Record of Decision, Three Transformer Sites (TD-10, K-14, W-4/W-5)

PEARL HARBOR NAVAL COMPLEX, OAHU, HAWAII

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Comprehensive Long-Term Environmental Action Navy
Contract Number N62742-03-D-1837, CTO HC04

CONTENTS

ACRONYMS AND ABBREVIATIONS

§	Section
µg/100 cm^2	microgram per 100 square centimeters
AM	action memorandum
AR	Administrative Record
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
bcy	bank cubic yard
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm^2	square centimeter
CSM	conceptual site model
cy	cubic yard
DoD	Department of Defense
DON	Department of the Navy
DOH	Department of Health, State of Hawaii
ECC	Environmental Chemical Corporation
EE/CA	engineering evaluation/cost analysis
EPA	Environmental Protection Agency, United States
FFA	Federal Facilities Agreement
GSA	geographic study area
IAS	initial assessment study
IMF	Intermediate Maintenance Facility
lcy	loose cubic yard
LUC	land use control
mg/kg	milligram per kilogram
NAS	Naval Air Station
NAVFAC Pacific	Naval Facilities Engineering Command, Pacific
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NCTAMS PAC	Naval Computer and Telecommunications Area Master Station Pacific
NEESA	Naval Energy and Environmental Support Activity
NPL	National Priorities List
NRTF	Naval Radio Transmitting Facility
NTCRA	non-time-critical removal action
PCB	polychlorinated biphenyl
PHNC	Pearl Harbor Naval Complex
ppm	parts per million
PWC	Public Works Center
RAB	Restoration Advisory Board
RAWP	remedial action work plan
RI	remedial investigation
ROD	record of decision
RVR	remediation verification report
SAL	soil action level
SARA	Superfund Amendments and Reauthorization Act
SI	site inspection
SSE	site summary evaluation

TBC	to-be-considered
TSCA	Toxic Substances Control Act
U.S.C.	United States Code
WP	work plan

1. Declaration

1.1 SITE NAME AND LOCATION

This record of decision (ROD) has been prepared for three transformer sites at Pearl Harbor Naval Complex (PHNC) located on Oahu, Hawaii. For administrative and management purposes, PHNC has been subdivided into 18 geographical study areas (GSA). Three of the PHNC GSAs are discussed in this ROD: Ford Island, Halawa-Main Gate and the Waipio Peninsula (see Figure 1). The subject transformer sites within each GSA are listed below.

- Ford Island: TD-10
- Halawa-Main Gate: K-14
- Waipio Peninsula: W-4/W-5

The United States (U.S.) Navy completed Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) non-time-critical removal actions (NTCRA) at these three transformer sites. PHNC is currently on the National Priorities List (NPL) maintained by the U.S. Environmental Protection Agency (EPA) (Comprehensive Environmental Response, Compensation, and Liability Information System Identification Number HI4170090076) and was listed on the NPL on 14 October 1992.

1.2 STATEMENT OF BASIS AND PURPOSE

This ROD presents the selected final remedy for the three transformer sites at PHNC, which was chosen in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Information supporting the decisions leading to the selected final remedy is contained in the Administrative Record (AR) files for these sites. The Navy and EPA, with concurrence by the State of Hawaii Department of Health (DOH), select land use controls (LUC) as the final remedy for these three transformer sites. Concurrence with this selected final remedy is indicated by the signatures in Section 1.1.

This ROD incorporates elements of a streamlined remedial action completion report, as described in the *Department of Defense (DoD)/EPA Joint Guidance on Streamlined Closeout and NPL Deletion Process* (DoD 2006) and Department of the Navy (DON) *Guidance to Documenting Milestones throughout the Site Closeout Process* (DON 2006a).

1.3 ASSESSMENT OF SITE

The selected final remedy in this ROD 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 these three transformer sites at PHNC.

1.4 DESCRIPTION OF THE SELECTED REMEDY

The Navy and EPA, with concurrence from the DOH, have selected LUCs as the final remedy for the three transformer sites located at PHNC. The final response action described in this document was developed in accordance with CERCLA and includes LUCs that will provide protection of human health and the environment at these three sites. The elements of the selected final remedy include the following:

- Administering LUCs to restrict land use to low-occupancy use only, and to ensure long-term viability of the final remedy. The elements of the selected remedy are detailed in a Remedial Action Work Plan (RAWP) for implementation of LUCs as the remedy for these sites.

This decision is based on the following:

- CERCLA NTCRAs were previously conducted at transformer sites TD-10 K-14 and W-4/W-5, consisting of excavation and on-island thermal desorption treatment of polychlorinated biphenyls (PCB)-contaminated soil and concrete. The implemented NTCRAs are consistent with the objectives of the final remedy presented in the proposed plan (DON 2006b) and thus are incorporated in the final remedy selected for the three transformer sites documented in this ROD.
- The action memorandum (AM) documented the Navy's decision to undertake NTCRAs if PCB concentrations in soil or concrete exceeded the Toxic Substances Control Act (TSCA) high-occupancy cleanup level (≤1 milligram per kilogram [mg/kg] for soil and ≤10 micrograms per 100 square centimeters [≤10 µg/100 cm^2] for concrete) found at Title 40 Code of Federal Regulations (CFR) Section (§) 761.61(a)(4) and the DOH Tier 1 soil action level (SAL) (1 mg/kg) for unrestricted use (DOH 2005) after confirmation sampling. The TSCA high-occupancy cleanup level (≤1 mg/kg) is an "applicable or relevant and appropriate requirement" (ARAR), and the DOH Tier 1 SAL (1 mg/kg) is a "to-be-considered" (TBC) criterion for the response actions completed at these sites. The AM did not evaluate the implementation of LUCs as a remedy alternative; however, LUCs were evaluated in the proposed plan (DON 2006b) for these three transformer sites.
- Post-excavation confirmation sampling results after the NTCRAs show that PCBs at some of the sites remain in the soil and concrete above TSCA high-occupancy cleanup levels and the DOH Tier 1 SAL that allow for unrestricted use of the three transformer sites.

Table 1 lists the land use access requirements under TSCA as related to the remaining concentrations of PCBs in contaminated media.

Table 1: TSCA Land Use Access Requirements for PCBs

PCB Concentration	Medium	Cap Required?	LUCs Required?	Occupancy Status
≤ 1 ppm	Bulk Waste	No	No	High
> 1ppm and ≤ 10 ppm	Bulk Waste	Yes	Yes, to maintain cap	High
> 1 ppm and ≤ 25 ppm	Bulk Waste	No	Yes, to restrict occupancy	Low
> 25 ppm and ≤ 50 ppm	Bulk Waste	No	Yes, to restrict occupancy	None (Fenced and Signed)
> 25 ppm and ≤ 100 ppm	Bulk Waste	Yes	Yes, to maintain cap and restrict occupancy	Low
PCB Concentration	Medium	Cap Required?	LUCs Required?	Occupancy Status
≤ 10 µg/100 cm^2	Non-porous Surface	N/A	No	High
< 100 µg/100 cm^2	Non-porous Surface	N/A	Yes, to restrict occupancy	Low
> 10 µg/100 cm^2	Porous Surface	N/A	Yes, to maintain surface coating	See requirements at 40 CFR § 761.30(p)
≤ 10 µg/100 cm^2	Porous Surface	N/A	Yes	High

§ section
µg microgram
cm^2 square centimeter
N/A not applicable
ppm part per million

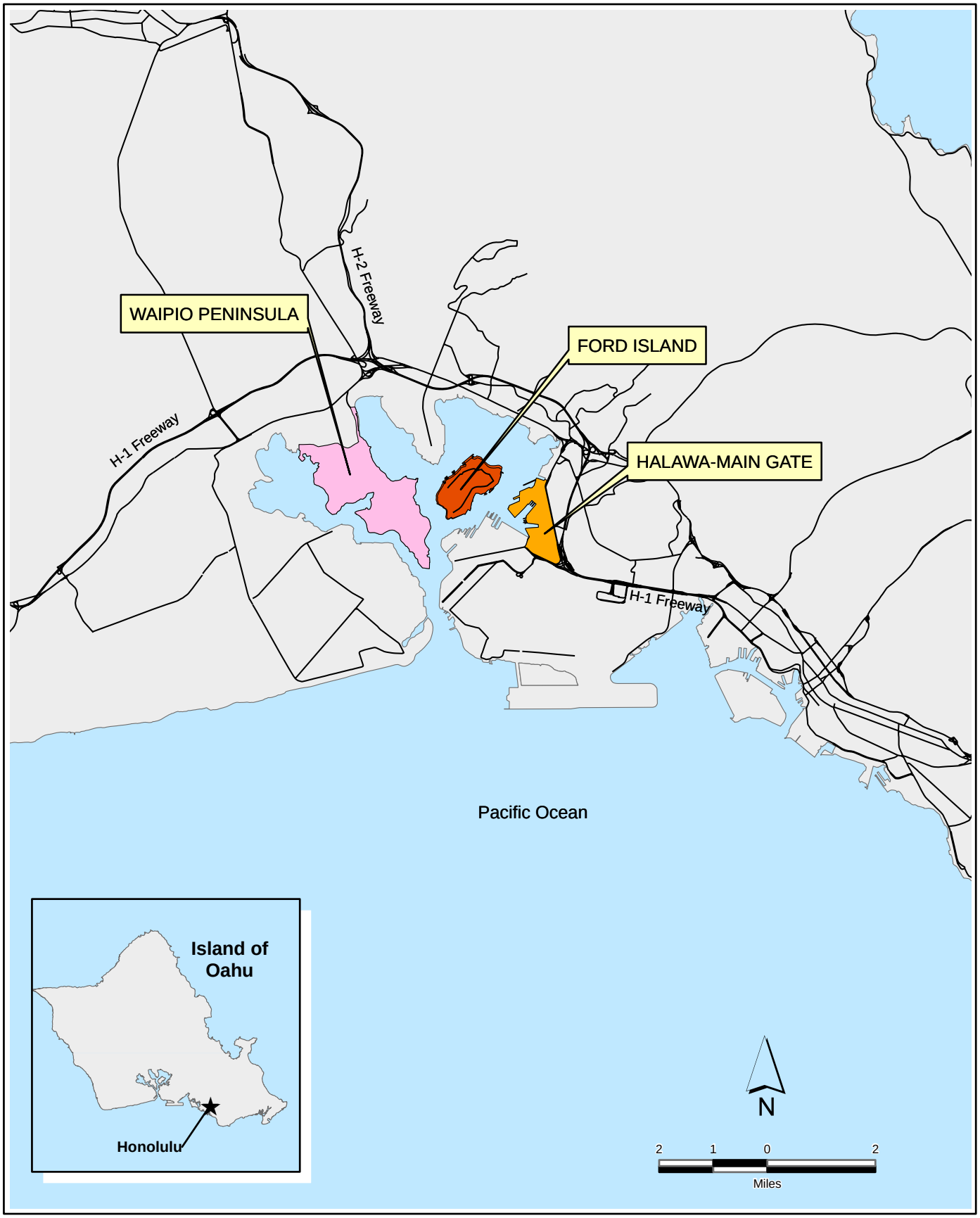

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Figure 1
Facility Location Map
Pearl Harbor Naval Complex GSAs
PHNC, Oahu, Hawaii

LUCs being implemented as the final remedy at these three transformer sites are to restrict current and future land use to activities compatible with low-occupancy use and to ensure long-term viability of the final remedy. Under TSCA, remediation sites fall into two categories: low-occupancy areas and high-occupancy areas. In terms of frequency of occupation, a low-occupancy area limits occupancy for any individual who is not wearing dermal and respiratory protection to less than 335 hours per calendar year for porous surfaces. Both soil and concrete are considered porous surfaces; thus, access would be restricted to approximately 6.7 hours per week or less under the low-occupancy scenario. Examples of a low-occupancy area could include an electrical substation where a worker spends small amounts of time per week (such as an unoccupied area outside a building, an electrical equipment vault, or in the non-office space in a warehouse where occupancy is transitory). High occupancy means areas where occupancy for any individual not wearing dermal and respiratory protection exceeds the time limits specified for low occupancy. Examples of a high-occupancy area could include: a residence, school, day care center, sleeping quarters, a single or multiple occupancy 40 hours per week work station, a school classroom, a cafeteria in an industrial facility, a control room, or a work station at an assembly line.

LUCs for these sites will remain in effect until a ROD addendum or other documentation is prepared based on intent to change land use. The Department of Defense and the State of Hawaii have agreed that a Uniform Environmental Covenants Act is not required until property transfer; however, the Navy will prepare an overall Land Use Control Implementation Plan identifying all LUC remedies at these sites. A RAWP will be prepared to document how the LUC component of the final remedy will be implemented. The final selected remedy is described in Section 2.12.

This decision is supported by documents in the AR file for PHNC. The Restoration Advisory Board (RAB), composed of representatives of the DOH, EPA, Navy, and the community, provided review and comment leading to the selection of this decision.

1.5 STATUTORY DETERMINATIONS

The Navy is the lead agency for environmental cleanup at Pearl Harbor pursuant to Executive Order 12580, which authorizes the Navy to conduct CERCLA response actions such as removal of PCB-contaminated soil and concrete at PHNC in accordance with CERCLA § 120, 42 United States Code (U.S.C.) § 9620. Pursuant to 10 U.S.C. § 2705 and § 11.4 of the PHNC Federal Facilities Agreement (FFA), EPA and DOH are afforded an opportunity for timely review and comment before the Navy undertakes a removal action. In addition, CERCLA § 120 provides for joint selection of remedial actions by the Navy and EPA. DOH has also provided oversight during environmental investigations and cleanup on PHNC.

The Navy and EPA jointly have concluded that LUCs are the final remedy necessary to ensure protection of human health at TD-10 (located at Ford Island), K-14 (located at Halawa-Main Gate), and W-4/W-5 (located at Waipio Peninsula). The selected final remedy for these three transformer sites is protective of human health and the environment, complies with federal requirements that are applicable or relevant and appropriate, is cost effective, and uses to the maximum extent practicable permanent and alternative technologies.

This decision was reached because residual PCB concentrations in soil and concrete at these sites exceed the TSCA high-occupancy action level ($\leq$1 mg/kg for soil and $\leq$10 µg/100 cm^2 for concrete) and the DOH Tier 1 SAL (1 mg/kg) for unrestricted use (DOH 2005). In an effort to achieve the TSCA cleanup levels, concrete was cleaned (power-washing or solvent extraction) at transformer site TD-10. Per TSCA, cleanup of concrete was verified by comparing results for bulk concrete samples with the TSCA action level of $\leq$1 mg/kg. The TSCA high-occupancy action level ($\leq$1 mg/kg) is an ARAR, and the DOH Tier 1 SAL (1 mg/kg) is a TBC criterion for the response action completed at

these sites. The removal and treatment of contaminated soil and concrete has already been completed at these sites. Through the NTCRAs at the three 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. For sites where the residual levels exceed the TSCA requirements for low-occupancy use (≤25 parts per million [ppm]), a clean, backfilled soil cap and vegetation or concrete encapsulation (double-painting with epoxy encapsulant at site TD-10 only) was placed over the remaining PCB contamination, or the site is enclosed with a fence and signage is in place (W-4/W-5 only). Table 1 provides detailed information on the specific TSCA requirements. The NTCRAs are consistent with cleanup objectives to provide a permanent cost-effective remedy for contaminated soils and concrete. Furthermore, they permanently and significantly reduce the mobility of hazardous wastes, thereby reducing the risk to human health and the environment. The NTCRAs and treatment satisfy the statutory preference for treatment as a principal element of the remedy.

This final remedy allows hazardous substances, pollutants, or contaminants to remain on site at concentrations above levels that allow for unlimited use and unrestricted exposure. As a result, a statutory review will be conducted every five years after initiation of the selected final remedy, as required under CERCLA § 121(c), 42 U.S.C. § 9621(c) and the NCP [40 CFR § 300.430(f)(4)(ii)]. The Five-Year Reviews will be performed to ensure that the LUCs remain protective of human health and the environment.

1.6 DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD (Section 2). Additional information can be found in the AR file for these three transformer sites.

- Summary of soil and concrete sampling results where cleanup levels were not achieved (Section 2.5.5)
- Current and reasonably anticipated future land use assumptions used in the ROD (Section 2.6)
- Potential land use that will be available at the site as a result of the selected final remedy (Section 2.6.2)
- Summary of site risks (Section 2.7)
- How source materials constituting principal threat are addressed (Section 2.11)
- Key factors that led to selecting the final remedy (Section 2.12.1)
- Estimated cost for annual inspections and maintenance (if necessary) and 5-year reviews, and the total number of years over which the remedy cost estimates are projected (Section 2.12.4)

1.7 AUTHORIZING SIGNATURES

The Navy and EPA, with concurrence from DOH, have concluded that LUCs are protective of human health and the environment. These LUCs will be put in place at transformer site TD-10 located at Ford Island; K-14, located at Halawa-Main Gate and W-4/W-5, located at Waipio Peninsula. In accordance with CERCLA requirements, Five-Year Reviews will be necessary to ensure that the selected final remedy remains protective of human health and the environment.

8/23/10

Aaron Y. Poentis
Regional Environmental Program Manager

Date

By direction of
Commander, Navy Region Hawaii

9/4/10

Michael Montgomery
Assistant Director, Federal Facility and Site Cleanup Branch
Superfund Division, U.S. Environmental Protection Agency, Region 9

Date

The State of Hawaii DOH concurs with the selected remedy as documented in the ROD.

9-23-10

Keith Kawaoka, D. Env.
Program Manager
Hazard Evaluation and Emergency Response Office
State of Hawaii, Department of Health

Date

2. Decision Summary

2.1 SITE NAME, LOCATION, AND DESCRIPTION

PHNC encompasses 12,600 acres of land and water on the southern shore of the island of Oahu, Hawaii. PHNC has been subdivided into 18 GSAs, three of which are discussed in this ROD: Ford Island, Halawa-Main Gate, and the Waipio Peninsula.

Ford Island is a 450-acre island surrounded by water, located within Pearl Harbor. One transformer site is located in this GSA (see Figure 2):

- **TD-10:** An inactive transformer located near the intersection of Yorktown Boulevard and Wasp Boulevard, at Building S181. The site encompasses the transformer's surrounding concrete slab.

Halawa-Main Gate encompasses the region west of the shoreline of Pearl Harbor to Kamehameha Highway. One transformer site is located in this GSA (see Figure 3):

- **K-14:** An active transformer in Building S485, located south of Kuahua Avenue and adjacent to Building 445. This site includes a building and surrounding asphalt and gravel.

Waipio Peninsula separates the Middle and West Lochs of Pearl Harbor. One transformer site is located in this GSA (see Figure 4):

- **W-4/W-5:** Located off of Waipio Point Access Road, active transformers W-4 and W-5 are collocated and considered a single site. The site includes an outdoor concrete pad (surrounded by a chain-link fence) and surrounding soil and gravel, with a concrete sidewalk on one side.

Previous investigations identified a potential for the three 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. The Navy served as the lead agency for all of the aforementioned investigations conducted at the PHNC. Throughout these investigations, additional support was provided by the EPA and DOH. Navy Environmental Restoration funds provided the monies used to conduct the cleanup and removal actions at the three PHNC transformer sites.

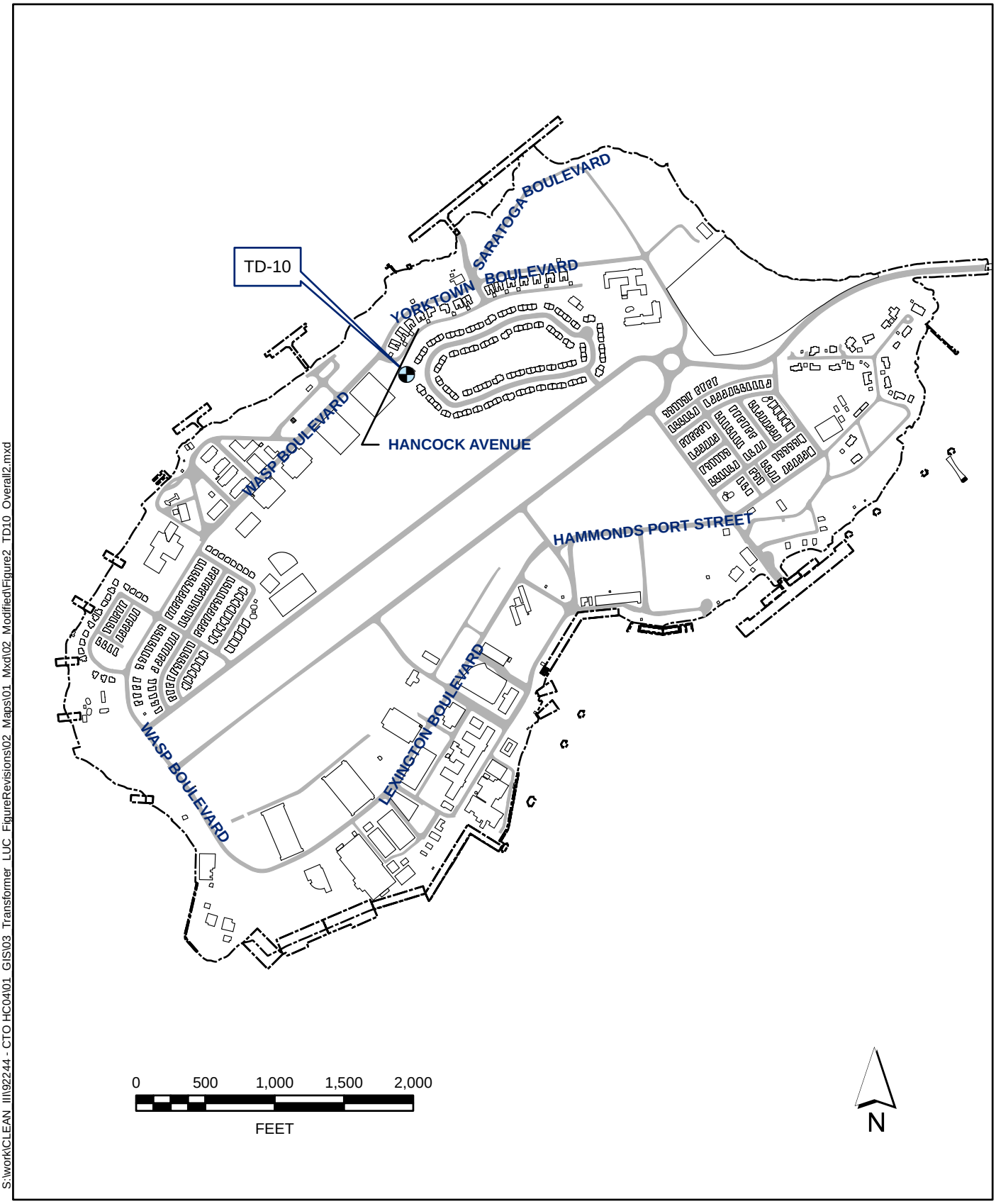


Figure 2
Transformer Site Location Map
Ford Island GSA
PHNC, Oahu, Hawaii

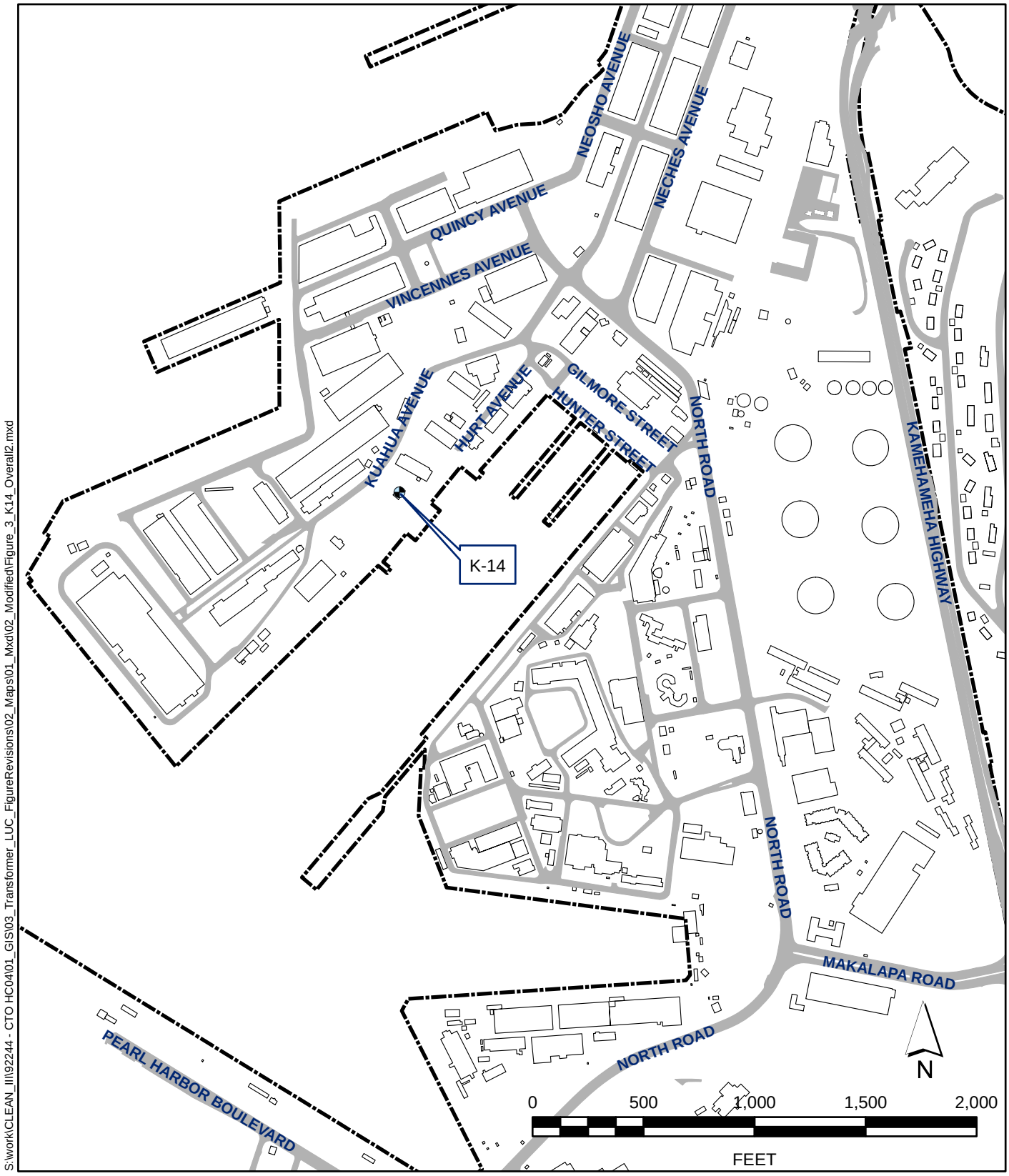


Figure 3
Transformer Site Location Map
Halawa-Main Gate GSA
PHNC, Oahu, Hawaii

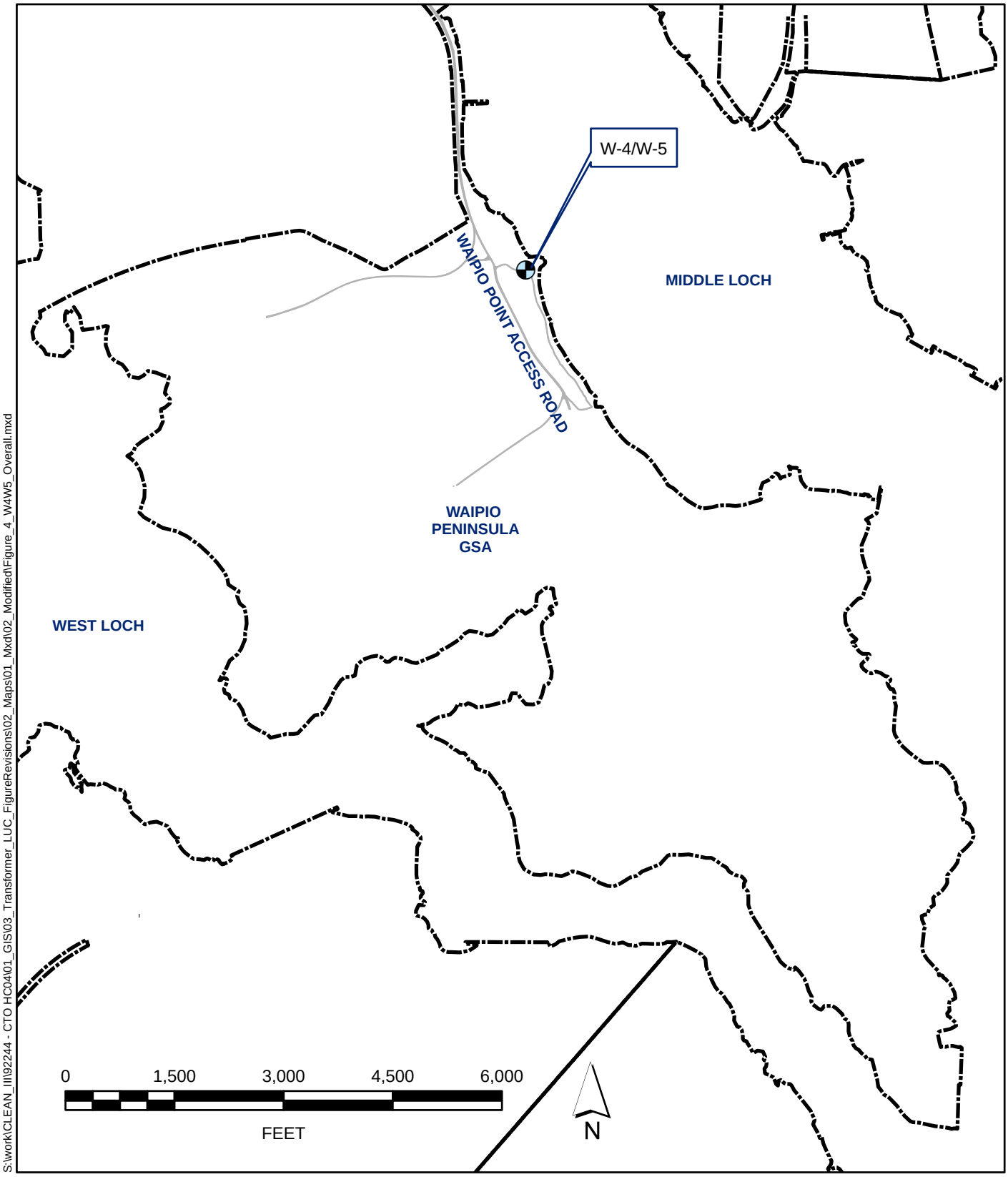


Figure 4
Transformer Site Location Map
Waipio Peninsula
PHNC, Oahu, Hawaii

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

Available historical records at PHNC indicate PCBs were present in the dielectric fluid used in many of the former and existing transformers at the three GSAs. The PCB-containing fluids may have been released to concrete surfaces or surface soil by leaking directly from the transformers or during regular testing and maintenance. Transformer maintenance included periodic sampling to test the dielectric properties of the transformer fluid. Once testing was completed, the fluid was reportedly poured onto the adjacent area, such as grass, concrete pads, or along building walls. All of the active transformers at PHNC have been replaced or retrofilled with non-PCB-containing dielectric fluid.

2.2.1 Site History

Table 2 provides a summary of all of the previous investigations completed at PHNC and includes which of the three transformer sites were included in each investigation or activity. Additional information on the final actions completed for the three transformer sites at PHNC is provided below:

Remediation Verification Report (RVR). After the NTCRAs were completed, RVRs were prepared to document the NTCRAs activities and verification sampling results for transformer sites. Sixty-three transformer sites achieved the cleanup level of ≤1 mg/kg for soil at these transformer sites (ECC 2007), as established in the AM (DON 2002) and in accordance with the TSCA high-occupancy action level (≤1 mg/kg for soil and ≤10 µg/100 cm^2 for concrete) and the DOH Tier 1 SAL (1 mg/kg) and are safe for future unrestricted land use.

However, LUCs are necessary for protection of human health and the environment for 12 transformer sites, where cleanup levels were not met after contaminated soil was excavated, and concrete was encapsulated. Of the 12 transformer sites, 3 are located at PHNC and are discussed in this ROD. These RVRs were ultimately included in a consolidated RVR prepared to document the removal and treatment activities at all sites included in the treatment system (Earth Tech 2008a). The remaining 9 transformer sites presented in the consolidated RVR (Earth Tech 2008a) are addressed in other RODs. At PHNC, 6 transformer sites (transformer sites D-02, TF-06, TF-08, TF-10, TG-04, and M-14) previously identified as LUC sites now require further evaluation.

Proposed Plan. In June 2006, a proposed plan was prepared to present the recommended final remedy for 70 individual transformer sites from two installations on Oahu. The proposed plan identified a response action, consisting of removal and treatment of contaminated soil and concrete, for 54 of the 70 sites (DON 2006b). The Navy and EPA selected no further action in a 2007 ROD for 52 of the 54 of the transformer sites initially proposed for no further action in the proposed plan. Of the transformer sites previously identified in the proposed plan as no further action sites, 2 now require further evaluation.

The proposed plan identified a response action consisting of removal and treatment of soil and concrete along with the implementation of LUCs to address human health risks as the proposed final remedy for 8 transformer sites, including 3 transformer sites at PHNC (TD-10 located at Ford Island, K-14, located at Halawa-Main Gate and W-4/W-5, located at Waipio Peninsula) and 5 transformer sites at Naval Computer and Telecommunications Area Master Station Pacific (NCTAMS PAC) (DON 2006b). The 5 transformer sites located at NCTAMS PAC that require LUCs are addressed in a separate ROD for NCTAMS PAC. Lastly, 8 transformer sites (Transformers D-02, TF-06, TF-08, TF-10, TG-04, and M-14 located at PHNC; and Transformer Buildings 121 and 242 located at NCTAMS PAC) previously identified in the proposed plan as LUC sites now require further evaluation.

Table 2: Previous Investigations at PHNC

Activity Initiated (Report Issue Date)	Action/Report Title	Primary Focus	PHNC LUC ROD Transformer Sites			Summary of Previous Investigations
			TD-10	K-14	WR/W-5	
1983 (NEESA 1983)	Initial Assessment Study (IAS) of Pearl Harbor Naval Base, Oahu, Hawaii	Inspections of sites with past hazardous waste storage operations				An IAS was conducted by NEESA in 1983 at 30 potentially contaminated sites at PHNC. The assessment of sites was based on past hazardous waste storage operations and disposal practices. The study concluded that three sites warrant further investigation to assess potential long-term impacts to human health or the environment. Sampling was not included in the IAS (NEESA 1983).
1991 (ERC 1991)	Final Site Inspection (SI) Report for PCB Transformer Stations, Oahu, Hawaii	Site inspection of 20 transformer locations and identification of sites needing further evaluation	X			An SI was conducted at PHNC in December 1990 to inspect 20 transformer locations. The SI identified PCB-contaminated soil at seven transformer locations that required further evaluation (ERC Environmental and Energy Services Company 1991). PWC later investigated two additional transformer locations in 1991 as part of a separate SI (PWC 1991). Of the nine transformer sites identified in the SIs for further evaluation, only one transformer sites (TD-10) is discussed in this ROD.
1991 (PWC 1991)	Final SI Report for PCB Transformer Stations, Oahu, Hawaii	Site inspection of two additional transformer locations by PWC in 1991				
1996 (Ogden 1996)	Engineering Evaluation/Cost Analysis (EE/CA), Pearl Harbor Naval Complex Transformer Sites, Pearl Harbor, Hawaii	Evaluation of the available alternatives to address the PCB contaminated soils located at multiple transformer locations	X			In 1996, an EE/CA (Ogden Environmental and Energy Services Co, Inc. 1996) was prepared for various transformer substations at PHNC. The EE/CA recommended excavation of PCB-contaminated soil at transformer site TD-10.
2000 (ECC 2007)	Non-time Critical Removal Action (NTCRA)	Excavate and stockpile contaminated soil for future treatment	X			A NTCRA was conducted for transformer site TD-10 from November 2000 to September 2001. A total of 203 cy of PCB-containing soil was excavated from the site. The excavated soil was stockpiled at former NAS Barbers Point until it could be transported to the thermal desorption unit for treatment in 2003 and 2004. Post-excavation confirmation sampling results following the NTCRAs show that PCBs 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. The excavated areas were later backfilled with treated soil from the treatment system that met the 1 mg/kg cleanup level, compacted, and restored (such as landscaping, concrete and asphalt paving) (Earth Tech 2006a; Environmental Chemical Corporation [ECC] 2007).
2000 (Earth Tech 2000)	EE/CA, Treatment/Disposal Alternatives for Contaminated Soil, NCTAMS PAC, Former NAS Barbers Point, and Pearl Harbor Naval Complex, Oahu, Hawaii	Evaluation of treatment alternatives for the proposed consolidated contaminated soil from multiple transformer sites located at multiple naval facilities	X			In 2000, the Navy, in consultation with the EPA and the DOH, determined that soil from multiple transformer sites from multiple naval facilities across Oahu could be consolidated for treatment and this action could be considered an onsite action. Based on this decision, an evaluation of treatment alternatives was conducted within a treatment EE/CA prepared in September 2000 (Earth Tech 2000) for the combined sites. The EE/CA recommended consolidating soils from three facilities (former NAS Barbers Point, PHNC, and NCTAMS PAC) and treating the soil with thermal desorption. Prior to implementation of the treatment process, soil that was already excavated was stockpiled either at former NAS Barbers Point or NRTF Lualualei. Once the treatment process began, these stockpiles were to be transported to the treatment unit located at former NAS Barbers Point.
2000 (DON 2000)	Action Memorandum (AM), Treatment of Contaminated Media from Multiple Naval Facilities, Oahu, Hawaii	Documentation from the Navy to approve the removal action at multiple transformer sites	X			An AM (DON 2000) documented the Navy's decision to undertake removal actions at transformer site TD-10. 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.

Activity Initiated (Report Issue Date)	Action/Report Title	Primary Focus	PHNC LUC ROD Transformer Sites			Summary of Previous Investigations
			TD-10	K-14	WR/W-5	
2001 (Earth Tech 2001b)	SI Report, Various Transformer Sites, Oahu, Hawaii	Site inspection for PCB contamination at transformer sites at the Halawa-Main Gate GSA and Waipio Peninsula GSA		X	X	In 2001, a SI report, field sampling plan, quality assurance project plan, and health and safety plan were prepared for transformer sites located at Halawa-Main Gate GSA and Waipio Peninsula GSA. The plans included inspection and environmental sampling guidelines that were used to evaluate the presence or absence of PCB contamination. Transformer sites K-14 and W-4/W-5 were identified for further evaluation (Earth Tech 2001b).
2001 (Earth Tech 2003a)	SI Report, Various Transformer Sites, Oahu, Hawaii	Site inspection for PCB contamination at transformer sites at the Halawa-Main Gate GSA		X		An SI of transformer sites was conducted between November and December 2001 at Halawa-Main Gate GSA. Biased field sampling was conducted to assess the presence or absence of PCBs at each transformer site. Sampling results were used to classify each site for further evaluation or for "no further action." Transformer site K-14 was again identified for further evaluation (Earth Tech 2003a).
2002 (DON 2002)	AM Addendum for Excavation and Treatment of Contaminated Media from Multiple Naval Facilities, Oahu, Hawaii	Documentation from the Navy on the approved procedures for the excavation, treatment, and final placement of contaminated media at sites not covered in the 2000 Action Memorandum				In 2002, an AM addendum (DON 2002) documented procedures for the excavation, treatment, and final placement of PCB-contaminated soil and concrete from transformer sites not originally considered in the 2000 AM (DON 2000) or any of the previous AMs or EE/CAs prepared for former NAS Barbers Point, PHNC, and NCTAMS PAC. The AM addendum also proposed site selection criteria for new sites that will 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 the reference action memoranda (DON 2000). While this AM addendum presented the general criteria for the inclusion of a site in the removal action, site-specific information for those sites was to 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 met the selection criteria.
2003 (DON 2003)	AM Attachment II for Excavation and Treatment of Contaminated Media from Multiple Naval Facilities, Oahu, Hawaii	Documentation from the Navy recommending that new transformer sites undergo removal action		X	X	In March 2003, a "plug-in" attachment to the AM addendum was prepared recommending that additional sites, including K-14 at Halawa-Main Gate and W-4/W-5 at Waipio Peninsula, 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 (DON 2003).
2003 (Earth Tech 2003b)	Removal Action Design Support and Confirmation Sampling	Preliminary sampling to support design efforts for proposed removal action		X	X	From 2002 to 2004, preliminary sampling was conducted to support the design efforts for the removal action at various transformer locations including transformer sites K-14 and W-4/W-5. Pre-excavation sampling was conducted to define the lateral and vertical extent of PCB contamination in soils exceeding the cleanup level (1 mg/kg) prior to soil excavation and treatment at former NAS Barbers Point (Earth Tech 2001c, 2003b).
2003 (Earth Tech 2006a and ECC 2007)	Non-time critical removal actions	Additional removal of PCB-contaminated soil	X	X	X	Additional NTCRAs were conducted for transformer site TD-10 from February 2002 to January 2003 and at transformer sites K-14 and W-4/W-5 from January 2004 to July 2004. A total of 78 cy of PCB-containing soil was excavated from these sites. The soil from the transformer sites was transported directly to the thermal desorption unit for treatment. Post-excavation confirmation sampling results after the NTCRAs show that PCBs remain in the soil or concrete at concentrations above TSCA high occupancy cleanup levels and the DOH Tier 1 SAL that allows for unrestricted use at these three transformer sites. The excavated areas were then backfilled with treated soil from the treatment system that met the 1 mg/kg cleanup level, compacted, and restored (such as landscaping, concrete and asphalt paving) (Earth Tech 2006a, ECC 2007).

cy cubic yard
NAS Naval Air Station
NEESA Naval Energy and Environmental Support Activity
NRTF Naval Radio Transmitting Facility
PWC Public Works Center

2.2.2 Enforcement Activities

No enforcement activities have been conducted at the three transformer sites at PHNC, Oahu, Hawaii.

2.3 COMMUNITY PARTICIPATION

Public participation in the response action selection process and during the environmental activities at the three transformer sites at PHNC has been continuously encouraged. In an effort to involve the public in the decision-making process for environmental activities at the three transformer sites, a RAB for Pearl Harbor was established in 1998. The RAB is composed of representatives of DOH, EPA, the Navy, and the community. The Navy has held periodic, public RAB meetings, issued fact sheets, and established official contacts for the public at Naval Facilities Engineering Command, Hawaii.

EE/CAs were prepared in 1998 and 2000 (Earth Tech 1998, 2000) and recommended the removal of PCB-contaminated soil and concrete from various transformer sites at Navy installations on Oahu, and consolidation of the material for on-island treatment using indirect thermal desorption treatment to reduce contaminant concentrations. Before they became final, draft EE/CAs were made available to the community for comment during a 30-day public review period. A notice of the availability of the EE/CAs was published in the *Honolulu Advertiser* and *Star-Bulletin* on 26 September 1997 and 2 July 2000, respectively.

A proposed plan (DON 2006b), identifying a response action consisting of removal and treatment of soil and concrete, and implementation of LUCs as the Navy's recommended alternative for the three transformer sites at PHNC, was released to the public on 25 June 2006. Public meetings to present and discuss the proposed plan were held on 20 July, 24 July, and 25 July 2006. A 30-day comment period for the proposed plan was held from 27 June to 26 July 2006. No written or verbal comments were received during the comment period or public meetings.

Project documents — including work plans, technical reports, fact sheets, and other materials relating to PHNC investigations — can be found in the information repositories for PHNC at the following locations:

Ewa Beach Public and School Library
91-950 North Road
Ewa Beach, Hawaii 96706
Reference Desk Telephone: (808) 689-1204

Pearl City Public Library
1138 Waimano Home Road
Pearl City, Hawaii 96782
Telephone: (808) 453-6566

Aiea Public Library
99-143 Moanalua Road
Aiea, HI 96701
Telephone: (808) 483-7333

Hamilton Library at the University of Hawaii at Manoa
Gifts and Exchange Section
2550 McCarthy Mall
Honolulu, HI 96822
Telephone: (808) 956-8264

Additional project information is included in the administrative record file located at Naval Facilities Engineering Command, Pacific (NAVFAC Pacific) in Pearl Harbor:

Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Attn: NAVFAC Pacific EV4
Pearl Harbor, Hawaii 96860-3134

2.4 SCOPE AND ROLE OF THE RESPONSE ACTION

The three transformer sites discussed in this ROD are located in three GSAs at PHNC. These GSAs were created for both administrative and management purposes to subgroup these sites. Removal actions were necessary at these three transformer sites to protect human health and the environment from PCBs in soil and concrete. NTCRAs and treatment of PCB-contaminated soil and concrete have already been completed at these sites; however, some residual PCB contamination remains in place under clean backfilled material (K-14 and W-4/W-5) or encapsulated in concrete (double-painted with epoxy encapsulant at site TD-10). The area where PCB contamination remains in soil at W-4/W-5 is located within a fenced area. LUCs were the selected final remedy for these sites and are necessary to restrict the sites to low-occupancy use only.

PHNC is listed on the NPL, which identifies priorities among known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The Navy, EPA, and DOH, through an FFA, have agreed to the following:

- Ensure that environmental impacts associated with past and present activities are thoroughly investigated and appropriate remedial actions taken, as necessary, to protect public health, welfare, and the environment.
- Establish a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions in accordance with CERCLA, SARA, the NCP, Superfund guidance and policy, Resource Conservation and Recovery Act guidance and policy, and applicable State of Hawaii law.
- Facilitate cooperation, exchange of information, and participation of the Navy, EPA, and DOH.
- Ensure adequate assessment of potential injury to natural resources necessary to ensure the implementation of response actions appropriate for achieving suitable cleanup levels.

The cleanup activities and implementation of LUCs at these three transformer sites are designed to fulfill the objectives of the FFA for PHNC. In accordance with the FFA, LUCs are appropriate for sites where current or potential unacceptable risk to human health or the environment exists. The Navy and EPA have jointly determined that LUCs with 5-year reviews are necessary to ensure protection of human health and the environment from residual PCB concentrations in soil and concrete that exceed the TSCA high-occupancy action level ($\leq$1 mg/kg for soil and $\leq$10 µg/100 cm^2 for concrete) and the DOH Tier 1 SAL (1 mg/kg) for unrestricted use (DOH 2005) at these three transformer sites. This conclusion is based on post-excavation confirmation soil and concrete sample results presented in the consolidated RVR (Earth Tech 2008a) documenting the NTCRAs, as well as the proposed plan (DON 2006b).

2.4.1 Past Response Actions

NTCRAs were implemented at the three transformer sites from 2000 through 2004 to remove PCB-contaminated soils and concrete at concentrations that exceeded cleanup levels. The results of the

NTCRAs indicate that conditions at the three transformer sites pose no unacceptable risk to human health or the environment under the current land use configurations (low-occupancy areas). The contamination exists beneath a clean, backfilled soil cap and vegetation (site K-14), beneath a clean, backfilled soil and gravel cap located within a fenced area (site W-4/W-5), or encapsulated concrete (double-painted with epoxy encapsulant at site TD-10).

2.5 SITE CHARACTERISTICS

PHNC is located on the island of Oahu, Hawaii, about 4 miles west of the City of Honolulu (see Figure 1). The Waipio and Pearl City peninsulas separate the harbor into three lochs: West Loch, Middle Loch, and Southeast Loch. Activities and land use at PHNC include Naval Shipyard and Intermediate Maintenance Facility (IMF), Naval Submarine Base, Naval Station, Fleet and Industrial Supply Center, Navy Public Works Center (PWC), and Inactive Ship Maintenance Facility.

The Navy initially subdivided it into 18 GSAs to evaluate the PHNC property. These GSAs were designed and created to manage the large amount of environmental sites that are located in PHNC. Field activities, from removal actions to confirmation sampling, could be done in a much more efficient and cost-effective manner by sorting and classifying the sites by geography. The Navy, EPA, and DOH initially concluded that 6 of the GSAs were adequately addressed under current Navy environmental programs. A site summary evaluation (SSE) was conducted for the remaining 12 GSAs. After the SSE, various response actions have been conducted at the PHNC GSAs. After those response actions, additional evaluation and action were required for transformer sites at 3 of the GSAs, which are the subject of this ROD: Ford Island, Halawa-Main Gate, and Waipio Peninsula.

2.5.1 Site Location and Description

2.5.1.1 FORD ISLAND GSA

Ford Island GSA is located within Pearl Harbor on Oahu, Hawaii. Initial military development of Ford Island occurred between 1912 and 1919. Naval Air Stations (NAS) Ford Island and Army Air Station Luke Field were established on Ford Island in 1917 (Earth Tech 2001c). Ford Island underwent considerable development and expansion in the 1930s and 1940s. Before and during World War II, Ford Island provided moorage and support to most of the Pacific Fleet and was home of NAS Ford Island. Use of Ford Island as a military air station ceased with the advent of jet aircraft. Pearl Harbor Naval Station assumed ownership of the island when the NAS was deactivated in 1962, and the airfield was leased to the State of Hawaii Department of Transportation for limited use by civilian aircraft. The airfield has been inactive since mid-1999, when the state opened Kalaeloa Airport (at former NAS Barbers Point) (Earth Tech 2001c). Currently, Ford Island provides housing and recreational facilities for Navy personnel (Earth Tech 2001c).

2.5.1.2 HALAWA-MAIN GATE GSA

The Halawa-Main Gate GSA is bounded by Halawa Stream to the north; Kamehameha Highway to the east; South Road to the south; and the East Loch, Southeast Loch, and Shipyard GSA to the west. The GSA occupies 595 acres: the area under the jurisdiction of the Fleet and Industry Supply Center includes 432 acres; the area under the jurisdiction of the Submarine Base includes 123 acres; and the Naval Station occupies an estimated 40 acres, including open recreation fields in the south portion of the GSA. The southernmost portion of the GSA is occupied by Hale Moku and Hokulani Naval Housing (Earth Tech 2003b).

2.5.1.3 WAIPIO PENINSULA GSA

Waipio Peninsula GSA is situated 4.5 miles southwest of Pearl City. The area is 3.5 miles long and 1.3 miles at its widest point. It is bordered on the north by Ted Makalena Golf Course and the ash

landfill area for the adjacent former Waipahu incinerator, on the east by the Middle Loch of Pearl Harbor, on the south by the entrance to Pearl Harbor, and on the west by the West Loch of Pearl Harbor (Earth Tech 2003b).

2.5.2 Geology and Hydrology

2.5.2.1 FORD ISLAND GSA

Ford Island lies within the Pearl Harbor basin and is flanked on the east by the Aliamanu, Salt Lake, and Makalapa vents of the Honolulu series Salt Lake volcanics. These vents on the western flank of the Koolau shield are 1.5 miles from Ford Island (Earth Tech 2001c). Pearl Harbor is located where the Koolau shield abuts the Waianae shield. The Pearl Harbor basin is a drowned river system with its several tributaries forming today's Pearl Harbor lochs. Pearl Harbor is the result of several geologic processes, including fluctuations in sea level (transgressive and regressive shorelines), stream erosion, alluvial deposits, and volcanism (Earth Tech 2001c). The Halawa, Moanalua, Waikele, and Wahiawa Streams cut deep canyons in the hard basalt of the Koolau Range before they flow into Pearl Harbor. These tributaries, as well as the rising and falling sea levels, deposited alternating beds of limestone, tuff, alluvium, and marine clays (Earth Tech 2001c).

Surface soil types on Ford Island are generally classified as silty sands or sandy silts with varying amounts of gravel, owing to the high degree of development and the associated usage of fill material throughout the island. Ford Island itself is classified as coral outcrop by the United States Department of Agriculture, Soil Conservation Service (Earth Tech 2001c), which consists of coral or cemented calcareous sand. The rising and falling sea levels, punctuated by stream erosion and artificial filling, deposited a variety of material in the Pearl Harbor area. These deposits consist of coralline material, alluvial deposits, lagoonal deposits, volcanic material, and fill, and may be intermixed in places (Earth Tech 2001c). The coralline debris deposits include gravelly clays; recemented limestone; mixtures of gravel with silt and clay; coral, sand, and clay lenses, and reef-related components. The consolidated lagoonal sediments primarily consist of soft silts and lean clays. The weathered volcanics consist of weathered tuff and primarily include brown to dark gray-brown stiff clays and silts. The fill material is made up of mixtures of gravels, sands, silts, and clays, and is thickest around areas of construction or where the shoreline has been reclaimed (Earth Tech 2001c).

Ford Island is located in the Honolulu–Pearl Harbor basal groundwater aquifer area. The shallow groundwater beneath Ford Island is considered nonpotable and is not hydraulically connected to the basal aquifer of Oahu. The source of shallow Ford Island groundwater is believed to originate from infiltration of precipitation combined with intrusion of seawater. As a result, the shallow groundwater is generally brackish and is, therefore, not regarded as a potential source of drinking water. There are two types of groundwater in the Pearl Harbor area: a shallow, predominantly caprock system overlying a deep basal aquifer (Earth Tech 2001c).

The caprock aquifer occurs from the water table to the first underlying aquitard and is approximately 16 feet thick. It is considered an unconfined aquifer since no overlying, laterally extensive confining unit has been identified (Earth Tech 2001c). It may, however, be semiconfined in places because of the occurrence of clay and silt layers that are of limited lateral extent. The caprock aquifer lies within the weathered volcanic material, lagoonal deposits, and coralline debris. This aquifer is brackish (with a chloride content of 250 to 1,000 milligrams per liter) and is considered ecologically important, not suitable for drinking, irreplaceable, and highly vulnerable to contamination (Earth Tech 2001c). The deep, underlying aquifer is characterized as a confined basal aquifer contained in basalt baserock. The characteristics of the basal aquifer are the same as the overlying groundwater, except that it is moderately vulnerable to contamination (Earth Tech 2001c).

2.5.2.2 HALAWA-MAIN GATE GSA

The geologic history of Pearl Harbor, which encompasses the Halawa-Main Gate, is complicated, but essentially consists of drowned river valley sediments interbedded with coral and pyroclastic material. The formation of three Pearl Harbor lochs is related to the repeated downcutting of a coalescing network of stream valleys into coral reef plateaus and volcanic strata. As sea levels fluctuated and rebounded to their present-day level, the stream valley was submerged, forming the present Pearl Harbor. This thick sequence of Tertiary and Pleistocene strata (approximately 1,000 feet) is underlain by the basal Koolau Volcanic Series (Earth Tech 2003b).

Pearl Harbor soils consist of poorly drained soils on nearly level coastal plains. These soils developed in alluvium overlying organic material. Pearl Harbor soils are geographically associated with Hanalei, Kaloko, and Keaau soils. Hanalei soils consist of poorly drained soils on bottom lands developed in alluvium derived from basic igneous rock. Kaloko soils are poorly drained soils developed in alluvium derived from basic igneous rock; the alluvium has been deposited over marshy lagoon deposits. Keaau soils are poorly drained soils that were developed in alluvium deposited over reef limestone or consolidated coral sand. In addition, some of the land that makes up Pearl Harbor is fill land. Fill land consists of areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources. Fill land is dominantly composed of packed, but unconsolidated, angular gravel and sand intermixed with varying proportions of silt and clay (Earth Tech 2003b).

The Halawa-Main Gate GSA lies within the Honolulu Pearl Harbor basal aquifer. In this area, the caprock confines the basal aquifer under artesian conditions and it is found at depths between 50 and 750 below ground surface (bgs). Groundwater is also found in the overlying caprock at shallower depths. This unconfined aquifer has an elevation of about sea level and is recharged by leakage from the underlying volcanics, rainfall, and percolating groundwater. The shallow groundwater is not used for drinking water because of its salinity. Groundwater flow is expected to be downhill, toward Pearl Harbor or the ocean. Localized flow directions within the two GSAs may vary as a result of underground utilities or subsurface conditions (Earth Tech 2003b).

2.5.2.3 WAIPIO PENINSULA GSA

Native coastal plain sediments line the edges of the Waipio Peninsula, with fill material located above the sediments. The fill consists of miscellaneous nonhazardous waste materials from sugar cane cultivation and mill operations and from disposal of soil, household trash, and construction debris (such as wood and scrap metal) (Earth Tech 2003b). The fill material occupies about 40 percent of the Waipio Peninsula area and is likely to be relatively permeable. Historical lease documents also showed significant fill activities to reclaim land for agricultural use, but did not differentiate in the type of fill materials used. Other specific soils found at Waipio Peninsula, primarily coastal plan sediments, include, in order of descending occurrence, Mamala stony silty clay loam, Honouliuli clay, Pearl Harbor clay, Mokuleia clay, Keaau clay, and Ewa silty clay loam (Earth Tech 2003b).

The Waipio Peninsula GSA lies within the Waipahu Sector of the Pearl Harbor system (Earth Tech 2003b). In this area, the basal aquifer is confined by the caprock under artesian conditions and is found at depths between 50 and 750 feet bgs. Groundwater is also found in the overlying caprock at shallower depths. This unconfined aquifer has an elevation of about sea level and is recharged by leakage from the underlying volcanics, rainfall, and percolating groundwater. However, the shallow groundwater is not used for drinking water because of its salinity (Earth Tech 2003b). Shallow groundwater beneath the Waipio Peninsula likely discharges radially into the surface waters of Pearl Harbor. Nine registered wells have been identified in the area. One sealed sewage underground injection control well was also identified. In the past, this well at the Degaussing Facility at

Beckoning Point was used for disposal of sewage. An onsite wastewater treatment plant now treats this sewage (Earth Tech 2003b).

2.5.3 Archaeological Importance

There are no known cultural resources (archaeological sites) located within or in close proximity to the three transformer sites located at PHNC based on the cultural resources management plans for the installations.

2.5.4 Sensitive Populations, Habitats, and Natural Resources

Surrounding areas at PHNC support a limited ecological environment. No sensitive populations, habitats, or natural resources have been seen in the vicinity of the transformer sites.

2.5.5 Results of Surface and Subsurface Soil and Concrete Sampling

Surface and subsurface soil samples and concrete wipe samples were collected as part of SI and removal action design support activities. PCBs were detected above cleanup levels. Confirmation samples were collected to verify the removal of PCB-contaminated media after the removal actions were complete.

Table 3 summarizes the site characteristics for each of the three transformer sites following removal action activities. The table incorporates the conclusions documented in the RVR (Earth Tech 2006a; ECC 2007) discussed in Section 2.2.1 of this ROD. Detailed information including site-specific activities, verification sample laboratory reports, and validated data, is presented in the respective RVRs (Earth Tech 2006a; ECC 2007).

2.5.6 Conceptual Site Model

As previously discussed in Section 2.2.1, an EE/CA (Earth Tech 1998) was prepared in January 1998 to evaluate removal action alternatives to address PCBs in soil and concrete at several transformer sites. The 1998 EE/CA recommended a removal action consisting of excavation of PCB-contaminated soil and concrete and disposal in an off-island landfill. However, since the EE/CA was finalized, the Navy concluded, after discussions with EPA and DOH, that soil from multiple transformer sites, including at the three PHNC GSAs, could be consolidated for treatment. Based on this decision, treatment alternatives were evaluated in the treatment EE/CA prepared in September 2000 (Earth Tech 2000). The three transformer sites at PHNC that are represented in this ROD were consolidated since they fulfilled the requirements for NTCRAs that were laid out in the AM and its subsequent addendums (DON 2000, 2002, 2003).

Table 3: Summary of Removal Actions at Three Transformer Sites at PHNC

GSA	Site	Excavation Dates	Removal Action Summary	Removal Action Final Volume [a]	Soil Cleanup Levels and Concrete Action Levels	Cleanup Level Results
Ford Island	TD-10	14Nov00 – 04Dec00; 03Jan01 – 24Jan01	Two excavation events were conducted at this site.	Approximately, 203 cy of soil was excavated.	≤1 mg/kg (soil)	All soil verification sample results do not exceed the cleanup level (≤1 mg/kg).
		30May01; 31May01; 23Jul01 – 24Jul01; 24Sep01 – 25Sep01	Four cycles of concrete washing performed. Verification results for concrete wipe samples showed one sample result exceeding the cleanup level (10 µg/100cm^2). Concrete was double-painted with epoxy encapsulant on 15 December 2004.	N/A	≤10 µg/100 cm^2 (concrete)	One concrete verification wipe sample result exceeded the cleanup level (10 µg/100 cm^2). The result was as follows: TO216=11 µg/100 cm^2
		07Feb02	One drainage structure was cleaned and sampled. PCB concentrations do not exceed the cleanup levels for soil and concrete (≤1 mg/kg and ≤10µg/100cm^2); therefore, no further action was recommended.	N/A	≤1 mg/kg (soil) ≤10 µg/100 cm^2 (concrete)	All soil and concrete verification sample results do not exceed the cleanup levels (1 mg/kg and 10 µg/100 cm^2).
		31Jan03	A bulk concrete sampling event was conducted; samples from two locations had results that exceeded the cleanup level of 1 mg/kg (bulk concrete).	N/A	≤1 mg/kg (bulk concrete)	Two bulk concrete sample results exceeded the cleanup level (1 mg/kg). The results were as follows: TO259 = 2.8 mg/kg TO261 = 3.7 mg/kg
Halawa-Main Gate	K-14	26Jan04 – 27Jan04; 19May04; 07Jun04	Excavation and overexcavation were conducted at this site. [b]	In total, 59.2 bcy of soil was excavated and 77 lcy treated (includes overexcavated volume).	≤1 mg/kg (soil)	One soil confirmation sample result was above the cleanup level (1 mg/kg). The result was as follows: TU1300 = 47 mg/kg
Waipio Peninsula	W-4/W-5	02Feb04 – 08Jul04; 16Feb05	Excavation and overexcavation were conducted at this site. [b]	In total, 18.4 bcy of soil was excavated and 23.9 lcy treated (includes overexcavated volume).	≤1 mg/kg (soil)	One soil confirmation sample had a result above the cleanup level (≤1 mg/kg). The result was as follows: TU1495 = 40.0 D mg/kg All results for confirmation samples collected outside of the transformer fence do not exceed the cleanup level.

bcy bank cubic yard
D the reported value is derived from analysis of a diluted sample of the sample extract
lcy loose cubic yard
N/A not applicable
[a] The volume difference between excavation (measures in bcy) and treated (measures in lcy) is a result of the thermal desorption process that increases the pore spaces and voids within the soil.
[b] Overexcavation was conducted when post-excavation confirmation sampling results were above the cleanup levels. This consisted of collecting soil samples laterally and vertically at the site and then excavating the site to the newly established excavation limits.

As part of the 1998 EE/CA, conceptual site models (CSM) were developed for each of the transformer sites based on the following:

- Location and type of transformers located at each site
- Known or suspected mechanism of PCB release into the environment
- Known or suspected media (soil or concrete) that may be affected
- Potential migration pathways to human and ecological receptors

The CSMs developed for the transformers identified the following site characteristics:

Location and Type of Transformers. The physical setting of the original transformer sites identified in the 1998 EE/CA were based on descriptions provided by previous investigations, reviews of as-built or plan drawings, and site reconnaissance. None of the three transformers sites discussed in this ROD was part of this 1998 EE/CA. However, based on similar site characteristics, these transformers were consolidated as part of the PCB treatment EE/CA, and the 1998 CSM was considered applicable to all consolidated sites. Historically, the transformers were filled with dielectric fluid that contained PCBs. Descriptions of the locations and types of the three transformers addressed in this ROD are as follows:

- TD-10 is an interior transformer located inside Building S181, near the intersection of Yorktown Boulevard and Wasp Boulevard, on Ford Island. The transformer is now inactive. Building S181 is located approximately 500 feet from the northwest shoreline of Ford Island and Pearl Harbor.
- K-14 is an active transformer in Building S485, located south of Kuahua Avenue and adjacent to Building 445. The site includes Building S485 and surrounding asphalt with underlying gravel and soil and is located approximately 150 feet from Magazine Loch.
- W-4/W-5 is located off of Waipio Point Access Road and includes two active outdoor pad-mounted transformers, W-4 and W-5, which are collocated and considered a single site. The site includes an outdoor concrete pad (surrounded by a chain-link fence) and surrounding soil and gravel, with a concrete sidewalk on one side and is located approximately 100 feet from Middle Loch.

Sources of PCB Contamination. Sources of PCB contamination at these transformer sites are a result of (1) testing and previously disposing of PCB dielectric fluid from the transformers onto the surrounding soils; and (2) leaking PCB dielectric fluid from the transformers onto the surrounding soil or concrete pad. These sources are considered the principal mechanisms that released PCBs at these transformer sites. PCBs are generally insoluble and tend to sorb to soil particles, making PCB transport by leaching unlikely. The primary mechanism for the transport of PCBs was erosion by surface runoff. Transport of PCBs sorbed to soil particles was possible in areas eroded by surface runoff; however, surface erosion was minimal in the areas surrounding these transformers sites because of gentle slopes and vegetative cover.

Affected Media. The potentially affected media were surface and subsurface soil and concrete in the immediate vicinity of the transformer sites. Depth of contamination was determined during excavation and verification sampling. Contamination of surface water and groundwater was considered unlikely because of the low solubility of PCBs and the depth to groundwater. As a result, groundwater samples were not collected because there was no indication that PCBs had migrated to groundwater, based on the depth of PCB contamination in soil and the depth to groundwater.

Following removal actions at these three transformer sites, PCB concentrations remain in soil or concrete at concentrations above cleanup levels established for these sites; therefore, LUCs are necessary to restrict the sites to low-occupancy use only.

Known and Potential Routes of Exposure. The primary route of exposure was direct contact with contaminated soil or concrete, either through the skin or by incidental ingestion. Contact with contaminated airborne dust or eroded soil particles in surface run-off was unlikely because of the vegetative or asphalt cover; however, dust generated by construction or removal activities was of concern. If vegetation or asphalt were disturbed through construction or removal activities, controls were implemented to minimize airborne transport of PCBs. Given the low volatility of PCBs, transport in the gaseous phase was not considered a significant mechanism. PCBs are nearly insoluble and have a strong tendency to sorb to soil particles, making it unlikely that PCBs have contaminated the groundwater. Exposure to PCB-contaminated groundwater was therefore considered unlikely.

Following removal actions at these three transformer sites, PCB concentrations remain in soil or concrete at concentrations above the cleanup levels established for these sites; therefore, LUCs are necessary to restrict the sites to low-occupancy use only, which will limit the routes of exposure to PCBs.

Known or Potential Human and Environmental Receptors. Access to PHNC is restricted to employees of the Navy, their dependents, and contractors. Employees and contractors who routinely enter the vicinity of the transformer sites were potentially exposed to contaminated soil through incidental ingestion, direct dermal contact, or inhalation of dust. Human exposure to contaminated air was possible if work generated fugitive dust. Surrounding areas at PHNC support a limited ecological environment.

Following removal actions at these three transformer sites, PCB concentrations remain in soil or concrete at concentrations above the cleanup levels established for these sites; therefore, LUCs are necessary to restrict the sites to low-occupancy use only, which will limit the exposure of PCBs to any known or potential human or environmental receptors.

Nature and Extent of Contamination at the Transformer Sites. The nature and extent of contamination were evaluated by incorporating the physical setting and CSM for the transformer sites with results of available previous sampling results to estimate the area(s) of potential contamination at each of the transformer sites. In cases where the sampling data were insufficient or nonexistent, assumptions were made regarding contamination extent. Since the 1998 EE/CA was finalized, the Navy determined, after discussions with EPA and DOH, that soil from multiple transformer sites could be consolidated for treatment purposes based on similar characteristics to those sites evaluated in the 1998 EE/CA. Therefore, the evaluations conducted in the 1998 EE/CA would be applicable to those additional transformer sites identified for treatment.

Removal actions were conducted at these three transformer sites. Based on post-excavation confirmation sampling results, PCB concentrations remain in soil or concrete at concentrations above the cleanup levels established for these sites; therefore, LUCs are necessary to restrict the sites to low-occupancy use only.

2.6 CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

2.6.1 Pre-Removal Action Land Use

The pre-removal action land use for the three transformer sites at PHNC was low-occupancy use. PHNC operates as a Naval Shipyard and IMF, Naval Submarine Base, Naval Station, Fleet and

Industrial Supply Center, Navy Public Works Center, and Inactive Ship Maintenance Facility. This Naval facility is currently active. Before redevelopment that included the construction of Base housing, transformer site TD-10 was located in an area of commercial and light industrial facilities on Ford Island. Transformer site K-14 was and still is situated in an industrial portion of the base adjacent to Magazine Loch. Surrounding land use includes the Fleet Industry Supply Center and the Submarine Base. Transformer site W-4/W-5 was and still is situated in an undeveloped, wooded area on the Waipio Peninsula. All three transformer sites at PHNC were active prior to removal actions, although PCBs were no longer used.

2.6.2 Post-Removal Action and Future Land Use

The post-removal action and future land use of the three transformer sites at PHNC is anticipated to remain unchanged from current conditions. Transformer site TD-10 was formerly located in an area of commercial and light industrial facilities, but (due to redevelopment and new housing construction) is now located in an area of mixed usage consisting of residential and commercial/light industrial facilities. Land usage at transformer site K-14 remains industrial, and the land surrounding transformer site W-4/W-5 remains undeveloped. Two of the three transformer sites (W-4/W-5 and K-14) are currently active. The Navy will maintain the current use of PHNC. Potential future onsite populations will be limited to Navy contractor personnel involved in routine maintenance and periodic inspections of the transformers, and making any necessary repairs. Currently, there are no plans to change the current land use of the three transformer sites at PHNC. In addition, there are no plans to change the land use of the areas surrounding the three transformer sites. All three transformer sites are located on active Navy bases with a high volume of industrial and commercial uses.

2.6.3 Land Use Controls

The land use at transformer sites TD-10 (located at Ford Island), K-14 (located at Halawa-Main Gate), and W-4/W-5 (located at Waipio Peninsula) is subject to specific restrictions. These restrictions, called LUCs, are an integral part of the final remedy selected for these sites. The purpose of LUCs is to limit all land use at the three transformer sites to activities compatible with restricting the transformer sites to "low-occupancy" use only and to ensure long-term viability of the final remedy. The risks that necessitate these LUCs are discussed in Section 2.7. Figure 5 through Figure 7 show the three transformer sites with the areas designated where LUCs are to be implemented.

A RAWP will be prepared to document how the LUC component of the final remedy will be implemented. The RAWP contains implementation and maintenance actions, including periodic inspections and reporting requirements for the LUC elements of the final remedy for the three transformer sites. The Navy is responsible for implementing, maintaining, reporting, and enforcing the LUCs until such time as the LUCs are terminated. LUCs will be maintained until the concentrations of hazardous substances in the soil and concrete are at such levels to allow for unrestricted land use and exposure. Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for remedy integrity.

2.7 SUMMARY OF SITE RISKS

The primary risks to human health and the environment at these three transformer sites are posed by the presence of PCBs in soil and concrete. The PCB-containing fluids may have been released to surface soil or concrete by leaking directly from the transformers or during regular transformer testing and maintenance. Transformer maintenance included periodic sampling to test the dielectric properties of the transformer fluid. Once testing was completed, the fluid was reportedly poured onto

the adjacent areas, such as the grass, concrete pad, or building wall. Data from sampling previously conducted by the Navy confirmed the presence of PCB contamination at these sites.

PCBs are listed and regulated as hazardous substances under CERCLA. Human and animal exposure to PCBs can result in adverse health effects, including chloracne (a dermal reaction), liver damage, suppression of development and reproduction, and possible cancer. PCBs accumulate in plant tissue, but are not known to adversely affect plants. Potential risks may result from the following exposure pathways:

- Dermal absorption (via direct contact) to human or ecological receptors
- Inhalation of particulates by human or ecological receptors
- Incidental ingestion of soil by human or ecological receptors
- Leaching of contaminants from the soil into groundwater

The health risk posed by exposure to PCBs takes into account contaminant concentrations, potential exposure pathways, and current land use. The risk evaluation conducted in the 1998 EE/CA (Earth Tech 1998) concluded that a removal action was justified to eliminate any actual or potential risk of human exposure to PCBs. Since the 1998 EE/CA was finalized and after discussions with EPA and DOH, the Navy concluded that soil from multiple transformer sites, including those at PHNC, could be consolidated for treatment based on similar site characteristics.

The three transformer sites at PHNC that are represented in this ROD were consolidated since they fulfilled the requirements for NTCRAs that were laid out in the AM and its subsequent addendums (DON 2000, 2002, 2003).

The NTCRAs included removal of soil and concrete with PCBs at concentrations above the cleanup levels followed by thermal desorption treatment of the excavated soil and concrete. Afterward, post-excavation confirmation samples were collected to evaluate whether the cleanup levels had been achieved. Post-excavation confirmation sampling results showed PCB concentrations in soil and concrete above the TSCA high-occupancy action level (≤1 mg/kg for soil and ≤10 µg/100 cm^2 for concrete) and the DOH Tier 1 SAL (1 mg/kg) for unrestricted use (DOH 2005).

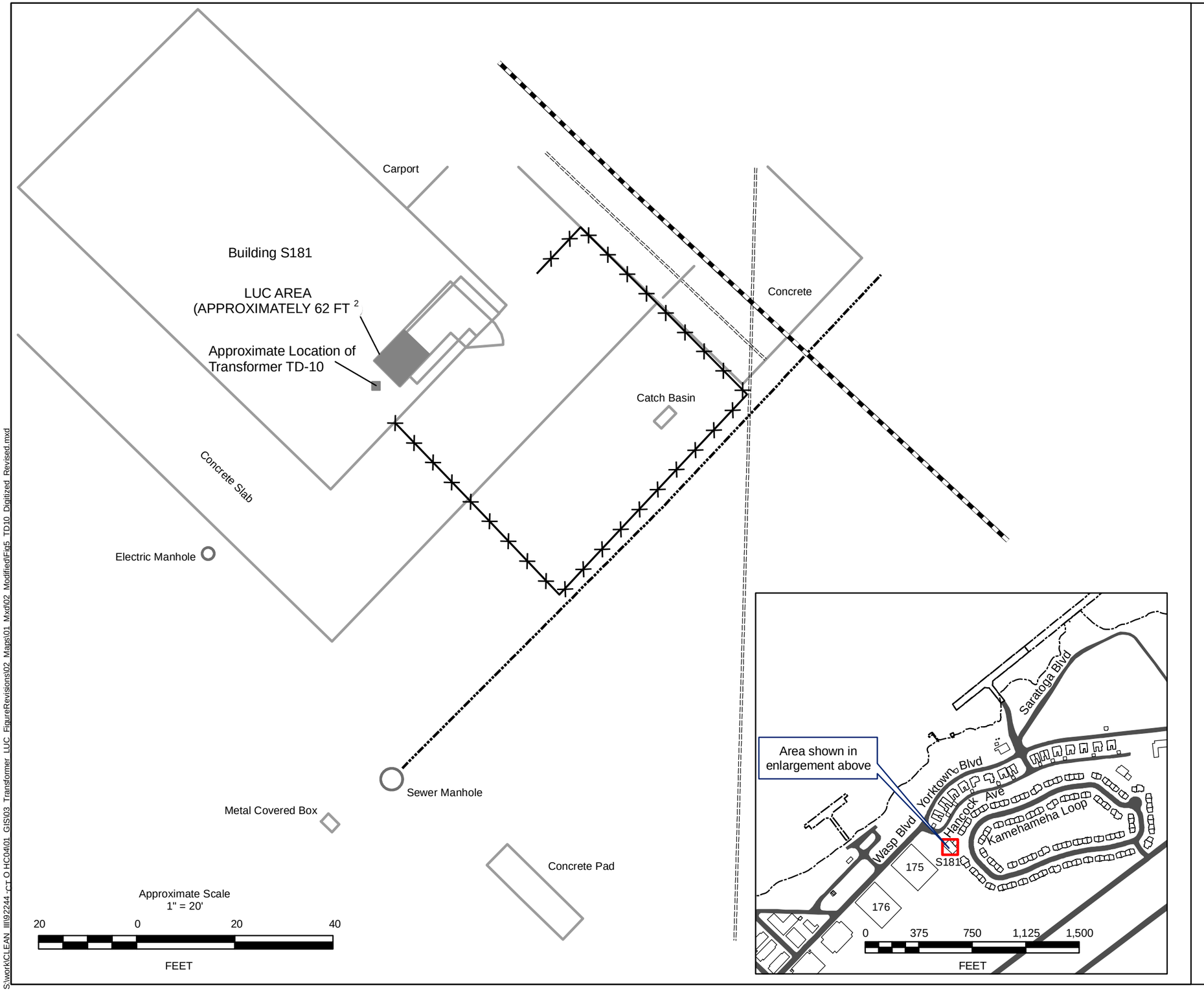
As a result of previous removal actions at the three transformer sites at PHNC, LUCs are required to ensure protection of human health and the environment. The LUCs will be applied only to the affected area within each site. An LUC WP provides details on implementing the LUCs (Earth Tech 2007).

A summary of site risks for each transformer site is discussed in the following subsections.

2.7.1 TD-10

Transformer site TD-10 is located in Building S181 on Ford Island (see Figure 5). The future land use of this area is planned to remain low-occupancy use.

Soil. All soil verification sample PCB results were below the TSCA high-occupancy cleanup level (≤1 mg/kg) and the DOH Tier 1 SAL (1 mg/kg) for unrestricted use.



LEGEND

- Fence
- Storm Drain
- Unknown Utility
- Water
- Road
- Land Use Control (LUC) Area
- 176 — Facility Location and ID

N

Figure 5
Site TD-10 and Land Use Control Area,
PHNC, Oahu, Hawaii

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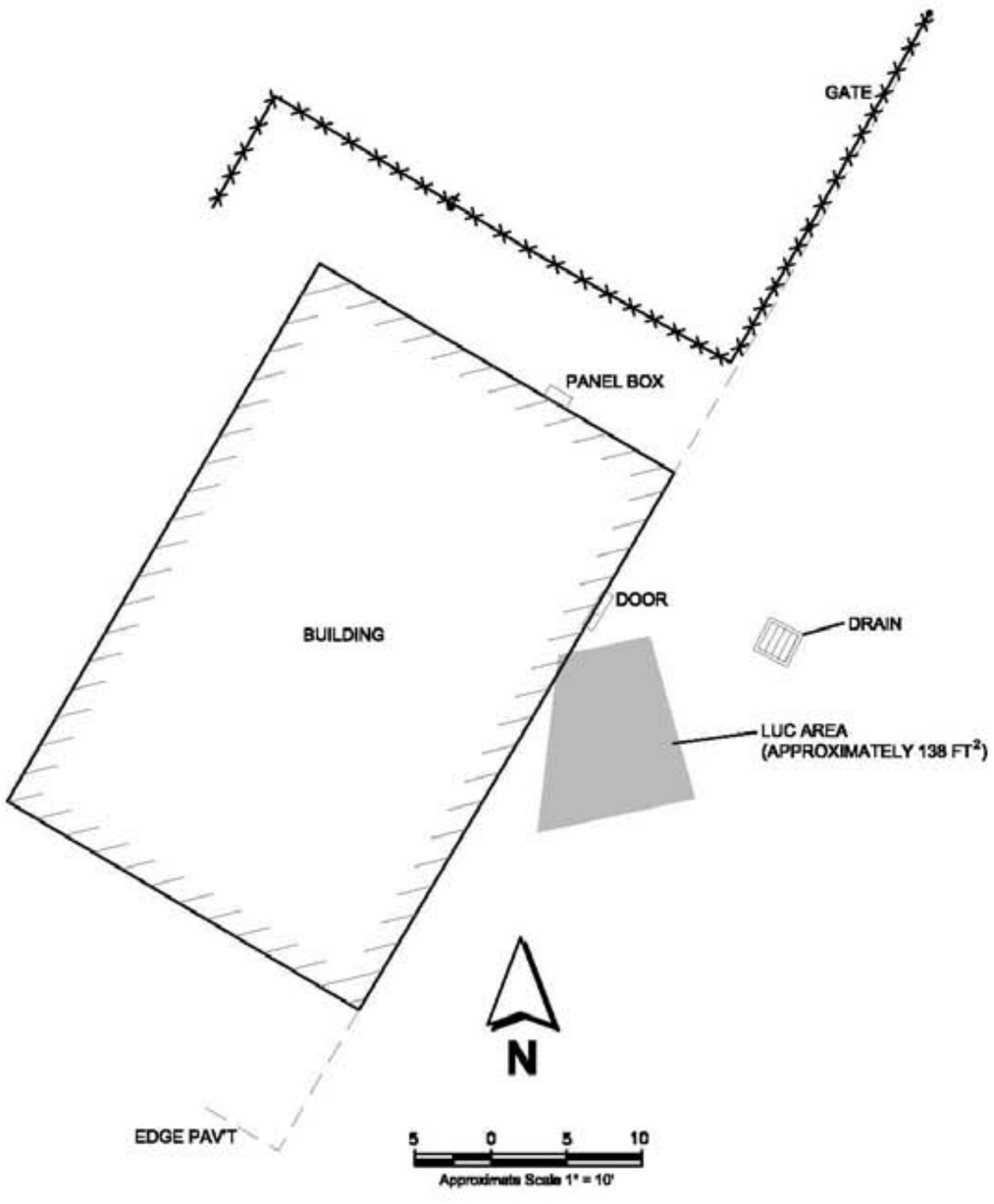
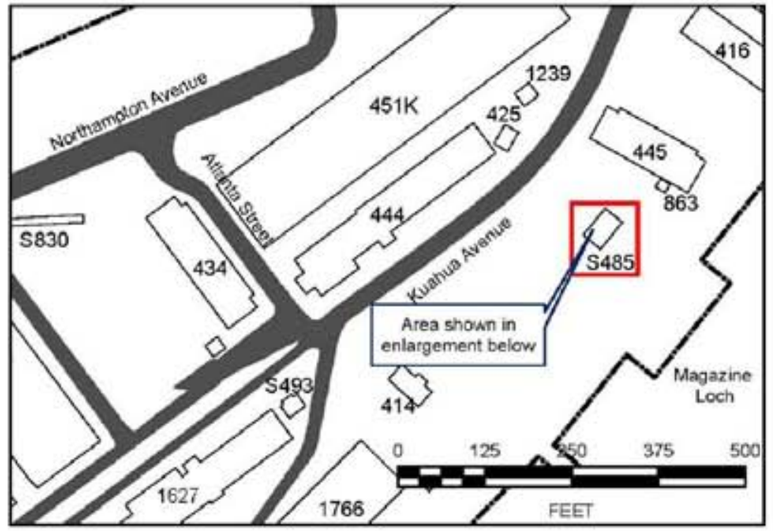
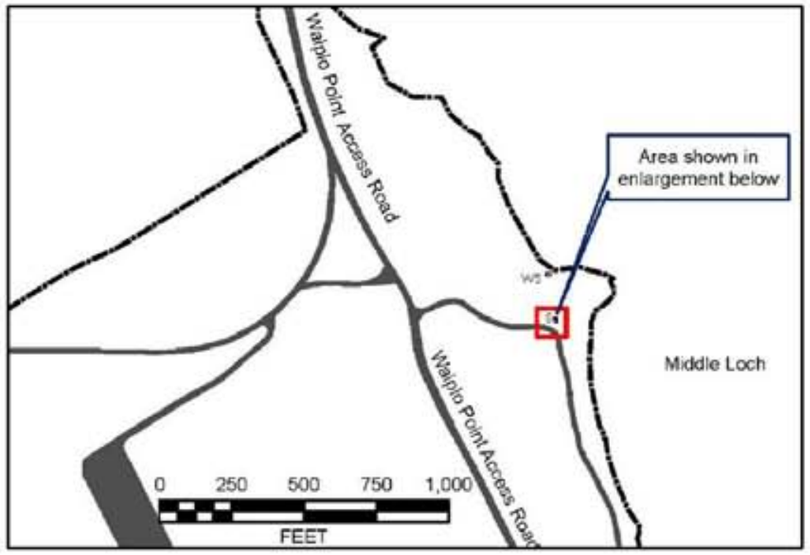


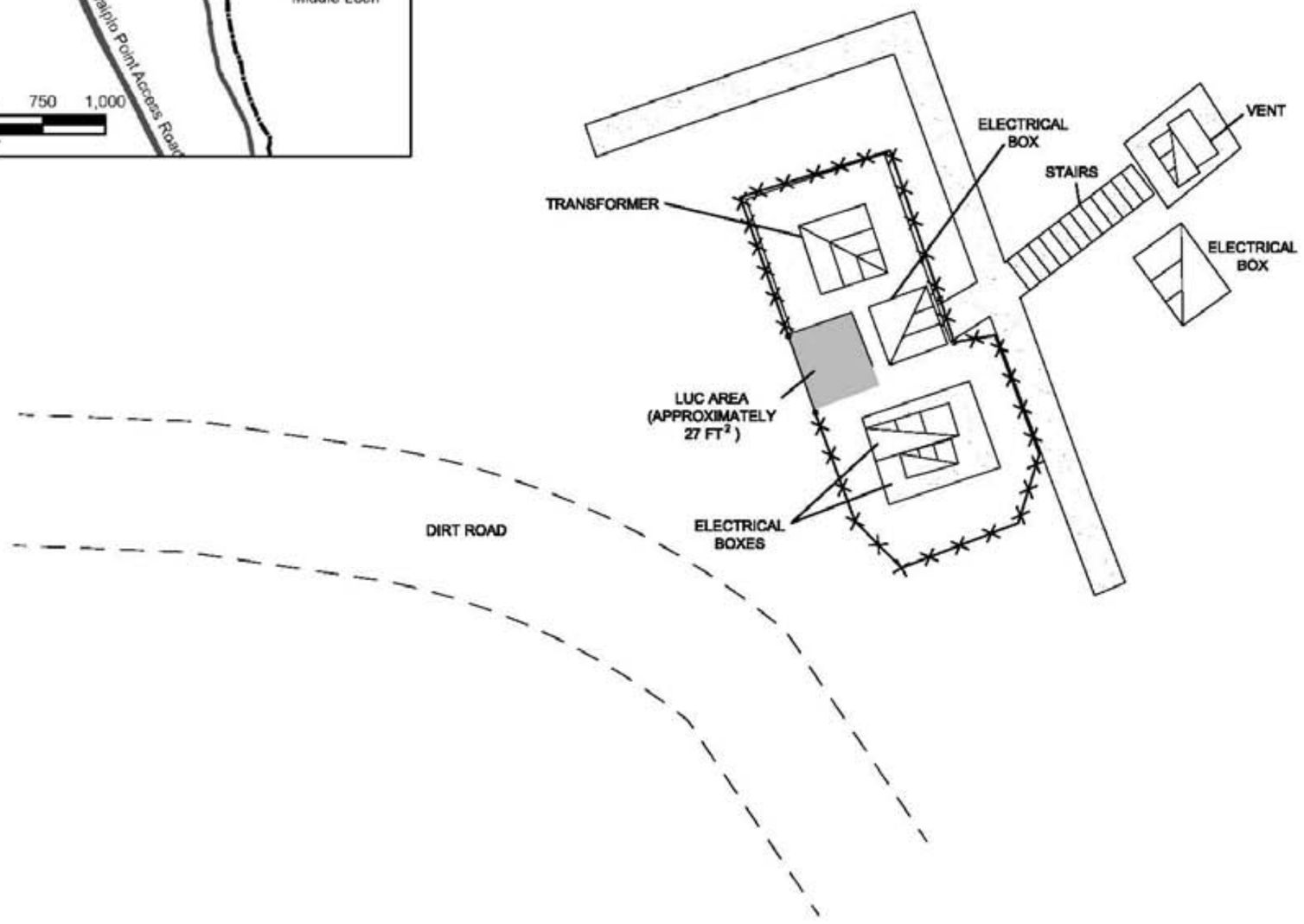


LEGEND

- Land Use Control (LUC) Area
- Fence

Figure 6
Site K-14 and Land Use Control Area
PHNC, Oahu, Hawaii





LEGEND

Land Use Control (LUC) Area

Fence

N

5 0 5 10

Approximate Scale 1" = 10'

Figure 7
Site W-4/W-5 and Land Use Control Area
PHNC, Oahu, Hawaii

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Concrete. The PCB concentrations in final concrete verification wipe samples were below the TSCA high-occupancy cleanup level (≤10 µg/100 cm^2) except for one sample, which had a result of 11 µg/100 cm^2. Results for two bulk concrete samples were 2.8 mg/kg and 3.7 mg/kg, which are above the TSCA high-occupancy cleanup level for bulk concrete (≤1 mg/kg). The concrete pad area was cleaned and double-painted with epoxy encapsulant to prevent further release of PCBs and to limit direct exposure to PCB concentrations. This site requires LUCs to restrict land use to low-occupancy use only because of the PCB contamination beneath the encapsulated concrete.

2.7.2 K-14

Transformer site K-14 is located in Building S485 and adjacent to Building 445 in the Halawa-Main Gate GSA (see Figure 6). The future land use of this site is anticipated to remain low-occupancy use. One soil verification sample result of 47.0 mg/kg is above the TSCA high-occupancy cleanup level (≤1 mg/kg) and the DOH Tier 1 SAL (1 mg/kg). This sample was collected between two utility line jackets. The close spacing of the two jackets prevented removal of this PCB-contaminated soil. This site requires LUCs to restrict the site to low-occupancy use because PCB-contaminated soil exists between the two concrete utility jackets beneath a clean, backfilled soil cap (as described in Section 2.12.1) and underneath asphalt put in place to prevent further release of PCBs and to limit direct exposure to PCB concentrations in subsurface soil.

2.7.3 W-4/W-5

Transformer site W-4/W-5 is located in the Waipio Peninsula GSA (see Figure 7). The future land use of this site is anticipated to remain low-occupancy use. One soil verification sample result of 40.0 mg/kg is above the TSCA high-occupancy cleanup level (≤1 mg/kg) and the DOH Tier 1 SAL (1 mg/kg) for unrestricted use. The excavation was backfilled with treated soil, capped by coarse gravel, and is surrounded by a fence. The current fence that surrounds this site must be maintained along with signage identifying that PCBs are on site. This site requires LUCs to restrict the site to low-occupancy use because PCB-contaminated soil exists within a secured fence that is marked by a sign to prevent further release of PCBs and to limit direct exposure to PCBs.

2.8 RESPONSE ACTION OBJECTIVE

AMs prepared for the transformer sites at PHNC 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 removal of PCB-contaminated soil and concrete, it was determined that LUCs would be required for these three transformer sites at PHNC for continued protection of human health and the environment. This action fulfills the ARARs as required by 40 CFR 300.430(f) of the NCP and 40 CFR 761.61 (a) of TSCA. Therefore, the response action objectives for the three 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).

2.9 DESCRIPTION OF ALTERNATIVES

In accordance with the AM addendum (DON 2002), LUCs for the NTCRA sites would be considered if confirmation sampling indicated that PCB concentrations exceeding the cleanup levels remained at a site and further excavation was not practical. This option is appropriate if there is a structure that remains in place over the area where sampling indicates that contamination exists. The three transformer sites located at PHNC fall under this scenario. The three remedy alternatives stated below were evaluated in the proposed plan (DON 2006b) because excavation and treatment of PCB-contaminated media were part of a previously recommended remedy for these sites and since been completed; however, the selected final remedy for these sites is LUCs.

Three remedy alternatives, as presented in the proposed plan (DON 2006b), were evaluated using the nine NCP evaluation criteria (40 CFR 300.430(e)(9)(iii)). The three remedy alternatives evaluated include:

- No Action
- Excavation to Low-Occupancy Reuse, Thermal Desorption Treatment, and Implementation of LUCs
- Excavation to High-Occupancy Reuse, Thermal Desorption Treatment

An evaluation of the implementation of LUCs alternative is available for public review in the proposed plan (DON 2006b). Section 2.10 presents the evaluation results for these three remedy alternatives.

2.9.1 Description of Final Remedy Components

The major components of each alternative are summarized in Table 4.

Table 4: Description of Final Remedy Components

Alternative Component	No Action	Excavation to Low -Occupancy Reuse, Thermal Desorption Treatment, and Implementation of LUCs	Excavation to High-Occupancy Reuse, Thermal Desorption Treatment
Treatment	None	All accessible contaminated soil exceeding cleanup levels is excavated and processed through thermal desorption treatment until final confirmation results are below cleanup levels. Inaccessible soil is left in place.	All contaminated soil exceeding cleanup levels is excavated and processed through thermal desorption treatment until final confirmation results are below cleanup levels for high-occupancy use.
Containment	None	Pathways to any residual material that is left in place at concentrations exceeding cleanup levels are removed through soil caps, concrete or asphalt barriers, epoxy encapsulants, or other engineering controls.	None
Institutional controls	None	The property owner will restrict the sites to low-occupancy use. Notifications will be added to the deed describing contamination left in place. Various other LUCs may also be required such as maintenance of the epoxy encapsulant or fencing.	None
Operation and Maintenance	None	5-year inspections of engineering controls and site conditions will be required and observations will be reported in 5-year reports. Any maintenance required will be conducted at that time.	None
Monitoring Requirements	None	5-year reviews are required to ensure that the LUCs are maintained.	None

2.9.2 Common Elements and Distinguishing Features of Each Alternative

The common elements and distinguishing features of each alternative are summarized in Table 5.

Table 5: Summary of Common Elements and Distinguishing Features of Each Alternative

Element and Feature	No Action	Excavation to Low Occupancy Reuse, Thermal Desorption Treatment, and Implementation of LUCs	Excavation to High Occupancy Reuse, Thermal Desorption Treatment
Key ARARs and TBCs	• ARARS are not identified for a No Action Remedy	• The following ARAR is pertinent to this alternative: • 40 CFR 761.61(a)(4)(i)(B), PCB remediation waste • 40 CFR 761.61(a)(7) – cap requirements • 40 CFR 761.61(a)(8) – deed restrictions for caps	• The following ARAR is pertinent to this alternative: • 40 CFR 761.61(a)(4)(i)(A), PCB remediation waste • The following TBC affects this alternative: • State of Hawaii DOH Tier 1 Soil Action Level
Long-term reliability	This alternative would provide no protection for human and ecological receptors.	Excavation and thermal desorption treatment of soil provide long-term effectiveness and with LUCs is a final remedy for these sites.	Excavation and thermal desorption of soil provides long-term effectiveness and no restrictions is a final remedy for the sites.
Quantity of waste to be managed	No soil would be handled. All waste remains at the site.	Approximately 40,000 cy of material has been excavated and treated by thermal desorption.	Additional volume of soil would be needed to be excavated to meet high-occupancy cleanup levels; this was deemed to be impractical at these sites due to operation and cost constraints.

2.9.3 Expected Outcomes of Each Alternative

No Action. The no-action alternative is not expected to be protective of both human health and the environment. Neither human receptors nor ecological receptors are protected from contaminants in soil or concrete at these three transformer sites.

Excavation to Low-Occupancy Reuse, Thermal Desorption Treatment, and Implementation of LUCs. The excavation and treatment alternatives are expected to be protective of both human health and the environment with the implementation of LUCs when excavation of the sites does not result in high-occupancy use. LUCs are necessary to restrict access for low-occupancy use.

Excavation to High-Occupancy Reuse, Thermal Desorption Treatment. The excavation and treatment alternatives are expected to be protective of both human health and the environment. Site obstructions prevent the excavation of all contaminated media to levels acceptable for high-occupancy use.

2.10 COMPARATIVE ANALYSIS OF ALTERNATIVES

The NCP (40 CFR § 300.430(e)(9)) requires evaluation of response action alternatives by nine criteria of effectiveness, implementability, and cost (EPA 1993). The criteria are summarized in Table 6.

Table 6: Criteria for Detailed Evaluation of the Alternatives

Criterion	How the Criterion is Applied
Effectiveness	
Overall protection of human health and the environment	Assesses the ability of an alternative to eliminate, reduce, or control the risks associated with exposure pathways including direct contact, potential migration, and risks to ecosystems.
Short-term effectiveness	Assesses the capability of an alternative to protect human health and the environment during implementation of the alternative (the construction, removal, and disposal).
Long-term effectiveness and permanence	Measures the ability of an alternative to permanently protect human health and the environment.
Reduction in toxicity, mobility, or volume of contaminants	Evaluates the ability of an alternative to permanently or significantly reduce the toxicity, mobility, or volume of the chemicals, particularly through treatment.
Compliance with applicable or relevant and appropriate requirements (ARAR)	Evaluates the potential of an alternative to achieve chemical-, location-, and action-specific ARARs.
Implementability	
Implementability	Evaluates the technical feasibility or difficulty of applying the alternative at the site, the reliability of the technology, the unknowns associated with the alternative, and the need for treatability studies.
	Assesses regulatory agency concurrence and the need for permits and waivers.
	Assesses mobilization needs, the accessibility of equipment, and number of trained personnel required to complete the alternative.
State acceptance	Evaluates the likelihood of approval by the State of Hawaii.
Community acceptance	Assesses the anticipated level of acceptance by the community.
Cost	Assesses the capital and operation and maintenance costs of each alternative.

Table 7 presents a summary of the comparative analysis of the no-action alternative and the two response action alternatives presented in the proposed plan (DON 2006b). Details regarding the cost estimated for each alternative are presented in Attachment A. Each alternative is evaluated against the nine criteria and rated (poor, fair, good, very good, or excellent) according to the ability of the alternative to achieve the removal action objectives.

2.11 PRINCIPAL THREAT WASTE

The NCP establishes an expectation that treatment will be used to address the principal threats (source material that is highly toxic or highly mobile) posed by a site, wherever practicable. Materials constituting a principal threat waste are source materials with toxicity and mobility characteristics that combine to pose a potential risk several orders of magnitude greater than the risk level that is acceptable for the current or anticipated future land use, given realistic exposure scenarios (EPA 1997). No highly toxic or highly mobile source material was identified at the three transformer sites located at PHNC; therefore, no principal threat wastes exist at these sites.

Table 7: Detailed Analysis of Removal Action Alternatives for the Implementation of LUCs

Criterion	1. No Action	2. Excavation to Low Occupancy Reuse [a], Thermal Desorption Treatment, and Implementation of LUCs	3. Excavation to High Occupancy Reuse [b] and Thermal Desorption Treatment
Overall Protection of Human Health and the Environment	**Poor** Alternative is not protective of human health and the environment.	**Fair** Alternative protects human health by limiting exposure pathways, and reduces contamination levels and risk of future exposures.	**Good** Alternative is protective of human health and the environment and reduces contaminant levels and risk of future exposure.
Compliance with ARARs	**Poor** Alternative does not comply with ARARs.	**Very Good** Alternative complies with ARARs.	**Very Good** Alternative complies with ARARs.
Long-Term Effectiveness and Permanence	**Poor** Alternative does not reduce contamination levels or restrict exposure pathways.	**Fair** Requires long-term maintenance and enforcement of LUCs.	**Good** Effectively reduces contaminant levels and risk of future exposure.
Reduction in Toxicity, Mobility, and Volume Through Treatment	**Poor** Alternative does not reduce toxicity, mobility, or volume of contamination.	**Good** Alternative reduces mobility and volume of contamination through treatment.	**Good** Alternative reduces mobility and volume of contamination through treatment.
Short-Term Effectiveness	**Good** No physical disturbance that would result in increased exposure.	**Good** Appropriate precautions will be taken to minimize exposure to significant quantities of contaminated soil during excavation, transportation, and treatment.	**Good** Appropriate precautions will be taken to minimize exposure to significant quantities of contaminated soil during excavation, transportation, and treatment.
Technical and Administrative Feasibility and Availability of Services and Materials	**Good** Little maintenance is required.	**Good** LUCs have been successfully applied to restrict access for low occupancy use.	**Poor** Site obstructions prevent the excavation of all contaminated soils to levels acceptable for high occupancy use.
Projected State Acceptance	**Poor** State acceptance is unlikely because contamination would not be removed.	**Good** State acceptance is likely because mobility and volume of contamination would be reduced. Site would be available for restricted future use.	**Good** State acceptance is likely because mobility and volume of contamination would be reduced. Contamination would be removed and site would be available for unrestricted future use.
Projected Community Acceptance	**Poor** Public acceptance is not likely because risk will not be reduced.	**Good** Public acceptance is likely. Site would be available for restricted future use.	**Good** Public acceptance is likely. Contamination would be removed from the site and site would be available for unrestricted future use.
Costs	**Very Good** $0	**Good** $129,210 (present value) $194,947 (future value)	**Poor** $367,763 [c]
Overall Rating	**Poor**	**Good**	**Fair**

Note: Scores based on scales of excellent, very good, good, fair, and poor.

[a] The cleanup level for bulk PCB remediation waste for low-occupancy reuse is PCB concentrations ≤25 mg/kg without further conditions.

[b] The cleanup level for bulk PCB remediation waste for high-occupancy reuse is PCB concentrations ≤1 mg/kg without further conditions.

[c] Present value cost not calculated for Alternative 3 since the alternative does not include long-term or ongoing actions.

2.12 SELECTED FINAL REMEDY

2.12.1 Summary of the Rationale for the Selected Final Remedy

LUCs were selected as the final remedy for the three transformer sites at PHNC. This decision is supported by documents in the AR for PHNC. In addition to ARARs previously established in the EE/CAs and AMs, the following requirements were also met:

- 40 CFR § 761.61(a)(4)(i)(B)(3) of the TSCA regulations states: "Bulk PCB remediation wastes may remain at a cleanup site at concentrations >25 ppm and ≤100 ppm if the site is covered with a cap meeting the requirements of paragraphs (a)(7) and (a)(8) of this section."
- 40 CFR § 761.61(a)(7) of the TSCA regulations contains cap requirements for PCB-remediation waste. The term "cap" means, when referring to onsite cleanup and disposal of PCB remediation waste, "a uniform placement of concrete, asphalt, or similar material of minimum thickness spread over the area where remediation waste was removed or left in place in order to prevent or minimize human exposure, infiltration of water, and erosion. . . . A cap of compacted soil shall have a minimum thickness of 25 cm (10 inches). A concrete or asphalt cap shall have a minimum thickness of 15 cm (6 inches). A cap must be of sufficient strength to maintain its effectiveness and integrity during the use of the cap surface which is exposed to the environment. A cap shall not be contaminated at a level ≥1 ppm PCB per Aroclor (or equivalent) or per congener."

A summary of the restoration activities at each of the three transformer sites is provided below:

TD-10. The excavated area was backfilled with clean crushed-coral fill from 15 May to 16 September 2001. The site was seeded with grass on 20 November 2001. In addition, the concrete surface was cleaned and double-painted with epoxy encapsulant on 15 December 2004.

K-14. The excavated area was backfilled with treated soil. The asphalt pavement at the site was restored on 10 December 2004.

W-4/W-5. The excavated area was backfilled with treated soil and completed with coarse gravel (Earth Tech 2008a).

Backfill and compaction at all sites was performed in accordance with design specifications that were submitted and approved by the Navy. In general, treated soil from the treatment system at former NAS Barbers Point was used as backfill at the excavation sites. The soil was loaded into tandem dump trucks at the treatment site, transported to the excavation sites, and either dumped directly into, or temporarily stockpiled next to, the excavations. Soil was spread onto the excavation floor in 8-inch lifts using heavy equipment and compacted using heavy equipment compactor attachments, tandem rollers, or portable jumping-jack type compactors. Soil was compacted to 90 percent of maximum dry density for landscaped areas and to 95 percent of maximum dry density for paved areas (American Society for Testing and Materials [ASTM] D 1557). Density testing was performed in accordance with ASTM D 2922 and D 1556. In addition, moisture content tests were also performed in accordance with ASTM D 3017. Once sites were backfilled and compacted to the specified density, the surface was restored to match the pre-excavation appearance (ECC 2007).

Before topsoil was placed, the backfill surface was cleared of all materials that might hinder subsequent maintenance operations. Topsoil previously removed from the treatment site at former NAS Barbers Point was stockpiled and reused or was imported from a commercial source and was free from subsoil, litter, and other objectionable material. Suitable topsoil was placed in the top 4 inches of all areas to be reseeded. Before the topsoil was put in place, the subgrade was scarified to

a depth of 3 inches. Topsoil was spread in such a manner that planting could proceed with little additional soil preparation. Topsoil was spread uniformly but not compacted (Earth Tech 2003c).

The contractor encapsulated contaminated concrete or completed site restoration at transformer TD-10 on Ford Island, where remediation had previously been performed by others. The encapsulating process was comprised of painting the specified areas with epoxy encapsulant in two layers of contrasting color, in accordance with § 761.30(p) of the TSCA regulations (ECC 2007).

In summary, the site restoration completed at each of the three transformer sites complies with TSCA requirements for capping contamination, as described in 40 CFR § 761.61(a)(7).

LUCs were selected as the final remedy because it represents the best balance of the NCP evaluation criteria. It is protective of human health and the environment, complies with ARARs, reduces contaminant mobility, is cost effective, and meets response action objectives. Although no principal threat wastes exist at these three transformer sites, the selected remedy satisfies the statutory preference for removal and treatment as a principal element of the final remedy because treatment of PCB-contaminated soil and concrete was performed to the extent practicable (40 CFR § 300.430(a)(1)(iii)(A)).

2.12.2 Description of the Selected Final Remedy

The Navy and EPA, with concurrence by DOH, have selected LUCs as the final remedy for the three PHNC transformer sites. The Navy will modify its internal procedures to ensure that land use at the three transformer sites remains 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 for these sites will remain in effect until a ROD addendum or other documentation is prepared based on the intent to change land use. The LUCs for the three transformer sites are presented in Section 2.12.3 and will be applied only to the affected area within the sites. Figure 5 through Figure 7 show each of the three transformer sites and the boundaries of the LUCs. The elements of the selected final remedy include the following:

- Administering LUCs to restrict land use to low-occupancy use only, and to ensure long-term viability of the final remedy.

A RAWP will be prepared to document how the LUC component of the final remedy will be implemented and to provide details on the LUCs.

2.12.3 Land Use Control Performance Objectives

Performance objectives for the LUCs being implemented as an integral part of the final remedy at these three transformer sites are to restrict current and future land use to activities compatible with low-occupancy use and to ensure long-term viability of the final remedy. The LUCs for future land use imposed at the three transformer sites are presented below and will be applied only to the affected area within the sites (see Figure 5 through Figure 7).

The following LUC performance objectives apply to the affected areas at all three transformer sites at PHNC:

- 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 or concrete is 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 such notice.
- Ensure that legal and physical notices of LUCs are maintained in perpetuity or until they are no longer needed or until a ROD addendum or other such documentation is prepared based on the intent to change land use.

The Navy shall implement internal procedures for upholding LUCs by maintaining a database of the LUCs (i.e., Naval Installation Restoration Information Solution). The Navy shall commit to notify EPA in advance of any changes to the internal procedures that would affect the LUCs.

2.12.4 Summary of the Estimated Final Remedy Costs

Detailed costs for adding LUCs to the previously completed removal actions were not estimated for the alternatives compared in the ROD. A detailed comparison of costs for the removal action was previously provided in the removal AM. LUCs are now being evaluated as part of the final remedy because removing PCB-contaminated soil and concrete to the TSCA high-occupancy cleanup levels was unfeasible based on operational and anticipated cost constraints.

The estimated present value cost for the LUCs (including inspections and maintenance) and 5-year reviews for 30 years is $129,210.

2.12.5 Expected Outcomes of the Selected Final Remedy

The selected final remedy at the three transformer sites will eliminate future human health risks by limiting PCB-contaminated soils and concrete to levels protective of low-occupancy use and by implementing LUCs to limit exposure pathways of human receptors to contaminants at these sites. By maintaining LUCs, the selected remedy reduces risks to human health to acceptable levels. The final remedy does not change the current or planned future land use of these three transformer sites.

2.12.6 Selected Final Remedy Ongoing Activities

Five-year reviews are required to evaluate the effectiveness of the final remedy for the three transformer sites at PHNC.

2.13 STATUTORY DETERMINATIONS

The implementation of LUCs at the three transformer sites is protective of human health, complies with ARARs, and is cost-effective. The following sections summarize how the selected remedy meets these statutory requirements.

2.13.1 Protection of Human Health and the Environment

Implementing LUCs limits the exposure pathway of human receptors to contaminants at these three transformer sites. By maintaining LUCs, the selected remedy reduces risks to human health to acceptable levels.

2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements

As required by CERCLA, SARA, and EPA policy, response actions are required to attain ARARs.

- "Applicable requirements" are defined as those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site.
- "Relevant and appropriate requirements" are defined as those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not directly applicable to a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site.

Because ARARs do not exist for every chemical or circumstance, nonpromulgated federal or state advisories, criteria, or guidance materials, or TBC materials, may help determine the levels or goals that are protective for a site and the necessary approach to carry out certain actions or requirements.

- "TBCs" are nonpromulgated federal, state, or local advisories or guidance that are not legally binding and do not have the status of ARARs. The NCP does not require agencies to follow TBCs; however, it suggests that TBCs be used when ARARs do not exist and when ARARs alone would not adequately protect human health and the environment.

ARARs and TBCs fall into three broad categories:

- Chemical-specific, which establish numerical standards limiting the concentration of substances in the medium of concern or medium affected by the cleanup action.
- Location-specific, which restrict the concentration of a substance or the performance of the cleanup action on the basis of site location.
- Action-specific, which restrict the performance and design standards of a particular cleanup action on the basis of a technology or activity.

ARARs and TBCs are used as screening criteria to assess the extent of significant contamination, to formulate response alternatives, and to govern implementation and operation of a selected action. According to SARA, EPA may waive ARARs under specific conditions, but only if protection of human health and the environment is still assured.

Federal and state chemical-specific, location-specific, and action-specific ARARs and TBCs pertinent to the evaluation of response actions for these three transformer sites are summarized below. A detailed description of the ARARs and TBC criteria is provided in the EE/CA (Earth Tech 2000).

2.13.2.1 CHEMICAL-SPECIFIC ARAR AND TBCS

The following ARARs and TBC were identified for the three transformer sites at PHNC:

ARARs:

- **40 CFR § 761.61(a)(4) of the TSCA regulations for PCB remediation waste.** Section 761.61(a)(4) contains cleanup levels for PCB remediation wastes. These cleanup levels are applicable to the action at the three transformer sites. Section 761.61(a)(4) sets cleanup levels for PCB bulk remediation waste at less than or equal to 1 mg/kg for high-occupancy areas and less than or equal to 25 ppm for low-occupancy areas. Cleanup levels for this project have been established for low occupancy at less than or equal to 25 ppm.
- **40 CFR § 761.79(b)(4) and 40 CFR § 761.30(p) of the TSCA regulations for cleanup and disposal of PCB remediation waste for porous surfaces.** These regulations outline cleanup and disposal procedures for porous surfaces. These regulations are applicable to the LUCs at the three transformer sites.
- **40 CFR § 761.61(a)(4)(i)(B) of the TSCA regulations for cleanup of PCBs at low-occupancy areas.** Section 761.61(a)(4)(i)(B) contains cleanup levels for PCB remediation wastes at low occupancy areas. These restrictions are applicable to the LUCs at the three transformer sites.

2.13.2.2 LOCATION-SPECIFIC ARARS AND TBCS

No location-specific ARARs were identified for the three transformer sites at PHNC.

2.13.2.3 ACTION-SPECIFIC ARARS AND TBCS

The following action-specific ARARs were identified for the response action at the three transformer sites at PHNC:

- **40 CFR § 761.61(a)(7) of the TSCA regulations for cap requirements for areas where remediation waste was removed or left in place.** Section 761.61(a)(7) outlines the requirements for capped surfaces in order to prevent or minimize human exposure, infiltration of water, and erosion of the remediated waste. These restrictions are applicable to the LUCs at the three transformer sites.
- **40 CFR § 761.61(a)(8) of the TSCA regulations for deed restrictions for caps, fences, and low-occupancy areas.** Section 761.61(a)(8) outlines deed restrictions and maintenance requirements for areas that have undergone PCB remediation and include the use of a cap or fence. These restrictions are applicable to the LUCs at the three transformer sites.

The selected remedy, implementation of LUCs, complies with the ARARs and TBCs listed above because implementation of LUCs limits exposure of human receptors to the contaminants left in place, reducing risks to acceptable levels. The LUCs selected for the three transformer sites are relevant or appropriate. In summary, the selected remedy of implementation of LUCs at the three transformer sites complies with 40 CFR § 300.430(e)(9)(iii)(B).

2.13.3 Cost-Effectiveness

LUCs provide a cost-effective remedy by establishing restrictions on land use for the three transformer sites at PHNC. The selected final remedy is effective in meeting remedial action objectives and protecting human health and the environment, is implementable, and is cost effective.

2.13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies

The selected alternative represents the maximum extent to which permanent solutions and treatment technologies can be used in a cost-effective manner. Specifically, this alternative provides the best short- and long-term effectiveness, is protective of human health and the environment, complies with ARARs, achieves removal action objectives, is feasible, and reduces contaminant mobility.

2.13.5 Preference for Treatment as a Principal Element

The NCP (40 CFR § 300.430(a)(1)(iii)(A)) establishes the expectation that treatment will be used to address the principal threats at a site, where practicable. A principal threat waste is a source material considered highly toxic or mobile and that cannot be contained in a reliable manner or that would present a significant risk to human health and the environment should exposure occur. Although no principal threat wastes were identified at the three transformer sites at PHNC, as discussed in Section 2.11, this final remedy satisfies the statutory preference for removal and treatment as a principal element of the final remedy.

Through the removal action at the three transformer sites, the toxicity, volume, and mobility of PCBs were reduced by excavating the soil and then treating the excavated soil by thermal desorption. The final remedial action described in this document was developed in accordance with CERCLA and concludes that LUCs will provide protection of human health at these three sites.

LUCs at these three transformer sites will limit the future use of the property and limit pathways for human exposure to contamination to acceptable levels. LUCs for these sites will remain in effect until a ROD addendum or other such documentation is prepared based on the intent to change land use.

2.13.6 Five-Year Review Requirement

Because the selected alternative results in contaminants remaining at the three transformer sites above levels that allow for high-occupancy use, a Five-Year Review is required every five years following the initiation of the final remedy to ensure that the LUC elements of the final remedy remain protective of human health and the environment.

2.14 DOCUMENTATION OF SIGNIFICANT CHANGES

No comments were received on the preferred remedy during the review of the proposed plan (DON 2006b). However, six transformer sites (Transformers TF-06, TF-08, TF-10, and TG-04 located on Ford Island; Transformer M-14 located in the PWC Main Complex; and Transformer D-02 located in the Pearl Harbor Naval Shipyard) that were previously identified in the proposed plan now require further evaluation. A revised proposed plan will be prepared for these sites.

3. Responsiveness Summary

A public notice, announcing the availability for review of the proposed plan (DON 2006b) and other project related documents, was published in the *Honolulu Advertiser* and *Star Bulletin* on 25 June 2006. A 30-day public comment period for the proposed plan was held from 27 June to 26 July 2006. In addition, public meetings to discuss the proposed plan were held on 20 July 2006 at the Leeward Community College, Pearl City, Hawaii; on 24 July 2006 at the Waianae Public Library, Waianae, Hawaii; and on 25 July 2006 at the Wahiawa Recreation Center, Wahiawa, Hawaii. Complete transcripts of the public meetings are available in the AR file. No verbal or written comments were received on the proposed plan at these meetings.

3.1 STAKEHOLDER ISSUES AND LEAD AGENCY RESPONSES

No stakeholder issues were received on the selected final remedy presented in the proposed plan.

3.2 TECHNICAL AND LEGAL ISSUES

No technical or legal issues were received on the selected final remedy presented in the proposed plan.

4. References

40 Code of Federal Regulations (CFR) 300. *National Oil and Hazardous Substances Pollution Contingency Plan*. Available: http://ecfr.gpoaccess.gov.

40 CFR 750 and 761. 1998. *Disposal of Polychlorinated Biphenyls (PCBs); Final Rule.* FR Volume 63, No. 124, p. 35383. 29 June.

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———. 2003a. *Site Inspection, Various Transformer Sites, Pearl Harbor Naval Complex, Oahu, Hawaii*. Pearl Harbor, HI: Naval Facilities Engineering Command, Pacific. January.

———. 2003b. *Sampling and Analysis Plan Removal Action Design Support and Confirmation Sampling - Group C Sites, Halawa-Main Gate GSA, Naval Housing GSA, PWC Main Complex GSA, Shipyard GSA, Waipio Peninsula GSA, West Loch GSA, NCTAMS Wahiawa, NRTF, Lualualei, NAVMAG PH Lualualei, Oahu, Hawaii.* Pearl Harbor, HI: Naval Facilities Engineering Command, Pacific. February.

———. 2003c. *Final Design Documents Thermal Desorption of PCB-Contaminated Soil, Former Naval Air Station, Barbers Point, Oahu, Hawaii*. Pearl Harbor, HI: Naval Facilities Engineering Command, Pacific. November.

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Attachment A
Cost Estimates

Attachment A.1
Alternative 2 Cost Estimate

PHNC Transformers Site HC04 Alternative 2
Land Use Controls
(Escalated)

Site Name: PHNC Transformers
Site ID: HC04
Alternative 2: LUCs
Location: Pearl Harbor Naval Complex, Oahu, Hawaii
Report Option: Fiscal

Estimator: Keith Robertson

Name: **Reviewer:** Mike West
Title: Senior Cost Engineer
Agency/Org./Office: AECOM
5575 DTC Parkway Suite 325
Business Address: Greenwood Village, CO 80111
Phone: 303-224-6777
Email: Mike.West2@aecom.com

Prepared Date: 3/24/2010

Phase Type	Phase Name	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016
Long Term Monitoring	Site HC04 Alt2, Land Use Controls FY2010-2040	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614
Long Term Monitoring	Site HC04 Alt2, 5-Year Reviews	$0	$0	$0	$0	$5,275	$0	$0
Sub-total with mark-ups		$3,614	$3,614	$3,614	$3,614	$8,889	$3,614	$3,614
Escalation Factor		1.02	1.0404	1.0612	1.0824	1.1041	1.1262	1.1487
Total		$3,686	$3,760	$3,835	$3,912	$9,814	$4,070	$4,151
Year		0	1	2	3	4	5	6
Present Value Discount Rate (2.7%)		1.0000	0.9737	0.9481	0.9232	0.8989	0.8753	0.8523
Present Worth Value		**$3,686**	**$3,661**	**$3,636**	**$3,611**	**$8,822**	**$3,562**	**$3,538**

Note: A 2.7 percent discount rate was used to calculate present value costs based upon the rates published in Appendix C of the *Circular A-94 Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (United States Office of Management and Budget, 2009)

PHNC Transformers Site HC04 Alternative 2
Land Use Controls
(Escalated)

Site Name: PHNC Transformers
Site ID: HC04
Alternative 2: LUCs
Location: Pearl Harbor Naval Complex, Oahu
Report Option: Fiscal

Name:
Title:
Agency/Org./Office:

Business Address:
Phone:
Email:
Prepared Date:

Phase Type	**FY2017**	**FY2018**	**FY2019**	**FY2020**	**FY2021**	**FY2022**	**FY2023**	**FY2024**	**FY2025**	**FY2026**	**FY2027**	**FY2028**	**FY2029**
Long Term Monitoring	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614
Long Term Monitoring	$0	$0	$5,275	$0	$0	$0	$0	$5,275	$0	$0	$0	$0	$5,275
Sub-total with mark-ups	$3,614	$3,614	$8,889	$3,614	$3,614	$3,614	$3,614	$8,889	$3,614	$3,614	$3,614	$3,614	$8,889
Escalation Factor	1.1717	1.1951	1.2190	1.2434	1.2682	1.2936	1.3195	1.3459	1.3728	1.4002	1.4282	1.4568	1.4859
Total	$4,235	$4,319	$10,836	$4,494	$4,583	$4,675	$4,769	$11,964	$4,961	$5,060	$5,162	$5,265	$13,208
Year	7	8	9	10	11	12	13	14	15	16	17	18	19
Present Value Discount Rate (2.7%)	0.8299	0.8080	0.7868	0.7661	0.7460	0.7264	0.7073	0.6887	0.6706	0.6529	0.6358	0.6191	0.6028
Present Worth Value	**$3,514**	**$3,490**	**$8,526**	**$3,443**	**$3,419**	**$3,396**	**$3,373**	**$8,239**	**$3,327**	**$3,304**	**$3,282**	**$3,259**	**$7,962**

Note: A 2.7 percent discount rate was used to calculate present value costs based upon the rates published in Appendix C of the *Circular A-94 Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (United States Office of Management and Budget, 2009)

PHNC Transformers Site HC04 Alternative 2
Land Use Controls
(Escalated)

Site Name: PHNC Transformers
Site ID: HC04
Alternative 2: LUCs
Location: Pearl Harbor Naval Complex, Oahu
Report Option: Fiscal

Name:
Title:
Agency/Org./Office:

Business Address:
Phone:
Email:
Prepared Date:

Phase Type	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	Row Total
Long Term Monitoring	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$3,614	$108,420
Long Term Monitoring	$0	$0	$0	$0	$5,275	$0	$0	$0	$0	$5,275	$31,650
Sub-total with mark-ups	$3,614	$3,614	$3,614	$3,614	$8,889	$3,614	$3,614	$3,614	$3,614	$8,889	$140,070
Escalation Factor	1.5157	1.5460	1.5769	1.6084	1.6406	1.6734	1.7069	1.7410	1.7758	1.8114	
Total	$5,478	$5,587	$5,699	$5,813	$14,583	$6,048	$6,169	$6,292	$6,418	$16,102	$194,947
Year	20	21	22	23	24	25	26	27	28	29	
Present Value Discount Rate (2.7%)	0.5869	0.5715	0.5565	0.5419	0.5276	0.5137	0.5002	0.4871	0.4743	0.4618	
Present Worth Value	**$3,215**	**$3,193**	**$3,171**	**$3,150**	**$7,694**	**$3,107**	**$3,086**	**$3,065**	**$3,044**	**$7,436**	**$129,210**

Note: A 2.7 percent discount rate was used to calculate present value costs based upon the rates published in Appendix C of the *Circular A-94 Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (United States Office of Management and Budget, 2009)

Alternative Cost Over Time Report
(with Markups)

System:

RACER Version: 10.2.0
Database Location: C:\Documents and Settings\testguest\Desktop\Hawaii\AECOM Honolulu Office Transformer Estimates.mdb

Folder:

Folder Name: NCTAMS and PHNC Estimates

Site:

Site ID: 92244.00.64.02_2
Site Name: PHNC Transformer Remediation Project
Site Category: None

Location

State / Country: HAWAII
City: HONOLULU

Location Modifier	Default	User
	1.690	1.690

Options

Database: Modified System
Cost Database Date: 2009
Report Option: Fiscal

Alternative Cost Over Time Report
(with Markups)

Description	Pearl Harbor Naval Complex (PHNC) Transformer Remediation Project Location: Honolulu, HI Sites included in the estimate: TD-10, K-14 and W-4/W-5. Three (3) alternatives will be evaluated: 1) No Action 2) Land Use Controls 3) Excavation to High Occupancy Reuse and Thermal Desorption Treatment

Alternative Cost Over Time Report
(with Markups)

Alternative:

Alternative ID:	PHNC 0002
Alternative Name:	Alt #2: Land Use Controls
Alternative Type:	None

Media/Waste Type

Primary:	Soil
Secondary:	N/A

Contaminant

Primary:	PCBs
Secondary:	None

Phase Names

Pre-Study:	☐
Study:	☐
Design:	☐
Removal/Interim Action:	☐
Remedial Action:	☐
Operations & Maintenance:	☐
Long Term Monitoring:	☑
Site Closeout:	☐

Documentation

Description: Alternative #2 - Land Use Controls
This alternative assumes that the soil remediation has already taken place. The activities captured in this alternative include 5 Year Reporting and a one 1 page annual letter report with a site visit, annually. The estimated long-term monitoring duration is 30 years.

Support Team: Jeff Johnson
AECOM
841 Bishop Street, Suite 500
Honolulu, HI 96813
Phone Number: (808) 523-8874

Alternative Cost Over Time Report
(with Markups)

References: Reference Documents:
ConfSamples_3Trans_PHNC.pdf
Email Communications: CE for PCB Removal Actions at Hickam AFB; Transformer Volumes; Transformer soil/concrete volumes; and Cost Estimate.

Estimator Information

Estimator Name: Andrew Schleppi, CCC
Estimator Title: Cost Engineer
Agency/Org./Office: AECOM
Business Address: 5575 DTC Parkway
Suite 200
Greenwood Village, CO 80111
Telephone Number: 303-771-3103
Email Address: andrew.schleppi@aecom.com

Estimate Prepared Date: 10/27/2009

Estimator Signature: _____ Date: _____

Reviewer Information

Reviewer Name:
Reviewer Title:
Agency/Org./Office:
Business Address:
Telephone Number:
Email Address:
Date Reviewed:

Reviewer Signature: _____ Date: _____

Alternative Cost Over Time Report
(with Markups)

Phase Type	Phase Name	2010	2011	2012	2013	2014	2015
Long Term Monitoring	Land Use Controls Phase	$3,614	$3,614	$3,614	$3,614	$8,889	$3,614
Total Alternative Cost		$3,614	$3,614	$3,614	$3,614	$8,889	$3,614
Escalation Factor		1.0200	1.0404	1.0612	1.0824	1.1041	1.1262
Escalated Cost		$3,686	$3,760	$3,835	$3,912	$9,814	$4,070

Alternative Cost Over Time Report
(with Markups)

Phase Type	Phase Name	2016	2017	2018	2019	2020	2021
Long Term Monitoring	Land Use Controls Phase	$3,614	$3,614	$3,614	$8,889	$3,614	$3,614
Total Alternative Cost		$3,614	$3,614	$3,614	$8,889	$3,614	$3,614
Escalation Factor		1.1487	1.1717	1.1951	1.2190	1.2434	1.2682
Escalated Cost		$4,151	$4,234	$4,319	$10,836	$4,494	$4,583

Alternative Cost Over Time Report
(with Markups)

Phase Type	Phase Name	2022	2023	2024	2025	2026	2027
Long Term Monitoring	Land Use Controls Phase	$3,614	$3,614	$8,889	$3,614	$3,614	$3,614
Total Alternative Cost		$3,614	$3,614	$8,889	$3,614	$3,614	$3,614
Escalation Factor		1.2936	1.3195	1.3459	1.3728	1.4002	1.4282
Escalated Cost		$4,675	$4,769	$11,964	$4,961	$5,060	$5,161

Alternative Cost Over Time Report
(with Markups)

Phase Type	Phase Name	2028	2029	2030	2031	2032	2033
Long Term Monitoring	Land Use Controls Phase	$3,614	$8,889	$3,614	$3,614	$3,614	$3,614
Total Alternative Cost		$3,614	$8,889	$3,614	$3,614	$3,614	$3,614
Escalation Factor		1.4568	1.4859	1.5157	1.5460	1.5769	1.6084
Escalated Cost		$5,265	$13,208	$5,478	$5,587	$5,699	$5,813

Alternative Cost Over Time Report
(with Markups)

Phase Type	Phase Name	2034	2035	2036	2037	2038	2039
Long Term Monitoring	Land Use Controls Phase	$8,889	$3,614	$3,614	$3,614	$3,614	$8,889
Total Alternative Cost		$8,889	$3,614	$3,614	$3,614	$3,614	$8,889
Escalation Factor		1.6406	1.6734	1.7069	1.7410	1.7758	1.8114
Escalated Cost		$14,583	$6,048	$6,169	$6,292	$6,418	$16,101

Alternative Cost Over Time Report
(with Markups)

Phase Type	Phase Name	Total
Long Term Monitoring	Land Use Controls Phase	$140,069
Total Alternative Cost		$140,069
Escalation Factor		
Escalated Cost		$194,945

Estimate Documentation Report

System:

RACER Version: 10.2.0
Database Location: C:\Documents and Settings\testguest\Desktop\Hawaii\AECOM Honolulu Office Transformer Estimates.mdb

Folder:

Folder Name: NCTAMS and PHNC Estimates

Site:

Site ID: 92244.00.64.02_2
Site Name: PHNC Transformer Remediation Project
Site Category: None

Location

State / Country: HAWAII
City: HONOLULU

Location Modifier	Default	User
	1.690	1.690

Options

Database: Modified System
Cost Database Date: 2009
Report Option: Fiscal

Description

Pearl Harbor Naval Complex (PHNC) Transformer Remediation Project
Location: Honolulu, HI
Sites included in the estimate: TD-10, K-14 and W-4/W-5.

Three (3) alternatives will be evaluated:
1) No Action
2) Land Use Controls
3) Excavation to High Occupancy Reuse and Thermal Desorption Treatment

Estimate Documentation Report

Alternative Documentation:

Alternative ID:	PHNC 0002
Alternative Name:	Alt #2: Land Use Controls
Alternative Type:	None

Media/Waste Type

Primary:	Soil
Secondary:	N/A

Contaminant

Primary:	PCBs
Secondary:	None

Phase Names

Pre-Study:	☐
Study:	☐
Design:	☐
Removal/Interim Action:	☐
Remedial Action:	☐
Operations & Maintenance:	☐
Long Term Monitoring:	☑
Site Closeout:	☐

Documentation

Description:	Alternative #2 - Land Use Controls This alternative assumes that the soil remediation has already taken place. The activities captured in this alternative include 5 Year Reporting and a one 1 page annual letter report with a site visit, annually. The estimated long-term monitoring duration is 30 years.
Support Team:	Jeff Johnson AECOM 841 Bishop Street, Suite 500 Honolulu, HI 96813 Phone Number: (808) 523-8874
References:	Reference Documents: ConfSamples_3Trans_PHNC.pdf Email Communications: CE for PCB Removal Actions at Hickam AFB; Transformer Volumes; Transformer soil/concrete volumes; and Cost Estimate.

Estimator Information

Estimator Name:	Andrew Schleppi, CCC
Estimator Title:	Cost Engineer
Agency/Org./Office:	AECOM
Business Address:	5575 DTC Parkway Suite 200 Greenwood Village, CO 80111
Telephone Number:	303-771-3103

Estimate Documentation Report

Email Address: andrew.schleppi@aecom.com
Estimate Prepared Date: 10/27/2009

Estimator Signature: _____ Date: _____

Reviewer Information
Reviewer Name:
Reviewer Title:
Agency/Org./Office:
Business Address:
Telephone Number:
Email Address:
Date Reviewed:

Reviewer Signature: _____ Date: _____

Estimated Costs:

Phase Names		Direct Cost	Marked-up Cost
Land Use Controls Phase		$135,571	$140,069
	Total Cost:	$135,571	$140,069
	Escalation:	$53,170	$54,876
	Total Alternative Cost:	$188,741	$194,945

Estimate Documentation Report

Phase Documentation:

Phase Type:	Long Term Monitoring
Phase Name:	Land Use Controls Phase
Description:	Alternative #2: Land Use Controls Phase Start Date: January 2010 This phase of work will esitmate the annual site inspection and letter report, and 5-year review reports for a duration of 30 years.

Start Date:	January, 2010
Labor Rate Group:	Hawaii Generic Labor Rates - 2009
Analysis Rate Group:	System Analysis Rate
Phase Markups:	System Defaults

Technology Markups	Markup	% Prime	% Sub.
Five-Year Review	Yes	100	0
LETTER REPORT AND SITE VISIT	Yes	100	0

Total Marked-up Cost: $140,069

Technologies:

Estimate Documentation Report

Technology Name: Five-Year Review (# 1)

Description	Default	Value	UOM
System Definition			
Required Parameters			
Site Complexity		Low	n/a
Document Review		Yes	n/a
Interviews		No	n/a
Site Inspection		No	n/a
Report		Yes	n/a
Travel		No	n/a
Rebound Study		No	n/a
Start Date		January-2014	n/a
No. Reviews		6	EA
Document Review			
Required Parameters			
5-Year Review Check List		Yes	n/a
Record of Decision		Yes	n/a
Remedial Action Design & Construction		Yes	n/a
Close-Out Report		Yes	n/a
Operations & Maintenance Manuals & Reports		No	n/a
Consent Decree or Settlement Records		No	n/a
Groundwater Monitoring & Reports		No	n/a
Remedial Action Required		No	n/a
Previous 5-Year Review Reports		Yes	n/a
Report			
Required Parameters			
Introduction		Yes	n/a
Remedial Objectives		Yes	n/a
ARARs Review		Yes	n/a
Summary of Site Visit		No	n/a
Areas of Non Compliance		Yes	n/a
Technology Recommendations		No	n/a
Statement of Protectiveness		Yes	n/a
Next Review		Yes	n/a
Implementation Requirements		Yes	n/a

Estimate Documentation Report

Comments: Assumptions:
Deselected tasks not applicable to the PHNC project.

Technology Name: Administrative Land Use Controls (# 1)
User Name: LETTER REPORT AND SITE VISIT

Description	Default	Value	UOM
System Definition			
Required Parameters			
Rename Model		LETTER REPORT AND SITE VISIT	n/a
Planning Documents		No	n/a
Implementation		No	n/a
Monitoring & Enforcement		Yes	n/a
Monitoring & Enforcement: Start Date		2010	n/a
Modification/Termination		No	n/a
Type of Site		Active Government Installation	n/a
Monitoring & Enforcement			
Required Parameters			
Duration of Monitoring/Enforcement		30	Years
Notice Letters		No	n/a
Guard Service/Security		No	n/a
Reports & Certifications		Yes	n/a
Reports & Certifications: Frequency		Annually	n/a
Site Visits/Inspections		Yes	n/a
Site Visits/Inspections: Number		1	EA
Site Visits/Inspections: Safety Level		D	n/a
Site Visits/Inspections: Duration		1	Days
Site Visits/Inspections: Number of People		2	EA
Site Visits/Inspections: Frequency		Annually	n/a
Site Visits/Inspections: Airfare		0	$ Per Ticket
Site Visits/Inspections: Mileage		15	MI

Comments: This technology assumes that 2 Staff Engineers will visit the site once annually. One (1) letter report will be written annually. Minor project management time was included along with ODCs. Removed the Health & Safety Officer assembly.

Attachment A.2
Alternative 3 Cost Estimate

Alternative Cost Over Time Report
(with Markups)

System:

RACER Version: 10.2.0
Database Location: C:\Documents and Settings\testguest\Desktop\Hawaii\AECOM Honolulu Office Transformer Estimates.mdb

Folder:

Folder Name: NCTAMS and PHNC Estimates

Site:

Site ID: 92244.00.64.02_2
Site Name: PHNC Transformer Remediation Project
Site Category: None

Location

State / Country: HAWAII
City: HONOLULU

Location Modifier	Default	User
	1.690	1.690

Options

Database: Modified System
Cost Database Date: 2009
Report Option: Fiscal

Alternative Cost Over Time Report
(with Markups)

Description	Pearl Harbor Naval Complex (PHNC) Transformer Remediation Project Location: Honolulu, HI Sites included in the estimate: TD-10, K-14 and W-4/W-5. Three (3) alternatives will be evaluated: 1) No Action 2) Land Use Controls 3) Excavation to High Occupancy Reuse and Thermal Desorption Treatment

Alternative Cost Over Time Report
(with Markups)

Alternative:

Alternative ID:	PHNC 0003
Alternative Name:	Alt #3: Excavation, Treatment, Backfill
Alternative Type:	None

Media/Waste Type

Primary:	Soil
Secondary:	N/A

Contaminant

Primary:	PCBs
Secondary:	None

Phase Names

Pre-Study:	☐
Study:	☐
Design:	☐
Removal/Interim Action:	☐
Remedial Action:	☑
Operations & Maintenance:	☐
Long Term Monitoring:	☑
Site Closeout:	☐

Documentation

Description: Alternative #3: Excavation to high occupancy reuse and thermal desorption treatment

Excavation of soil/concrete, confirmation sampling, transport to treatment facility, treatment, transport back to transformer site, backfill basin.

Support Team: Jeff Johnson
AECOM
841 Bishop Street, Suite 500
Honolulu, HI 96813
Phone Number: (808) 523-8874

Alternative Cost Over Time Report
(with Markups)

References:	Reference Documents: ConfSamples_3Trans_PHNC.pdf Email Communications: CE for PCB Removal Actions at Hickam AFB; Transformer Volumes; Transformer soil/concrete volumes; and Cost Estimate.

Estimator Information

Estimator Name:	Andrew Schleppi, CCC
Estimator Title:	Cost Engineer
Agency/Org./Office:	AECOM
Business Address:	5575 DTC Parkway Suite 200 Greenwood Village, CO 80111
Telephone Number:	303-771-3103
Email Address:	andrew.schleppi@aecom.com

Estimate Prepared Date:	10/27/2009

Estimator Signature: _____ Date: _____

Reviewer Information

Reviewer Name:	
Reviewer Title:	
Agency/Org./Office:	
Business Address:	
Telephone Number:	
Email Address:	
Date Reviewed:	

Reviewer Signature: _____ Date: _____

Alternative Cost Over Time Report
(with Markups)

Phase Type	Phase Name	2010	Total
Remedial Action	Excavation and Treatment Activities	$360,551	$360,551
Total Alternative Cost		$360,551	$360,551
Escalation Factor		1.0200	
Escalated Cost		$367,763	$367,763

Estimate Documentation Report

System:

RACER Version: 10.2.0
Database Location: C:\Documents and Settings\testguest\Desktop\Hawaii\AECOM Honolulu Office Transformer Estimates.mdb

Folder:

Folder Name: NCTAMS and PHNC Estimates

Site:

Site ID: 92244.00.64.02_2
Site Name: PHNC Transformer Remediation Project
Site Category: None

Location

State / Country: HAWAII
City: HONOLULU

Location Modifier	Default	User
	1.690	1.690

Options

Database: Modified System
Cost Database Date: 2009
Report Option: Fiscal

Description

Pearl Harbor Naval Complex (PHNC) Transformer Remediation Project
Location: Honolulu, HI
Sites included in the estimate: TD-10, K-14 and W-4/W-5.

Three (3) alternatives will be evaluated:
1) No Action
2) Land Use Controls
3) Excavation to High Occupancy Reuse and Thermal Desorption Treatment

Estimate Documentation Report

Alternative Documentation:

Alternative ID:	PHNC 0003
Alternative Name:	Alt #3: Excavation, Treatment, Backfill
Alternative Type:	None

Media/Waste Type

Primary:	Soil
Secondary:	N/A

Contaminant

Primary:	PCBs
Secondary:	None

Phase Names

Pre-Study:	☐
Study:	☐
Design:	☐
Removal/Interim Action:	☐
Remedial Action:	☑
Operations & Maintenance:	☐
Long Term Monitoring:	☑
Site Closeout:	☐

Documentation

Description:	Alternative #3: Excavation to high occupancy reuse and thermal desorption treatment Excavation of soil/concrete, confirmation sampling, transport to treatment facility, treatment, transport back to transformer site, backfill basin.
Support Team:	Jeff Johnson AECOM 841 Bishop Street, Suite 500 Honolulu, HI 96813 Phone Number: (808) 523-8874
References:	Reference Documents: ConfSamples_3Trans_PHNC.pdf Email Communications: CE for PCB Removal Actions at Hickam AFB; Transformer Volumes; Transformer soil/concrete volumes; and Cost Estimate.

Estimator Information

Estimator Name:	Andrew Schleppi, CCC
Estimator Title:	Cost Engineer
Agency/Org./Office:	AECOM
Business Address:	5575 DTC Parkway Suite 200 Greenwood Village, CO 80111
Telephone Number:	303-771-3103

Estimate Documentation Report

Email Address: andrew.schleppi@aecom.com
Estimate Prepared Date: 10/27/2009

Estimator Signature: _____ Date: _____

Reviewer Information
Reviewer Name:
Reviewer Title:
Agency/Org./Office:
Business Address:
Telephone Number:
Email Address:
Date Reviewed:

Reviewer Signature: _____ Date: _____

Estimated Costs:

Phase Names		Direct Cost	Marked-up Cost
Excavation and Treatment Activities		$357,972	$360,551
	Total Cost:	$357,972	$360,551
	Escalation:	$7,159	$7,211
	Total Alternative Cost:	$365,131	$367,763

Estimate Documentation Report

Phase Documentation:

Phase Type:	Remedial Action
Phase Name:	Excavation and Treatment Activities
Description:	Alternative #3: Excavation to high occupancy reuse and thermal desorption treatment This phase of work captures the cost of excavation of soil/concrete, confirmation sampling, transport to treatment facility, treatment, transport back to transformer site, backfill basin, and restore site. Sites included in the estimate: TD-10, K-14 and W-4/S-5.
Approach:	Ex Situ
Start Date:	January, 2010
Labor Rate Group:	Hawaii Generic Labor Rates - 2009
Analysis Rate Group:	System Analysis Rate
Phase Markups:	System Defaults

Technology Markups	Markup	% Prime	% Sub.
THERMAL DESORPTION UNIT START UP COST	Yes	100	0
Excavation	Yes	100	0
Transportation	Yes	100	0
Excavation	Yes	100	0
Transportation	Yes	100	0
Excavation	Yes	100	0
Transportation	Yes	100	0
INDIRECT THERMAL TREATMENT OF IMPACTED MEDIA	Yes	100	0
Professional Labor Management	Yes	100	0
SITE PREP AND RESTORATION COSTS	Yes	100	0
SPENT FILTER CAKE/CARBON T&D	Yes	100	0

Total Marked-up Cost: $360,551

Technologies:

Estimate Documentation Report

Technology Name: User Defined Estimate (# 1)
User Name: THERMAL DESORPTION UNIT START UP COST

Description	Default	Value	UOM
System Definition			
Required Parameters			
Model Name		THERMAL DESORPTION UNIT START UP COST	n/a
WBS Type		HTRW	n/a
Selected WBS		331.01.90	n/a
Safety Level		D	n/a

Comments: This technology captures that cost to establish a thermal desorption unit. The technology includes a line item cost for mob/demob and a line item cost for proof of performance and shake down. The total startup cost of $600,000 was divided evenly between the NCTAMS and PHNC sites.

Estimate Documentation Report

Technology Name: Excavation (# 1)

Description	Default	Value	UOM
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1.2	CY
Depth		0.5	FT
Soil Type		Sand-Silt/Sand-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	< 6 IN Concrete, Rod Reinforced	n/a
Replacement Cover	Soil/Seeding	< 6 IN Concrete, Rod Reinforced	n/a
Sidewall Protection	None	None	n/a
% of Excavated Material To Be Used as Backfill	0	0	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - PCBs	System Soil - PCBs	n/a
Secondary Analytical Template	None	None	n/a
Number of Sampling Points/Locations	5	9	EA
Number of Composites Submitted to Lab	5	9	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavation #1:
This technology captures the cost of excavation, confirmation sampling and reporting, and site restoration. Impacted site is located inside a building. Removal activities will include concrete removal, transport of spoil material outside, and hand digging. Estimated 2 laborers for an 8 hour day for removal. Sampling on the grid nodes for the site 24ft x 20ft = 30 samples.
Site: TD-10, Ford Island

62 ft2 x 6" concrete slab= 1.14 yd3 concrete
TD-10 (PHNC Excavation #1): 9 samples

Technology Name: Transportation (# 1)

Description	Default	Value	UOM
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid		2	CY
Distance to Off-site Facility (One-way)		22	MI
Safety Level		D	n/a

Comments: Transportation #1
This technology captures the cost to transport the concrete spoil material from the site to the thermal desorption treatment facility. Subsequent to treatment, transport and dispose at a clean landfill. Added a truck bed liner assembly. The assembly quantities were doubled. BCY volume was increased by 35% fluff factor for concrete. Assumed a $60/CY dump charge at a clean landfill.
Site: TD-10

Estimate Documentation Report

Technology Name: Excavation (# 2)

Description	Default	Value	UOM
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		38.3	CY
Depth		7.5	FT
Soil Type		Sand-Silt/Sand-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Asphalt	n/a
Replacement Cover	Soil/Seeding	Asphalt	n/a
Sidewall Protection	Side Sloping	Trench Box	n/a
% of Excavated Material To Be Used as Backfill	0	100	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - PCBs	System Soil - PCBs	n/a
Secondary Analytical Template	None	None	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavation #2:
This technology captures the cost of excavation, confirmation sampling and reporting, and site restoration. Add an equipment operator for a full 8 hour day.
Site: K-14, PHNC
138 ft2 x 7.5’ depth= 38.3 yd3 soil
K-14 (PHNC Excavation #2): 7 samples

Estimate Documentation Report

Technology Name: Transportation (# 2)

Description	Default	Value	UOM
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid		48	CY
Distance to Off-site Facility (One-way)		22	MI
Safety Level		D	n/a

Comments: Transportation #2
This technology captures the cost to transport the spoil material from the site to the thermal desorption treatment facility and then back to the site. Added a truck bed liner assembly. The assembly quantities were doubled. BCY volume was increased by 25% fluff factor.
Site: K-14

Estimate Documentation Report

Technology Name: Excavation (# 3)

Description	Default	Value	UOM
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		2.5	CY
Depth		2.5	FT
Soil Type		Sand-Silt/Sand-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	None	None	n/a
% of Excavated Material To Be Used as Backfill	0	100	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - PCBs	System Soil - PCBs	n/a
Secondary Analytical Template	None	None	n/a
Number of Sampling Points/Locations	5	4	EA
Number of Composites Submitted to Lab	5	4	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavation #3:
This technology captures the cost of excavation, confirmation sampling and reporting, and site restoration. Add an equipment operator for a full 8 hour day.
Site: W4/W5, PHNC
27 ft2 x 2.5' depth= 2.5 yd3 soil
W-4/W-5 (PHNC Excavation #3): 4 samples

Estimate Documentation Report

Technology Name: Transportation (# 3)

Description	Default	Value	UOM
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid		3	CY
Distance to Off-site Facility (One-way)		22	MI
Safety Level		D	n/a

Comments: Transportation #3
This technology captures the cost to transport the spoil material from the site to the thermal desorption treatment facility and then back to the site. Added a truck bed liner assembly. The assembly quantities were doubled. BCY volume was increased by 25% fluff factor.
Site: W-4/S-5

Technology Name: User Defined Estimate (# 2)
User Name: INDIRECT THERMAL TREATMENT OF IMPACTED MEDIA

Description	Default	Value	UOM
System Definition			
Required Parameters			
Model Name		INDIRECT THERMAL TREATMENT OF IMPACTED MEDIA	n/a
WBS Type		HTRW	n/a
Selected WBS		331.14.02	n/a
Safety Level		D	n/a

Comments: Indirect Thermal Treatment of PCB Impacted Soil/Concrete estimated at $756.76 per BCY. Historical price quote received from like project. PHNC site estimated at 42 BCY of media.

Estimate Documentation Report

Technology Name: Professional Labor Management (# 1)

Description	Default	Value	UOM
System Definition			
Required Parameters			
Markedup Construction Cost ($)		12,340	$
Percentage	20.1	20.1	%
Dollar Amount		2,480	$

Comments: Assumptions:
Accepted the default professional labor percentage for oversight and field reporting of the excavation and transportation activities.

Technology Name: User Defined Estimate (# 3)
User Name: SITE PREP AND RESTORATION COSTS

Description	Default	Value	UOM
System Definition			
Required Parameters			
Model Name		SITE PREP AND RESTORATION COSTS	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.01	n/a
Safety Level		D	n/a

Comments: Assumptions:
This technology captures the costs of various site preparation and restoration activites. Activities include fence demo and replacement, landscaping, retaining wall support and site cleanup.

Estimate Documentation Report

Technology Name: User Defined Estimate (# 4)
User Name: SPENT FILTER CAKE/CARBON T&D

Description	Default	Value	UOM
System Definition			
Required Parameters			
Model Name		SPENT FILTER CAKE/CARBON T&D	n/a
WBS Type		HTRW	n/a
Selected WBS		331.07.90	n/a
Safety Level		D	n/a

Comments: This technology captures the cost to pack, load, transport and dispose of spent filter cake/carbon from the thermal desorption system.
PHNC Quantity = 42 BCY = 52.5 CY x 1.3 = 68.25 tons x 0.00086 = 0.059 tons of carbon / 1.3 = 0.045 CY of spent carbon.
Estimated a minimum of 1 CY to be transported. Added a $500 startup cost to cover misc. costs.

Attachment B
Region 9 Federal Facility Land Use Control ROD Checklist

Region 9

FEDERAL FACILITY LAND USE CONTROL ROD CHECKLIST

(Navy/Army, DLA RODs, #s 1-9 below and RD/RAWP, #s 10-19 below /Air Force RODs, #s 1-19 below)

Cross-Checked Against Navy Record of Decision and Land Use Control Work Plan

No.	Checklist Item	Section Where Addressed
To Be Addressed in the Record of Decision		
1	Map/Figure showing boundaries of the land use controls	Figure 5 to Figure 7
2	Document risk exposure assumptions and reasonably anticipated land uses, as well as any known prohibited uses which might not be obvious based on the reasonably anticipated land uses. (For example, where "unrestricted industrial" use is anticipated, list prohibited uses such as onsite company day-care centers, recreation areas, etc.)	Section 1.4: Description of selected remedy Section 2.6.2: Post-removal action and future land use
3	Describe the risks necessitating the LUCs.	Sections 2.7 and 2.7.1 to 2.7.3: Summary of site risks
4	State the LUC performance objectives. We have had comments on these because several of the objectives have not been clear. The following are some examples of what we have been looking for: • Prohibiting digging or disturbing of site soil • Prohibiting excavation and removal of site soil to an offsite location • Prohibiting the development and use of the property for residential housing, elementary or secondary schools, and child care facilities • Ensuring protective covers are maintained • Ensuring metals have not impacted the underlying shallow groundwater at the Bldg. 284 Site at concentrations that could adversely impact adjacent Pearl Harbor	Section 2.12.3: Land Use Control Performance Objectives
5	Generally describe the LUC (restriction), the logic for its selection and any related deed restrictions/notifications.	Section 1.4: Description of Selected Remedy Section 2.12.1: Summary of the Rationale for the Selected Final Remedy Section 2.12.2: Description of Selected Final Remedy
6	Duration language: *"Land Use Controls will be maintained until the concentration of hazardous substances in the soil and groundwater are at such levels to allow for unrestricted use and exposure."*	Section 2.6.3: Land Use Controls
7	Include language that the Navy is responsible for implementing, maintaining, reporting on, and enforcing the land use controls. This may be modified to include another party should the site-specific circumstances warrant it.	Section 2.6.3: Land Use Controls
8	Where someone else will or the Navy plans that someone else will ultimately be implementing, maintaining, reporting on, and enforcing land use controls, the following language should be included: *"Although the Navy may later transfer [has transferred] these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for remedy integrity."*	Section 2.6.3: Land Use Controls
9	Refer to the remedial design (RD) or remedial action work plan (RAWP) for the implementation actions. Because this is a new idea (i.e., including the LUC implementation actions in either or both of these two primary documents), to ensure that the requirement is clear and enforceable, we developed the following language where it makes sense: *"A LUC Work Plan will be prepared as the land use component of the Remedial Design. Within 90 days of ROD signature, the Navy shall prepare and submit to EPA for review and approval a LUC Work Plan that shall contain implementation and maintenance actions, including periodic inspections."*	Section 1.4: Description of selected remedy Section 2.6.3: Land Use Controls

No.	Checklist Item	Section Where Addressed
To Be Addressed in the Land Use Control Work Plan		
10	Commitment by military service to address any situation that may interfere with the effectiveness of LUC: *"Any activity that is inconsistent with the IC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs will be addressed by the Navy as soon as practicable, but in no case will the process be initiated later than 10 days after the Navy becomes aware of the breach."*	
11	Commitment by military service to notify EPA of and address any situation that may interfere with the effectiveness of LUC: *"The Navy will notify EPA and DOH as soon a practicable but no longer than ten days after discovery of any activity that is inconsistent with the IC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs The Navy will notify EPA and DOH regarding how the Navy has addressed or will address the breach within 10 days of sending EPA and DOH notification of the breach."*	
12	Notification to EPA and the state regarding land use changes: <u>For a closing base:</u> *"Prior to seeking approval from the EPA and DOH the recipient of the property must notify and obtain approval from the Navy of any proposals for a land use change at a site inconsistent with the use restrictions and assumptions described in this ROD Amendment."* <u>For an active base:</u> *"The Navy shall notify EPA and state 45 days in advance of any proposed land use changes that are inconsistent with land use control objectives or the selected remedy."*	
13	Notification regarding transfers and federal-to-federal transfers: *"The Navy will provide notice to EPA and DOH at least six (6) months prior to any transfer or sale of [OUs at issue] so that EPA and DOH can be involved in discussions to ensure that appropriate provisions are included in the transfer terms or conveyance documents to maintain effective ICs. If it is not possible for the facility to notify EPA and DOH at least six months prior to any transfer or sale, then the facility will notify EPA and DOH as soon as possible but no later than 60 days prior to the transfer or sale of any property subject to ICs. In addition to the land transfer notice and discussion provisions above, the Navy further agrees to provide EPA and DOH with similar notice, within the same time frames, as to federal-to-federal transfer of property. The Navy shall provide a copy of executed deed or transfer assembly to EPA and DOH."*	
14	Concurrence language: *"The Navy shall not modify or terminate Land Use Controls, implementation actions, or modify land use without approval by EPA and DOH. The Navy shall seek prior concurrence before any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs."*	
15	Monitoring and reporting language: *"Monitoring of the environmental use restrictions and controls will be conducted annually [or more or less frequently as may be determined to be necessary based upon site activities or conditions] by the Navy. The monitoring results will be included in a separate report or as a section of another environmental report, if appropriate, and provided to the EPA and DOH. The annual monitoring reports will be used in preparation of the Five Year Review to evaluate the effectiveness of the remedy.* *The annual monitoring report, submitted to the regulatory agencies by the Navy, will evaluate the status of the ICs and how any IC deficiencies or inconsistent uses have been addressed. The annual evaluation will address whether the use restrictions and controls referenced above were communicated in the deed(s), whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed with such restrictions and controls."*	

No.	Checklist Item	Section Where Addressed
16	A comprehensive list of LUCs. If the description of the LUCs in #5 above is comprehensive, it could substitute for #16's listing of LUCs.	
17	For active facilities, a description of the internal procedures for implementing the LUCs (e.g., orders, instructions, Base Master Plan) and a commitment by the Navy to notify EPA and DOH in advance of any changes to the internal procedures that would affect the LUCs.	
18	Other property transfer language: a. "Deed Restrictions: "Each transfer of fee title from the United States will include a CERCLA 120(h)(3) covenant which will have a description of the residual contamination on the property and the environmental use restrictions, expressly prohibiting activities inconsistent with the performance measure goals and objectives. The environmental restrictions are included in a section of the CERCLA 120(h)(3) covenant that the United States is required to include in the deed for any property that has had hazardous substances stored for one year or more, known to have been released or disposed of on the property. Each deed will also contain a reservation of access to the property for the Navy, USEPA, and DOH, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the Navy's Installation Restoration Program ("IRP") or the Federal Facility Agreement ("FFA"). The deed will contain appropriate provisions to ensure that the restrictions continue to run with the land and are enforceable by the Navy." b. "Lease Restrictions: " During the time between the adoption of this ROD and deeding of the property, equivalent restrictions are being implemented by lease terms, which are no less restrictive than the use restrictions and controls described above, in this ROD. These lease terms shall remain in place until the property is transferred by deed, at which time they will be superseded by the institutional controls described in this ROD." c. "Notice: "Concurrent with the transfer of fee title from the Navy to transferee, information regarding the environmental use restrictions and controls will be communicated in writing to the property owners and to appropriate state and local agencies to ensure such agencies can factor such conditions into their oversight and decision-making activities regarding the property."	
19	Ensure that the document adequately describes pre-transfer LUCs, not just post-transfer LUCs.	