for the Five Transformer Sites indicated no significant changes to land use or site conditions that would affect the remedy effectiveness.

SITE: FIVE TRANSFORMER SITES	
QUESTION A: Is the remedy functioning as intended by the decision documents?	
Element	Assessment
Remedial Action Performance	The final remedy implemented at the Five Transformer Sites is LUCs. LUCs are the non-technical and non-engineering actions that mitigate potential risks to human health and the environment by restricting access to contaminated media. The physical barriers placed to prevent exposure to contaminated soil and concrete remain intact at each site.
System Operations/O&M	No active systems are in place.
Cost of Systems Operations/O&M	No cost variances that suggest the remedy is not functioning properly were identified.
Opportunities for Optimization	No opportunities for optimization were identified.
Early Indicators of Potential Remedy Failure	The remedy is functioning as intended at the five sites. At the S-26 site, the cap appears to have settled approximately 6–10 inches below the surrounding grade. Since the constructed cap is reportedly greater than 10 feet thick, the cap is still protective of the underlying PCB-impacted soil.  The S-17 site is located within an unmaintained field to the south of Polaris Drive. Tall grass and shrubs make locating the concrete structure of the S-17 LUC area difficult. A faded yellow post next to Polaris Drive is the only marker that demarcates the approximate direction of the S-17 site. Future annual and five-year review site inspections may be less effective if the site cannot be found.
Implementation of Institutional Controls and Other Measures	Removal actions at the Five Transformer Sites included the excavation of PCB-impacted soil and backfilling with clean fill (Bldg. 3, Bldg. 106, Bldg. 81, and S-26) and the sealing of a concrete vault with 56 cy of concrete at Site S-17. Institutional controls were subsequently implemented as part of the long-term remedy for the sites to restrict site access and prevent disturbance of the caps. Navy administrative processes and procedures require approval for all projects involving construction or digging and subsurface disturbance. These procedures involve coordination and approval by NAVFAC Hawaii environmental personnel for projects located in or near environmental restoration sites, including LUC sites. The Navy ensures that these or similar processes and procedures remain in place and are followed for all proposed construction, digging, and subsurface soil disturbing activities. No evidence of intrusive activities was observed at the transformer sites during the 6 November 2014 site visit and during two previous annual inspections in September 2012 and November 2013.  Engineering controls to restrict site access at the Five Transformer Sites were not required in the remedial action work plan (AECOM 2011). Only the S-26 and Bldg. 106 sites have perimeter fencing; however, all sites are located within JBPHH, LLL Annex and Wahiawa Annex, secure facilities that vigorously enforce entry restrictions.

O&M      operations and maintenance

**SITE: FIVE TRANSFORMER SITES**  
**QUESTION B: Are the assumptions used at the time of remedy selection still valid?**

Element	Assessment
Changes in Standards and TBC Requirements	Regulatory requirements including TSCA cleanup levels and DOH Tier 1 SALs were considered in the selection of the final remedy. Changes to cleanup levels are discussed below under Changes in Toxicity and Other Contaminant Characteristics.
Changes in Exposure Pathways and Land Use	<p>During the site visit, no changes in land use since the ROD were observed at the Five Transformer sites. The current land use at each site is as follows:</p> <ul style="list-style-type: none"> <li>• Bldg. 3: The LUC area is not actively used and is covered by landscaped grass. The site is adjacent to a dining facility (Bldg. 3), and the surrounding area includes administrative buildings (Bldgs. 2 and 24), a storage facility (Bldg. 25), and a transformer (Bldg. 127).</li> <li>• Bldg. 106: Subsites A and B are located near to a parking lot used by Bldgs. 106 (generator housing) and 105 (administrative offices). Subsite A is covered by landscaped grass and is not actively used. Subsite B is paved with asphalt and is part of the driveway adjoining the south side of Bldg. 106.</li> <li>• S-17: The LUC area is located in an open unmaintained field. Tall grass and shrubs surround the site.</li> <li>• Bldg. 81: The LUC area consists of an open field maintained with landscaped grass and is not actively used. Bldg. 81 is used as an emergency power plant facility.</li> <li>• S-26: The S-26 LUC area adjoins an active transformer substation to the east and is not actively used. Abandoned homes to the south of the site are not planned for future residential use.</li> </ul> <p>Currently, there are no plans to change the land use at the sites. In addition, there are no plans to change the land use of the areas surrounding the sites. Foreseeable future exposure scenarios will be limited to Navy and contractor personnel involved in routine maintenance and periodic inspections of the transformers, and making any necessary repairs. The Five Transformer Sites are located on an active Navy base used for military and industrial activities.</p>
Changes in Toxicity and Other Contaminant Characteristics	<p>Table 6-1 compares the PRGs (e.g., TSCA and DOH SAL) used to derive the original risk estimates to the current DOH EALs (DOH 2011), EPA RSLs (EPA 2014), and TSCA cleanup standards. The only change noted in the screening levels is that the unrestricted-use DOH SAL identified in the ROD (1 mg/kg) has since been revised to the current EAL of 1.1 mg/kg. The TSCA criteria have not changed. EPA RSL criteria were not included in the ROD.</p> <p>Based on the risk evaluation (Table 6-1), remedial actions including soil removal, capping, and implementation of LUCs remain protective of the industrial worker. The changes to the EALs therefore do not affect the RAOs. Thus, it is not necessary to update the standards used at the time of remedy selection.</p>
Changes in Risk Assessment Methodologies	Risk assessment methodologies since the time the ROD was prepared in 2010 now include the consideration of the inhalation exposure pathway in the estimation of risk. This change does not require reevaluation of the protectiveness of the remedy for the Five Transformer Sites because the inhalation pathway is not the major pathway of concern due to the presence of the caps at each site.
Remedy Byproducts	No remedy byproducts have been identified for consideration in this assessment.
New Contaminants and Contaminant Sources	No new contaminants or contaminant sources have been identified.
Expected Progress Toward Meeting RAOs	<p>The site inspection results confirm that the LUCs are providing adequate long-term protection of human health and the environment and compliance with ARARs in accordance with the RAOs. The physical barriers to prevent exposure to contaminated soil and concrete remain intact at each site. Exposure pathways that could result in unacceptable risks are being controlled.</p> <p>The RAOs for the Five Transformer Sites remain appropriate.</p>

ARAR	applicable or relevant and appropriate requirement
EAL	environmental action level
PRG	preliminary remediation goal
RAO	remedial action objective
RSL	regional screening level
TBC	to be considered

**Table 6-1: Review of Human Health Toxicity Data Used in Risk Assessment – Residential Use**

Site	MDC within LUC Area	Original PRG <sup>a</sup>	Does MDC Exceed Original PRG?	Current EPA RSL <sup>b</sup>	Current EPA RSL Basis	Does MDC Exceed Current EPA RSL?	Current DOH EAL <sup>c</sup>	Current DOH EAL Basis	Does MDC Exceed Current DOH EAL?	Cancer Risk <sup>d</sup> Based on Current EPA RSL and MDC	NC HI <sup>e</sup> Based on Current DOH EAL and MDC	Conclusion
<b>Total PCBs (Soil)<sup>f</sup></b>												
Bldg. 3	6.07	1	Yes	0.24	Cancer	Yes	1.1	Noncancer	Yes	2.5E-05	5.5E+00	MDC still exceeds RSL and EAL; current residential risk is within the acceptable cancer risk range of 10 <sup>-6</sup> to 10 <sup>-4</sup> , but above the noncancer HI of 1.0 <sup>g</sup> . No further evaluation is recommended because the site is under industrial use and LUCs are in place to prevent residential usage.
Bldg. 106	7.73	1	Yes	0.24	Cancer	Yes	1.1	Noncancer	Yes	3.2E-05	7.0E+00	MDC still exceeds RSL and EAL; current residential risk is within the acceptable cancer risk range of 10 <sup>-6</sup> to 10 <sup>-4</sup> , but above the noncancer HI of 1.0 <sup>g</sup> . No further evaluation is recommended because the site is under industrial use and LUCs are in place to prevent residential usage.
Bldg. 81	43	1	Yes	0.24	Cancer	Yes	1.1	Noncancer	Yes	1.8E-04	3.9E+01	MDC still exceeds RSL and EAL; current residential risk is within the acceptable cancer risk range of 10 <sup>-6</sup> to 10 <sup>-4</sup> , but above the noncancer HI of 1.0 <sup>g</sup> . No further evaluation is recommended because the site is under industrial use and LUCs are in place to prevent residential usage.
S-26	8.39	1	Yes	0.24	Cancer	Yes	1.1	Noncancer	Yes	3.5E-05	7.6E+00	MDC still exceeds RSL and EAL; current residential risk is within the acceptable cancer risk range of 10 <sup>-6</sup> to 10 <sup>-4</sup> , but above the noncancer HI of 1.0 <sup>g</sup> . No further evaluation is recommended because the site is under industrial use and LUCs are in place to prevent residential usage.
S-17	0.14	1	No	0.24	Cancer	No	1.1	Noncancer	No	5.8E-07	1.3E-01	MDC is below the EAL and RSL; current residential risk is within or below the acceptable cancer risk range of 10 <sup>-6</sup> to 10 <sup>-4</sup> <sup>g</sup> ; no further evaluation recommended.
<b>Total PCBs (Concrete)<sup>f</sup></b>												
S-26	2.8	10	No	NA	NA	No	10	NA	No	NA	NA	MDC is below the PRG <sup>g</sup> ; no further evaluation recommended.
S-17	0.75	10	No	NA	NA	No	10	NA	No	NA	NA	MDC is below the PRG <sup>g</sup> ; no further evaluation recommended.

Note: Soil concentrations are in mg/kg; concrete concentrations are µg/100 cm<sup>2</sup>.

Sources: MDCs (DON 2010), Original PRGs (DOH 2005), Current EPA RSLs (EPA 2014), Current DOH EALs (DOH 2011).

HI hazard index  
MDC maximum detected concentration  
NA not applicable

<sup>a</sup> TSCA high occupancy cleanup level (\$761.61) and Hawaii DOH soil action level (DOH 2005) were used as screening criteria.

<sup>b</sup> EPA RSL for Resident Soil (EPA 2014).

<sup>c</sup> Hawaii DOH EAL (Unrestricted Land Use, groundwater is not a drinking water resource, greater than 150 m from surface water body) (DOH 2011).

<sup>d</sup> Cancer risk is derived using the following equation: (MDC/Current RSL) x (target risk level [1E-06]).

<sup>e</sup> Non-cancer HI is derived using the following equation: (MDC/Current EAL) x (target hazard quotient [1]).

<sup>f</sup> Confirmation soil sample collected in 2004 (DON 2010).

<sup>g</sup> See Section 6, Question B: Changes in Toxicity and Other Contaminant Characteristics for discussion.



**Table 6-2: Review of Human Health Toxicity Data Used in Risk Assessment – Industrial Use**

Site	MDC within LUC Area (mg/kg)	Original PRG (mg/kg) <sup>a</sup>	Does MDC Exceed Original PRG?	Current EPA RSL (mg/kg) <sup>b</sup>	Current EPA RSL Basis	Does MDC Exceed Current EPA RSL?	Current DOH EAL (mg/kg) <sup>c</sup>	Current DOH EAL Basis	Does MDC Exceed Current DOH EAL?	Cancer Risk <sup>d</sup> Based on Current EPA RSL and MDC	NC HI <sup>e</sup> Based on Current DOH EAL and MDC	Conclusion
<b>Total PCBs (Soil)</b>												
Bldg. 3	6.07	1	Yes	1	Cancer	Yes	7.4	Cancer	No	6.1E-06	8.2E-07	MDC still exceeds RSL, but is below the EAL; current risk is within or below the acceptable cancer risk range of 10 <sup>-6</sup> to 10 <sup>-4</sup> <sup>g</sup> ; no further evaluation recommended.
Bldg. 106	7.73	1	Yes	1	Cancer	Yes	7.4	Cancer	Yes	7.7E-06	1.0E-06	MDC still exceeds RSL and EAL; current risk is within or below the acceptable cancer risk range of 10 <sup>-6</sup> to 10 <sup>-4</sup> <sup>g</sup> ; no further evaluation recommended.
Bldg. 81	43	1	Yes	1	Cancer	Yes	7.4	Cancer	Yes	4.3E-05	5.8E-06	MDC still exceeds RSL and EAL; current risk is within or below the acceptable cancer risk range of 10 <sup>-6</sup> to 10 <sup>-4</sup> <sup>g</sup> ; no further evaluation recommended.
S-26	8.39	1	Yes	1	Cancer	Yes	7.4	Cancer	Yes	8.4E-06	1.1E-06	MDC still exceeds RSL and EAL; current risk is within or below the acceptable cancer risk range of 10 <sup>-6</sup> to 10 <sup>-4</sup> <sup>g</sup> ; no further evaluation recommended.
S-17	0.14	1	No	1	Cancer	No	7.4	Cancer	No	1.4E-07	1.9E-08	MDC still exceeds RSL and EAL; current risk is within or below the acceptable cancer risk range of 10 <sup>-6</sup> to 10 <sup>-4</sup> <sup>g</sup> ; no further evaluation recommended.

Sources: MDCs (DON 2010), Original PRGs (DOH 2005), Current EPA RSLs (EPA 2014), Current DOH EALs (DOH 2011).

NA not applicable

<sup>a</sup> TSCA high occupancy cleanup level (§761.61) and Hawaii DOH soil action level (DOH 2005) were used as screening criteria.

<sup>b</sup> EPA RSL for Industrial Soil (EPA 2014).

<sup>c</sup> Hawaii DOH EAL (Commercial/Industrial Land Use, groundwater is not a drinking water resource, greater than 150 m from surface water body) (DOH 2011).

<sup>d</sup> Cancer risk is derived using the following equation: (MDC/Current RSL) x (target risk level [1E-06]).

<sup>e</sup> Non-cancer HI is derived using the following equation: (MDC/Current EAL) x (target hazard quotient [1]).

<sup>f</sup> Confirmation soil sample collected in 2004 (DON 2010).

<sup>g</sup> See Section 6, Question B: Changes in Toxicity and Other Contaminant Characteristics for discussion.



**SITE: FIVE TRANSFORMER SITES**

**QUESTION C: Does any other information call into question the protectiveness of the remedy?**

<b>Element</b>	<b>Assessment</b>
Overall	No information that would call into question the protectiveness of the remedy has been identified.



## 7. Issues, Recommendations, and Follow-up Actions

Issues identified during the site inspection and interviews are listed in Table 7-1.

**Table 7-1: Issues and Recommendations**

Issue	Recommendations/Follow-up Actions	Party Responsible	Oversight Agency	Affects Protectiveness? (Yes/No)		Anticipated Date of Implementation
				Current	Future	
The S-17 LUC area is located in an open field and is difficult to find among the tall grass and shrubs.	Permanent signage, posts, or similar landmark should be installed to make the LUC area more visible for future annual and five-year review site inspections.	Navy	EPA/DOH	No	No	Spring 2016



## **8. Protectiveness Statement**

The remedy at the Five Transformer Sites, NCTAMS PAC NPL sites on Oahu, Hawaii, are protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled.

No changes in land use are expected in the foreseeable future.



## 9. References

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**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

**Five Transformer Sites**

**Attachment A: Five-Year Review Site Inspection Checklist**

Old Incinerator Site

Old Wahiawa Landfill



**FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST**

Information may be completed by hand and attached to the five-year review report as supporting documentation of site status. "N/A" refers to "not applicable."

<b>I. SITE INFORMATION</b>	
<b>Site Name:</b> Transformer Sites Bldg. 81 and S-26, JBPHH Lualualei Annex	<b>Date of Inspection:</b> November 6, 2014
<b>Location and Region:</b> Honolulu, HI	<b>EPA ID:</b> HI4170090076
<b>Agency, office or company leading the five-year review:</b> NAVFAC Hawaii/AECOM	<b>Weather/temperature:</b> Sunny, 80 °F
<b>Remedy Includes:</b> (Check all that apply) <input type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input checked="" type="checkbox"/> Other – LUCs, soil cap	
<b>Attachments:</b> <input type="checkbox"/> Inspection team roster attached Inspection Team Members: Dustin Goto (AECOM) Andrea von Burg Hall (AECOM)	
<input type="checkbox"/> Site map attached	

<b>II. INTERVIEWS</b> (Check all that apply)	
1. <b>O&amp;M Site Manager</b>	<input checked="" type="checkbox"/> N/A
2. <b>O&amp;M Staff</b>	<input checked="" type="checkbox"/> N/A
<b>3. Local regulatory authorities and response agencies</b> (i.e.; State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.). Fill in all that apply.	
Agency <u>Hawaii Department of Health</u> Contact <u>Name</u> <u>Title here</u> <u>Date</u> <u>Phone Number</u> Maria Reyes Remedial Project Mgr. November 13, 2014 808-586-4249	
Agency <u>EPA Region 9</u> Contact <u>Name</u> <u>Title here</u> <u>Date</u> <u>Phone Number</u> Mark Ripperda Regulatory Project Mgr. November 7, 2014 415-972-3028	
Problems, suggestions: <input checked="" type="checkbox"/> Report attached to Five-Year Review Report (Refer to Attachment C) Remarks:	
<b>4. Other interviews</b> (optional) <input checked="" type="checkbox"/> Report attached to Five-Year Review Report (Refer to Attachment C) Jan Kotoshirodo, NAVFAC RPM (November 10, 2014)	

<b>III. ONSITE DOCUMENTS &amp; RECORDS VERIFIED (Check all that apply)</b>			
<b>1. O&amp;M Documents</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks:			
<b>2. Site-Specific Health and Safety Plan</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>3. O&amp;M and OSHA Training Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>4. Permits and Service Agreements</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>5. Gas Generation Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>6. Settlement Monument Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>7. Groundwater Monitoring Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>8. Leachate Extraction Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>9. Discharge Compliance Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>10. Daily Access/Security Logs</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A

<b>IV. O&amp;M COSTS</b>	
<b>1. O&amp;M Organization</b>	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Other: PRP <input type="checkbox"/> Contractor for State <input type="checkbox"/> Contractor for PRP
<b>2. O&amp;M Cost Records</b>	<input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Funding mechanism/agreement in place Original O&M cost estimate <u>N/A</u> <input type="checkbox"/> Up to date <input type="checkbox"/> Breakdown attached
<b>3. Unanticipated or Unusually High O&amp;M Costs During Review Period</b>	None

<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b>		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
<b>A. Fencing</b>			
<b>1. Fencing damaged</b>	<input type="checkbox"/> Location shown on map	<input type="checkbox"/> Gates secure	<input type="checkbox"/> N/A
Remarks: Fencing is not specifically indicated as an access control for the S-26 and Bldg. 81 LUC areas in the RAWP (AECOM 2011). An approximately 6-ft high chain-link fence topped with barbed wire surrounds the S-26 site, and includes the active transformer adjacent to the LUC area. All access gates within the fencing are secured with locks. No barbed wire is present above a south fencing gate and the barbed to the west of the gate requires repair. No fencing is present around the Bldg. 81 LUC area.			
<b>B. Other Access Restrictions</b>			
<b>1. Signs and other security measures</b>	<input type="checkbox"/> Signs	<input checked="" type="checkbox"/> N/A	
Remarks: Signage is not specifically indicated as an access control for the S-26 and Bldg. 81 LUC areas in the RAWP (AECOM 2011). Five signs ("Danger High Voltage, 46,000 Volts) are present on the chain-link fence surrounding the S-26 site. No signage is present at the Bldg. 81 site.			
<b>C. Institutional Controls</b>			
<b>1. Implementation and enforcement</b>	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
			<input type="checkbox"/> N/A
			<input type="checkbox"/> N/A

<b>V.C ACCESS AND INSTITUTIONAL CONTROLS (cont'd)</b>			
Remarks: <u>Upon implementation of the final remedy, the S-26 LUC area consisted of an 8.5 foot layer of clean coral fill overlain with 4 to 6 inches of clean topsoil. At the time of the site visit, no topsoil was observed within the LUC area and the coral fill was exposed. Based on the depth of exposed concrete pavement adjoining the LUC area to the north, the soil cap has settled 6-10 inches.</u>			
<u>The Bldg. 81 LUC area was constructed to consist of an 18 inch soil cap, which was hydroseeded and replanted with trees. During the site visit, the area was observed to be landscaped with only grass. According to a staff member working in Bldg. 81, the LUC area is irrigated and regularly mowed. No evidence of intrusive activities or disturbance of the soil cap were noted.</u>			
Type of monitoring (e.g., self-reporting, drive by): <u>No regular monitoring is performed, except annual LUC inspections.</u>			
Frequency: <u>Annual</u>			
Responsible party/agency: <u>NAVFAC Hawaii</u>			
Contact Name:	Title	Date	Phone No.
<u>Jan Kotoshirodo</u>	<u>RPM</u>	<u>11/10/2014</u>	<u>808-471-1171 X 341</u>
Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Violations have been reported	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Other problems or suggestions:			
<b>2. Adequacy</b> <input checked="" type="checkbox"/> ICs are adequate <input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A			
<b>D. General</b>			
<b>1. Vandalism/trespassing</b> <input type="checkbox"/> Vandalism evident <input checked="" type="checkbox"/> No vandalism evident Remarks: <u>No evidence of vandalism was observed at the S-26 and Bldg. 81 sites.</u>			
<b>2. Land use changes on site</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Remarks: <u>No land use changes were noted. The S-26 LUC area is not actively used and is located within a fenced area next to an active transformer. The Bldg. 81 LUC area is within a landscaped field (i.e., regularly irrigated and mowed grass). Bldg. 81, which is used for industrial activities, is approximately 30 feet from the LUC area.</u>			
<b>3. Land use changes off site</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Remarks: <u>The area surrounding both sites does not appear to have changed since the ROD (DON 2010). No new development in areas around the sites was noted during the site visit.</u>			

<b>VI. GENERAL SITE CONDITIONS</b>		
<b>A. Roads</b>	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
<b>B. Other Site Conditions</b>	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A

<b>VII. LANDFILL COVERS</b>	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
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<b>VIII. VERTICAL BARRIER WALLS</b>	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
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<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b>	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
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<b>X. OTHER REMEDIES</b>
Institutional controls remain in place to prevent disturbance of the LUC areas at the three transformer sites.

<b>XI. OVERALL OBSERVATIONS</b>
<b>A. Implementation of the Remedy</b>
The implemented remedy at the S-26 and Bldg. 81 sites is a soil cap. The soil cap at the S-26 site includes an 8.5 foot layer of clean coral fill overlain by 4 to 6 inches of topsoil. The soil cap at the Bldg. 81 site includes an 18 inch layer of compacted treated soil.
<b>B. Adequacy of O&amp;M</b>
O&M appears adequate.
<b>C. Early Indicators of Potential Remedy Failure</b>
During the site inspection, the upper 6-10 inches of the soil cap at the S-26 site appeared to have been disturbed greater than 1 year before the site visit. The soil cap at the Bldg. 81 site was intact and undisturbed.
<b>D. Opportunities for Optimization</b>
The soil cap at the S-26 site should be repaired.

### FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

Information may be completed by hand and attached to the five-year review report as supporting documentation of site status. "N/A" refers to "not applicable."

I. SITE INFORMATION	
<b>Site Name:</b> Transformer Sites S-17, Bldg. 3, and Bldg. 106, JBPHH Wahiawa Annex	<b>Date of Inspection:</b> November 6, 2014
<b>Location and Region:</b> Honolulu, HI	<b>EPA ID:</b> HI4170090076
<b>Agency, office or company leading the five-year review:</b> NAVFAC Hawaii/AECOM	<b>Weather/temperature:</b> Sunny, 80 °F
<b>Remedy Includes:</b> (Check all that apply) <input type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input checked="" type="checkbox"/> Other – LUCs, soil cap (Bldg. 3 and Bldg. 106), concrete cap (S-17)	
<b>Attachments:</b> <input type="checkbox"/> Inspection team roster attached Inspection Team Members: Dustin Goto (AECOM) Andrea von Burg Hall (AECOM)	
<input type="checkbox"/> Site map attached	

II. INTERVIEWS (Check all that apply)	
1. O&M Site Manager	<input checked="" type="checkbox"/> N/A
2. O&M Staff	<input checked="" type="checkbox"/> N/A
<b>3. Local regulatory authorities and response agencies</b> (i.e.; State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.). Fill in all that apply.	
Agency <u>Hawaii Department of Health</u>	
Contact <u>Name</u>	<u>Title here</u>
Maria Reyes	Remedial Project Mgr.
	<u>Date</u>
	November 13, 2014
	<u>Phone Number</u>
	808-586-4249
Agency <u>EPA Region 9</u>	
Contact <u>Name</u>	<u>Title here</u>
Mark Ripperda	Regulatory Project Mgr.
	<u>Date</u>
	November 7, 2014
	<u>Phone Number</u>
	415-972-3028
Problems, suggestions:	<input checked="" type="checkbox"/> Report attached to Five-Year Review Report (Refer to Attachment C)
Remarks:	
<b>4. Other interviews</b> (optional) <input checked="" type="checkbox"/> Report attached to Five-Year Review Report (Refer to Attachment C)	
Jan Kotoshirodo, NAVFAC RPM (November 10, 2014)	

<b>III. ONSITE DOCUMENTS &amp; RECORDS VERIFIED</b> (Check all that apply)			
<b>1. O&amp;M Documents</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>2. Site-Specific Health and Safety Plan</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>3. O&amp;M and OSHA Training Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>4. Permits and Service Agreements</b>	<input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>5. Gas Generation Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>6. Settlement Monument Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>7. Groundwater Monitoring Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>8. Leachate Extraction Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>9. Discharge Compliance Records</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>10. Daily Access/Security Logs</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A

<b>IV. O&amp;M COSTS</b>	
<b>1. O&amp;M Organization</b>	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Other: PRP <input type="checkbox"/> Contractor for State <input type="checkbox"/> Contractor for PRP
<b>2. O&amp;M Cost Records</b>	<input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Funding mechanism/agreement in place Original O&M cost estimate <u>N/A</u> <input type="checkbox"/> Up to date <input type="checkbox"/> Breakdown attached
<b>3. Unanticipated or Unusually High O&amp;M Costs During Review Period</b>	None

<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b>		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
<b>A. Fencing</b>			
<b>1. Fencing damaged</b>	<input type="checkbox"/> Location shown on map	<input type="checkbox"/> Gates secure	<input checked="" type="checkbox"/> N/A
Remarks: Fencing is not specifically indicated as an access control for the LUC areas in the RAWP (AECOM 2011). An approximately 6-ft high chain-link fence topped with barbed wire surrounds the Bldg. 106 site, and includes both LUC areas. No fencing is present around the S-17 and Bldg. 3 LUC areas.			
<b>B. Other Access Restrictions</b>			
<b>1. Signs and other security measures</b>	<input type="checkbox"/> Signs		<input checked="" type="checkbox"/> N/A
Remarks: Signage is not specifically indicated as an access control for the S-17, Bldg. 3, and Bldg. 106 LUC areas in the RAWP (AECOM 2011). No signage is present at any of the sites.			
<b>C. Institutional Controls</b>			
<b>1. Implementation and enforcement</b>	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
			<input type="checkbox"/> N/A
			<input type="checkbox"/> N/A

**V.C ACCESS AND INSTITUTIONAL CONTROLS (cont'd)**

Remarks: The restoration activities at the Bldg. 3 and Bldg. 106 sites included the excavation of PCB-contaminated soil. The Bldg. 3 excavation was backfilled with 3B-Fine aggregate to within 2 feet of the ground surface, and the top 2 feet was filled with clean topsoil. At the time of this five-year review site visit, the Bldg. 3 LUC area was covered with landscaped grass. No evidence of intrusive activities or disturbance of the soil cap was noted.

The Bldg. 106 site consisted of two excavations: Subsite A and Subsite B. Subsite A and Subsite B were backfilled with a minimum of 18 inches and 6 to 8 inches, respectively, of compacted clean coral fill. The ground surface of Subsite A was restored with 4 to 6 inches of topsoil, while the surface of Subsite B was repaved with asphalt to match the surrounding surface. During the site visit, no evidence of intrusive activities at Subsite A and B were observed.

Site S-17 includes a concrete vault, which was sealed with concrete to prevent exposure to PCB-contaminated concrete within the vault. No evidence of damage to the concrete seal was observed during the site visit.

Type of monitoring (e.g., self-reporting, drive by):  
No regular monitoring is performed, except annual LUC inspections.  
 Frequency: Annual

Responsible party/agency: NAVFAC Hawaii

Contact Name:	Title	Date	Phone No.
<u>Jan Kotoshirodo</u>	<u>RPM</u>	<u>11/10/2014</u>	<u>808-471-1171 X 341</u>

Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Violations have been reported	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Other problems or suggestions:			

**2. Adequacy**       ICs are adequate       ICs are inadequate       N/A

**D. General**

**1. Vandalism/trespassing**       Vandalism evident       No vandalism evident

Remarks: No evidence of vandalism was observed.

**2. Land use changes on site**       Yes       No

Remarks: No land use changes were noted. The S-17 LUC area is not actively used and is located within an overgrown field approximately 120 feet to the south of Polaris Drive.

The Bldg. 106 LUC areas are located within a chain-link fenced area that includes Bldgs. 105 and 106. Subsite A is not actively used; however, the grass covering the area appears to be regularly mowed. The LUC area within Subsite B is part of the paved driveway adjoining the southwest side of Bldg. 106.

**3. Land use changes off site**       Yes       No

Remarks: The area surrounding both sites does not appear to have changed since the ROD (DON 2010). No new development in areas around the sites was noted during the site visit.

<b>VI. GENERAL SITE CONDITIONS</b>		
<b>A. Roads</b>	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
<b>B. Other Site Conditions</b>	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
<b>VII. LANDFILL COVERS</b>		
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
<b>VIII. VERTICAL BARRIER WALLS</b>		
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b>		
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
<b>X. OTHER REMEDIES</b>		
Institutional controls remain in place to prevent disturbance of the LUC areas at the three transformer sites.		
<b>XI. OVERALL OBSERVATIONS</b>		
<b>A. Implementation of the Remedy</b>		
The implemented remedy at the S-17, Bldg. 3, and Bldg. 106 sites includes LUCs to prevent disturbance of previously completed restorative activities. The restorative activities include caps at the Bldg. 3 and 106 sites, and sealing of a concrete vault at site S-17. LUCs were implemented for the sites as part of the RAWP (AECOM 2011).		
<b>B. Adequacy of O&amp;M</b>		
O&M appears adequate. No additional O&M activities appear necessary to prevent disturbance of PCB-contaminated soils and concrete left in place at the sites.		
<b>C. Early Indicators of Potential Remedy Failure</b>		
None identified.		
<b>D. Opportunities for Optimization</b>		
The S-17 LUC area is located in an open field and is difficult to find among the 4 to 5 foot high vegetation. The Navy should install posts or signage to make the concrete vault more visible for future annual inspections and five-year review site visits.		

**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

**Five Transformer Sites**

**Attachment B: Site Photographs**

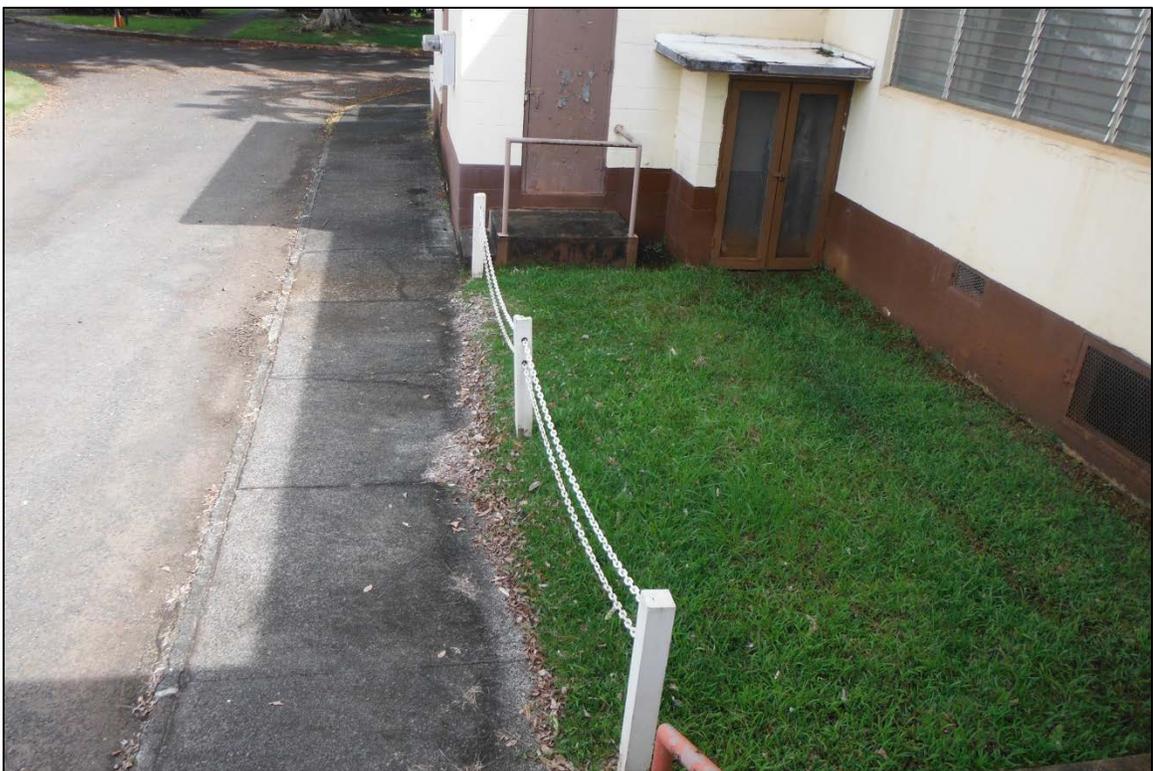
Old Incinerator Site

Old Wahiawa Landfill





Photograph No. 1: Overview of Bldg. 3 LUC area, looking south.



Photograph No. 2: View of landscaped grass within the Bldg. 3 LUC area. Photo looking east.



Photograph No. 3: View of Bldg. 106 Subsite A LUC area, looking southeast.



Photograph No. 4: Overview of Bldg. 106 Subsite B LUC area, looking east.



Photograph No. 5: Overview of Bldg. 106 Subsite A LUC area, looking northeast.



Photograph No. 6: View looking south towards S-17 LUC area from Polaris Drive. A faded yellow post and marking on the road denote the location of the S-17 site.



Photograph No. 7: Overview of S-17 LUC area, looking east towards concrete vent structure.



Photograph No. 8: S-17 vent structure located to the east of the vault. Photo looking south.



Photograph No. 9: Overview of the Bldg. 81 LUC area, looking north.



Photograph No. 10: View of landscaped grass within the Bldg. 81 LUC area, looking west.



Photograph No. 11: Overview of the S-26 LUC area, looking southwest.



Photograph No. 12: View of exposed coral gravel fill on east part of the LUC area at transformer site S-26. Photo looking south.



Photograph No. 13: View of concrete covered west part of S-26 LUC area. Note height of coral gravel fill relative to the concrete pad to the west and concrete sidewalk to the north. Photo looking west.



Photograph No. 14: View of active S-26 transformer site, looking northeast.



**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

**Five Transformer Sites**

**Attachment C: Interview Forms**

Old Incinerator Site

Old Wahiawa Landfill



<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Bldg. 3 Transformer, JBPHH Wahiawa Annex <b>DOH Regulatory PM:</b> Maria Reyes		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Maria Reyes	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> DOH-HEER
<b>Telephone No.:</b> 808-586-7576	<b>Street Address:</b> 919 Ala Moana Boulevard, Rm 206	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> Honolulu, Hawaii 96814	
<b>E-Mail Address:</b> maria.reyes@doh.hawaii.gov		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>I have been familiar w/ the project site since 2009.</i></li> <li>2. What is your overall impression of the project? <i>A thorough investigation was conducted.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>Yes, the remedy is functioning as expected. The remedy is effective at protecting human health and the environment.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>There are no trends to show.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>I am not aware of any continuous on-site O&amp;M presence. There are annual LUC inspections.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>I am not aware of any.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>I am not aware of any.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>I am not aware of any.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>I am not aware of any.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>I have no additional comments.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Bldg. 3 Transformer, JBPHH Wahiawa Annex <b>EPA Regulatory PM:</b> Mark Ripperda		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Mark Ripperda	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> U.S. EPA
<b>Telephone No.:</b> 415-972-3028	<b>Street Address:</b>	
<b>Fax No.:</b> —	<b>City, State, Zip:</b>	
<b>E-Mail Address:</b> Ripperda.Mark@epamail.epa.gov		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>Approximately 10 years.</i></li> <li>2. What is your overall impression of the project? <i>Good.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>The remedy is functioning as expected and appears to be effective.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>No.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>The remedy calls for inspections at least every twelve months. It appears that the time between inspections was more like 15 months last year.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>No.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>No.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>No.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>No, there really isn't much opportunity to optimize LUCs and signage maintenance.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>No.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Bldg. 3 Transformer, JBPHH Wahiawa Annex <b>Navy RPM:</b> Jan Kotoshirodo		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Jan Kotoshirodo	<b>Title:</b> Navy Project Manager	<b>Organization:</b> Navy
<b>Telephone No.:</b> 808-471-1171 ext. 341	<b>Street Address:</b> 400 Marshall Road	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> JBPHH, HI 96860-3139	
<b>E-Mail Address:</b> jan.kotoshirodo@navy.mil		
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<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Bldg. 106 Transformer, JBPHH Wahiawa Annex <b>DOH Regulatory PM:</b> Maria Reyes		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Maria Reyes	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> DOH-HEER
<b>Telephone No.:</b> 808-586-7576	<b>Street Address:</b> 919 Ala Moana Boulevard, Rm 206	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> Honolulu, Hawaii 96814	
<b>E-Mail Address:</b> maria.reyes@doh.hawaii.gov		
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<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Bldg. 106 Transformer, JBPHH Wahiawa Annex <b>EPA Regulatory PM:</b> Mark Ripperda		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Mark Ripperda	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> U.S. EPA
<b>Telephone No.:</b> 415-972-3028	<b>Street Address:</b>	
<b>Fax No.:</b> —	<b>City, State, Zip:</b>	
<b>E-Mail Address:</b> Ripperda.Mark@epamail.epa.gov		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>Approximately 10 years.</i></li> <li>2. What is your overall impression of the project? <i>Good.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>The remedy is functioning as expected and appears to be effective.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>No.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>The remedy calls for inspections at least every twelve months. It appears that the time between inspections was more like 15 months last year.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>No.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>No.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>No.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>No, there really isn't much opportunity to optimize LUCs and signage maintenance.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>No.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Bldg. 106 Transformer, JBPHH Wahiawa Annex <b>Navy RPM:</b> Jan Kotoshirodo		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Jan Kotoshirodo	<b>Title:</b> Navy Project Manager	<b>Organization:</b> Navy
<b>Telephone No.:</b> 808-471-1171 ext. 341	<b>Street Address:</b> 400 Marshall Road	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> JBPHH, HI 96860-3139	
<b>E-Mail Address:</b> jan.kotoshirodo@navy.mil		
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<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>March 2009 to present.</i></li> <li>2. What is your overall impression of the project? <i>Remedy functioning as intended.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>Yes. LUCs are protective of human health and the environment.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>N/A.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>Only requirement in RAWP is annual inspection to visit site and confirm LUCs are protective.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>No.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>No.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>No.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>N/A.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>No.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> S-17 Transformer, JBPHH Wahiawa Annex <b>DOH Regulatory PM:</b> Maria Reyes		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Maria Reyes	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> DOH-HEER
<b>Telephone No.:</b> 808-586-7576	<b>Street Address:</b> 919 Ala Moana Boulevard, Rm 206	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> Honolulu, Hawaii 96814	
<b>E-Mail Address:</b> maria.reyes@doh.hawaii.gov		
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<b>Site Name:</b> S-17 Transformer, JBPHH Wahiawa Annex <b>EPA Regulatory PM:</b> Mark Ripperda		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Mark Ripperda	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> U.S. EPA
<b>Telephone No.:</b> 415-972-3028	<b>Street Address:</b>	
<b>Fax No.:</b> —	<b>City, State, Zip:</b>	
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<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> S-17 Transformer, JBPHH Wahiawa Annex <b>Navy RPM:</b> Jan Kotoshirodo		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Jan Kotoshirodo	<b>Title:</b> Navy Project Manager	<b>Organization:</b> Navy
<b>Telephone No.:</b> 808-471-1171 ext. 341	<b>Street Address:</b> 400 Marshall Road	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> JBPHH, HI 96860-3139	
<b>E-Mail Address:</b> jan.kotoshirodo@navy.mil		
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<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Bldg. 81 Transformer, JBPHH Lualualei Annex <b>DOH Regulatory PM:</b> Maria Reyes		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Maria Reyes	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> DOH-HEER
<b>Telephone No.:</b> 808-586-7576	<b>Street Address:</b> 919 Ala Moana Boulevard, Rm 206	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> Honolulu, Hawaii 96814	
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<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Bldg. 81 Transformer, JBPHH Lualualei Annex <b>Navy RPM:</b> Jan Kotoshirodo		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Jan Kotoshirodo	<b>Title:</b> Navy Project Manager	<b>Organization:</b> Navy
<b>Telephone No.:</b> 808-471-1171 ext. 341	<b>Street Address:</b> 400 Marshall Road	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> JBPHH, HI 96860-3139	
<b>E-Mail Address:</b> jan.kotoshirodo@navy.mil		
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<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>March 2009 to present.</i></li> <li>2. What is your overall impression of the project? <i>Remedy functioning as intended.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>Yes. LUCs are protective of human health and the environment.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>N/A.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>Only requirement in RAWP is annual inspection to visit site and confirm LUCs are protective.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>No.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>No.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>No.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency <i>N/A.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>No.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> S-26 Transformer, JBPHH Lualualei Annex <b>DOH Regulatory PM:</b> Maria Reyes		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Maria Reyes	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> DOH-HEER
<b>Telephone No.:</b> 808-586-7576	<b>Street Address:</b> 919 Ala Moana Boulevard, Rm 206	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> Honolulu, Hawaii 96814	
<b>E-Mail Address:</b> maria.reyes@doh.hawaii.gov		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>I have been familiar w/ the project site since 2009.</i></li> <li>2. What is your overall impression of the project? <i>A thorough investigation was conducted.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>Yes, the remedy is functioning as expected. The remedy is effective at protecting human health and the environment.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>There are no trends to show.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>I am not aware of any continuous on-site O&amp;M presence. There are annual LUC inspections.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>I am not aware of any.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>I am not aware of any.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>I am not aware of any.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>I am not aware of any.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>I have no additional comments.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> S-26 Transformer, JBPHH Lualualei Annex <b>EPA Regulatory PM:</b> Mark Ripperda		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Mark Ripperda	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> U.S. EPA
<b>Telephone No.:</b> 415-972-3028	<b>Street Address:</b>	
<b>Fax No.:</b> —	<b>City, State, Zip:</b>	
<b>E-Mail Address:</b> Ripperda.Mark@epamail.epa.gov		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>Approximately 10 years.</i></li> <li>2. What is your overall impression of the project? <i>Good.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>The remedy is functioning as expected and appears to be effective.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>No.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>The remedy calls for inspections at least every twelve months. It appears that the time between inspections was more like 15 months last year.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>No.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>No.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>No.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>No, there really isn't much opportunity to optimize LUCs and signage maintenance.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>No.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> S-26 Transformer, JBPHH Lualualei Annex <b>Navy RPM:</b> Jan Kotoshirodo		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <b>Date:</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Jan Kotoshirodo	<b>Title:</b> Navy Project Manager	<b>Organization:</b> Navy
<b>Telephone No.:</b> 808-471-1171 ext. 341	<b>Street Address:</b> 400 Marshall Road	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> JBPHH, HI 96860-3139	
<b>E-Mail Address:</b> jan.kotoshirodo@navy.mil		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>March 2009 to present.</i></li> <li>2. What is your overall impression of the project? <i>Remedy functioning as intended.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>Yes. LUCs are protective of human health and the environment.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>N/A.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>Only requirement in RAWP is annual inspection to visit site and confirm LUCs are protective.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>No.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>No.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>No.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>N/A.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>No.</i></li> </ol>		

**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

Five Transformer Sites

**Old Incinerator Site**

Old Wahiawa Landfill



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## CONTENTS

### Old Incinerator Site

Acronyms and Abbreviations	iii
1. Site Chronology	1-1
2. Background	2-1
2.1 Site Description	2-1
2.2 Land Use	2-1
2.3 History of Contamination	2-1
2.4 Initial Response	2-3
2.5 Basis for Taking Remedial Action	2-3
3. Remedial Actions	3-1
3.1 Remedial Action Objectives	3-1
3.2 Remedy Description	3-1
3.3 Remedy Implementation	3-2
3.4 Systems Operations and Maintenance	3-2
4. Progress Since the Last Five-Year Review	4-1
5. Five-Year Review Process	5-1
5.1 Administrative Components	5-1
5.2 Community Involvement	5-1
5.3 Document Review	5-1
5.4 Data Review	5-1
5.4.1 Monitoring Reports	5-2
5.5 Five-Year Site Inspection	5-4
5.6 Interviews	5-4
6. Technical Assessment	6-1
7. Issues, Recommendations, and Follow-up Actions	7-1
8. Protectiveness Statement	8-1
9. References	9-1

### ATTACHMENTS

A	Five-Year Review Site Inspection Checklist
B	Site Photographs
C	Interview Forms

### FIGURE

2-1	Facility Location Map, Old Incinerator Site	2-5
2-2	Old Incinerator Site Location Map	2-7
3-1	Land Use Control Boundary, Old Incinerator Site	3-5

**TABLES**

1-1	Old Incinerator Site Chronology of Events	1-1
5-1	Five-Year Review Team Members	5-1
6-1	Chemical ARAR Comparison, Residential	6-5
6-2	Surface Soil Metals ARAR Comparison, Residential	6-7
7-1	Issues and Recommendations	7-1

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## ACRONYMS AND ABBREVIATIONS

AECOM	AECOM Technical Services, Inc.
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
Bldg.	Building
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOH	Department of Health, State of Hawaii
COC	chemical of concern
COPC	chemical of potential concern
EPA	Environmental Protection Agency, United States
ESI	expanded site inspection
FS	feasibility study
IAS	initial assessment study
JBPHH	Joint Base Pearl Harbor-Hickam
LTM	long-term monitoring
LUC	land use control
MDC	maximum detected concentration
NCTAMS PAC	Naval Computer and Telecommunications Area Master Station Pacific
O&M	operations and maintenance
OIS	Old Incinerator Site
NPL	National Priorities List
PAH	polynuclear aromatic hydrocarbon
PRG	preliminary remediation goal
RAB	Restoration Advisory Board
RAO	remedial action objective
RI	remedial investigation
ROD	record of decision
RPM	remedial project manager
RSL	regional screening level
SI	site inspection
U.S.	United States



## 1. Site Chronology

Significant events relevant to the Old Incinerator Site (OIS) at Joint Base Pearl Harbor-Hickam (JBPHH) Wahiawa Annex, Oahu, Hawaii are presented in Table 1-1.

**Table 1-1: Old Incinerator Site Chronology of Events**

Event	Date
Naval Radio Station, Wahiawa begins operations as a temporary radio and direction finder station, and is quickly expanded in the period leading up to World War II. The operation was later renamed to Naval Computer and Telecommunications Area Master Station, Pacific (NCTAMS PAC), Wahiawa Branch.	1940–1941
Ash from an incinerator located behind Building (Bldg.) 336 that was used to incinerate discarded controlled documents and other miscellaneous wastes was disposed of at the OIS.	1951–1975
The incinerator behind Bldg. 336 was removed.	1975
An initial assessment study (IAS) was conducted by the Navy to identify areas that may require investigation or cleanup through a document search and personal interviews. Subsequently, it was recommended that a site inspection be conducted at the nearby Bldg. 6 Disposal Area to determine whether contamination existed and to develop recommendations for further action (NEESA 1986).	1986
A site inspection conducted by the Navy to characterize soil at the Bldg. 6 Disposal Area (which encompassed the former location of the incinerator and the adjacent area of ash identified during the site inspection as the “Burn Area”) concluded that arsenic, lead, mercury, and xylene in soil may be the result of historical waste management practices (HLA 1989).	1989
An expanded site inspection conducted by the Navy to further investigate the Bldg. 6 Disposal Area found elevated concentrations of lead common in surface soil, subsurface soil, and sediment samples. The results defined some contaminant sources, including the OIS. The offsite civilian population was considered potentially at risk because of possible transport of contaminants via surface drainage, and Naval personnel were determined to be the most at risk via direct contact with contaminated soil (ANL 1992).	1992
A remedial investigation (RI) conducted by the Navy to quantify risk associated with the Bldg. 6 Disposal Area initially excluded the OIS, but it was later added to the RI scope based on observations made during the initial RI field reconnaissance in 1996. Surface and subsurface soil samples were collected at the OIS and analyzed for organic compounds and metals (surface water and groundwater were not encountered at the site). The RI concluded that, based on risk estimates for subsurface soil, the OIS required abatement through land use controls (LUCs) or removal action to protect human health and ecological receptors from exposure to metals, primarily arsenic and lead (Earth Tech 2006).	1996–2006
A feasibility study (FS) conducted by the Navy evaluated response action alternatives to address contamination in subsurface soil at the OIS and recommended a site-specific response action. Response action alternatives retained for detailed analysis included LUCs, hot spot removal and disposal in conjunction with LUCs, and excavation and disposal of all contaminated soil. The FS recommended the LUC alternative (Earth Tech 2007).	2007
A record of decision (ROD) issued by the Navy in December 2009 documented LUCs as the selected final remedy for the OIS (DON 2009). The ROD became effective with receipt of the final authorizing signature on February 17, 2010.	17 February 2010
New location names were implemented with the establishment of Joint Base Pearl Harbor-Hickam. The location of the NCTAMS PAC Wahiawa activity was named JBPHH Wahiawa Annex.	October 2010
A LUC work plan for the OIS issued by the Navy detailed the means for implementing and maintaining the final remedy of LUCs (AECOM 2011b).	September 2011
A long-term monitoring (LTM) plan issued by the Navy provided the procedures and supporting documentation for implementing the monitoring and maintenance activities required for the OIS (AECOM 2011a).	September 2011
A remedial action completion report issued by the Navy formally documented achievement of the remedial action objectives (RAOs), as specified in the OIS ROD and remedy in place (AECOM 2013).	May 2013
Annual LTM site inspections were conducted at the OIS to verify compliance with the LUCs specified in the ROD; results were documented in LTM monitoring reports issued by the Navy (AECOM and Environet 2011; PRC-ERRG 2013, 2014).	2011–2013



## 2. Background

The OIS is included in the Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS PAC) National Priorities List (NPL) site as Operable Unit 01 located at JBPHH Wahiawa Annex, formerly named NCTAMS PAC Wahiawa.

### 2.1 SITE DESCRIPTION

A general description of JBPHH Wahiawa Annex and its physical characteristics is presented in Introduction Section I.6.1.

The 0.14-acre OIS is a currently unused vacant land situated on the western flank of a steep gulch in the south-central portion of JBPHH Wahiawa Annex (Figure 2-1). The gulch is approximately 60 feet deep and densely vegetated. An unnamed intermittent stream flows through the gulch and past the OIS. The site comprises concrete steps, a landing, and the foundation of a former incinerator in which controlled documents and other miscellaneous wastes were burned. The surrounding area is a secure military facility used for industrial/commercial activities. The OIS is located near two other Installation Restoration sites: the Building (Bldg.) 6 Disposal Area (OU-8) and the Dump Site Near Bldg. 293 (OU-2); a fourth Installation Restoration site, the Old Wahiawa Landfill (OU-4), occupies the head of the gulch and is located approximately 3,200 feet to the east from the other three sites (Figure 2-2).

The OIS lies atop weathered basaltic flows. The site is underlain by ash, silty clay fill with ash, and saprolite. Approximately 6 inches of surface soil overlay the ash layer, which ranges from 3 feet to 11 feet in thickness. At the nearby Bldg. 6 Disposal Area, limited, perched water was encountered at depths of 8–10 feet below ground surface (bgs) in two borings into the gulch floor alluvium; however, neither surface water nor groundwater were encountered at the OIS during the remedial investigation (RI) (Earth Tech 2006).

### 2.2 LAND USE

*Current Site Use:* NCTAMS PAC Wahiawa at JBPHH Wahiawa Annex operates and maintains communications facilities for the Navy in the Pacific, which is considered an industrial/commercial use. The OIS is currently unused, and no activities currently occur within the gulch. The entire OIS is within a designated land use control (LUC) area. The site boundaries are shown on Figure 2-2.

*Future Site Use:* NCTAMS PAC Wahiawa at JBPHH Wahiawa Annex will be maintained by the Navy for use as a communications facility. There are no current plans for development of the steep gulch walls, and no land use changes are anticipated in the foreseeable future for the OIS.

### 2.3 HISTORY OF CONTAMINATION

The main source of contamination is from residual ash resulting from past incinerator operations where controlled documents and other miscellaneous wastes were burned.

Discarded controlled documents and other miscellaneous wastes were burned in an incinerator on the western edge of the gulch behind Bldg. 336. Ash from the incinerator was disposed of at the OIS, which occupies about 0.14 acre of land within the same gulch as the Bldg. 6 Disposal Area, and was formerly included in the Bldg. 6 Disposal Area and referred to as the “Burn Area.” The incinerator was removed in 1975. Remnants of the incinerator include a concrete foundation, steps, and a single wall near the top of the gulch slope. Immediately downslope of the concrete foundation, the ground is covered with ash, small amounts of slag (i.e., melted metal), and other miscellaneous wastes. Ash

has been reported to depths up to 11 feet bgs. The presence of ash at depth indicates that the ash was occasionally covered with soil. The presence of slag materials indicates materials other than paper may also have been burned during document destruction.

The OIS has been the subject of four previous environmental investigations and a feasibility study (FS) and was considered a part of the Bldg. 6 Disposal Area during the first three of these investigations. It was not investigated as a separate site until the RI.

*Initial Assessment Study (IAS) (NEESA 1986):* The Naval Energy and Environmental Support Activity conducted an IAS of the Naval Communication Area Master Station, Eastern Pacific (NAVCAMS EASTPAC) (later renamed NCTAMS PAC) to identify areas that may require further investigation or cleanup. The IAS report (NEESA 1986) recommended that a site inspection be conducted to determine whether contamination existed at the Bldg. 6 Disposal Area and to develop recommendations for further action.

*Site Inspection (HLA 1989):* A site inspection by the Navy to characterize the Bldg. 6 Disposal Area by determining the presence or absence of contamination in the surface and subsurface soil. The Bldg. 6 Disposal Area encompasses the former location of the incinerator and the adjacent area of ash identified during the site inspection as the “Burn Area.” The SI report (HLA 1989) concluded that arsenic, lead, mercury, and xylene in soil may be the result of historical waste management practices.

*Expanded Site Inspection (ESI) (ANL 1992):* A supplemental or ESI was conducted by the Navy to further investigate the Bldg. 6 Disposal Area. Investigators concluded that elevated concentrations of lead were common in surface soil and sediment samples, although only one detection exceeded the corrective action level used for comparison. Results from subsurface samples correlated with surface and sediment samples and defined some contaminant sources, including the OIS. The great depth to the groundwater and the presence of intervening clay layers greatly reduce the risk of groundwater contamination. It was concluded the surrounding offsite civilian population was probably not in any immediate risk (as they are unlikely to come into direct contact with the soil), the offsite civilian population was considered potentially at risk due to possible transport of contaminants in the future via surface drainage. The ESI concluded that naval personnel were the most at risk, due to their access to the site and the possibility of direct contact with contaminated soil.

*Remedial Investigation (Earth Tech 2006):* The Navy completed a RI (Earth Tech 2006) based on the findings and recommendations of the two previous site inspections. The initial scope of the RI was to collect and evaluate the data needed to quantify risk associated with the Bldg. 6 Disposal Area and, if necessary, to identify appropriate remedial actions. The OIS was not included in the original scope of the RI. However, observations made during the initial RI field reconnaissance in 1996 revealed concerns about the site, and the OIS was added to the RI scope. During the RI, surface and subsurface soil samples were collected at the OIS and analyzed for organic compounds and metals; surface water and groundwater were not encountered at the site and therefore were not sampled. The RI identified two polynuclear aromatic hydrocarbons (PAHs) (benzo[a]pyrene and benzo[b]fluoranthene) and four metals (antimony, arsenic, copper, and lead) as chemicals of potential concern (COPCs) for soil. Metals (primarily arsenic and lead) present in subsurface soil were found to pose unacceptable risks to human health for residential and industrial land use settings. Lead in one surface soil sample exceeded the estimated background range and industrial preliminary remediation goal (PRG), but risks to human health from exposure to surface soil were estimated to be in the acceptable risk range. The RI identified copper, lead, and zinc as potential contaminants of concern for posing ecological risks, but a subsequent Tier 2, Step 3a baseline

ecological risk assessment indicated a low probability of adverse effects from exposure to these metals or from dioxins detected during supplemental dioxin sampling conducted at the site.

*FS (Earth Tech 2007):* A FS evaluated response action alternatives to address contamination in subsurface soil at the OIS and recommended a site-specific response action. Response action alternatives retained for detailed analysis included LUCs, hot spot removal and disposal in conjunction with LUCs, and excavation and disposal of all contaminated soil. The FS recommended the LUCs alternative.

## **2.4 INITIAL RESPONSE**

No pre-record of decision (ROD) cleanup activities were conducted at the site.

## **2.5 BASIS FOR TAKING REMEDIAL ACTION**

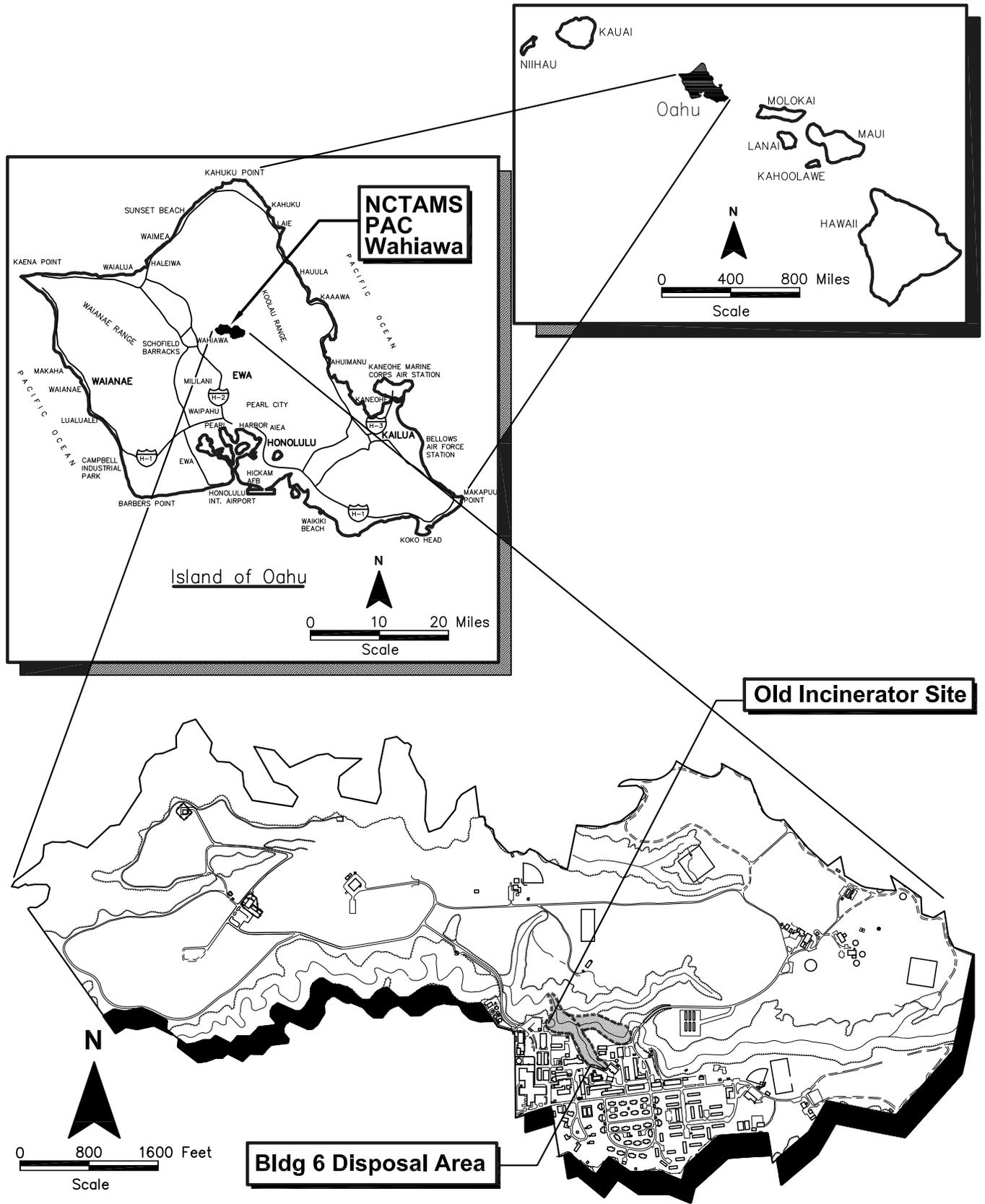
The ROD (DON 2009) determined that a response action was necessary to protect human health and the environment at the OIS from exposure to contaminants in soil at concentrations that pose an unacceptable risk or hazard.

The RI conducted at the OIS indicated sufficient potential for contamination from the OIS to pose an unacceptable risk to human health. Two PAHs (benzo[a]pyrene and benzo[b]fluoranthene) and four metals (antimony, arsenic, copper, and lead) were identified as COPCs for subsurface soil because detected concentrations were greater than United States (U.S.) Environmental Protection Agency (EPA) Region 9 (2004) residential PRGs and estimated background concentration ranges (Earth Tech 2006). Lead also exceeded the EPA Region 9 (2004) industrial PRG. RI results for surface soil, however, indicated there was no unacceptable risk of adverse effect to bird or mammal populations.

LUCs are necessary to prevent unacceptable human health cancer risks from exposure to metals (primarily arsenic present at concentrations above the estimated background range of 22 milligrams per kilogram) and two PAHs (benzo[a]pyrene and benzo[b]fluoranthene), and non-cancer hazards from exposure to antimony, arsenic, and copper, identified in the RI report (Earth Tech 2006). Human health risks/hazards from surface soil exposure at the OIS were found to be below the target points of departure for all exposure scenarios considered when background is eliminated. Although the trespasser scenario was not specifically evaluated, the residential scenario was and is considered protective of the trespasser as the residential exposure scenario is more sensitive. The incremental lifetime cancer risk for the resident under the RME scenario is  $4 \times 10^{-7}$ . The non-cancer hazard for the resident did not exceed the target HI of 1. Therefore, there is no health risk/hazard for the trespasser from exposure to surface soil at the OIS site. LUCs are required as the final remedy for the OIS because contaminants remain in subsurface soil, making the site unsuitable for unrestricted land use. The final decision was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by Superfund Amendments and Reauthorization Act (1986) (42 U.S. Code Section 9601 et seq.), the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300, and the Office of the President U.S. Executive Order 12580. Information supporting the decisions leading to the selected remedy is contained in the Administrative Record file for the site. LUCs will be used as the final remedy to ensure that the conditions at the OIS remain protective of human health and the environment.



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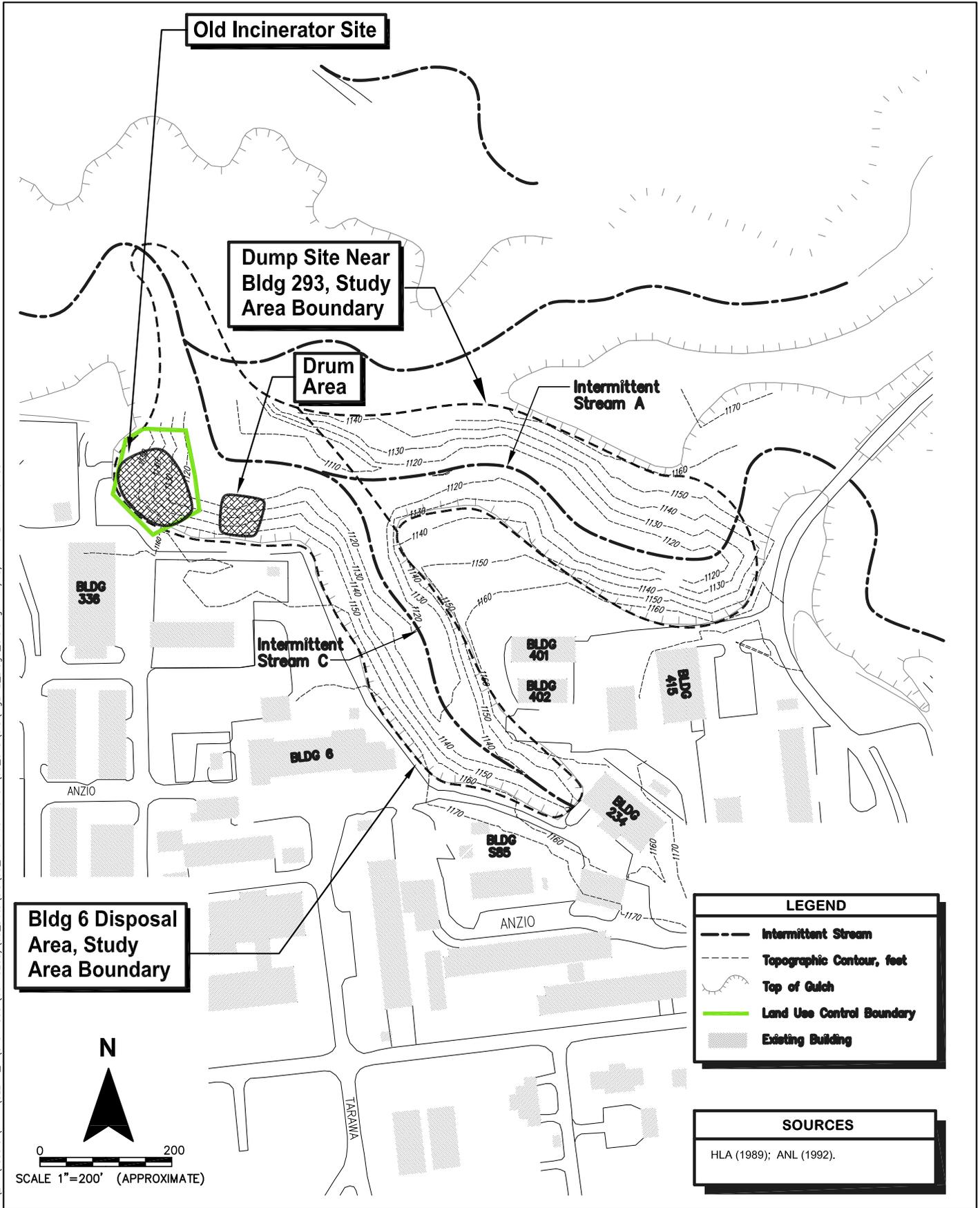


Source: Earth Tech (1996a).

**Figure 2-1**  
**Facility Location Map, Old Incinerator Site**  
**First Five-Year CERCLA Review of Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPHH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**



P:\ENV\Federal\NAVY\CLEAN\_JII\CTO\_HC38 (60145293)\50\_Data\GIS\05\_Five Year\_Review\03\_CAD\GIS\Fig2-2\_Bldg6\_OIS.dwg 11/18/14 5:21 PM namocd



**Figure 2-2**  
**Old Incinerator Site Location Map**  
**First Five-Year CERCLA Review of Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPHH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**



### 3. Remedial Actions

A ROD was signed in 2010 to address contamination in soil at the OIS and specifies LUCs as the final remedy for the site (DON 2009).

#### 3.1 REMEDIAL ACTION OBJECTIVES

Response action objectives for the OIS are as follows:

- Protect human health and the environment.
- Prohibit unauthorized access to the OIS.
- Ensure no unauthorized excavation, uncontrolled soil removal, or construction occurs at the OIS.
- Provide adequate notice of the contaminated media in the OIS to site users, workers, and any future landowners.
- Protect worker safety by ensuring that any authorized entry (i.e., annual inspection) is performed by personnel that are properly trained for hazardous material operations.
- Ensure that there is no unauthorized land development or land use at the OIS, particularly schools, child care facilities, and playgrounds.

#### 3.2 REMEDY DESCRIPTION

The response action objective of protecting human health and the environment is achieved through implementation of the selected remedy of LUCs. This remedy ensures that the contaminated soils are not disturbed and that potential routes for exposure are not created due to future land uses or land use changes.

LUCs limit or eliminate potential routes of exposure to the COPCs in the subsurface soil. Because the site risk is confined to the subsurface soil, the remedy remains protective for exposure to surface soil at the OIS site. LUCs, which include the implementation and maintenance of institutional controls, are designed to restrict land use activities and ensure long-term viability of the final remedy. The LUC boundary for the OIS is shown on Figure 3-1.

Elements of the selected remedy include the following:

- LUCs were implemented to control access to and restrict use of the site to ensure that impacted soils are not disturbed, and to reduce long-term site risks to human and ecological receptors by limiting the potential of exposure to COPCs in the site soils. Human and ecological receptors are protected from direct contact with contaminants in subsurface soil by the existing soil cover. Land use restrictions prohibit any activity or land modifications (e.g., vegetation clearing, regrading, excavation, landscaping, and construction of structures) that may potentially expose contaminated soil at the OIS. The land use restrictions are recorded in the facility planning records/land use database (Navy Installation Restoration Information Solution).
- Annual monitoring and maintenance (as required) are conducted to maintain slope stability and cover at the OIS. The annual site inspection consists of a visual survey of the OIS, side slopes, and vegetated cover and slope stability evaluation. Annual monitoring results are reported to EPA Region 9 and State of Hawaii Department of Health (DOH). If maintenance around the LUC warning signs is required, the Navy is responsible for taking timely action

to address the maintenance issues to minimize both the chance of unauthorized access and disturbance of the OIS cover, or to potential exposure of trespassers to contaminated media. Procedures for implementing the monitoring and maintenance activities are detailed in a long-term monitoring (LTM) plan prepared for the site (AECOM 2011a).

- Because contaminants are present at the site at concentrations above levels that allow for unlimited land use and unrestricted exposure, the Navy also conducts five-year reviews to ensure that LUCs remain effective in preventing exposure to contaminated soil.

### **3.3 REMEDY IMPLEMENTATION**

Access restriction consists of warning signage to prohibit unauthorized access to the OIS. Land use restrictions implemented by the Navy prohibit any land modifications (e.g., vegetation clearing, regrading, excavation, landscaping, and construction of structures) that could potentially expose contaminated soil at the site. In addition to these maintenance items, annual inspections and reports are required to certify compliance with the LUCs, and five-year reviews are required to evaluate the effectiveness of the remedy. Records of the land use restrictions are maintained in the Navy's facility planning documents/land use database.

### **3.4 SYSTEMS OPERATIONS AND MAINTENANCE**

The implementation and maintenance of, and compliance with, LUCs are confirmed by annual inspections performed by the Navy. An LUC work plan for the OIS details how the specific LUCs are to be implemented and maintained and specifies the requirements for annual inspections and five-year reviews (AECOM 2011b).

Annual physical inspections of the OIS are conducted. The inspection documents the condition of the surface soils and confirms that no inappropriate land use or unauthorized site access is taking place, to prevent potential unacceptable exposure to contaminated media at the OIS. The inspection verifies that the access control signage is in place and in good condition. The inspection also includes representative photographs of the OIS surface, a review of maintenance records (if available), and brief interviews with maintenance crews (if warranted). The annual site inspection consists of a visual inspection and surface soil stability evaluation. The inspection is conducted to identify any signs indicative of possible erosional effects that could cause waste exposure. This will include an inspection to determine any visible signs of surficial or gross slope instability, such as surface cracks and ruptures, exposure of wastes, land subsidence, and disturbed areas.

If activities are found to be inconsistent with the institutional control (IC) objectives or use restrictions, if maintenance is required, or any other activity is identified that may interfere with the effectiveness of the ICs, the Navy will initiate response activities as soon as practicable, but in no case will the process be initiated later than 30 days after the Navy becomes aware of activities inconsistent with IC objectives or use restrictions. The risk evaluation for the site determined that the risk to an industrial worker (and therefore the trespasser) at the site was acceptable. The final remedy of LUCs included the element of site access control to prevent land modifications, vegetation clearing, regrading, excavation, landscaping, and construction of structures. The issue of trespassers at the site would only be a concern if there were disturbances to the subsurface soils, which has not been observed. Inspections which identify missing or faded signs are addressed by budgeting and contracting for the replacements.

The monitoring results are included in annual LTM inspection reports that, along with LUC Site Inspection Compliance Certificates, are provided to the regulatory agencies (EPA Region 9 and DOH). The certificates evaluate the status of the LUCs and how any deficiencies or uses inconsistent

with the LUCs have been addressed. The annual evaluation addresses whether the use restrictions and controls referenced above were communicated in the Base Master Plan/Base Comprehensive Plan, whether state and local agencies were notified of the use restrictions and controls affecting the OIS, and whether use of the OIS has conformed to such restrictions and controls. If any deficiencies are found during the annual inspection, the Navy prepares, along with the certificate, a separate written explanation indicating the specific deficiencies found and what efforts or measures have or will be taken to correct them, including a schedule for these measures. Any recommendations for additional or different LUCs, including termination of LUCs, are provided in the LUC Site Inspection Compliance Certificate. Information provided in the annual monitoring reports and the LUC Site Inspection Compliance Certificate is used in preparation of the CERCLA five-year reviews to evaluate the effectiveness of the remedy.



LUC Boundary Marker Coordinates

ID	Easting	Northing
SM-1	1638759.64	127536.4839
SM-2	1638706.637	127589.4964
SM-3	1638723.351	127659.9203
SM-4	1638746.47	127674.8669
SM-5	1638802.534	127672.1404
SM-6	1638813.052	127614.0652
SM-7	1638819.755	127568.9404
SM-8	1638759.647	127536.4863

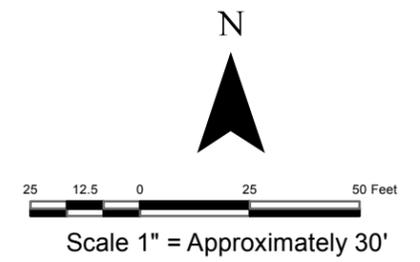
LUC Warning Sign Coordinates

ID	Easting	Northing
S-1	1638737.077	127678.541
S-2	1638821.837	127636.968
S-3	1638833.744	127582.883
S-4	1638749.387	127538.485
S-5	1638705.796	127605.89

LEGEND	
	Settlement Monument Locations
	LUC Warning Sign
	OWLF Legal Description LUC Boundary Marker
	Site Boundary
	Bldg. Building

SOURCES	
LUC Boundary Marker Coordinates: Baseline Surveying LLC, September 2007	
LUC Warning Sign Coordinates: AECOM (Site Visit), December 2009	

P:\ENV\Federal\NAVY\CLEAN\_IL\CTO\_HG38 (60145293)\50\_Data\GIS\05\_Five Year\_Review\02\_Map\Map\MXDs\OIS\Fig3-1\_LUC\_OIS.mxd 11/18/2014



**Figure 3-1**  
**Land Use Control Boundary**  
**Old Incinerator Site**  
**First Five-Year CERCLA Review of**  
**Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPHH, Lualualei Annex and**  
**Wahiawa Annex, Oahu, Hawaii**



#### **4. Progress Since the Last Five-Year Review**

This is the first five-year review for the OIS at JBPHH Wahiawa Annex, Oahu, Hawaii. Consequently, there is no new progress to report from a previous five-year review.



## 5. Five-Year Review Process

### 5.1 ADMINISTRATIVE COMPONENTS

The five-year review team members are listed in Table 5-1.

**Table 5-1: Five-Year Review Team Members**

DOH	Regulatory Project Manager:	Maria Reyes
Navy	RPM for five-year review:	Robert Kaito
	RPM for specific site:	Robert Kaito
EPA	Regulatory Project Manager:	Mark Ripperda
AECOM	Project Manager:	Robin Boyd
	Project Support:	Louann Kromer
		Andrea VonBurg Hall Dustin Goto

RPM remedial project manager

The team members established a review schedule of November 2014, during which they completed the following activities: reviewed relevant documents, performed data review, and conducted interviews.

### 5.2 COMMUNITY INVOLVEMENT

The Central Oahu Restoration Advisory Board (RAB) holds two to three meetings per year to update the public on the Navy’s Environmental Restoration Program and status of Installation Restoration Program sites. The RAB helps increase community awareness of environmental restoration issues at current and former naval facilities. Information is provided through quarterly meetings of the RAB, by maintaining the public information repository, and by publishing various announcements, fact sheets, and public notices in the local newspaper.

As part of community involvement, the Navy announced the five-year review of the OIS via the meeting minutes for the September 17, 2014 RAB meeting held at the Aiea Public Library.

### 5.3 DOCUMENT REVIEW

This five-year review consists of a review of relevant documents including ROD, RI, FS, risk assessments, work plans, completion reports, LTM and operation reports, LUC inspection reports, and various compliance reports. The list of documents reviewed is provided in Section 9. Applicable cleanup standards, as listed in the ROD, were reviewed. Applicable or relevant and appropriate requirements and to be considered criteria that may have changed since the ROD was completed were also evaluated; however, no changes were noted.

### 5.4 DATA REVIEW

Compliance monitoring at the OIS includes cover soil and side slope inspections, surveying, and site maintenance. The LTM program was implemented to monitor site conditions and to ensure the remedy remains protective of human health and the environment.

#### 5.4.1 Monitoring Reports

The cover soil and side slope inspections began at the OIS in 2011. As of the publication of this first five-year review, three annual monitoring reports (e.g., 1st, 2nd, and 3rd) were completed following the 2009 ROD, and are reviewed below.

The inspections comprise a visual survey of the vegetative cover coil and the side slopes. Deficiencies requiring correction are recorded on inspection forms for subsequent action.

*1st Monitoring Event (AECOM and Environet 2011):* The first annual OIS inspection was conducted on May 24, 2011. The inspection indicated that the OIS cover had mature trees and overgrown dense vegetation throughout the site. The cover soil and side slope integrity were described to be in excellent condition. No zones of depression, cracks, or evidence of standing water were observed inside the OIS. Discarded waste items such as tires, an old car battery, pipes, and cables that appeared to be very old were identified at the OIS. Based on the maturity of the vegetation engulfing the debris, the items were suggested to have been dumped there after the closing of the OIS and not exposed due to erosion. Ash was visible on the surface in a number of small areas (each less than 3 square feet in area). There was no observed stressed or dying vegetation, cracks, erosion gullies, crooked trees, or escarpments on the side slopes.

Settlement monitoring monument installation and baseline surveying were performed in June 2011; therefore, monitoring of the settlement and slope movement would be performed in the subsequent annual inspection. The LUC signs were in good condition with current accurate information.

There was no evidence of trespassing, excavation, soil removal, construction of structures, or evidence of activities that could damage or disturb the cover at the OIS.

*2nd Monitoring Event (ERRG 2013):* The second annual OIS inspection was conducted on December 27, 2012. The inspection indicated that the OIS cover had mature trees and overgrown dense vegetation throughout the site. Vegetation on steep slopes within the site was thinner in flat areas of the site, identified to be typical for naturally occurring slopes. There was no observed stressed or dying vegetation or areas of standing water were observed. No zones of depression, cracks, or bare soil areas were observed. No stressed or dying vegetation was observed. Discarded waste items such as tires, pipes, and cables were observed as well as minor mounts of empty beverage containers, suggested to be from recent dumping activities by unauthorized personnel. Ash was visible on the surface in the central portion of the site. No erosion gullies, crooked trees or posts, or escarpments were observed on the side slopes. Evidence of feral pig rooting 50 feet north of the site was documented in the photolog (Attachment B), but none were documented as occurring within the LUC boundary.

The settlement monuments were found to be in good condition with no vandalism, cracks, or other signs of damage. Comparison of the 2011 and 2012 survey data showed elevation differences on the order of 4 feet. Based on the absence of any visual evidence of subsidence or erosion at the OIS, the 2011 data were evaluated further to identify the survey location used. It was identified that the 2011 survey measurement location deviated from the standard industry practice of surveying the brass disk at the base of the monument, therefore, an evaluation of settlement from 2011 to 2012 could not be performed. However, based on field observations, there appeared to be no or minimal settlement at each monument.

No evidence of trespassing, other than the debris observed on the soil cover, or other unauthorized use was encountered during the inspection. However, the gate to OIS was unsecured at the time of

the inspection. A keyed padlock was installed during the inspection to prevent unauthorized access to the OIS.

Six pole-mounted signs were legible and generally free of vegetation. A fence mounted sign (S-7) was detached and propped against the fence at ground level. This sign was reattached to the fence during the inspection. The perimeter fence along the southern boundary of the OIS was standing and in good repair.

*3rd Monitoring Event (PRC-ERRG 2014):* The third annual OIS inspection was conducted on November 22, 2013. The inspection indicated that the OIS cover had mature trees and overgrown dense vegetation throughout the site. Vegetation on steep slopes within the site was thinner in flat areas of the site, identified to be typical for naturally occurring slopes. No stressed or dying vegetation, or standing water were observed. No zones of depression, cracks, or bare soil areas were observed. Discarded waste items such as tires, pipes, cables, and minor mounts of empty beverage containers were observed, suggested to be from recent dumping activities by unauthorized personnel. Ash was visible on the surface in the central portion of the site. No erosion gullies, crooked trees or posts, or escarpments were observed on the side slopes.

The settlement monuments were found to be in good condition with no vandalism, cracks, or other signs of damage. There were no elevation changes between 2012 and 2013.

No evidence of trespassing, other than the debris observed on the soil cover, was observed.

All LUC signs were posted and legible. The perimeter fence along the southern boundary of the OIS was standing and in good repair. However, a fallen tree damaged the perimeter fence near Sign S-9, such that the fence was in danger of collapsing.

*4th Monitoring Event:* The fourth annual OIS inspection was conducted on October 30, 2014. Field notes from general observations were provided for this Five-Year Review report and are summarized here. Exposed ash was present at the site. All pole-mounted and fence mounted signs were intact, however pole-mounted Sign S-5 was blocked by a fallen tree. No LUC violations (erosion, construction, recent use) was observed.

The 2014 LTM report should be reviewed in the future for more details and summarized in the second Five-Year Review report.

Each of the three annual inspection reports, and the field notes from the fourth annual inspection documented the presence of small areas of exposed ash and the first three reports recommended applying topsoil to the exposed areas. However, conditions as the site have not changed since the RI and publication of the ROD. Dioxin results from surface soil samples, collected using incremental sampling methodology, did not exceed the 2004 industrial PRG (EPA 2004). When evaluating the dioxin results against current regional screening levels (EPA 2014), none exceeded the residential screening level. Over the three years no trend has been observed that the soil cover is eroding. Because the site conditions have not changed, exposed ash is limited to small areas at the site, and levels of dioxins in the surface were below screening levels, the Navy does not concur with the recommendation for the application of topsoil to the surface ash areas at the site.

Because the majority of the OIS is fenced, the surface debris noted in the annual monitoring reports and attributed to recent dumping activities will be evaluated in subsequent annual inspections for

evidence of changes or new debris to determine if the surface debris is a result of trespassers. If no changes are noted, it can be inferred that trespassing at the OIS is effectively being prevented.

## 5.5 FIVE-YEAR SITE INSPECTION

This five-year review is based on all inspections/evaluations/reports conducted at the site prior to November 2014. The fourth annual LUC inspection for the OIS was completed in October 2014 and was used in the evaluation for the five-year review inspection. Interviews with relevant personnel have also been conducted as part of the five-year review process. The 2014 annual Site Inspection Compliance Certificate and Documentation forms are included in Attachment A and were summarized in Section 5.4.1. There were no new LUC concerns identified on the Site Inspection Compliance Certificate and Documentation forms.

Photographs from the 2014 annual inspection were not available at the time of the final Five-Year Report. Photographs from the 2013 annual inspection are presented in Attachment B.

## 5.6 INTERVIEWS

An interview was conducted with the following personnel:

Name	Affiliation	Date
Maria Reyes	DOH, Regulatory Project Manager	November 13, 2014
Mark Ripperda	EPA, Regulatory Project Manager	November 7, 2014
Robert Kaito	NAVFAC Hawaii, RPM	November 12, 2014

The remedial project manager and Regulatory Project Managers indicated that the remedy for the OIS is functioning well.

Interview forms are presented in Attachment C.

## 6. Technical Assessment

Answers to the following three key technical questions are presented in tabular format below:

- A: Is the remedy functioning as intended by the ROD?
- B: Are the assumptions used at the time of remedy selection still valid?
- C: Does any other information call into question the protectiveness of the remedy?

OLD INCINERATOR SITE	
QUESTION A: Is the remedy functioning as intended by the ROD?	
Element	Assessment
Remedial Action Performance	The final remedy implemented at the OIS is LUCs and includes LTM. LUCs are the non-technical and non-engineering actions that will help mitigate potential risks to human health and the environment by restricting access to contaminated media. The current land use at the OIS will be maintained to reduce the possibility of exposure to constituents under other land use scenarios. Continued maintenance of the surface cover soil prevents direct contact of underlying contaminated soil and the migration or relocation of contaminated soil to areas where human or ecological exposure could occur.
System Operations/O&M	No active systems are in place.
Cost of Systems Operations/O&M	No cost variances suggesting that the remedy is not functioning properly were identified.
Opportunities for Optimization	No opportunities for optimization were identified for the OIS.
Early Indicators of Potential Remedy Failure	The remedy is functioning as intended. No indications of remedy failure were evident during the review. However, feral pig rooting was observed to occur 50 feet north of the site.
Implementation of Institutional Controls and Other Measures	Signs indicating that digging is prohibited have been placed along the north and west site boundaries. JBPHH Wahiawa Annex is a secure facility, and entry is restricted and vigorously enforced. Administrative processes and procedures require approval for all projects involving construction or digging and subsurface disturbance. These procedures involve coordination and approval by NAVFAC Hawaii environmental personnel for projects located in or near environmental restoration sites, including LUC sites. The Navy will ensure that these or similar processes and procedures remain in place and are followed for all proposed construction, digging, and subsurface soil disturbing activities.
O&M	operations and maintenance

OLD INCINERATOR SITE	
QUESTION B: Are the assumptions used at the time of remedy selection still valid?	
Element	Assessment
Changes in Standards and TBC Requirements	Regulatory requirements were considered in the selection of the final remedy. Changes to the ARARs developed for the OIS are evaluated in Section 5.3. Chemical-specific ARARs that impact cleanup levels are discussed under Changes in Toxicity and Other Contaminant Characteristics below.
Changes in Exposure Pathways and Land Use	A vegetative soil cover has been in place for over 40 years and is inspected on a regular basis. At the time of the ROD, the OIS was unused, and within a steep wooded gulch. No changes in land use were observed during the annual site inspections. The site is zoned for restricted land use (industrial/commercial) and is expected to remain the same in the future. No significant change in exposure pathways has occurred at the site. Receptor populations are also the same.
Changes in Toxicity and Other Contaminant Characteristics	<p>The OIS was initially investigated as part of the Bldg. 6 Disposal Area during an IAS (NEESA 1986). The OIS was investigated as a separate site during the RI (Earth Tech 2006). A risk evaluation was conducted and presented in the RI report (Earth Tech 2006). The Navy has selected LUCs and LTM as the final remedy.</p> <p>For this five-year review, a streamlined risk evaluation using EPA RSLs (EPA 2014) was performed. MDC were compared against current EPA RSLs (EPA RSL, May 2014, hazard index [HI] of 0.1). If a MDC exceeded both its current RSL and Navy maximum background value, it was deemed a COC and further evaluated for potential cancer risk or noncancer hazard. Table 6-2 compares the MDCs of COCs and COPCs with original PRGs (EPA 2004) and with current RSLs (EPA 2014) and presents the current risk evaluations.</p> <p>Of the 47 analytes detected in soil, 30 had a reduction in screening criteria (EPA RSL, May 2014, hazard index [HI] of 0.1). Six additional analytes were identified as COCs during this evaluation: benzo(a)anthracene, barium, cadmium, nickel, silver, and zinc, for a total of 13 COCs included in this risk evaluation. Screening criteria increased for one original COC, dioxin. Dioxin results no longer exceed screening criteria and do not require further evaluation. The following 12 COCs were then evaluated for current risk at the site: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, antimony, arsenic, barium, cadmium, copper, lead, nickel, silver, and zinc.</p> <p>Eight of the 12 COCs do not currently pose unacceptable residential risk at the site: benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, barium, cadmium, nickel, silver, and zinc. Three of the remaining COCs currently pose unacceptable residential risk but do not pose unacceptable industrial risk: antimony, arsenic, copper. Only one COC (lead) poses current unacceptable residential and industrial risk at the site.</p> <p>Because the LUCs at the site restrict any intrusive activities at the site, the current human receptor (trespasser) exposure pathway is limited to surface soil. The four analytes that pose unacceptable residential risk at the site (antimony, arsenic, copper, and lead) were further evaluated to determine if the surface soil concentrations present unacceptable risk at the site. Results from (IS) methodology surface soil samples collected after the RI for antimony, arsenic, copper, and lead were reviewed (Table 6-2). The maximum IS surface soil concentrations for all four metals were compared against the residential RSLs and Navy background concentrations at Oahu Facilities. Antimony was slightly above the Navy background value, but the current noncancer hazard is below the acceptable noncancer hazard of 1. Arsenic exceeded the residential RSL but did not exceed the Navy background concentration. Copper exceeded the residential RSL, however the current noncancer hazard is below the acceptable noncancer HI of 1. Lead did not exceed the current residential RSL.</p> <p>An ecological risk assessment was also conducted for the RI. After the review of the ecological risk evaluation methodology used for the RI, it was determined there have not been any significant changes to the ecological risk methodology that would bring into question the ecological risk assessment conclusions.</p> <p>Remedial actions including implementation of LUCs are still protective of the receptor. Therefore, the changes to the screening levels do not affect the RAOs that limit use of the site. Thus, it is not necessary to update the standards used at the time of remedy selection.</p>
Changes in Risk Assessment Methodologies	No changes in risk assessment methodologies have occurred since the ROD.
Remedy Byproducts	No remedy byproducts have been identified to consider in this assessment.
New Contaminants and Contaminant Sources	No new contaminants or contaminant sources were identified.

OLD INCINERATOR SITE	
QUESTION B: Are the assumptions used at the time of remedy selection still valid?	
Element	Assessment
Expected Progress Toward Meeting RAOs	Human health risk at these sites has been addressed by the cover soil and ROD documentation that led to the LUCs that have been implemented at the OIS. No change has occurred in the physical condition of the OIS that would affect the protectiveness of the remedy. Exposure assumptions, cleanup levels, and RAOs remain valid for the selected remedy. The RAOs for the OIS are still appropriate.
ARAR	applicable or relevant and appropriate requirement
COC	chemical of concern
IS	incremental sampling
MDC	maximum detected concentration
TBC	to be considered
RAO	remedial action objective



**Table 6-1: Chemical ARAR Comparison, Residential**

Detected Analyte	MDC within LUC Area (mg/kg)	Original Residential RI PRG (mg/kg)	Does MDC Exceed Original Residential PRG?	Current (May 2014) EPA Residential RSL, HI=0.1 (mg/kg)	Current Residential RSL Basis	Does MDC Exceed Current Residential RSL?	Background Concentration (mg/kg) (Metals only)	Does MDC Exceed Background?	Cancer Risk <sup>a</sup> Based on Current EPA RSL and MDC	Noncancer HI <sup>b</sup> Based on Current EPA RSL (HI=0.1) and MDC	Conclusions
<b>COCs - 7 identified in ROD</b>											
Benzo(a)pyrene	0.34	0.062	Yes	0.015	Cancer	Yes	NA	NA	2.3E-05	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Benzo(b)fluoranthene	0.72	0.62	Yes	0.15	Cancer	Yes	NA	NA	4.8E-06	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Antimony	67	31	Yes	3.1	Noncancer	Yes	7	Yes	NA	2.2E+00	MDC exceeds RSL and background; the current noncancer hazard is above acceptable noncancer HI of 1; further evaluation performed, see Table 6-2.
Arsenic <sup>g</sup>	133	0.39	Yes	0.67	Cancer	Yes	22	Yes	2.0E-04	NA	MDC still exceeds RSL and background; current residential risk is above acceptable cancer risk range of 1E-04 to 1E-06; further evaluation performed, see Table 6-2.
Copper	4600	3100	Yes	310	Noncancer	Yes	235	Yes	NA	1.5E+00	MDC exceeds RSL and background; current noncancer hazard is above acceptable noncancer HI of 1; further evaluation performed, see Table 6-2.
Lead	6910	400	Yes	400	NA	Yes	117	Yes	NA	NA	MDC exceeds RSL and background; further evaluation performed, see Table 6-2.
Dioxin TEQ <sup>e</sup> (pg/g)	68.4	NA	No	4900	Cancer	No	NA	NA	1.4E-08	NA	No further evaluation.
<b>COC - 6 additional COCs identified during 5-yr review</b>											
Barium	1550	5400	No	1500	Noncancer	Yes	293	Yes	NA	1.0E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Cadmium	10.9	37	No	7	Noncancer	Yes	2	Yes	NA	1.6E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Nickel	1080	1600	No	150	Noncancer	Yes	579	Yes	NA	7.2E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Silver	214	390	No	39	Noncancer	Yes	3.1	Yes	NA	5.5E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Zinc	9780	23000	No	2300	Noncancer	Yes	214	Yes	NA	4.3E-01	MDC exceeds PRG and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Benzo(a)anthracene	0.42	0.62	No	0.15	Cancer	Yes	NA	NA	2.8E-06	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
<b>Detected COPCs - 47 from RI</b>											
Aluminum	66800	76000	No	7700	Noncancer	Yes	156000	No	NA	8.7E-01	MDC exceeds RSL but is within background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Antimony	67	31	Yes	3.1	Noncancer	Yes	7	Yes	NA	2.2E+00	MDC exceeds RSL and background; current noncancer hazard is above acceptable noncancer HI of 1; further evaluation recommended.
Arsenic <sup>g</sup>	133	0.39	Yes	0.67	Cancer	Yes	22	Yes	2.0E-04	NA	MDC still exceeds RSL and background; current residential risk is above acceptable cancer risk range of 1E-04 to 1E-06; further evaluation recommended.
Barium	1550	5400	No	1500	Noncancer	Yes	293	Yes	NA	1.0E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Beryllium	0.62	150	No	16	Noncancer	No	6.9	No	NA	3.9E-03	No further evaluation.
Cadmium	10.9	37	No	7	Noncancer	Yes	2	Yes	NA	1.6E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Calcium	87200	NA	No	NA	NA	No	360000	No	NA	NA	No further evaluation.
Chromium <sup>d</sup>	434	210	Yes	12000	Noncancer	No	599	No	NA	3.6E-03	No further evaluation.
Cobalt	27.9	900	No	2.3	Noncancer	Yes	157	No	NA	1.2E+00	MDC exceeds RSL but is within background; current noncancer hazard is above acceptable noncancer HI; no further evaluation recommended because MDC is within background levels.
Copper	4600	3100	Yes	310	Noncancer	Yes	235	Yes	NA	1.5E+00	MDC exceeds RSL and background; current noncancer hazard is above acceptable noncancer HI of 1; further evaluation recommended.
Cyanide	1	11	No	2.1	Noncancer	No	NA	NA	NA	4.8E-02	No further evaluation.
Iron	127000	23000	Yes	5500	Noncancer	Yes	219000	No	NA	2.3E+00	MDC exceeds RSL but is within background; current noncancer hazard is above acceptable noncancer HI of 1; no further evaluation recommended because MDC is within background levels.
Lead	6910	400	Yes	400	NA	Yes	117	Yes	NA	NA	MDC exceeds RSL and background; further evaluation recommended.
Magnesium	5030	NA	No	NA	NA	No	NA	NA	NA	NA	No further evaluation.
Manganese	1100	1800	No	180	Noncancer	Yes	7040	No	NA	6.1E-01	MDC exceeds RSL but is within background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.

Detected Analyte	MDC within LUC Area (mg/kg)	Original Residential RI PRG (mg/kg)	Does MDC Exceed Original Residential PRG?	Current (May 2014) EPA Residential RSL, HI=0.1 (mg/kg)	Current Residential RSL Basis	Does MDC Exceed Current Residential RSL?	Background Concentration (mg/kg) (Metals only)	Does MDC Exceed Background?	Cancer Risk <sup>a</sup> Based on Current EPA RSL and MDC	Noncancer HI <sup>b</sup> Based on Current EPA RSL (HI=0.1) and MDC	Conclusions
Mercury <sup>f</sup>	1.1	23	No	2.3	Noncancer	No	1	Yes	NA	4.8E-02	No further evaluation
Nickel	1080	1600	No	150	Noncancer	Yes	579	Yes	NA	7.2E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Potassium	5630	NA	No	NA	NA	No	NA	NA	NA	NA	No further evaluation.
Selenium	7.1	390	No	39	Noncancer	No	11	No	NA	1.8E-02	No further evaluation.
Silver	214	390	No	39	Noncancer	Yes	3.1	Yes	NA	5.5E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Sodium	7050	NA	No	NA	NA	No	NA	NA	NA	NA	No further evaluation.
Thallium	3.9	5.2	No	0.078	Noncancer	Yes	4.8	No	NA	5.0E+00	MDC exceeds RSL but is within background; current noncancer hazard is above acceptable noncancer HI of 1; no further evaluation recommended because MDC is within background levels.
Vanadium	316	78	Yes	39	Noncancer	Yes	560	No	NA	8.1E-01	MDC exceeds RSL but is within background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Zinc	9780	23000	No	2300	Noncancer	Yes	214	Yes	NA	4.3E-01	MDC exceeds PRG and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Dioxin TEQ <sup>e</sup> (pg/g)	68.4	NA	No	4900	Cancer	No	NA	NA	1.4E-08	NA	No further evaluation.
TPH-DRO <sup>h</sup>	49	500	No	500	Noncancer	No	NA	NA	NA	9.8E-03	No further evaluation.
chlordane (α and γ) <sup>c</sup>	0.024	1.6	No	1.8	Cancer	No	NA	NA	1.3E-08	NA	No further evaluation.
4-4'-DDD	0.014	2.4	No	2.2	Cancer	No	NA	NA	6.4E-09	NA	No further evaluation.
4-4'-DDE	0.24	1.7	No	1.6	Cancer	No	NA	NA	1.5E-07	NA	No further evaluation.
4-4'-DDT	0.23	1.7	No	1.9	Cancer	No	NA	NA	1.2E-07	NA	No further evaluation.
Heptachlor epoxide	0.002	0.053	No	0.059	Cancer	No	NA	NA	3.4E-08	NA	No further evaluation.
Aroclor 1260	0.025	0.22	No	0.24	Cancer	No	NA	NA	1.0E-07	NA	No further evaluation.
Total PCBs	0.025	0.22	No	0.24	Cancer	No	NA	NA	1.0E-07	NA	No further evaluation.
Monocrotophos	0.066	NA	No	NA	NA	No	NA	NA	NA	NA	No further evaluation.
2,4,5-trichlorophenoxyacetic acid	0.0044	610	No	62	Noncancer	No	NA	NA	NA	7.1E-06	No further evaluation.
2,4-dichlorophenoxybutyric acid	0.12	490	No	49	Noncancer	No	NA	NA	NA	2.4E-04	No further evaluation.
Acetone	47	14000	No	6100	Noncancer	No	NA	NA	NA	7.7E-04	No further evaluation.
Xylene (total)	0.005	270	No	58	Noncancer	No	NA	NA	NA	8.6E-06	No further evaluation.
Pyrene	0.88	2300	No	170	Noncancer	No	NA	NA	NA	5.2E-04	No further evaluation.
Chrysene	0.58	62	No	15	Cancer	No	NA	NA	3.9E-08	NA	No further evaluation.
Bis(2-ethylhexyl)phthalate	0.57	35	No	38	Cancer	No	NA	NA	1.5E-08	NA	No further evaluation.
Benzo(b)fluoranthene	0.72	0.62	Yes	0.15	Cancer	Yes	NA	NA	4.8E-06	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Benzo(a)anthracene	0.42	0.62	No	0.15	Cancer	Yes	NA	NA	2.8E-06	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Benzo(a)pyrene	0.34	0.062	Yes	0.015	Cancer	Yes	NA	NA	2.3E-05	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Benzo(k)fluoranthene	0.25	6.2	No	1.5	Cancer	No	NA	NA	1.7E-07	NA	No further evaluation.
Fluoranthene	0.75	2300	No	230	Noncancer	No	NA	NA	NA	3.3E-04	No further evaluation.
Phenanthrene <sup>h,i</sup>	0.1	NA	No	445	Noncancer	No	NA	NA	NA	2.2E-05	No further evaluation.

Sources: MDCs (DON 2009 [OIS ROD]), Original PRGs (EPA 2004, industrial and residential), Current PRGs (EPA May 2014, 0.1, residential).

HI hazard index

NA not available

<sup>a</sup> Residential cancer risk is derived using the following equation: (MDC/Current PRG) x (target risk level [1E-06]).

<sup>b</sup> Residential non-cancer HI is derived using the following equation: (MDC/Current PRG) x (target hazard quotient [0.1]).

<sup>c</sup> Chlordane (α and γ) c used chlordane RSL.

<sup>d</sup> Originally, chromium was evaluated using a total chromium screening value. Value listed is for chromium III soluble salts.

<sup>e</sup> Dioxin is TCDD, 2,3,7,8- RSL.

<sup>f</sup> Mercury used mercuric chloride RSL.

<sup>g</sup> Arsenic max is from additional sampling event, but even without it, the table had same results (max was 42.3).

<sup>h</sup> Value listed is a DOH EAL for direct exposure, unrestricted land use scenario (DOH 2011; Table I-1).

<sup>i</sup> Value listed under the Current (May 2014) EPA Residential RSL, HI=0.1.

**Table 6-2: Surface Soil Metals ARAR Comparison, Residential**

Detected Analyte	Maximum Detected Concentration (MDC) of additional surface sampling (IS) (mg/kg)	Original Residential RI PRG (mg/kg)	Does MDC Exceed Original Residential PRG?	Current (May 2014) EPA Residential RSL, HI=0.1 (mg/kg)	Current Residential RSL Basis	Does MDC Exceed Current Residential RSL?	Background Concentration (mg/kg) (Metals only)	Does MDC Exceed Background?	Cancer Risk <sup>a</sup> Based on Current EPA RSL and MDC	Noncancer HI <sup>b</sup> Based on Current EPA RSL (HI=0.1) and MDC	Conclusions
<b>COCs - 4 of the COCs included in the ROD that were included in the additional incremental surface soil sampling event</b>											
Antimony	7.4	31	No	3.1	Noncancer	Yes	7	Yes	NA	2.4E-01	MDC exceeds RSL and only slightly exceeds background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Arsenic <sup>c</sup>	10.6	0.39	Yes	0.67	Cancer	Yes	22	No	1.6E-05	NA	MDC exceeds RSL but is within background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Copper	500	3100	No	310	Noncancer	Yes	235	Yes	NA	1.6E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Lead	177	400	No	400	NA	No	117	Yes	NA	NA	MDC is below RSL; no further evaluation recommended.

Sources: MDCs (DON 2009 [OIS ROD]), Original PRGs (EPA 2004, industrial and residential), Current PRGs (EPA May 2014, 0.1, residential).

<sup>a</sup> Residential cancer risk is derived using the following equation: (MDC/Current PRG) x (target risk level [1E-06]).

<sup>b</sup> Residential non-cancer HI is derived using the following equation: (MDC/Current PRG) x (target hazard quotient [0.1]).

<sup>c</sup> Arsenic max is from additional sampling event, but even without it, the table had same results (max was 42.3)



OLD INCINERATOR SITE	
QUESTION C: Does any other information call into question the protectiveness of the remedy?	
Element	Assessment
Overall	No other information has been identified that would call into question the protectiveness of the remedy.



## 7. Issues, Recommendations, and Follow-up Actions

Issues identified during the site inspection and interviews are listed in Table 7-1.

**Table 7-1: Issues and Recommendations**

Issue	Recommendations/Follow-up Actions	Party Responsible	Oversight Agency	Affects Protectiveness? (Yes/No)		Anticipated Date of Implementation
				Current	Future	
Trespassers may access the site as evidenced by discarded waste items found at the site.	Contact number for the Navy Environmental Office should be verified annually and updated as appropriate when LUC signs are replaced or installed.	Navy	EPA/DOH	No	No	As needed
Damaged perimeter fence near Sign S-9.	Replace damaged fence near Sign S-9.	Navy	EPA/DOH	Yes	Yes	No later than the subsequent LTM event
If feral pig rooting were to occur within the OIS LUC boundary, subsurface soil may become exposed.	Update the LTM Inspection list to include surface soil disturbances resulting from feral pig activities.	Navy	EPA/DOH	No	Yes	No later than the subsequent LTM event



## **8. Protectiveness Statement**

The remedy at the OIS is currently protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. The soil cover should be maintained to prevent future exposure.

No changes in land use are expected in the foreseeable future.



## 9. References

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**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

Five Transformer Sites

**Old Incinerator Site**

**Attachment A: Five-Year Review Site Inspection Checklist**

(No Five-Year Review Site Inspection was performed. The 2014 Annual Site Inspection Checklist is included in this attachment.)

Old Wahiawa Landfill



Site Inspection Compliance Certificate and Documentation  
Old Incinerator Site  
Joint Base Pearl Harbor-Hickam, Wahiawa Annex,  
Oahu, Hawaii

**Inspector Documentation**

Inspector:	<u>Jon Mollison</u>	Title:	<u>Project Geologist</u>
Firm:	<u>ERRG Inc.</u>	Address:	<u>677 Ala Moana Blvd.</u>
			<u>Suite 308</u>
			<u>Honolulu, HI 96813</u>
Date:	<u>10/30/14</u>	Time:	<u>12:30</u>

Weather conditions at the time of inspection:  
Overcast, scattered light rain, high 70°Fs

Locations inspected:  
Walked site perimeter, inspected signage on site fence, settlement monuments, and exposed ash areas.

Maintenance Record Review Results:

Maintenance Crew Interviews:

Name:

Activities performed:

Inspection covers 01 January: 2014 to 31 December: 2014. Form shall be submitted by 01 April of the year following the reporting period.

Site Inspection Compliance Certificate and Documentation  
Old Incinerator Site  
Joint Base Pearl Harbor-Hickam, Wahiawa Annex,  
Oahu, Hawaii

**Access to the Site**

Deed covenants and other agreements between the United States Navy and its transferee authorize annual Navy site inspections. As an inspector on behalf of the Navy or subsequent property owner (if applicable), you should be allowed free access to this site.

*Were there any barriers present that prevented inspection of the entire site?*

If not, please check:  I had free access to the site.

If so, please explain.

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Please attach results of most recent groundwater monitoring.

Please attach additional notes if necessary.

Site Inspection Compliance Certificate and Documentation  
Old Incinerator Site  
Joint Base Pearl Harbor-Hickam, Wahiawa Annex,  
Oahu, Hawaii

**Condition of the Site**

The purpose of this inspection is to ensure that Land Use Controls (LUCs) are properly maintained at this site, known as the Old Incinerator Site, Joint Base Pearl Harbor-Hickam, Wahiawa Annex, Oahu, Hawaii. LUCs are necessary to protect the surface soil, and because contamination within the OIS is present within the subsurface soil, the area becomes unsuitable for unrestricted use. LUCs for this site are described in the *Land Use Control Work Plan, Old Incinerator Site, Joint Base Pearl Harbor-Hickam, Wahiawa Annex, Oahu, Hawaii* (by AECOM Technical Services, Inc., Honolulu, HI, for the Department of the Navy, Naval Facilities Engineering Command, Hawaii, Pearl Harbor, HI, September 2011). All persons conducting inspections should be familiar with this document and any subsequent revisions.

The following restrictions are placed on land use:

1. All future landowners and site users shall be notified that contaminated media are present within the OIS (not suitable for any reuse) and that the contained media and surface soil shall not be disturbed and/or excavated.
2. The integrity and effectiveness of signage intended to restrict site access and the OIS surface soil shall be inspected annually and maintained.
3. Only monitoring and maintenance crews that are properly trained for hazardous material operations shall be granted access to the OIS to conduct the long-term monitoring and maintenance activities, implementing the requirements of (40 CFR §1910.120).
4. Annual LUC Compliance Certificates and Five-Year Review Reports shall include confirmation of the integrity of the OIS signage and surface soil, and, if maintenance is required, a discussion of any actions required to reestablish and maintain the structures, as shown in Attachments 1 and 2 of the LUC WP.
5. The development or use of any portion of the OIS as residential housing, day care, school, playground, retail, commercial or industrial facilities shall be prohibited.
6. Any soil-disturbing land modifications (e.g., excavation clearing, regrading) within any portion of the OIS that would compromise the integrity of the surface soils, monitoring systems, or control structures shall be prohibited without the prior approval of regulatory agencies.
7. If any soil, debris, or other waste is removed from within the OIS, it shall be properly characterized, manifested, and transported by appropriately licensed transporters, and disposed of at an appropriate treatment, storage, and disposal (TSD) facility.
8. The Navy, its contractors, and regulatory agencies shall be allowed free and unhindered access to the OIS for purposes of verifying and maintaining the integrity of the LUCs.

Site Inspection Compliance Certificate and Documentation  
Old Incinerator Site  
Joint Base Pearl Harbor-Hickam, Wahiawa Annex,  
Oahu, Hawaii

*Did you observe any indication of natural or manmade disturbance on or within any of the restricted areas?*

If not, please check:  I did not observe any condition indicating violations of LUCs.

If so, please explain.

Fence intact, but fallen tree is threatening to break fence.

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*Do you suggest any additional or different LUCs to improve or correct any deficiencies?*

If not, please check:  I do not recommend additional or different LUCs.

If so, please explain.

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*Do you suggest termination of LUCs?*

If not, please check:  I do not recommend termination of LUCs.

If so, please explain.

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Site Inspection Compliance Certificate and Documentation  
 Old Incinerator Site  
 Joint Base Pearl Harbor-Hickam, Wahiawa Annex,  
 Oahu, Hawaii

**Certification Checklist**

Item	In Compliance	Non-Compliance	See Comment
Signage maintained.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parcel not being used for residential housing, day care, school playground, retail, commercial or industrial facilities.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No excavation and removal of soil, debris, or IDW from the site.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No construction of any structures at the site.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No signs of tampering or activity that would disturb or damage the OIS surface soil.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No settlement, erosion or other damage to surface soil.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please attach additional notes if necessary.

Please attach a copy of the site map with the approximate route walked and locations where photographs were taken clearly marked (including the direction of the photographs). Attach at least four color photographs of the site representing site conditions at the time of the inspection. In addition, clearly mark the following on the map:

- Any locations you could not inspect
- Locations of any observed disturbance(s) to the OIS surface soils
- Locations of any maintenance item, including missing or damaged signage
- Any indication of habitation, or other land use not consistent with the LUCs

Site Inspection Compliance Certificate and Documentation  
Old Incinerator Site  
Joint Base Pearl Harbor-Hickam, Wahiawa Annex,  
Oahu, Hawaii

**Certification:** *I hereby certify that I am an authorized representative of the above-named property owner and that the above-described LUCs have been compiled for the period noted. I am familiar with the Site known as "OIS," located at the Joint Base Pearl Harbor-Hickam, Wahiawa Annex, Oahu, Hawaii. I have personally conducted the above inspection and certify that the information accurately reflects my observations made during the inspection.*

Signed:   
Printed Name: Jon M Morrison  
Title: PROJECT GEOLOGIST  
Date: 10/30/14

Attachments (Check all included):

- Site Map
- Photographs
- Additional Notes

**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

Five Transformer Sites

**Old Incinerator Site**

**Attachment B: Site Photographs**

(No Five-Year Review Site Inspection was performed. The 2013 Annual Site Inspection Photographs are included in this attachment.)

Old Wahiawa Landfill





Photograph No. 1: Perimeter fencing with Sign 10 obscured by vegetation, looking northeast. Photographed by ERRG.



Photograph No. 2: Perimeter fencing and Sign 10 cleared of vegetation. Photo looking northeast. Photographed by ERRG.



Photograph No. 3: Surface debris and ash exposed at surface. Photo looking southwest.  
Photographed by ERRG.



Photograph No. 4: Settlement monument SM-1 near slope top, looking east.  
Photographed by ERRG.



Photograph No. 5: Perimeter fencing near Sign 9, damaged but intact, looking north.  
Photographed by ERRG.



Photograph No. 6: Sign 4 in place and cleared of vegetation, looking north.  
Photographed by ERRG.



**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

Five Transformer Sites

**Old Incinerator Site**

**Attachment C: Interview Forms**

Old Wahiawa Landfill



<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Old Incinerator Site, JBPHH Wahiawa Annex <b>DOH Regulatory PM:</b> Maria Reyes		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <b>Date:</b>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Maria Reyes	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> DOH-HEER
<b>Telephone No.:</b> 808-586-7576	<b>Street Address:</b> 919 Ala Moana Boulevard, Rm 206	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> Honolulu, Hawaii 96814	
<b>E-Mail Address:</b> maria.reyes@doh.hawaii.gov		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>I have been familiar w/ the project site since 2009.</i></li> <li>2. What is your overall impression of the project? <i>A thorough investigation was conducted.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>Yes, the remedy is functioning as expected. The remedy is effective at protecting human health and the environment when ash is adequately covered.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>There are no trends to show.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>There is vegetation clearance and annual site inspections.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>I am not aware of any.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>I am not aware of any.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>I am not aware of any.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>Yes, in terms of needing more frequent vegetation clearance to improve visibility of LUC boundary markers.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>I have no additional comments.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Old Incinerator Site, JBPHH Wahiawa Annex <b>EPA Regulatory PM:</b> Mark Ripperda		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <b>Date:</b> 11/7/2014
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Mark Ripperda	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> U.S. EPA
<b>Telephone No.:</b> 415-972-3028	<b>Street Address:</b>	
<b>Fax No.:</b> —	<b>City, State, Zip:</b>	
<b>E-Mail Address:</b> Ripperda.Mark@epamail.epa.gov		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>Approximately 10 years.</i></li> <li>2. What is your overall impression of the project? <i>Good.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>Yes, the remedy is functioning as expected and is effective.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>No.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>The Navy performs annual LUC inspections.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>Not that I'm aware of.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>No.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>No.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>No, the LUCs have been functioning well with the annual inspections. However, I would not want to decrease the frequency of the inspections to less than annual.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>No.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Old Incinerator Site, JBPHH Wahiawa Annex <b>Navy RPM:</b> Robert Kaito		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <b>Date:</b>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Robert Kaito	<b>Title:</b> Navy Project Manager	<b>Organization:</b> Navy
<b>Telephone No.:</b> 808-471-1171 ext. 231	<b>Street Address:</b> 400 Marshall Road	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> JBPHH, HI 96860-3139	
<b>E-Mail Address:</b> robert.kaito@navy.mil		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>11 Years.</i></li> <li>2. What is your overall impression of the project? <i>Project actions taken to date have been appropriate to ensure protectiveness of human health &amp; environment. Annual monitoring conducted regularly without issues.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>Yes, remedy is functioning properly and effectively as a soil barrier.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>Annual topographic survey data reassures the Navy that the soil cover is not eroding, remains in place, and is functioning properly and effectively as intended. No trend has been observed that the soil cover is eroding. Analysis of previous contaminants of concern (COCs) or evaluation of the concentration levels is not necessary since COCs remain in the subsurface soil and no pathway is available to affect humans or the environment.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>Yes, on-base staff in charge of facilities and activities involving the project site and Land Use Controls (LUCs) are as follows: Assistant Public Work Officer (APWO), Facility Operations Specialist (FOS), and Environmental Coordinator (EC). Off-base staff includes the Remedial Project Manager, who is located at NAVFAC HI. All staff are in charge of ensuring protectiveness measures remain in place by monitoring daily activities on-base that involve or potentially involve the project site. All staff review all planned on-base construction activities. The review ensures that the project site does not impact any construction activities or LUCs and remains protective of human health and the environment. The Remedial Project Manager (RPM), plans, conducts, and oversees, field effort involving Long Term Monitoring (LTM) efforts at the project site. In accordance with the revised LUC Work Plan, annual inspections and maintenance are being conducted by NAVFAC HI with support from on-base staff.</i></li> </ol>		

### Summary of Conversation (cont'd)

6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details.

*During the 2<sup>nd</sup> annual LTM event, it was discovered that the 1st annual LTM topographic survey inadvertently surveyed the top of survey settlement monument as a baseline indicator for settlement. Consequently, the 2<sup>nd</sup> annual LTM surveyed both top and bottom of each settlement monument and now serves as the baseline for tracking future settlement going forward. The 2<sup>nd</sup> annual LTM events did not indicate that erosion or settling is occurring at the project site. Follow-on annual LTM events including the topographic surveys, now survey the bottom of the settlement monuments and use the 2<sup>nd</sup> annual LTM topographic survey as the baseline.*

7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

*The Navy is unaware of any concerns regarding this site and its operations.*

8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

*Yes, during the 1<sup>st</sup> annual LTM event, site boundary markers appear to have been missing. Boundary markers were replaced and remain in place to date.*

9. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

*No sampling is necessary or appropriate at this site. Therefore, no optimization is necessary.*

10. Do you have any comments, suggestions, or recommendations regarding the project?

*No.*

**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

Five Transformer Sites

Old Incinerator Site

**Old Wahiawa Landfill**



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## CONTENTS

### Old Wahiawa Landfill

Acronyms and Abbreviations	iii
1. Site Chronology	1-1
2. Background	2-1
2.1 Site Description	2-1
2.2 Land Use	2-1
2.3 History of Contamination	2-5
2.4 Initial Response	2-6
2.5 Basis for Taking Remedial Action	2-6
3. Remedial Actions	3-1
3.1 Remedial Action Objectives	3-1
3.2 Remedy Description	3-1
3.3 Remedy Implementation	3-2
3.4 Systems Operations and Maintenance	3-2
4. Progress Since the Last Five-Year Review	4-1
5. Five-Year Review Process	5-1
5.1 Administrative Components	5-1
5.2 Community Involvement	5-1
5.3 Document Review	5-1
5.4 Data Review	5-1
5.4.1 Monitoring Reports	5-2
5.5 Five-Year Site Inspection	5-4
5.6 Interviews	5-4
6. Technical Assessment	6-1
7. Issues, Recommendations, and Follow-up Actions	7-1
8. Protectiveness Statement	8-1
9. References	9-1

### ATTACHMENTS

A	Five-Year Review Site Inspection Checklist
B	Site Photographs
C	Interview Forms

### FIGURES

2-1	Facility Location Map, Old Wahiawa Landfill	2-3
3-1	Land Use Control Boundary, Old Wahiawa Landfill	3-5

### TABLES

1-1	Old Wahiawa Landfill Chronology of Events	1-1
5-1	Five-Year Review Team Members	5-1

6-1	Review of Human Health Toxicity Data Used in Risk Assessment, Residential	6-5
6-2	Review of Human Health Toxicity Data Used in Risk Assessment, Industrial	6-9
7-1	Issues and Recommendations	7-1

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## ACRONYMS AND ABBREVIATIONS

AECOM	AECOM Technical Services, Inc.
ARAR	applicable or relevant and appropriate requirement
BEHP	bis 2-ethylhexyl phthalate
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
COPC	chemical of potential concern
DOH	Department of Health, State of Hawaii
EPA	Environmental Protection Agency, United States
FS	feasibility study
IAS	initial assessment study
JBPHH	Joint Base Pearl Harbor-Hickam
LTM	long-term monitoring
LTMM	long-term monitoring and maintenance
LUC	land use control
MCL	maximum contaminant level
MDC	maximum detected concentrations
NAVFAC	Naval Facilities Engineering Command
NCTAMS PAC	Naval Computer and Telecommunications Area Master Station Pacific
NPL	National Priorities List
O&M	operations and maintenance
RAB	Restoration Advisory Board
RAO	remedial action objective
RI	remedial investigation
ROD	record of decision
RPM	remedial project manager
RSL	regional screening level
SI	site inspection
TBC	to be considered
TCE	trichloroethene
WP	work plan
WQS	Water Quality Standard(s), State of Hawaii Department of Health



## 1. Site Chronology

Significant events relevant to the Old Wahiawa Landfill (OWLF) site at Joint Base Pearl Harbor-Hickam (JBPHH) Wahiawa Annex, Oahu, Hawaii are presented in Table 1-1.

**Table 1-1: Old Wahiawa Landfill Chronology of Events**

Event	Date
Naval Radio Station, Wahiawa begins operations as a temporary radio and direction finder station, and is quickly expanded in the period leading up to World War II. The operation was later renamed to Naval Computer and Telecommunications Area Master Station, Pacific (NCTAMS PAC) Wahiawa Branch.	1940–1941
The OWLF served as the primary disposal area for wastes (mostly municipal) generated at the NCTAMS PAC Wahiawa facility. Received wastes included pigment, paints, plastic, metals, waste oils, solvents, and other hazardous materials (NEESA 1986). Pesticide containers and pesticide tank rinsates were reportedly dumped in the landfill. The OWLF closed in 1973.	1940–1973
The landfill was graded and covered with a 3-foot-deep soil layer to meet contemporary landfill closure requirements.	1978
An initial assessment study (IAS) was conducted by the Navy to identify areas that may require investigation or cleanup through a document search and personal interviews. Subsequently, it was recommended that a site inspection be conducted at the OWLF to determine whether contamination existed and to develop recommendations for further action (NEESA 1986).	1986
A site inspection conducted by the Navy assessed levels of soil contamination and the extent of downgradient contaminant migration at the OWLF. The report concluded that lead and mercury in site soil may be the result of historical waste management practices (HLA 1989).	1989
An expanded site inspection conducted by the Navy further investigated the OWLF. Sampling results generally supported the findings of the 1989 site inspection.	1992
A remedial investigation (RI) conducted by the Navy collected surface and subsurface soil, groundwater, and surface water samples and analyzed them for organic compounds and metals. Based on results of human health and ecological risk assessments, the RI found that chromium present in subsurface soil posed unacceptable risk to human health, and that the OWLF required a response action to protect human health and the environment (Earth Tech 2006).	2006
A feasibility study (FS) conducted by the Navy evaluated response action alternatives to address contamination in subsurface soil at the OWLF and recommended a site-specific response action. Retained alternatives that underwent detailed evaluation included long-term monitoring and maintenance (LTMM) and land use controls (LUCs), and cover reinforcement, LTMM, and LUCs. The FS recommended the LTMM and LUCs alternative (Earth Tech 2007).	2007
A record of decision (ROD) for the OWLF site issued by the Navy in December 2009 documented the selected final remedy of LTMM and LUCs (DON 2009). The ROD became effective with receipt of the final authorizing signature on February 18, 2010.	February 18, 2010
New location names were implemented with the establishment of Joint Base Pearl Harbor-Hickam. The location of the NCTAMS PAC Wahiawa operation was named JBPHH Wahiawa Annex.	October 2010
A LUC work plan for the OWLF site issued by the Navy detailed the means for implementing and maintaining the final remedy of LTMM and LUCs (AECOM 2011b).	September 2011
A long-term monitoring (LTM) plan for the OWLF site issued by the Navy provided the procedures and supporting documentation for implementing the monitoring and maintenance activities required for the OWLF site (AECOM 2011a).	September 2011
A remedial action completion report issued by the Navy formally documented achievement of the remedial action objectives as specified in the OWLF ROD and remedy in place (AECOM 2013).	May 2013
Annual LTM site inspections were conducted at the OWLF to verify and document compliance with the LUCs specified in the ROD; LTM monitoring reports issued by the Navy documented the results of the inspections (AECOM and Environet 2011; PRC-EERG 2013, 2014).	2011–2013



## 2. Background

The OWLF is included in the Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS PAC) National Priorities List (NPL) site as Operable Unit 04 located at JBPHH Wahiawa Annex.

### 2.1 SITE DESCRIPTION

A general description of JBPHH Wahiawa Annex and its physical characteristics is presented in Introduction Section I.6.1.

The 4-acre OWLF is a remote closed landfill located near the eastern perimeter of JBPHH Wahiawa Annex (Figure 2-1). The landfill is capped with soil and anchored by dense vegetation. The site is bound to the southwest by a remote, rugged, heavily overgrown gulch. An unnamed intermittent stream lies at the bottom of the gulch and flows westward during heavy rainfall.

The OWLF is covered by clayey/sandy silt with gravel. Native Helemano silty clay soil extends beneath the landfill, grading downward into saprolite and weathered basalt. Some alluvial clayey silt and silty clay, derived from upgradient erosion, lies beneath the refuse horizon. Perched groundwater, which has been encountered at approximately 40 feet below ground surface (bgs), occurs locally where less permeable strata impede the downward flow of surface water. It is not likely to represent a potential source of drinking water and is distinct from the regional water supply, the Schofield Aquifer, which occurs at an approximate depth of 900 feet (Earth Tech 2006).

The OWLF is covered by clayey/sandy silt with gravel. Native Helemano silty clay soil extends beneath the landfill, grading downward into saprolite and weathered basalt. Some alluvial clayey silt and silty clay, derived from upgradient erosion, lies beneath the refuse horizon. Perched groundwater has been encountered at the site at approximately 40 feet below ground surface (bgs) (Earth Tech 2006).

The OWLF has been closed since 1973 and is currently unused vacant land. There are no current Navy plans to redevelop, transfer, or sell the property.

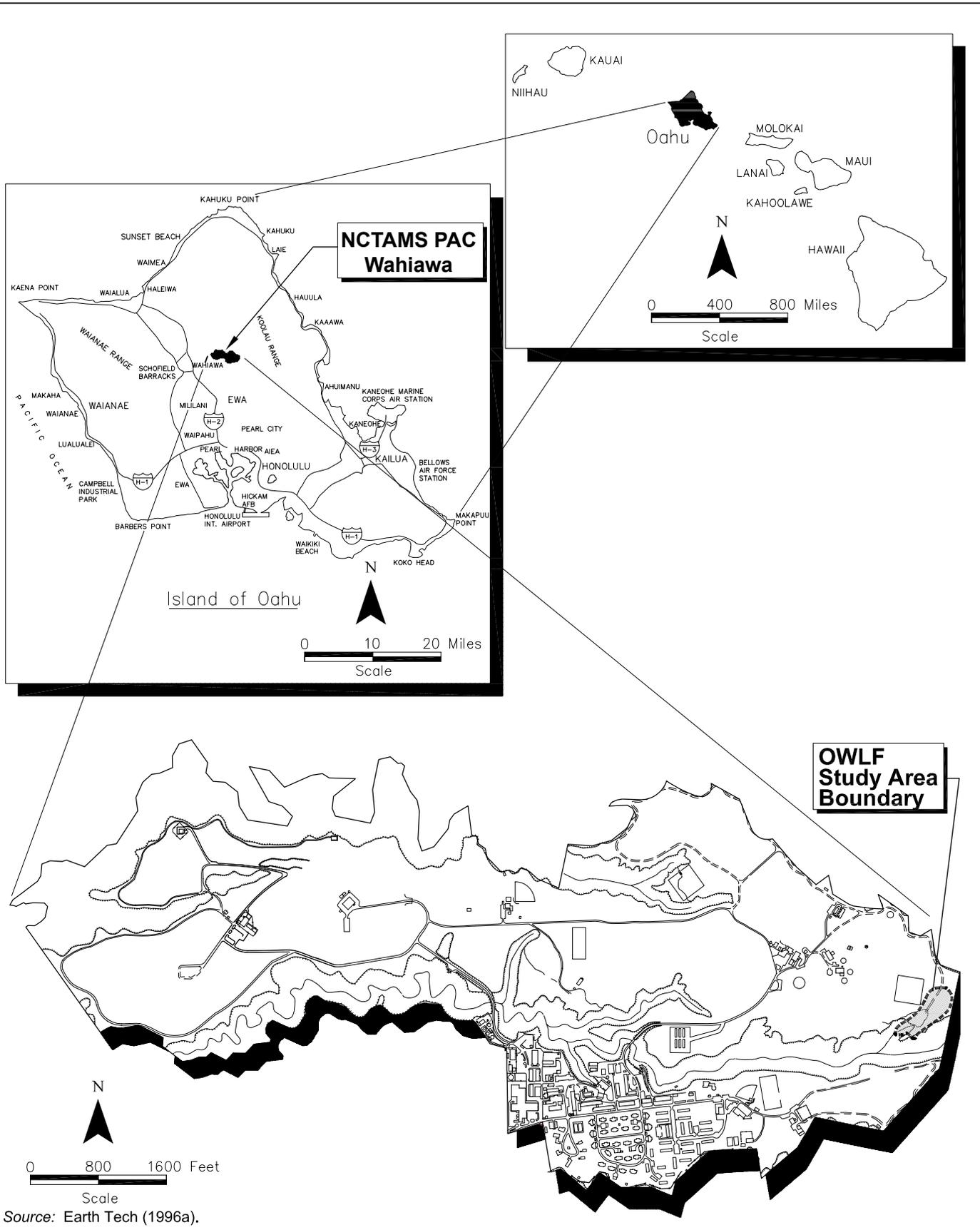
### 2.2 LAND USE

*Current Site Use:* NCTAMS PAC Wahiawa at JBPHH Wahiawa Annex operates and maintains communications facilities for the Navy in the Pacific, which is considered an industrial/commercial use. The OWLF is currently closed as a landfill and is unused vacant land. The entire OWLF is within a designated land use control (LUC) area. The site boundaries are shown on Figure 2-1.

*Future Site Use:* NCTAMS PAC Wahiawa at JBPHH Wahiawa Annex will be maintained by the Navy for use as a communications facility, which is considered an industrial/commercial use. There are no plans for development of the steep gulch walls adjacent to the OWLF site, and no land use changes are anticipated in the foreseeable future for the OWLF site.



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**Figure 2-1**  
**Facility Location Map, Old Wahiawa Landfill**  
**First Five-Year CERCLA Review of Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPBH, Lualualei Annex and Wahiawa Annex,**  
**Oahu, Hawaii**



## 2.3 HISTORY OF CONTAMINATION

From 1940 to 1973, the OWLF served as the primary disposal area for wastes (mostly municipal) generated on base. Wastes received at the landfill that included pigment, paints, plastic, metals, waste oils, solvents, and other hazardous materials (NEESA 1986). Additionally, pesticide containers and pesticide tank rinsates were reportedly dumped in the landfill. Waste generators included the power plant and repair and maintenance facilities (e.g., electrical shop, antenna maintenance shop, calibration shop).

Refuse was originally dumped into the southwestern end of the gulch. As usage increased, the landfill was operated more traditionally, with alternating layers of waste and soil. Previous investigations indicated that the landfill has no engineered liner with a maximum landfill thickness of 41 feet bgs. The OWLF was closed in 1973, which was prior to the passage of the Resource Conservation and Recovery Act. In 1978, it was leveled and covered with a 3-foot-deep soil layer to meet contemporary landfill closure requirements.

The OWLF has been the subject of four previous environmental investigations and a feasibility study (FS).

*Initial Assessment Study (IAS)* (NEESA 1986): The Naval Energy and Environmental Support Activity conducted an IAS of the Naval Communication Area Master Station, Eastern Pacific (NAVCAMS EASTPAC) (later renamed to NCTAMS PAC) to identify areas that may require further investigation or cleanup. The IAS report recommended that a site inspection be conducted to determine whether contamination existed at the OWLF and to develop recommendations for further action.

*Site Inspection (SI)* (HLA 1989): The Navy conducted a site inspection at the OWLF by determining the presence or absence of contamination in the surface and subsurface soil. Soil samples were collected to assess levels of soil contamination and the extent of downgradient contaminant migration. The SI report concluded that lead and mercury in site soil may be the result of historical waste management practices.

*Expanded Site Inspection* (ANL 1992): The Navy conducted a supplemental or expanded site inspection to further investigate the OWLF. Sampling results generally supported the findings of the 1989 SI Report.

*Remedial Investigation (RI)* (Earth Tech 2006): The Navy completed a RI based on the findings and recommendations of the two SIs. The initial scope of the RI was to collect and evaluate the data needed to quantify risk associated with the OWLF and, if necessary, identify appropriate remedial actions. The RI report identified five polynuclear aromatic hydrocarbons (PAHs), three metals (chromium, thallium, and vanadium), total polychlorinated biphenyls, and cyanide as chemicals of potential concern (COPCs) in soil. Although other metals, including lead and mercury, were also detected in soil; concentrations were below either the 2004 preliminary remediation goals and/or the estimated background range. Estimates of human and ecological risks were below target points of departure for surface soil. Human health and ecological risk estimates for subsurface soil indicated that chromium presented unacceptable risks/hazards. The RI concluded that a response action may be required for the OWLF to protect human health and the environment.

Perched groundwater encountered at approximately 40 feet bgs was considered to likely not represent a potential source of drinking water and was found to be distinct from the regional water supply, the Schofield Aquifer; a high-level, unconfined aquifer contained in dike compartments

within the deep volcanic bedrock. The unconfined top of the Schofield Aquifer is approximately 800–900 feet bgs at JBPHH Wahiawa Annex (Earth Tech 2006). Perched groundwater beneath the OWLF contained the following site-related contaminants: the organic compounds trichloroethene (TCE) and bis 2-ethylhexyl phthalate (BEHP), and the inorganic chemicals aluminum, cobalt, copper, iron, manganese, and zinc at concentrations exceeding the screening criteria. BEHP and TCE were detected in the perched aquifer at concentrations that were below their respective maximum contaminant levels (MCLs) (with the exception of one detection of BEHP that was a laboratory estimated value reported above the MCL).

No organic compounds were detected at concentrations above the acute or chronic State of Hawaii Water Quality Standards (WQSs) in surface water samples collected at the OWLF. Carbon disulfide was the only organic chemical detected in the surface water. Four metals were detected at concentrations above WQS values; chromium, copper, lead, nickel, and zinc (dissolved phase). The surface water does not support ecological receptors; therefore, WQSs were used for comparison only, and are not considered applicable or relevant and appropriate requirements (ARARs) or to be considered (TBC) requirements.

*FS* (Earth Tech 2007): A FS evaluated response action alternatives to address contamination in subsurface soil at the OWLF and to recommend a site-specific response action. A variety of response alternatives were initially screened based on implementability, effectiveness, and cost. Response action alternatives retained for detailed analysis included long-term monitoring and maintenance (LTMM) and LUCs, and LTMM and LUCs with cover reinforcement. The FS recommended the LTMM and LUCs alternative.

## **2.4 INITIAL RESPONSE**

No pre-record of decision (ROD) cleanup activities were conducted at the site.

## **2.5 BASIS FOR TAKING REMEDIAL ACTION**

The ROD (DON 2009) determined that a response action was necessary to protect human health and the environment at the OWLF from exposure to contaminants in soil at concentrations that pose an unacceptable risk or hazard.

The RI conducted at the OWLF indicated sufficient potential for contamination from the OWLF to pose an unacceptable risk to human health and the environment. Human health risks/hazards from surface soil exposure at the OWLF were found to be within the acceptable risk range for the child woodland trespasser exposure scenario. The incremental lifetime cancer risk for the child woodland trespasser under the RME scenario is  $2 \times 10^{-6}$ . The non-cancer hazard for the child woodland trespasser did not exceed the target HI of 1. Therefore, there is no health risk/hazard for the trespasser from exposure to surface soil at the OWLF site. Soil within the landfill was found to contain PAHs, thallium, and chromium contamination as a result of past landfill use (Earth Tech 2006).

LTMM and LUCs are necessary to prevent unacceptable human health risks from exposure to chromium at concentrations above the estimated upper bound of the background concentration range (599 mg/kg) identified in the RI report (Earth Tech 2006). LUCs are required as part of the final remedy for the OWLF because the site is not suitable for unrestricted land use as a result of the landfill wastes being left in place. The final decision was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by, 42 United States Code Section 9601, et seq., the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, and the Office of the President of the United

States Executive Order 12580. Information supporting the decisions leading to the selected remedy is contained in the Administrative Record file for the site. LTMM and LUCs will be used as the final remedy to ensure that the OWLF remains protective of human health and the environment.



### 3. Remedial Actions

A ROD was signed in 2010 to address contamination in soil at the OWLF and specifies LTMM and LUCs as the final remedy for the site (DON 2009).

#### 3.1 REMEDIAL ACTION OBJECTIVES

The response action objectives for the OWLF are as follows:

- Control site access.
- Maintain the viability of the existing landfill cover.
- Prevent the disturbance of the surface and subsurface soil.
- Reduce the potential risk of exposure by humans to COPCs in surface and subsurface soil.

#### 3.2 REMEDY DESCRIPTION

The remedy for the OWLF is LTMM and LUCs. The cleanup strategy documented in the ROD for the OWLF is waste containment and control. This strategy is consistent with United States Environmental Protection Agency (EPA) (1993) presumptive remedy guidance for solid waste landfill sites. The LUC boundary for the OWLF is shown on Figure 3-1.

The remedy reduces potential future human health risks by containment of landfill wastes/contaminated soil and by restricting access and activities at the OWLF. This is achieved by maintaining both the condition of the existing landfill cover and the cover vegetation at the OWLF to eliminate direct contact with surface soil and buried landfill waste. Because the site risk is not an issue for the trespasser, the remedy remains protective for exposure to surface soil at the OWLF site. The remedy does not change the current or planned future land use or reduce the toxicity or volume of landfill waste or contaminants. The remedy requires that restrictive LUCs be implemented.

Elements of the remedy include the following:

- LUCs are implemented to control access to and restrict use of the site to ensure that the impacted soils are not disturbed. LUCs also ensure that potential routes for exposure are not created due to land use changes. Site access restrictions prevent unauthorized entry. LUCs prohibit any land modification that disturbs the existing cover and potentially expose landfill wastes at the OWLF (e.g., vegetation clearing, excavation, and construction of structures). The Navy is responsible for implementing, maintaining, reporting on, and enforcing the LUCs. LUCs will be maintained at the OWLF until the concentrations of hazardous substances in the soil and groundwater are at such levels to allow for unrestricted land use and exposure. LUCs will then be terminated. A LUC work plan (WP) specifies implementation and maintenance actions, including periodic inspections and reporting requirements, notification requirements, specific responsibilities, and details on LUC enforcement (AECOM 2011b). The LUC WP is the remedial action WP for implementation of LUCs as the remedy for this site.
- Annual monitoring and maintenance (as required) are conducted to maintain slope stability and cover at the OWLF. The annual site inspection consists of a visual survey of the OWLF, side slopes, and vegetated cover and slope stability evaluation. Annual monitoring results are reported to EPA Region 9 and State of Hawaii Department of Health (DOH). If maintenance is required, the Navy is responsible for taking timely action to address the maintenance

issues to minimize the chance of unauthorized access and disturbance of the OWLF cover, and potential exposure of trespassers to contaminated media. Procedures for implementing the monitoring and maintenance activities are detailed in a long-term monitoring (LTM) plan prepared for the site (AECOM 2011a).

- Because contaminants, particularly chromium, remain in place at concentrations above levels that allow for unlimited land use and unrestricted exposure, five-year reviews are performed by the Navy to ensure that the final remedy remains effective to prevent exposure of contaminated soil.

### **3.3 REMEDY IMPLEMENTATION**

Site risks are being mitigated by instituting site controls that limit or eliminate potential routes of exposure to the COPCs in the surface and subsurface. Several elements of the remedy for the OWLF require ongoing maintenance to remain protective of human health and the environment. The landfill cover requires regular inspections and occasional maintenance to remain effective. The warning signage at the OWLF requires regular inspections to ensure visibility and legibility and occasional maintenance to remain effective. In addition to these maintenance items, annual inspections and reports are required to certify compliance with the LUCs, and five-year reviews are required to evaluate the effectiveness of the remedy. Records of the land use restrictions are maintained in the facility planning documents/land use database.

### **3.4 SYSTEMS OPERATIONS AND MAINTENANCE**

Long-term monitoring and maintenance of the OWLF consists of annual inspections and surveys to document site conditions and maintenance of the landfill cover and side slopes to ensure its integrity is maintained such that the remedy remains protective of human health and the environment.

The OWLF LUC WP (AECOM 2011b) specifies that the Navy (or current landowner) conduct periodic inspection and reporting actions to ensure that the LUC performance objectives for the OWLF are met and maintained. Annual physical inspections are conducted that consist of visually observing the entire OWLF. The inspection documents the condition of the landfill cover and that no inappropriate land use or unauthorized site access is taking place to prevent potential unacceptable exposure to contaminated media within the landfill. The inspection verifies that access control signage is in place and in good condition and documents the conditions of the surface cover (i.e., erosion). The inspection also reviews maintenance records (if available), conducts interviews with maintenance crews, if warranted, and reviews groundwater monitoring results from the regional water supply wells located at JBPHH, Wahiawa Annex.

If maintenance is required, the Navy addresses the maintenance issues no later than 30 days after the Navy becomes aware of the breach, to minimize the chance of unauthorized access and disturbance of the OWLF cover, and potential exposure of trespassers to contaminated media.

If activities are found to be inconsistent with the institutional control (IC) objectives or use restrictions, if maintenance is required, or any other activity is identified that may interfere with the effectiveness of the ICs, the Navy will initiate response activities as soon as practicable, but in no case will the process be initiated later than 30 days after the Navy becomes aware of activities inconsistent with IC objectives or use restrictions. The risk evaluation for the site determined that the risk to a child woodland trespasser at the site was acceptable. Although the risk evaluation determined that the subsurface soils did not pose an unacceptable risk to any receptors, the final remedy considered that the subsurface was too heterogeneous to characterize. The final remedy of LUCs included the element of site access control to prevent land modifications, vegetation clearing,

regrading, excavation, landscaping, and construction of structures. The issue of trespassers at the site would only be a concern if there were disturbances to the subsurface soils, which has not been observed. Inspections which identify missing or faded signs are addressed by budgeting and contracting for the replacements.

The monitoring results are included in annual Long-term monitoring inspection reports that along with LUC Site Inspection Compliance Certificates are provided to the regulatory agencies (EPA Region 9 and DOH). The certificate evaluates the status of the LUCs and how any deficiencies or uses inconsistent with the LUCs have been addressed. The annual evaluation addresses whether the use restrictions and controls referenced above were communicated in the Base Master Plan/Base Comprehensive Plan, whether state and local agencies were notified of the use restrictions and controls affecting the OWLF, and whether use of the OWLF has conformed to such restrictions and controls. If any deficiencies are found during the annual inspection, the Navy prepares, along with the LUC Site Inspection Compliance Certificates, a separate written explanation indicating the specific deficiencies found and what efforts or measures have or will be taken to correct them, including a schedule for these measures. Any recommendations for additional or different LUCs, including termination of LUCs, are provided in the LUC Site Inspection Compliance Certificate. Information provided in the annual monitoring reports and the LUC Site Inspection Compliance Certificates is used in preparation of the CERCLA five-year reviews to evaluate the effectiveness of the remedy.



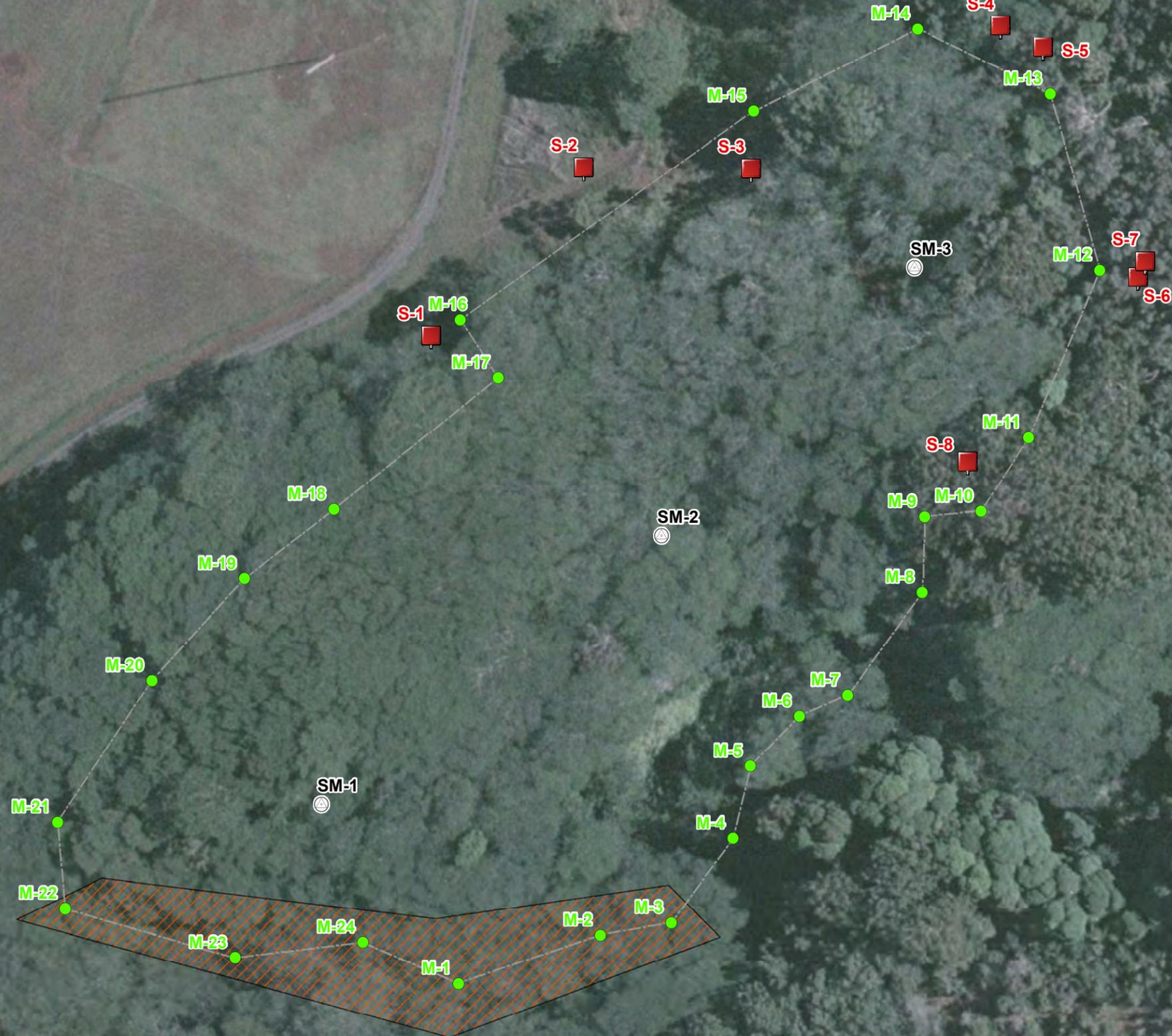
LUC Boundary Marker Coordinates

ID	Easting	Northing
M-1	1643031.651	127447.0706
M-2	1643148.503	127486.5453
M-3	1643206.607	127497.0165
M-4	1643257.316	127565.7939
M-5	1643271.685	127625.1083
M-6	1643312.192	127666.1845
M-7	1643351.736	127683.2276
M-8	1643413.117	127767.8128
M-9	1643415.181	127829.9786
M-10	1643461.476	127834.3405
M-11	1643500.243	127894.6088
M-12	1643558.996	128031.9058
M-13	1643518.425	128176.5744
M-14	1643409.309	128229.8348
M-15	1643274.42	128162.6821
M-16	1643032.885	127991.3538
M-17	1643064.336	127943.7444
M-18	1642929.264	127835.9212
M-19	1642855.551	127779.0229
M-20	1642779.591	127695.1505
M-21	1642702.154	127579.3338
M-22	1642708.344	127508.3331
M-23	1642847.874	127467.7937
M-24	1642953.098	127480.681

LUC Warning Sign Coordinates

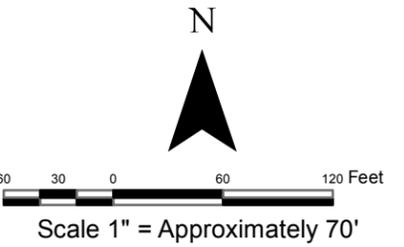
ID	Easting	Northing
S-1	1643009.26	127977.48
S-2	1643134.72	128115.72
S-3	1643272.39	128114.63
S-4	1643477.55	128232.11
S-5	1643512.25	128214.4
S-6	1643590.53	128025.68
S-7	1643596.47	128038.74
S-8	1643450.36	127874.13

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LEGEND	
	Settlement Monument Locations
	LUC Warning Sign
	OWLF Legal Description LUC Boundary Marker
	Site Boundary
	Trespassing Zone

SOURCE	
LUC Boundary Marker Coordinates: Baseline Surveying LLC, September 2007	
LUC Warning Sign Coordinates: ATS (Site Visit), December 2009	



**Figure 3-1**  
**Land Use Control Boundary**  
**Old Wahiawa Landfill**  
**First Five-Year CERCLA Review of**  
**Seven NCTAMS PAC NPL Sites**  
**NCTAMS PAC National Priorities List Site**  
**JBPHH, Lualualei Annex and**  
**Wahiawa Annex, Oahu, Hawaii**



#### **4. Progress Since the Last Five-Year Review**

This is the first five-year review for the OWLF site at JBPHH Wahiawa Annex, Oahu, Hawaii. Consequently, there is no new progress to report from a previous five-year review.



## 5. Five-Year Review Process

### 5.1 ADMINISTRATIVE COMPONENTS

The five-year review team members are listed in Table 5-1.

**Table 5-1: Five-Year Review Team Members**

DOH	Regulatory Project Manager:	Maria Reyes
Navy	RPM for five-year review:	Robert Kaito
	RPM for specific site:	Robert Kaito
EPA	Regulatory Project Manager:	Mark Ripperda
AECOM	Project Manager:	Robin Boyd
	Project Support:	Louann Kromer Andrea VonBurg Hall Dustin Goto

AECOM AECOM Technical Services, Inc.  
 RPM remedial project manager

The team members established a review schedule of November 2014, during which they completed the following activities: reviewed relevant documents, performed data review, and conducted interviews.

### 5.2 COMMUNITY INVOLVEMENT

The Central Oahu Restoration Advisory Board (RAB) holds two to three meetings per year to update the public on the Navy’s Environmental Restoration Program and status of Installation Restoration Program sites. The RAB helps increase community awareness of environmental restoration issues at current and former naval facilities. Information is provided through quarterly meetings of the RAB, by maintaining the public information repository, and by publishing various announcements, fact sheets, and public notices in the local newspaper.

As part of community involvement, the Navy announced the five-year review of the OWLF via the meeting minutes for the September 17, 2014 RAB meeting held at the Aiea Public Library.

### 5.3 DOCUMENT REVIEW

This five-year review consists of a review of relevant documents including the ROD, RI, FS, risk assessments, WPs, completion reports, LTM reports, LUC inspection reports, and various compliance reports. The list of documents reviewed is provided in Section 9. Applicable cleanup standards, as listed in the ROD, were reviewed. ARARs and TBC criteria that may have changed since the ROD was completed were also evaluated; however, no changes were noted.

### 5.4 DATA REVIEW

Compliance monitoring at the OWLF site includes annual landfill soil cover inspections, side slope inspections, surveying, and site maintenance. The LTMM program was implemented to monitor landfill conditions and to ensure the remedy remains protective of human health and the environment. The review of groundwater data from the Wahiawa Deep Well (well number 3100-02) was misidentified in the first annual LTM inspection report (DON 2012) as a required annual inspection activity. However review of groundwater monitoring data is not a component of the

Response Action Alternative identified in the ROD and does not need to be included in the annual inspections.

#### **5.4.1 Monitoring Reports**

Landfill soil cover and side slope inspections began at the Old Wahiawa Landfill in 2011. As of the publication of this First Five-Year Review, three monitoring reports (e.g., 1st, 2nd, and 3rd) have been completed subsequent to the 2009 ROD and are reviewed below.

The landfill inspection comprises a visual survey of the landfill vegetative cover and the side slopes, as well as surveying the settlement monitoring monuments. Deficiencies requiring correction are recorded on inspection forms for subsequent action.

*1st Monitoring Event (AECOM and Environet 2011):* The first annual landfill inspection was identified on the field inspection sheet as conducted on May 24 and 25, 2011, however the LTM Report identified the inspection dates as May 25 and 26, 2011. The inspection indicated that the landfill cover had mature trees and overgrown dense vegetation throughout the site. No zones of depression, cracks, or bare soil areas were observed. Standing water was observed and consisted of one small ponding area of approximately 15 square feet on the northern end of the landfill. Refuse and debris could be seen at the surface in the northern area and in the center of the landfill. Debris varied from car parts, plastic items, a sink, a refrigerator, tires and pipes to scrap metal and wire cables. There was no observed stressed or dying vegetation, cracks, erosion gullies, bare soil, crooked trees, or escarpments on the side slopes. There was less vegetation on the side slopes, which is typical for naturally occurring slopes. Sediment buildup at the bottom of the slope indicates that the side slope closest to M-9 may be eroding. No wastes were exposed on the side slope close to M-9.

The settlement monitoring monument installation and baseline surveying were performed in June 2011; therefore monitoring of the settlement and slope movement would be performed in the subsequent annual inspection.

Evidence of trespassing was encountered during the visual inspection of the OWLF. There were footprints and footpaths going into the southern border of the OWLF, as well as theft of six LUC boundary markers and other boundary markers were observed hanging from trees. The site feature map was updated to include a trespassing zone (Figure 3-1). The trespassers are assumed to be pig hunters because dogs were heard on two separate days while conducting the topographic survey and the JBPHH Wahiawa Annex police had warned of pig hunters using the south side of the OWLF.

One of the 19 LUC signs (S-19) was observed to be damaged (bent), likely struck by a fallen tree.

While there was evidence of inappropriate land use, there was no excavation, soil removal, construction of structures, or evidence of activities that could damage or disturb the cover at the OWLF.

*2nd Monitoring Event (PCR-ERRG JV LCC 2013):* The second annual landfill inspection was conducted on December 27, 2012. The inspection indicated that the landfill cover had mature trees and overgrown dense vegetation throughout the site. No zones of depression, cracks, or bare soil areas were observed. Standing water consisted of one small ponding area on the northern end of the landfill. The ponding area did not appear to have changed in location, aerial extent, or depth from the previous inspection. Refuse and debris could be seen at the surface in the northern area and in the center of the landfill. Debris varied from scrap metal and concrete blocks to tires. There was no observed stressed or dying vegetation, cracks, erosion gullies, bare soil, crooked trees, or

escarpments on the side slopes. Minor amounts of soil erosion were observed along the lower portions of the steep slope of the gulch near Sign S-8.

The settlement monuments were found to be in good condition with no vandalism, cracks, or other signs of damage. Comparison of the 2011 and 2012 survey data showed elevation differences on the order of 3 feet. Based on the absence of any visual evidence of subsidence or erosion at the OWLF, the 2011 data were evaluated further to identify the survey location used. It was identified that the 2011 survey measurement location deviated from the standard industry practice of surveying the brass disk at the base of the monument; therefore, an evaluation of settlement from 2011 to 2012 could not be performed. However, based on field observations, there appeared to be no or minimal settlement at each monument.

Evidence of trespassing was encountered during the visual inspection of the OWLF. There were footprints and footpaths following the southern border of the OWLF, and several areas of unauthorized dumping of beverage and food containers, with the greatest density along the steep slope of the gulch. The inspection report stated the trespassers were most likely hikers or pig hunters accessing the site from the south.

No evidence of excavation, soil removal, construction, or activities that could damage or disturb the cover at the OWLF was observed during the 2012 inspection.

*3rd Monitoring Event (PRC-ERRG 2014):* The third annual landfill inspection was conducted on November 22, 2013. The inspection indicated that the landfill cover had mature trees and overgrown dense vegetation throughout the site. No stressed or dying vegetation was observed. Standing water was again observed in one small ponding area on the northern end of the landfill. The water occurred in a natural low area of the site, and did not result in soil erosion or exposure of landfill waste. The ponding area did not appear to have changed in location, aerial extent, or depth from the previous inspection. Exposed nonhazardous waste (e.g., scrap metal, concrete blocks, tires) was observed in the northern area and in the center of the landfill; however these were left in place at the time of the landfill closure and did not represent post-closure dumping at the site. No erosion gullies, crooked trees or posts, or escarpments were observed along the slopes.

The settlement monuments were found to be in good condition with no vandalism, cracks, or other signs of damage. There were no elevation changes between 2012 and 2013.

Evidence of trespassing was observed during the visual inspection. There were footprints and footpaths following the southern property boundary, as well beverage and food containers in several areas of the site.

All LUC signs were posted and legible.

No evidence of excavation, soil removal, construction or activities that could damage or disturb the cover at the OWLF was observed.

*4th Monitoring Event:* The fourth annual landfill inspection was conducted on October 30, 2014. Field notes from general observations were provided for this Five-Year Review report and are summarized here. Standing water was observed on the landfill and no differences with the areas of standing water from previous inspection reports was observed. All signs were intact. Vegetation was cleared around Sign S-2. The three settlement monuments were intact.

The 2014 LTM Report should be reviewed in the future for more details and summarized in the second Five-Year Review report.

## 5.5 FIVE-YEAR SITE INSPECTION

This five-year review is based on all inspections/evaluations/reports conducted at the site prior to November 2014. The fourth annual LUC inspection for the OWLF site was completed in October 2014 and was used in the evaluation for the five-year review inspection. Interviews with relevant personnel have also been conducted as part of the five-year review process. The 2014 annual Site Inspection Compliance Certificate and Documentation forms are included in Attachment A and were summarized in Section 5.4.1. There were no new LUC concerns identified on the Site Inspection Compliance Certificate and Documentation forms.

Photographs from the 2014 annual inspection were not available at the time of the draft version of the Five-Year Report. Photographs from the 2013 annual site inspection are presented in Attachment B.

## 5.6 INTERVIEWS

Interviews were conducted with the following personnel:

Name	Affiliation	Date
Maria Reyes	DOH, Regulatory Project Manager	November 13, 2014
Mark Ripperda	EPA, Regulatory Project Manager	November 7, 2014
Robert Kaito	NAVFAC Hawaii, RPM	November 12, 2014

NAVFAC Naval Facilities Engineering Command

The remedial project manager and Regulatory Project Managers indicated that the remedy for the OWLF is functioning well.

Interview forms are presented in Attachment C.

## 6. Technical Assessment

Answers to the following three key technical questions are presented in tabular format below:

- A: Is the remedy functioning as intended by the RODs?
- B: Are the assumptions used at the time of remedy selection still valid?
- C: Does any other information call into question the protectiveness of the remedy?

OLD WAHIAWA LANDFILL	
QUESTION A: Is the remedy functioning as intended by the ROD?	
Element	Assessment
Remedial Action Performance	The final remedy implemented at the OWLF is LUCs and includes long-term monitoring and maintenance. LUCs are the non-technical and non-engineering actions that will help mitigate potential risks to human health and the environment by restricting access to contaminated media. The current land use at the OWLF will be maintained to reduce the possibility of exposure to constituents under other land use scenarios. Continued maintenance of the landfill cover prevents direct contact of underlying contaminated soil and debris and the migration or relocation of contaminated soil to areas where human or ecological exposure could occur.
System Operations/O&M	No active systems are in place.
Cost of Systems Operations/O&M	No cost variances were identified that suggest the remedy is not properly functioning.
Opportunities for Optimization	No opportunities for optimization were identified for the OWLF.
Early Indicators of Potential Remedy Failure	The remedy is functioning as intended. No damage to the landfill cover has been observed.
Implementation of Institutional Controls and Other Measures	Although access to the OWLF site is not specifically controlled, JBPHH Wahiawa Annex is a secure facility and entry is restricted. Administrative processes and procedures are in place that require approval for all projects involving construction, digging, or subsurface disturbance. These procedures involve coordination and approval by NAVFAC Hawaii environmental personnel for projects located in or near an environmental restoration site, and includes sites that have LUCs. The Navy will ensure these or similar processes and procedures remain in place and are complied with for all proposed construction, digging, and subsurface soil disturbing activities.
O&M	operations and maintenance

**OLD WAHIAWA LANDFILL**

**QUESTION B: Are the assumptions used at the time of remedy selection still valid?**

Element	Assessment
Changes in Standards and TBC Requirements	<p>Regulatory requirements were considered in the selection of the final remedy. Changes to the ARARs developed for the OWLF site and included in the ROD (DON 2009) are evaluated in Section 5.3. Chemical-specific ARARs that impact cleanup levels are discussed under Changes in Toxicity and Other Contaminant Characteristics below.</p>
Changes in Exposure Pathways and Land Use	<p>A vegetative soil cap has been in place for over 40 years, and is inspected on a regular basis. At the time of the ROD, the OWLF site was a closed landfill and unused vacant land within a steep wooded gulch. No changes in land use were observed during the annual site inspections. The site is zoned for restricted land use (industrial/commercial) and is expected to remain the same in the future. No significant change in exposure pathways has occurred at the site. Receptor populations are also the same.</p>
Changes in Toxicity and Other Contaminant Characteristics	<p>The OWLF was initially investigated during an IAS (NEESA 1986). A risk assessment was conducted during the RI and presented in the RI report (Earth Tech 2006). The Navy has selected LUCs and long-term monitoring and maintenance as the final remedy.</p> <p>The RI risk assessment included the evaluation of soil, groundwater, and surface water data. The groundwater and surface water samples were collected from intermittent sources (perched groundwater and surface water following a rainfall event). Because of the intermittent nature of these sources, the analytical results are not repeatable. Therefore groundwater and surface water data do not warrant continued evaluation.</p> <p>For this five-year review, a streamlined risk evaluation using EPA RSLs (EPA 2014) was performed. MDCs were compared against current EPA RSLs (EPA RSL, May 2014, hazard index [HI] of 0.1). If an MDC exceeded its current RSL and Navy maximum background value, it was deemed a COC and further evaluated for potential cancer risk or noncancer hazard. Table 6-1 compares the MDCs of COCs and COPCs with original PRGs (EPA 2004) and with current RSLs (EPA 2014) and presents the current risk evaluations.</p> <p>Of the 79 analytes detected in soil, 52 had a reduction in screening criteria (EPA RSL, May 2014, hazard index [HI] of 0.1). Four additional analytes were identified as COCs during this evaluation: Aroclor 1254, benzo(k)fluoranthene, antimony, and mercury, for a total of 14 COCs included in this risk evaluation. Screening criteria increased for 2 of the original 10 COCs, chromium and total PCBs. These analytes no longer exceed screening criteria and do not require further evaluation. Thus, the following 12 COCs were then evaluated for current risk at the site: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene, Aroclor 1254, cyanide, antimony, mercury, thallium, and vanadium.</p> <p>Eight of the 12 COCs do not currently pose unacceptable residential risk; (benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene, Aroclor 1254, antimony, and mercury). Three of the remaining COCs currently pose unacceptable residential risk but do not do not pose unacceptable industrial risk; benzo(a)pyrene, cyanide, and vanadium (Table 6-2). No further evaluation is recommended for these 11 COCs, as the remedy is still protective. Only one COC (thallium) poses current unacceptable residential and industrial risk at the site (Table 6-2).</p> <p>Because the LUCs at the OWLF restrict any intrusive activities at the site, exposure for the current human receptor (trespasser) is limited to surface soil. To determine if any thallium results pose unacceptable residential or industrial risk in the surface soil, further evaluation was performed. Although various thallium samples exceed current RSLs and Navy background concentrations at Oahu Facilities, only 1 surface sample (SS17) of the 27 analyzed for thallium also exceeded the established State of Hawaii DOH background level. All thallium results from surrounding sample locations were well below the Navy and/or DOH maximum background levels. Furthermore, the area in which trespassing has been noted by previous visual inspections is located approximately 75 feet from the one sampling location in exceedance of the Navy background concentrations at Oahu Facilities and State of Hawaii DOH background level for thallium. Receptor exposure to thallium above the acceptable noncancer hazard level is significantly limited to a small area within the 4-acre site.</p> <p>An ecological risk assessment was also conducted for the RI. After the current review of the ecological risk evaluation methodology used for the RI, it was determined there have not been any significant changes to the ecological risk methodology that would bring into question the ecological risk assessment conclusions.</p> <p>Remedial actions, including implementation of LUCs, are still protective of the receptor. Therefore, the changes to the screening levels do not affect the RAOs that limit use of the site. Thus, it is not necessary to update the standards used at the time of remedy selection. However, if the intermittent water sources cause erosion of the site so that subsurface contaminants are exposed, further evaluation is recommended.</p>

**OLD WAHIAWA LANDFILL**  
**QUESTION B: Are the assumptions used at the time of remedy selection still valid?**

Element	Assessment
Changes in Risk Assessment Methodologies	The risk assessment conducted as part of the RI included evaluation of the groundwater and surface water pathways; however, because surface water is intermittent and exposure to the perched groundwater by non-residential receptors is considered incomplete, these pathways were not evaluated as part of the five-year review.
Remedy Byproducts	No remedy byproducts have been identified to consider in this assessment.
New Contaminants and Contaminant Sources	No new contaminants or contaminant sources were identified.
Expected Progress Toward Meeting RAOs	Human health and ecological risk at these sites has been addressed by the landfill cover and ROD documentation that led to the LUCs that have been implemented at the OWLF site. No change has occurred in the physical condition of the OWLF site that would affect the protectiveness of the remedy. Exposure assumptions, cleanup levels, and RAOs remain valid for the selected remedy. The RAOs for the OWLF site are still appropriate.

- COC chemical of concern
- MDC maximum detected concentration
- PCB polychlorinated biphenyl
- PRG preliminary remediation goal
- RSL regional screening level



**Table 6-1: Review of Human Health Toxicity Data Used in Risk Assessment, Residential**

Detected Analyte	Maximum Detected Concentration (MDC) within LUC Area (mg/kg)	Original Residential ROD PRG (mg/kg)	Does MDC Exceed Original Residential PRG?	Current (May 2014) EPA Residential RSL, HI=0.1 (mg/kg)	Current Residential RSL Basis	Does MDC Exceed Current Residential RSL?	Background Concentration (mg/kg) (Metals only)	Does MDC Exceed Background?	Cancer Risk <sup>a</sup> Based on Current EPA RSL and MDC	Noncancer HI <sup>b</sup> Based on Current EPA RSL (HI=0.1) and MDC	Conclusions
<b>COCs -10 identified in ROD</b>											
Benzo[a]anthracene	4.4	0.621	Yes	0.15	Cancer	Yes	NA	NA	2.9E-05	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Benzo[a]pyrene	3.9	0.062	Yes	0.015	Cancer	Yes	NA	NA	2.6E-04	NA	MDC still exceeds RSL; current residential risk is above acceptable cancer risk range of 1E-04 to 1E-06; further evaluation performed, see Table 6-2.
Benzo[b]fluoranthene	9.5	0.621	Yes	0.15	Cancer	Yes	NA	NA	6.3E-05	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Dibenz[a,h]anthracene	0.43	0.062	Yes	0.015	Cancer	Yes	NA	NA	2.9E-05	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Indeno[1,2,3-cd]pyrene	1.2	0.621	Yes	0.15	Cancer	Yes	NA	NA	8.0E-06	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Chromium	787	211	Yes	12000	Noncancer	No	599	Yes	NA	6.6E-03	No further evaluation.
Thallium	17.4	5.162	Yes	0.078	Noncancer	Yes	4.8	Yes	NA	2.2E+01	MDC exceeds RSL and background; the current noncancer hazard is above acceptable noncancer HI of 1; further evaluation performed, see Table 6-2.
Vanadium	630	78	Yes	39	Noncancer	Yes	560	Yes	NA	1.6E+00	MDC exceeds RSL and background; the current noncancer hazard is above acceptable noncancer HI of 1; further evaluation performed, see Table 6-2.
PCBs (total)	0.233	0.222	Yes	0.24	Cancer	No	NA	NA	9.7E-07	NA	No further evaluation.
Cyanide	88.1	10.8	Yes	2.1	Noncancer	Yes	NA	NA	NA	4.2E+00	MDC exceeds RSL; the current noncancer hazard is above acceptable noncancer HI of 1; further evaluation performed, see Table 6-2.
<b>COC - 4 additional COCs identified during 5-yr review</b>											
Aroclor 1254	0.19	0.222	No	0.11	Noncancer	Yes	NA	NA	NA	1.7E-01	MDC exceeds RSL; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Antimony	14.2	31	No	3.1	Noncancer	Yes	7	Yes	NA	4.6E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Mercury	2.5	23	No	2.3	Noncancer	Yes	1	Yes	NA	1.1E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Benzo[k]fluoranthene	3.4	6.22	No	1.5	Cancer	Yes	NA	NA	2.3E-06	NA	MDC still exceeds RSL; however, current risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
<b>Detected COPCs - 79 from RI</b>											
Aluminum	112000	76,142	Yes	7700	Noncancer	Yes	156000	No	NA	1.5E+00	MDC exceeds RSL but is within background; current noncancer hazard is above acceptable noncancer HI of 1; no further evaluation recommended because MDC is within background levels.
Antimony	14.2	31	No	3.1	Noncancer	Yes	7	Yes	NA	4.6E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Arsenic	20.5	0.39	Yes	0.67	Cancer	Yes	22	No	3.1E-05	NA	MDC exceeds RSL but is within background; current risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Barium	214	5,375	No	1500	Noncancer	No	293	No	NA	1.4E-02	No further evaluation.
Beryllium	1.2	154	No	16	Noncancer	No	6.9	No	NA	7.5E-03	No further evaluation.
Cadmium	0.7	37	No	7	Noncancer	No	2	No	NA	1.0E-02	No further evaluation.
Calcium	126000	NS	No	NA	NA	No	360,000	No	NA	NA	No further evaluation.

Detected Analyte	Maximum Detected Concentration (MDC) within LUC Area (mg/kg)	Original Residential ROD PRG (mg/kg)	Does MDC Exceed Original Residential PRG?	Current (May 2014) EPA Residential RSL, HI=0.1 (mg/kg)	Current Residential RSL Basis	Does MDC Exceed Current Residential RSL?	Background Concentration (mg/kg) (Metals only)	Does MDC Exceed Background?	Cancer Risk <sup>a</sup> Based on Current EPA RSL and MDC	Noncancer HI <sup>b</sup> Based on Current EPA RSL (HI=0.1) and MDC	Conclusions
Chromium <sup>d</sup>	787	211	Yes	12000	Noncancer	No	599	Yes	NA	6.6E-03	No further evaluation.
Cobalt	119	903	No	2.3	Noncancer	Yes	157	No	NA	5.2E+00	MDC exceeds RSL but is within background; current noncancer hazard is above acceptable noncancer HI of 1; no further evaluation recommended because MDC is within background levels.
Copper	183	3,129	No	310	Noncancer	No	235	No	NA	5.9E-02	No further evaluation.
Cyanide	88.1	10.8	Yes	2.1	Noncancer	Yes	NA	No	NA	4.2E+00	MDC exceeds RSL; the current noncancer hazard is above acceptable noncancer HI of 1; further evaluation recommended.
Iron	217500	23,463	Yes	5500	Noncancer	Yes	219,000	No	NA	4.0E+00	MDC exceeds RSL but is within background; current noncancer hazard is above acceptable noncancer HI of 1; no further evaluation recommended because MDC is within background levels.
Lead	296	400	No	400	NA	No	117	Yes	NA	NA	No further evaluation.
Magnesium	2200	NS	No	NA	NA	No	NA	No	NA	NA	No further evaluation.
Manganese	1810	1,762	Yes	180	Noncancer	Yes	7,040	No	NA	1.0E+00	MDC exceeds RSL but is within background; current noncancer hazard is equal to acceptable noncancer HI of 1; no further evaluation recommended.
Mercury <sup>e</sup>	2.5	23	No	2.3	Noncancer	Yes	1	Yes	NA	1.1E-01	MDC exceeds RSL and background; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Nickel	511	1,564	No	150	Noncancer	Yes	579	No	NA	3.4E-01	No further evaluation.
Potassium	1090	NS	No	NA	NA	No	NA	No	NA	NA	No further evaluation.
Selenium	11.1	391	No	39	Noncancer	No	11	Yes	NA	2.8E-02	No further evaluation.
Silver	1	391	No	39	Noncancer	No	3.1	No	NA	2.6E-03	No further evaluation.
Sodium	3040	NS	No	NA	NA	No	NA	No	NA	NA	No further evaluation.
Thallium	17.4	5.162	Yes	0.078	Noncancer	Yes	4.8	Yes	NA	2.2E+01	MDC exceeds RSL and background; current noncancer hazard is above acceptable noncancer HI of 1; further evaluation recommended.
Vanadium	630	78	Yes	39	Noncancer	Yes	560	Yes	NA	1.6E+00	MDC exceeds RSL and background; current noncancer hazard is above acceptable noncancer HI of 1; further evaluation recommended.
Zinc	361	23,463	No	2300	Noncancer	No	214	Yes	NA	1.6E-02	No further evaluation.
2-Butanone (MEK)	0.035	22,311	No	2700	Noncancer	No	NA	NA	NA	1.3E-06	No further evaluation.
Acetone	7.8	14,127	No	6100	Noncancer	No	NA	NA	NA	1.3E-04	No further evaluation.
Carbon disulfide	0.003	355	No	77	Noncancer	No	NA	NA	NA	3.9E-06	No further evaluation.
Dichloromethane	0.017	9.107	No	35	Noncancer	No	NA	NA	NA	4.9E-05	No further evaluation.
Ethylbenzene	0.002	395	No	5.8	Cancer	No	NA	NA	3.4E-10	NA	No further evaluation.
Xylene (total)	0.01	271	No	58	Noncancer	No	NA	NA	NA	1.7E-05	No further evaluation.
2-Methylnaphthalene	0.29	NA	No	23	Noncancer	No	NA	NA	NA	1.3E-03	No further evaluation.
Acenaphthene	0.42	3,682	No	350	Noncancer	No	NA	NA	NA	1.2E-04	No further evaluation.
Acenaphthylene <sup>f,g</sup>	0.38	NA	No	317	Noncancer	No	NA	NA	NA	1.2E-04	No further evaluation.
Anthracene	0.55	21,896	No	1700	Noncancer	No	NA	NA	NA	3.2E-05	No further evaluation.
Benzo[a]anthracene	4.4	0.621	Yes	0.15	Cancer	Yes	NA	NA	2.9E-05	NA	MDC still exceeds RSL; however, current risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Benzo[a]pyrene	3.9	0.062	Yes	0.015	Cancer	Yes	NA	NA	2.6E-04	NA	MDC still exceeds RSL; current residential risk is above acceptable cancer risk range of 1E-04 to 1E-06; further evaluation recommended.
Benzo[b]fluoranthene	9.5	0.621	Yes	0.15	Cancer	Yes	NA	NA	6.3E-05	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Benzo[g,h,i]perylene <sup>f,g</sup>	1.5	NA	No	459	Noncancer	No	NA	NA	NA	3.3E-04	No further evaluation.

Detected Analyte	Maximum Detected Concentration (MDC) within LUC Area (mg/kg)	Original Residential ROD PRG (mg/kg)	Does MDC Exceed Original Residential PRG?	Current (May 2014) EPA Residential RSL, HI=0.1 (mg/kg)	Current Residential RSL Basis	Does MDC Exceed Current Residential RSL?	Background Concentration (mg/kg) (Metals only)	Does MDC Exceed Background?	Cancer Risk <sup>a</sup> Based on Current EPA RSL and MDC	Noncancer HI <sup>b</sup> Based on Current EPA RSL (HI=0.1) and MDC	Conclusions
Benzo[k]fluoranthene	3.4	6.22	No	1.5	Cancer	Yes	NA	NA	2.3E-06	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Bis[2-ethylhexyl]phthalate	22	34.74	No	38	Cancer	No	NA	NA	5.8E-07	NA	No further evaluation.
Carbazole	0.5	24.32	No	NA	NA	No	NA	NA	NA	NA	No further evaluation.
Chrysene	7.2	62.15	No	15	Cancer	No	NA	NA	4.8E-07	NA	No further evaluation.
Dibenz[a,h]anthracene	0.43	0.062	Yes	0.015	Cancer	Yes	NA	NA	2.9E-05	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Dibenzofuran	0.34	145	No	7.2	Noncancer	No	NA	NA	NA	4.7E-03	No further evaluation.
Fluoranthene	14	2,294	No	230	Noncancer	No	NA	NA	NA	6.1E-03	No further evaluation.
Fluorene	0.56	2,747	No	230	Noncancer	No	NA	NA	NA	2.4E-04	No further evaluation.
Indeno[1,2,3-cd]pyrene	1.2	0.621	Yes	0.15	Cancer	Yes	NA	NA	8.0E-06	NA	MDC still exceeds RSL; however, current residential risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Naphthalene	1.2	55.92	No	3.8	Cancer	No	NA	NA	3.2E-07	NA	No further evaluation.
Phenanthrene <sup>f,g</sup>	1.5	NA	No	445	Noncancer	No	NA	NA	NA	3.4E-04	No further evaluation.
Pyrene	17	2,316	No	170	Noncancer	No	NA	NA	NA	1.0E-02	No further evaluation.
TPH-GRO <sup>f</sup>	34	100	No	500	Noncancer	No	NA	NA	NA	6.8E-03	No further evaluation.
TPH-DRO <sup>f</sup>	380	500	No	500	Noncancer	No	NA	NA	NA	7.6E-02	No further evaluation.
4,4'-DDD	0.068	2.437	No	2.2	Cancer	No	NA	NA	3.1E-08	NA	No further evaluation.
4,4'-DDE	0.093	1.72	No	1.6	Cancer	No	NA	NA	5.8E-08	NA	No further evaluation.
4,4'-DDT	0.058	1.72	No	1.9	Cancer	No	NA	NA	3.1E-08	NA	No further evaluation.
BHC (b))	0.068	0.316	No	0.3	Cancer	No	NA	NA	2.3E-07	NA	No further evaluation.
Chlordane (α)	0.014	1.624	No	1.8	Cancer	No	NA	NA	7.8E-09	NA	No further evaluation.
Dieldrin	0.012	0.03	No	0.033	Cancer	No	NA	NA	3.6E-07	NA	No further evaluation.
Endosulfan (α and b)	0.56	367	No	37	Noncancer	No	NA	NA	NA	1.5E-03	No further evaluation.
Endrin	0.06	18.33	No	1.8	Noncancer	No	NA	NA	NA	3.3E-03	No further evaluation.
Endrin aldehyde <sup>c</sup>	0.01	NA	No	1.8	Noncancer	No	NA	NA	NA	5.6E-04	No further evaluation.
Endrin ketone <sup>c</sup>	0.016	NA	No	1.8	Noncancer	No	NA	NA	NA	8.9E-04	No further evaluation.
Heptachlor epoxide	0.0073	0.053	No	0.059	Cancer	No	NA	NA	1.2E-07	NA	No further evaluation.
PCBs (total)	0.233	0.222	Yes	0.24	Cancer	No	NA	NA	9.7E-07	NA	No further evaluation.
Aroclor 1254	0.19	0.222	No	0.11	Noncancer	Yes	NA	NA	NA	1.7E-01	MDC exceeds RSL; current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Aroclor 1260	0.073	0.222	No	0.24	Cancer	No	NA	NA	3.0E-07	NA	No further evaluation.
2,4,5-T	0.017	611	No	62	Noncancer	No	NA	NA	NA	2.7E-05	No further evaluation.
2,4-DB	0.67	489	No	49	Noncancer	No	NA	NA	NA	1.4E-03	No further evaluation.
Dicamba	0.022	1,833	No	180	Noncancer	No	NA	NA	NA	1.2E-05	No further evaluation.
Dichloroprop	0.056	NA	No	NA	NA	No	NA	NA	NA	NA	No further evaluation.
Silvex (2,4,5-TP)	0.012	489	No	49	Noncancer	No	NA	NA	NA	2.4E-05	No further evaluation.
Monocrotophos	0.087	NA	No	NA	NA	No	NA	NA	NA	NA	No further evaluation.
Bromacil	0.16	NA	No	NA	NA	No	NA	NA	NA	NA	No further evaluation.
Carbofuran	0.9	306	No	31	Noncancer	No	NA	NA	NA	2.9E-03	No further evaluation.
Chlorpropham	1.1	12,220	No	1200	Noncancer	No	NA	NA	NA	9.2E-05	No further evaluation.
Diuron	0.15	122.2	No	12	Noncancer	No	NA	NA	NA	1.3E-03	No further evaluation.
Linuron	0.81	122.2	No	12	Noncancer	No	NA	NA	NA	6.8E-03	No further evaluation.

Detected Analyte	Maximum Detected Concentration (MDC) within LUC Area (mg/kg)	Original Residential ROD PRG (mg/kg)	Does MDC Exceed Original Residential PRG?	Current (May 2014) EPA Residential RSL, HI=0.1 (mg/kg)	Current Residential RSL Basis	Does MDC Exceed Current Residential RSL?	Background Concentration (mg/kg) (Metals only)	Does MDC Exceed Background?	Cancer Risk <sup>a</sup> Based on Current EPA RSL and MDC	Noncancer HI <sup>b</sup> Based on Current EPA RSL (HI=0.1) and MDC	Conclusions
Neburon	4	NA	No	NA	NA	No	NA	NA	NA	NA	No further evaluation.
Propoxur (Baygon)	0.21	244	No	25	Noncancer	No	NA	NA	NA	8.4E-04	No further evaluation.

Sources: MDCs and COC (DON 2009 [ROD OWLF]), Original PRGs (EPA 2004, residential and industrial), Current PRGs (EPA May 2014, 0.1, residential).

HI hazard index  
 MDC maximum detected concentration  
 NA not available

<sup>a</sup> Industrial cancer risk is derived using the following equation: (MDC/Current PRG) x (target risk level [1E-06]).  
<sup>b</sup> Industrial non-cancer HI is derived using the following equation: (MDC/Current PRG) x (target hazard quotient [1]).  
<sup>c</sup> Value listed is for Endrin.  
<sup>d</sup> Originally, chromium was evaluated using a total chromium screening value. Value listed is for chromium III soluble salts.  
<sup>e</sup> Mercury used mercuric chloride RSL.  
<sup>f</sup> Value listed is a DOH EAL for direct exposure, unretictrd land use scenario (DOH 2011; Table I-1).  
<sup>g</sup> Value listed under the Current (May 2014) EPA Residential RSL, HI=0.1.

**Table 6-2: Review of Human Health Toxicity Data Used in Risk Assessment, Industrial**

Detected Analyte	Maximum Detected Concentration (MDC) within LUC Area (mg/kg)	Original Industrial ROD PRG (mg/kg)	Does MDC Exceed Original Residential PRG?	Current (May 2014) EPA Industrial RSL, HI=0.1 (mg/kg)	Current Residential RSL Basis	Does MDC Exceed Current Industrial RSL?	Background Concentration (mg/kg) (Metals only)	Does MDC Exceed Background?	Cancer Risk <sup>a</sup> Based on Current EPA RSL and MDC	Noncancer HI <sup>b</sup> Based on Current EPA RSL (HI=0.1) and MDC	Conclusions
Benzo[a]pyrene	3.9	0.211	Yes	0.29	Cancer	Yes	NA	NA	1.3E-05	NA	MDC still exceeds RSL; however, current risk is within acceptable cancer risk range of 1E-04 to 1E-06; no further evaluation recommended.
Thallium	17.4	67	No	1.2	Noncancer	Yes	4.8	Yes	NA	1.5E+00	MDC exceeds RSL and background; the current noncancer hazard is above acceptable noncancer HI of 1; further evaluation recommended. See Report Table 6B, Changes in Toxicity and Other Contaminant Characteristics.
Vanadium	630	1022	No	580	Noncancer	Yes	560	Yes	NA	1.1E-01	MDC still exceeds RSL and background; however, current, noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.
Cyanide	88.1	35.4	Yes	13	Noncancer	Yes	NA	NA	NA	6.8E-01	MDC still exceeds RSL; however current noncancer hazard is below acceptable noncancer HI of 1; no further evaluation recommended.

Sources: MDCs and COC (DON 2009 [ROD OWLF]), Original PRGs (EPA 2004, residential and industrial), Current PRGs (EPA May 2014, 0.1, residential).

NA not available

<sup>a</sup> Industrial cancer risk is derived using the following equation: (MDC/Current PRG) x (target risk level [1E-06]).

<sup>b</sup> Industrial non-cancer HI is derived using the following equation: (MDC/Current PRG) x (target hazard quotient [1]).



**OLD WAHIAWA LANDFILL**

**QUESTION C: Does any other information call into question the protectiveness of the remedy?**

Element	Assessment
Overall	No other information has been identified that would call into question the protectiveness of the remedy.



## 7. Issues, Recommendations, and Follow-up Actions

Issues identified during the site inspection and interviews are listed in Table 7-1.

**Table 7-1: Issues and Recommendations**

Issue	Recommendations/Follow-up Actions	Party Responsible	Oversight Agency	Affects Protectiveness? (Yes/No)		Anticipated Date of Implementation
				Current	Future	
Trespassers continue to access the southern portion of the OWLF LUC area.	Three additional LUC warning signs will be placed around the area where trespassing was previously observed. The Navy intends to prepare an explanation of significant differences (ESD) as well as revise the RAWP to properly address the fact that trespassers are not at risk at the site.	Navy	EPA/DOH	Yes	Yes	No later than the subsequent LTM event
	Contact number for the Navy Environmental Office should be verified annually and updated as appropriate when LUC signs are replaced or installed.	Navy	EPA/DOH	No	No	As needed
If feral pig rooting were to occur within the OWLF LUC boundary, subsurface soil may become exposed.	Update the LTM Inspection list to include surface soil disturbances resulting from feral pig activities.	Navy	EPA/DOH	No	Yes	No later than the subsequent LTM event



## **8. Protectiveness Statement**

The remedy at the OWLF site is currently protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. The soil cover should be maintained to prevent future exposure.

No changes in land use are expected in the foreseeable future.



## 9. References

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**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

Five Transformer Sites

Old Incinerator Site

**Old Wahiawa Landfill**

**Attachment A: Five-Year Review Site Inspection Checklist**

(No Five-Year Review Site Inspection was performed. The 2014 Annual Site Inspection Checklist is included in this attachment.)



Site Inspection Compliance Certificate and Documentation  
Old Wahiawa Landfill  
Joint Base Pearl Harbor-Hickam, Wahiawa Annex  
Oahu, Hawaii

**Inspector Documentation**

Inspector:	Jon Mollison	Title:	Project Geologist
Firm:	ERRG Inc.	Address:	677 Ala Moana Blvd. Suite 308 Honolulu, HI 96813
Date:	10/30/14	Time:	09:00

Weather conditions at the time of inspection:

Overcast, mid to high 70°Fs

Locations inspected:

Walked site perimeter. Verify standing water locations, inspect three settlement monuments. Verify erosion areas have not expanded.

Maintenance Record Review Results:

Maintenance Crew Interviews:

Name:

Activities performed:

Inspection covers 01 January: 2014 to 31 December: 2014. Form shall be submitted by 01 April of the year following the reporting period.

Site Inspection Compliance Certificate and Documentation  
Old Wahiawa Landfill  
Joint Base Pearl Harbor-Hickam, Wahiawa Annex  
Oahu, Hawaii

**Access to the Site**

Deed covenants and other agreements between the United States Navy and its transferee authorize annual Navy site inspections. As an inspector on behalf of the Navy or subsequent property owner (if applicable), you should be allowed free access to this site.

*Were there any barriers present that prevented inspection of the entire site?*

If not, please check:  I had free access to the site.

If so, please explain.

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Please attach results of most recent groundwater monitoring.

Please attach additional notes if necessary.

Site Inspection Compliance Certificate and Documentation  
Old Wahiawa Landfill  
Joint Base Pearl Harbor-Hickam, Wahiawa Annex  
Oahu, Hawaii

**Condition of the Site**

The purpose of this inspection is to ensure that Land Use Controls (LUCs) are properly maintained at this site, known as the Old Wahiawa Landfill, Joint Base Pearl Harbor-Hickam, Wahiawa Annex, Oahu, Hawaii. LUCs are necessary to protect the cover, and because contamination within the OWLF is present within the landfill that makes the area unsuitable for unrestricted use. LUCs for this site are described in the *Land Use Control Work Plan, Old Wahiawa Landfill, Joint Base Pearl Harbor-Hickam, Wahiawa Annex, Oahu, Hawaii*, September 2011 (by AECOM Technical Services, Inc., Honolulu, HI, for the Department of the Navy, Naval Facilities Engineering Command, Hawaii, Pearl Harbor, HI). All persons conducting inspections should be familiar with this document and any subsequent revisions.

The following restrictions are placed on land use:

1. All future landowners and site users shall be notified that contaminated media are present within the landfill (not suitable for any reuse) and that the contained media and cover system shall not be disturbed and/or excavated.
2. The integrity and effectiveness of signage intended to restrict site access and the OWLF cover layer shall be inspected annually and maintained.
3. Only monitoring and maintenance crews that are properly trained for hazardous material operations shall be granted access to the OWLF to conduct the long-term monitoring and maintenance activities, implementing the requirements of (40 CFR §1910.120).
4. Annual LUC Compliance Certificates and five-year review reports shall include confirmation of the integrity of the OWLF signage and OWLF cover, and, if maintenance is required, a discussion of any actions required to reestablish and maintain the structures, as shown in Attachments A and B.
5. The development or use of any portion of the OWLF as residential housing, day care, school, playground, retail, commercial or industrial facilities shall be prohibited.
6. Any soil-disturbing land modifications (e.g., excavation clearing, regrading) within any portion of the OWLF that would compromise the integrity of the OWLF cover system, monitoring systems or control structures shall be prohibited without the prior approval of regulatory agencies.
7. If any soil, debris, or other waste is removed from within the OWLF, it shall be properly characterized, manifested, and transported by appropriately licensed transporters, and disposed of at an appropriate treatment, storage, and disposal (TSD) facility.
8. The Navy, its contractors, and regulatory agencies shall be allowed free and unhindered access to the OWLF for purposes of verifying and maintaining the integrity of the LUCs.

Site Inspection Compliance Certificate and Documentation  
Old Wahiawa Landfill  
Joint Base Pearl Harbor-Hickam, Wahiawa Annex  
Oahu, Hawaii

*Did you observe any indication of natural or manmade disturbance on or within any of the restricted areas?*

If not, please check: \_\_\_\_\_ I did not observe any condition indicating violations of LUCs.

If so, please explain.

Unable to locate all LUC boundary markers due to heavy vegetation around landfill boundary.

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*Do you suggest any additional or different LUCs to improve or correct any deficiencies?*

If not, please check:  I do not recommend additional or different LUCs.

If so, please explain.

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*Do you suggest termination of LUCs?*

If not, please check:  I do not recommend termination of LUCs.

If so, please explain.

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Site Inspection Compliance Certificate and Documentation  
 Old Wahiawa Landfill  
 Joint Base Pearl Harbor-Hickam, Wahiawa Annex  
 Oahu, Hawaii

**Certification Checklist**

Item	In Compliance	Non-Compliance	See Comment
Signage maintained.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parcel not being used for residential housing, day care, school playground, retail, commercial or industrial facilities.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No excavation and removal of soil, debris, or IDW from the site.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No construction of any structures at the site.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No signs of tampering or activity that would disturb or damage the OWLF cover.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No settlement, erosion or other damage to surface cover.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

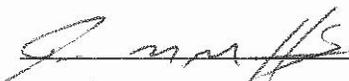
Please attach additional notes if necessary.

Please attach a copy of the site map with the approximate route walked and locations where photographs were taken clearly marked (including the direction of the photographs). Attach at least four color photographs of the site representing site conditions at the time of the inspection. In addition, clearly mark the following on the map:

- Any locations you could not inspect
- Locations of any observed disturbance(s) to the OWLF cover
- Locations of any maintenance item, including missing or damaged signage
- Any indication of habitation, or other land use not consistent with the LUCs

Site Inspection Compliance Certificate and Documentation  
Old Wahiawa Landfill  
Joint Base Pearl Harbor-Hickam, Wahiawa Annex  
Oahu, Hawaii

**Certification:** *I hereby certify that I am an authorized representative of the above-named property owner and that the above-described LUCs have been compiled for the period noted. I am familiar with the Site known as "OWLF," located at the Joint Base Pearl Harbor-Hickam, Wahiawa Annex, Oahu, Hawaii. I have personally conducted the above inspection and certify that the information accurately reflects my observations made during the inspection.*

Signed:   
Printed Name: JON M MORRISON  
Title: PROJECT GEOLOGIST  
Date: 10/30/14

Attachments (Check all included):

- Most recent groundwater and methane gas monitoring results
- Site Map
- Photographs
- Additional Notes

**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

Five Transformer Sites

Old Incinerator Site

**Old Wahiawa Landfill**

**Attachment B: Site Photographs**

(No Five-Year Review Site Inspection was performed. The 2013 Annual Site Inspection Photographs are included in this attachment.)





Photograph No. 1: Sign 1, looking south. Photographed by ERRG.



Photograph No. 2: Standing water present near Sign 6. Photo looking south.  
Photographed by ERRG.



Photograph No. 3: Settlement monument SM-1. Photo looking southwest.  
Photographed by ERRG.



Photograph No. 4: Example of surface debris present throughout the site, looking west.  
Photographed by ERRG.



Photograph No. 5: Evidence of trespassing within boundary (can left on branch near Sign 7), looking north. Photographed by ERRG.



**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

Five Transformer Sites

Old Incinerator Site

**Old Wahiawa Landfill**

**Attachment C: Interview Forms**



<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Old Wahiawa Landfill, JBPHH Wahiawa Annex <b>DOH Regulatory PM:</b> Maria Reyes		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <b>Date:</b>
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Maria Reyes	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> DOH-HEER
<b>Telephone No.:</b> 808-586-7576	<b>Street Address:</b> 919 Ala Moana Boulevard, Rm 206	
<b>Fax No.:</b> —	<b>City, State, Zip:</b> Honolulu, Hawaii 96814	
<b>E-Mail Address:</b> maria.reyes@doh.hawaii.gov		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>I have been familiar w/ the project site since 2009.</i></li> <li>2. What is your overall impression of the project? <i>A thorough investigation was conducted.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>The remedy is not functioning quite as expected. LUC is not deterring trespassers. Additional security measures are needed.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>There are no trends to show.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>There is vegetation clearance and annual site inspections.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>Signs of trespassing and littering were observed.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>I am not aware of any.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>There were signs of trespassing in the southern property boundary.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>Yes, in terms of needing more frequent vegetation clearance to improve visibility of LUC boundary markers.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>I have no additional comments.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Old Wahiawa Landfill, JBPHH Wahiawa Annex <b>EPA Regulatory PM:</b> Mark Ripperda		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> <b>Date:</b> 11/7/2014
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Mark Ripperda	<b>Title:</b> Regulatory Project Manager	<b>Organization:</b> U.S. EPA
<b>Telephone No.:</b> 415-972-3028	<b>Street Address:</b>	
<b>Fax No.:</b> —	<b>City, State, Zip:</b>	
<b>E-Mail Address:</b> Ripperda.Mark@epamail.epa.gov		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>Approximately 10 years.</i></li> <li>2. What is your overall impression of the project? <i>Good.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>Yes, the remedy is functioning as expected and is effective.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>No.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>The Navy performs annual LUC inspections.</i></li> <li>6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details. <i>Not that I'm aware of.</i></li> <li>7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details. <i>No.</i></li> <li>8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. <i>No.</i></li> <li>9. Have there been opportunities to optimize O&amp;M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. <i>No, the LUCs have been functioning well with the annual inspections. However, I would not want to decrease the frequency of the inspections to less than annual.</i></li> <li>10. Do you have any comments, suggestions, or recommendations regarding the project? <i>No.</i></li> </ol>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Old Wahiawa Landfill, JBPHH Wahiawa Annex <b>Navy RPM:</b> Robert Kaito		<b>EPA ID No.:</b> HI0170090054
<b>Subject:</b> Five-Year Review Information Survey		<b>Time:</b> 1313 <b>Date:</b> 11/10/2014
<b>Type:</b> <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Email		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b> N/A		
<b>Contact Made By:</b>		
<b>Name:</b> Robin Boyd	<b>Title:</b> Project Manager	<b>Organization:</b> AECOM <b>Street Address:</b> 1001 Bishop Street <b>City, State, Zip:</b> Honolulu, HI 96813
<b>Individual Contacted:</b>		
<b>Name:</b> Robert Kaito	<b>Title:</b> Navy Project Manager	<b>Organization:</b> Navy
<b>Telephone No.:</b> 808-471-1171 ext. 231	<b>Fax No.:</b> —	<b>Street Address:</b> 400 Marshall Road <b>City, State, Zip:</b> JBPHH, HI 96860-3139
<b>E-Mail Address:</b> robert.kaito@navy.mil		
<b>Summary of Conversation</b>		
<ol style="list-style-type: none"> <li>1. How long have you been familiar with the project site? <i>11 Years.</i></li> <li>2. What is your overall impression of the project? <i>Project actions taken to date have been appropriate to ensure protectiveness of human health &amp; environment. Annual monitoring conducted regularly without issues.</i></li> <li>3. Is the remedy functioning as expected? How well is the remedy performing? <i>Yes, remedy is functioning properly and effectively as a soil barrier.</i></li> <li>4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? <i>Annual topographic survey data reassures the Navy that the soil cover is not eroding, remains in place, and is functioning properly and effectively as intended. No trend has been observed that the soil cover is eroding. Analysis of previous contaminants of concern (COCs) or evaluation of the concentration levels is not necessary since COCs remain in the subsurface soil and no pathway is available to affect humans or the environment.</i></li> <li>5. Is there a continuous on-site O&amp;M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities, including LUC inspections. <i>Yes, on-base staff in charge of facilities and activities involving the project site and Land Use Controls (LUCs) are as follows: Assistant Public Work Officer (APWO), Facility Operations Specialist (FOS), and Environmental Coordinator (EC). Off-base staff includes the Remedial Project Manager, who is located at NAVFAC HI. All staff are in charge of ensuring protectiveness measures remain in place by monitoring daily activities on-base that involve or potentially involve the project site. All staff review all planned on-base construction activities. The review ensures that the project site does not impact any construction activities or LUCs and remains protective of human health and the environment. The Remedial Project Manager (RPM), plans, conducts, and oversees, field effort involving Long Term Monitoring (LTM) efforts at the project site. In accordance with the revised LUC Work Plan, annual inspections and maintenance are being conducted by NAVFAC HI with support from on-base staff.</i></li> </ol>		

### Summary of Conversation (cont'd)

6. Have there been unexpected costs or difficulties at the site in the last five years (or since the ROD was signed)? Please provide details.

*During the 2<sup>nd</sup> annual LTM event, it was discovered that the 1st annual LTM topographic survey inadvertently surveyed the top of survey settlement monument as a baseline indicator for settlement. Consequently, the 2<sup>nd</sup> annual LTM surveyed both top and bottom of each settlement monument and now serves as the baseline for tracking future settlement going forward. The 2<sup>nd</sup> annual LTM events did not indicate that erosion or settling is occurring at the project site. Follow-on annual LTM events including the topographic surveys, now survey the bottom of the settlement monuments and use the 2<sup>nd</sup> annual LTM topographic survey as the baseline.*

7. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

*The Navy is unaware of any concerns regarding this site and its operations.*

8. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

*Yes, during the 1<sup>st</sup> annual LTM event, site boundary markers appear to have been missing. Boundary markers were replaced and remain in place to date.*

9. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

*No sampling is necessary or appropriate at this site. Therefore, no optimization is necessary.*

10. Do you have any comments, suggestions, or recommendations regarding the project?

*No.*

**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

**Certification of Protectiveness**

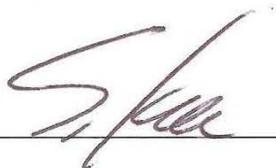


### **CERTIFICATION OF PROTECTIVENESS**

Based on the information provided in this Five-Year Review Report, the Department of the Navy certifies that the remedies previously selected in individual Record of Decisions for the following Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS PAC) National Priorities List (NPL) sites on Oahu, Hawaii remain protective of human health and the environment:

- Five Transformer Sites:
  - Building 3, Joint Base Pearl Harbor-Hickam (JBPHH) Wahiawa Annex
  - Building 106, JBPHH Wahiawa Annex
  - S-17, JBPHH Wahiawa Annex
  - Building 81, JBPHH Lualualei Annex
  - S-26, JBPHH Lualualei Annex
- Old Incinerator Site, JBPHH Wahiawa Annex
- Old Wahiawa Landfill, JBPHH Wahiawa Annex

I hereby approve the First Five-Year Comprehensive Environmental Response, Compensation, and Liability Act Review of Seven NCTAMS PAC NPL sites.



\_\_\_\_\_  
S. KEEVE  
Captain, U.S. Navy  
Commander, Joint Base Pearl Harbor-Hickam

02 FEB 2015  
\_\_\_\_\_  
Date



**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

**Response to Comments/Concurrence**



**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

**DOH**



NEIL ABERCROMBIE  
GOVERNOR OF HAWAII



LINDA ROSEN, M.D., M.P.H.  
DIRECTOR OF HEALTH

STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. Box 3378  
HONOLULU, HAWAII 96801-3378

In reply, please refer to:  
File:  
2014-598 MR

December 1, 2014

Ms. Janice Fukumoto  
Environmental Restoration  
Product Line Supervisor  
Department of the Navy  
Naval Facilities Engineering Command, Hawaii  
400 Marshall Road, Building X-11  
Pearl Harbor, Hawaii 96860

Facility/Site: **JBPHH, Lualualei and Wahiawa Annexes, Five Transformer Sites  
JBPHH, Wahiawa Annex, Old Incinerator Site  
JBPHH, Wahiawa Annex, Old Wahiawa Landfill**

Subject: **Concurrence with Draft First Five-Year CERCLA Review of Seven Naval  
Computer and Telecommunications Area Master Station Pacific National  
Priorities List Sites, Joint Base Pearl Harbor-Hickam Lualualei Annex and  
Wahiawa Annex, Oahu, Hawaii, NCTAMS PAC National Priorities List Site;  
dated November 2014**

Dear Ms. Fukumoto:

The Hawaii Department of Health, Hazard Evaluation and Emergency Response Office has reviewed the subject document and has no substantive comments at this time. Please finalize the document and submit a copy to our office at your convenience. Should new information concerning on-site contamination become available, the HEER Office will re-evaluate the site to determine if a response action is appropriate. Should you have any questions regarding this matter, you may contact me at (808) 586-7576. Thank you very much for your time and consideration in this matter.

Sincerely,

A handwritten signature in cursive script, appearing to read "Maria Eloisa Q. Reyes".

Maria Eloisa Q. Reyes, Ph.D.  
Remedial Project Manager  
Hazard Evaluation and Emergency Response Office



**Final First Five-Year CERCLA Review  
of Seven NCTAMS PAC NPL Sites,  
JBPHH, Lualualei Annex and Wahiawa Annex,  
Oahu, Hawaii**

**EPA**



Project Title: First Five-Year CERCLA Review of Seven Naval Computer and Telecommunications Area Master Station Pacific National Priorities List Sites  
 Joint Base Pearl Harbor-Hickam, Lualualei Annex and Wahiawa Annex, Oahu, Hawaii  
 Reviewer: Mark Ripperda, EPA Region 9  
 Date: December 2014

Item	Section No.	Comment
1	Executive Summary, Sites Reviewed	The document states that inspections were not conducted at OIS and OWL. If inspections were done at these sites as part of the site specific O&M, please state that those inspections were used for the Five Year Review.

Response:

In the executive summary, Sites Reviewed section, the second sentence of the second paragraph has been revised as follows:

“Five-year inspections were performed at the five transformer sites, however the fourth annual LUC inspections for the OIS and Old Wahiawa Landfill (OWLF) were substituted for the five-year review inspections. Interviews with relevant personnel have also been conducted as part of the five-year review process.”

The first sentence of Section 5.5, of both the OIS and OWLF reports, has been revised as follows:

“With approval from the Navy project manager, a five-year review inspection at the OIS (OWLF) was not conducted for this five-year review report. However, the findings from the fourth annual LUC inspection, completed on October 30, 2014, were used to evaluate the current condition of the site for this first five-year review report.”

2	Summary Table	There is a reference to Sign S-17 under the OWL. Is this the same as Transformer Site S-17?
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Response: This Sign S-17 reference is to sign number 17, of the 19 LUC warning signs posted at the OWLF.

3	Summary Table	The protectiveness statement says that trespassers must be restricted for the remedy to be protective in the long term. Similar to my comment below for Page 3-3, I suggest deleting the reference to trespassers.
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Response: The protectiveness statements included in the Summary Table for the OIS and OWLF, and Section 8 of the OIS and OWLF reports, have been revised as follows:

“The remedy at the OIS (OWLF) site is currently protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. The soil cover should be maintained to prevent future exposure.

No changes in land use are expected in the foreseeable future”

4	Section 1.7 and Executive Summary, Next Review	The ES says that Navy policy is for the next due date to be within 5 years of the completion of the current FYR. However, EPA policy is that it's never more than 5 years from the due date of the current FYR. This is to keep the time from slipping if any FYR is late. Please double check the Navy policy.
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Response: Section 1.7 has been revised as follows:

“The next five-year review for the seven NCTAMS PAC NPL sites is required to be completed and signed out within five years from the signature date of the current five-year review report. The date will be finalized upon completion of this five-year review.”

5	Page 3-3, Section 3.4	The first bullet says that trespassers or indications of trespassing at the sites would be out of compliance. Trespassing would still be low occupancy and thus not out of compliance with the remedy. It is good practice to not have trespassers and that should be part of the annual inspection, but I would remove it from the Five Year Review. I also suggest removing trespassing from the other numerous locations in the document. Calling it out implies that the remedy is not protective, when in fact it is.
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Project Title: First Five-Year CERCLA Review of Seven Naval Computer and Telecommunications Area Master Station Pacific National Priorities List Sites  
 Joint Base Pearl Harbor-Hickam, Lualualei Annex and Wahiawa Annex, Oahu, Hawaii  
 Reviewer: Mark Ripperda, EPA Region 9  
 Date: December 2014

Item	Section No.	Comment
<p>Response: The first bullet in Section 3.4 in the Five Transformers report has been removed as requested.</p> <p>In the OWLF report: Section 6, Question A, Early Indicators of Potential Remedy Failure, has been revised as follows:</p> <p>“The remedy is functioning as intended. No damage to the landfill cover has been observed.”</p> <p>In the Summary Table, OWLF section, and Table 7-1 of the OWLF report, the second issue has been revised as follows:</p> <p>“LUC boundary markers are difficult to see.”</p> <p>The Protectiveness Statements for OIS and OWLF in the Summary Table and Section 8 of the OIS and OWLF reports, have been revised as follows:</p> <p>“The remedy at the OIS (OWLF) site is currently protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. The soil cover should be maintained to prevent future exposure.</p> <p>No changes in land use are expected in the foreseeable future”</p>		
6	Page A-3, Section V.C	Edit the sentence: “Annual LUC inspections.”
<p>Response: The Five-Year Review Site Inspection Checklists in Attachment A of the Five Transformer Sites have been revised as requested.</p>		

Project Title: First Five-Year CERCLA Review of Seven Naval Computer and Telecommunications Area Master Station Pacific National Priorities List Sites  
 Joint Base Pearl Harbor-Hickam, Lualualei Annex and Wahiawa Annex, Oahu, Hawaii  
 Reviewer: Larry Bradfish, EPA Region 9  
 Date: December 2014

Item	Section No.	Comment
1	General	Overall, the report looks good with plenty of detail. It appears to follow the EPA guidance on preparing a 5 year review. This one is actually 3 separate reports combined as one. The Navy appears to be implementing the ICs and they seem to support a protectiveness determination, although the trespassing issue at the OWLF seems problematic, and possibly raises protectiveness concerns.

Response: Comment acknowledged. The trespassing issue as it relates to both the OWLF and OIS ROD Land Use Control element of "Site Access Control" throughout each ROD is not supported by the risk evaluation established for these sites (see response regarding risk in RTC 2.b. Due to this unsupported restriction, Navy will be proposing an "Explanation of Significant Differences" to address this element. Both sites remain protective of human health and the environment based on the implementation of the remaining ROD IC elements.

1	Subsequent Comment	Why is the Navy proposing an ESD related to trespassing in response 1? Subsequent responses explain that trespassing is within acceptable risk exposures.
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Response: While the risk is acceptable, the Navy is concerned that in the future someone looking at just the ROD and RAWP will be misled into thinking that there is risk to the trespasser, when that receptor is not actually at risk. To eliminate this potential problem, the Navy believes the ESD would be the simplest solution.

2	Executive Summary	<ul style="list-style-type: none"> <li>a. Table ES-1 -- Selected remedy for OWLF should include long term monitoring and maintenance (see p. 3--1, sec. 3.2 of the OWLF 5-year review report).</li> <li>b. Summary Table -- General question applicable here and in the following reports-- Why does the Navy need until Oct. 2015 to Spring 2016 to replace signs and boundary markers? This is especially of concern for OWLF which states in the report that maintenance will occur within 30 days of the Navy knowing about a problem (OWLF at page 3-2).</li> <li>c. Acronyms at p. xv -- Looks like typo -- "fNAVFAC" instead of "NAVFAC"</li> <li>d. Introduction -- p. 1-i -- include FFA and date?</li> </ul>
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Response:

- a. Table ES-1, OWLF, Selected Remedy, has been revised as follows: "Long-term monitoring and maintenance and LUCs".
- b. Regarding maintenance to occur within 30 days, Sections 2, 3.2.3, and 3.2.7 of the OIS and OWLF LUC WPs, clarifies that the Navy is required to initiate responses within 30 days of activities found to be inconsistent with the IC objectives. To clarify this requirement, the third paragraph of the OIS and OWLF Section 3.4 in the five-year review report has been revised, and this revised language has been added as follows:

"If activities are found to be inconsistent with the institutional control (IC) objectives or use restrictions, if maintenance is required, or any other activity is identified that may interfere with the effectiveness of the ICs, the Navy will initiate response activities as soon as practicable, but in no case will the process be initiated later than 30 days after the Navy becomes aware of activities inconsistent with IC objectives or use restrictions. The risk evaluation for the site determined that the risk to a child woodland trespasser at the site was acceptable. Although the risk evaluation determined that the subsurface soils did not pose an unacceptable risk to any receptors, the final remedy considered that the subsurface was too heterogeneous to characterize. The final remedy of LUCs included the element of site access control to prevent land modifications, vegetation clearing, regrading, excavation, landscaping, and construction of structures. The issue of trespassers at the site would only be a concern if there were disturbances to the subsurface soils, which has not been observed. Inspections which identify missing or faded signs are addressed by budgeting and contracting for the replacements."

Recommendations for the OIS and OWLF site have been revised, including the following (please see Attachment A for revised Executive Summary Table):

- Because none of the issues identified in the Summary Table and Table 7-1 in the OIS and OWLF sections are causing trespasser exposure to site contamination, the anticipated dates of implementation have been revised to correct the language as follows:
  1. OWLF Site, Additional signs: "No later than the subsequent LTM event."
  2. OIS Site, Damaged perimeter fence: "No later than the subsequent LTM event."

Project Title: First Five-Year CERCLA Review of Seven Naval Computer and Telecommunications Area Master Station Pacific National Priorities List Sites  
 Joint Base Pearl Harbor-Hickam, Lualualei Annex and Wahiawa Annex, Oahu, Hawaii  
 Reviewer: Larry Bradfish, EPA Region 9  
 Date: December 2014

Item	Section No.	Comment
		<ul style="list-style-type: none"> <li>References to boundary markers in the Summary Table, and Sections 3.2, 5.4.1, and Table 7-1 in the OIS and OWLF sections of the five-year review report have been removed, as maintenance of boundary markers is not a component of the final remedies.</li> </ul> <p>c. Acronym page xv, “fNAVFAC” has been revised to “NAFVAC”.</p> <p>d. Page I.1, Section I., second paragraph, has been revised as follows:                      “NCTAMS PAC is identified on the NPL as United States Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Information System Number HI0170090054. NCTAMS PAC was listed on the NPL on May 31, 1994. In 2009, the EPA, State of Hawaii, and the Navy entered into a Federal Facilities Agreement (FFA) for NCTAMS PAC (EPA, State of Hawaii, and DON 2009). The NCTAMS PAC FFA specifies the CERCLA environmental response procedural requirements that will be implemented at the NCTAMS PAC NPL site. The Navy served as the lead agency for the investigations conducted at NCTAMS PAC. Throughout these investigations, oversight and additional support were provided by the EPA and the State of Hawaii Department of Health (DOH). The general location of the seven sites is shown on Figure I-1.”</p>
2	Subsequent Comment	<p>The timeline of issues and actions in Response 2 is hard to follow. I don't understand how the sentence "Subsequent inspections ..." fits in with the timeline. Please edit that first paragraph to clarify if there are currently identified missing or non-readable signs. The following action item bullets are good and easy to follow, so make as much of this response as possible into bullets of what is known, what has been done, and what needs to be done and when.</p> <p>Lastly, would it make sense to change the terminology from trespasser to site visitor or something else? Since the sites are on an active base with restricted access to the base, the only "trespassers" are probably navy personnel. Trespasser seems like a loaded term and one that implies local community members camping out.</p>

Response: Response to 2b has been revised, see above.

Trespassers is the appropriate terminology for these sites, as the trespassers are believed to be hunters and no evidence of camping has been observed at the sites.

3	Five Transformers	<p>a. Page 1-2 -- Event 1998-2000 -- Concrete cleaning standard for PCBs on concrete seems to be incorrect. They have 1 ppm when it should be 10 micrograms per 100 cm<sup>2</sup> for surfaces of concrete (high occupancy). The previous sentence discusses power washing concrete surfaces. See also page 2-4. There is some confusion in these passages as to whether they are talking about bulk concrete debris or existing concrete surfaces that still remain onsite.</p> <p>b. Page 1-3 -- Event 2001 -- Define "RSE" before using it in this text.</p>
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Response:

- Page 1-2 – Event 1998-2000: During the 1998-2000 NTCRA, concrete wipe samples were collected from existing structures. Results from Bldg. 106 and S-17 were compared to a low-occupancy cleanup concentration of 10 µg/100 cm<sup>2</sup> and results from S-26 were compared to a high-occupancy cleanup concentration of 1 µg/100 cm<sup>2</sup>. The discussions on pages 1-2 and 2-4 have been revised accordingly.
- Page 1-3 –Event 2001: The first instance of “RSE” in the text has been revised to define “RSE” as meaning “Removal Site Evaluation”.

Project Title: First Five-Year CERCLA Review of Seven Naval Computer and Telecommunications Area Master Station Pacific National Priorities List Sites  
 Joint Base Pearl Harbor-Hickam, Lualualei Annex and Wahiawa Annex, Oahu, Hawaii  
 Reviewer: Larry Bradfish, EPA Region 9  
 Date: December 2014

Item	Section No.	Comment
4	Old Incinerator	<p>a. Attachment B -- Face page says no 5-year inspection but there appears to have been some type of inspection carried out in Oct. 2014 by Jon Mollison of ERRG at this site. Face page also states the photos in the attachment came from a 2013 inspection -- date stamps on all of the photos say 2010, not 2013. Where are the 2014 photos from the Mollison inspection? Same comment for OWLF attachments.</p> <p>b. Page 5-4 -- Report states that EPA RPM suggests considering reducing the frequency of Site inspections. This statement misstates RPM Ripperda's comments in the interview, page C-2, which says: "I would not want to decrease the frequency of the inspections to less than annual." This same misstatement is repeated in in the OWLF Report at page 5-4- See RPM Ripperda's statement on Page C-2 of that report.</p>

Response:

- a. The fourth annual LUC inspections for the OIS and OWLF were completed in October 2014. The evaluation of protectiveness by this five-year review is based on all of the inspections and reports completed prior to November 2014. In the executive summary, Sites Reviewed section, the second sentence of the second paragraph has been revised as follows:
- “This five-year review is based on all inspections/evaluations/reports conducted at the site prior to November 2014. Five-year review inspections were performed at the five transformer sites. The fourth annual LUC inspections for the OIS and Old Wahiawa Landfill (OWLF) were completed in October 2014 and were used in the evaluation for the five-year review inspections. Interviews with relevant personnel have also been conducted as part of the five-year review process.”
- The first sentence of Section 5.5, of both the OIS and OWLF reports, has been revised as follows:
- “This five-year review is based on all inspections/evaluations/reports conducted at the site prior to November 2014. Five-year review inspections were performed at the five transformer sites. The fourth annual LUC inspections for the OIS and Old Wahiawa Landfill (OWLF) were completed in October 2014 and were used to evaluate the current condition of the site for this first five-year review report.”
- Photographs used for Attachment B of the five-year review report were reproduced from the 2013 LUC inspection report photograph appendices. Navy-approved photographs of the OIS and OWLF, taken during the 2014 Annual LUC inspections, will be added to Attachment B of the OIS and OWLF sections of the five-year review report.
- b. The second paragraph of Section 5.6 of both the OIS and OWLF has been revised as follows to eliminate the reference to reducing the frequency of inspections:
- “The remedial project manager and Regulatory Project Managers indicated that the remedy for the OIS (OWLF) is functioning well.”

5	Old Wahiawa Landfill	<p>a. Trespassers seem to be of concern at this site. DOH indicated in the interview notes that this is a problem. The Navy's proposed solution is to add more signs. Given that the trespassers appear to be stealing, moving or destroying boundary markers, putting more signs up would seem to be a largely ineffective solution to this problem--especially if they wait until late 2015 or later to put up signs. The Navy should consider fencing the property to keep trespassers out to avoid dumping of litter, sign and marker destruction and to prevent trespasser from being exposed to contaminants on the site. The Navy claims in its report to remedy problems within 30 days of becoming aware of them (see page. 3-2), but the trespassing issue has gone on for several years without an effective solution.</p> <p>b. Page 5-4 -- see comments above in the OIS comments about misstatements by the Navy concerning the EPA RPM's comments.</p> <p>c. General comment -- the remedy is often referred to as long term monitoring without mentioning long term maintenance, which is also part of the remedy. See Sec. 3.2.</p>
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Project Title: First Five-Year CERCLA Review of Seven Naval Computer and Telecommunications Area Master Station Pacific National Priorities List Sites  
 Joint Base Pearl Harbor-Hickam, Lualualei Annex and Wahiawa Annex, Oahu, Hawaii  
 Reviewer: Larry Bradfish, EPA Region 9  
 Date: December 2014

Item	Section No.	Comment
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Response:

- a. Risk assessment indicates that trespassers are not a concern at the OWLF because the risk from surface soil at the site was found to be acceptable for a child woodland trespasser. Therefore the presence of trespassers by itself does not impact the protectiveness of the remedy. Although the risk evaluation determined that the subsurface soils were acceptable risk in all exposure scenarios, the final remedy considered that the subsurface soil was too heterogeneous to characterize. The final remedy of LUCs included the element of site access control to prevent land modifications, vegetation clearing, regrading, excavation, landscaping and construction of structures. The issue of trespassers at the site would only be a concern if there were disturbances to the subsurface soils, which has not been observed. Fencing the area is not a practical remedy due to the heavy vegetation in the area.

At the OIS, there is minimal evidence of trespassers accessing the site. Text has been added to the last paragraph of Section 5.4.1 as follows:

Because the majority of the OIS is fenced, the surface debris noted in the annual monitoring reports and attributed to recent dumping activities will be evaluated in subsequent annual inspections for evidence of changes or new debris to determine if the surface debris is a result of trespassers. If no changes are noted, it can be inferred that trespassing at the OIS is effectively being prevented.” The first recommendation column of the executive summary table and Table 7-1 of the OIS section of the five-year review report (additional signs) has been removed.

Additionally, three new LUC warning signs will be posted in the area of the OWLF identified in the annual monitoring reports as areas where evidence of trespassing was observed. During future annual inspections, this action will be evaluated to determine if evidence of trespassers has been reduced in response to the additional signage. The first recommendation column of the executive summary table and Table 7-1 of the OWLF section of the five-year review report has been revised as follows: “Three additional LUC warning signs will be placed around the area where trespassing was previously observed.” The anticipated date of completion will be “no later than subsequent LTM event” (See Attachment A).

The Navy proposes to clarify the challenge of previous documents making an issue of trespassers by clearly stating in the five-year review report where the risk is located and that the mere presence of trespassers does not negatively impact the protectiveness of the remedy. Text has been revised in Section 2.5 of both the OIS and OWLF sections of the five-year review report to clarify that there is no human health risk or hazard to trespassers from exposure to surface soil.

A new second sentence has been added to the third paragraph of Section 2.5 of the OIS section of the five-year review report as follows: “human health risks/hazards from surface soil exposure at the OIS were found to be below the target points of departure for all exposure scenarios considered when background is eliminated. Although the trespasser scenario was not specifically evaluated, the residential scenario was and is considered protective of the trespasser as the residential exposure scenario is more sensitive. The incremental lifetime cancer risk for the resident under the RME scenario is  $4 \times 10^{-7}$ . The non-cancer hazard for the resident did not exceed the target HI of 1. Therefore, there is no health risk/hazard for the trespasser from exposure to surface soil at the OIS site.”

A new second sentence has been added to the second paragraph of Section 2.5 of the OWLF section of the five-year review report as follows: “Human health risks/hazards from surface soil exposure at the OWLF were found to be within the acceptable risk range for the child woodland trespasser exposure scenario. The incremental lifetime cancer risk for the child woodland trespasser under the RME scenario is  $2 \times 10^{-6}$ . The non-cancer hazard for the child woodland trespasser did not exceed the target HI of 1. Therefore, there is no health risk/hazard for the trespasser from exposure to surface soil at the OWLF site.”

A new second sentence has been added to the second paragraph of Section 3.2 of the OIS section of the five-year review report as follows: “Because the site risk is confined to the subsurface soil, the remedy remains protective for exposure to surface soil at the OIS site.”

Project Title: First Five-Year CERCLA Review of Seven Naval Computer and Telecommunications Area Master Station Pacific National Priorities List Sites  
 Joint Base Pearl Harbor-Hickam, Lualualei Annex and Wahiawa Annex, Oahu, Hawaii  
 Reviewer: Larry Bradfish, EPA Region 9  
 Date: December 2014

Item	Section No.	Comment
		<p>A new third sentence has been added to the second paragraph of Section 3.2 of the OWLF section of the five-year review report as follows: "Because the site risk is not an issue for the trespasser, the remedy remains protective for exposure to surface soil at the OWLF site."</p> <p>The Navy is also considering making revisions to the LUC work plan regarding the trespasser issue.</p> <p>b. Section 5.6 of both OIS and OWLF has been revised as follows:                      "The remedial project manager and Regulatory Project Managers indicated that the remedy for the OIS (OWLF) is functioning well."</p> <p>c. OWLF report, Section 3.4, first sentence has been revised as follows: "Long-term monitoring and maintenance of the OWLF...."</p> <p>OWLF report, Section 5.4, second sentence has been revised as follows: "The LTMM program was implemented to monitor landfill conditions and to ensure the remedy remains protective of human health and the environment."</p> <p>OWLF report, Section 6, Question A, Remedial Action Performance, first sentence, has been revised as follows: "The final remedy implemented at the OWLF is LUCs and includes long-term monitoring and maintenance."</p> <p>OWLF report, Section 6, Question B, Changes in Toxicity and Other Contaminant Characteristics, third sentence, has been revised as follows: "The Navy has selected LUCs and long-term monitoring and maintenance as the final remedy."</p>



**Attachment A**  
**Executive Summary Table**



**Summary of Five-Year CERCLA Review of Seven NCTAMS PAC NPL Sites**

Issues	Recommendations and Follow-up Actions	Anticipated Date of Implementation	Protectiveness Statement
<b>Five Transformer Sites</b>			
The S-17 LUC area is located in an open field and is difficult to find among the tall grass and shrubs.	Permanent signage, posts, or similar landmark should be installed to make the LUC area more visible for future annual and five-year review site inspections.	Spring 2016	The remedy at the Five Transformer Sites, a NCTAMS PAC NPL site on Oahu, Hawaii, is protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. No changes in land use are expected in the foreseeable future.
<b>Old Incinerator Site</b>			
Trespassers may access the site as evidenced by discarded waste items found at the site.	Contact number for the Navy Environmental Office should be verified annually and updated as appropriate when LUC signs are replaced or installed.	As needed	The remedy at the OIS is currently protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. The soil cover should be maintained to prevent future exposure. No changes in land use are expected in the foreseeable future.
Damaged perimeter fence near Sign S-9.	Replace damaged fence near Sign S-9.	No later than the subsequent LTM event	
If feral pig rooting were to occur within the OIS LUC boundary, subsurface soil may become exposed.	Update the LTM Inspection list to include surface soil disturbances resulting from feral pig activities.	Prior to 5th Annual Site Inspection	
<b>Old Wahiawa Landfill</b>			
Trespassers continue to access the southern portion of the OWLF LUC area.	Three additional LUC warning signs will be placed around the area where trespassing was previously observed.	No later than the subsequent LTM event	The remedy at the OWLF site is currently protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. The soil cover should be maintained to prevent future exposure. No changes in land use are expected in the foreseeable future.
	Contact number for the Navy Environmental Office should be verified annually and updated as appropriate when LUC signs are replaced or installed.	As needed	
If feral pig rooting were to occur within the OWLF LUC boundary, subsurface soil may become exposed.	Update the LTM Inspection list to include surface soil disturbances resulting from feral pig activities.	Prior to 5th Annual Site Inspection	

IC institutional control  
LTM long-term monitoring  
OWLF Old Wahiawa Landfill

