



# Proposed Plan

## Former Trap and Skeet Range (Site UXO 0003) Marine Corps Base Hawaii, Oahu, Hawaii

### MARINE CORPS ANNOUNCES PROPOSED PLAN

The U.S. Marine Corps (Marine Corps) invites the public to review and comment on this **Proposed Plan (PP)** for the Former Trap and Skeet Range (Site **Unexploded Ordnance [UXO] 0003**) at **Marine Corps Base (MCB) Hawaii, Oahu, Hawaii** (*Figure 1*).

The Marine Corps proposes **Land Use Controls (LUCs)** as the preferred remedial action alternative for the site. The LUCs would consist of **Institutional**

**Controls (ICs)**, which are legal or administrative mechanisms that restrict access or use of property, and **Engineering Controls (ECs)** such as fencing and signage, to control physical access to the site.

Long-term monitoring and **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** five-year reviews would be required to ensure that the LUCs continue to provide long-term protection of human health and the environment.

October 2015



Figure 1: Site Location

Public Comment Period  
October 5, 2015—November 5, 2015

Public Meeting  
October 7, 2015, 7:30 p.m., Aikahi Elementary School  
281 Iliha Street, Kailua, Hawaii

## INTRODUCTION

This PP summarizes the background and characteristics of the site, explains the findings of human health and ecological risk assessments, and discusses the cleanup objectives, evaluation of remedial alternatives, and the preferred alternative recommended for the site. Detailed site information is provided in the reports referenced at the end of this PP.

The Marine Corps has issued this PP to invite public involvement in selecting the final site remedy and to fulfill the requirements of CERCLA §117(a) and the **National Contingency Plan (NCP)** §300.430(f)(2). The **Hawaii Department of Health (HDOH)** has concurred with the conclusions and recommendations summarized in this PP.

## SITE BACKGROUND

The Former Trap and Skeet Range is located along the southern boundary of MCB Hawaii, within the Nuupia Ponds **Wildlife Management Area (WMA)** (*Figure 1*). The range was active between the early 1940s and 1975. After the range was closed, military personnel used the site for physical training.

These investigations have been completed at the site:

- **1998** – A **Range Identification and Preliminary Range Assessment (RIPRA)** and **Archival Search Report (ASR)** were completed for MCB Hawaii. A 1943 aerial photograph indicates that the UXO 0003 site consisted of seven individual firing fields (three trap and four skeet) (*Photo 1*). A 1954 map indicates that only four of the original firing fields (two trap and two skeet) remained. The RIPRA report noted that the direction of fire

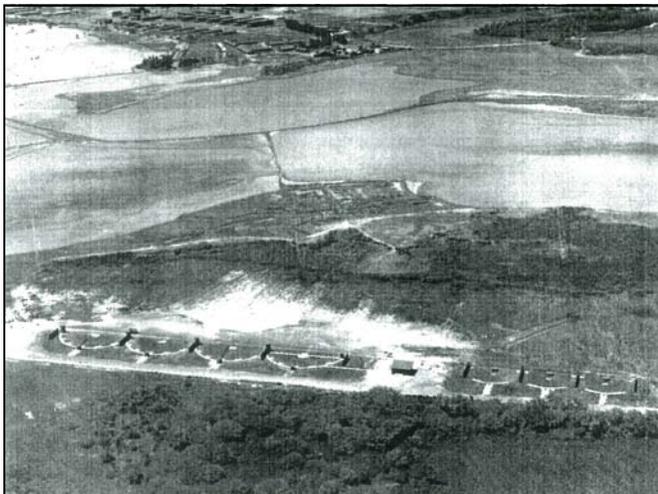


Photo 1: 1943 Aerial Photograph Showing Trap & Skeet Range Layout

for each range would have been to the north, toward the Nuupia Ponds. The reports also referenced a 1975 activity utilization map, which showed a Guerilla Warfare Training area at the site (*USACE 1998*).

- **2008-2011** – The **Site Inspection (SI)** included a site reconnaissance, geophysical survey, and surface soil sampling. No munitions and explosives of concern (**MEC**) were recovered; however, munitions debris items including abundant expended shotgun primers and wadding, as well as expended blank 7.62 millimeter cartridges were observed on the ground surface. The remains of a mock Vietnamese Village consisting of a series of aluminum-frame structures were also identified. Surface soil samples collected during the SI indicated that concentrations of **Munitions Constituents (MC)** exceeded screening levels for antimony, arsenic, copper, lead, and **polynuclear aromatic hydrocarbons (PAHs)**. The SI report therefore recommended a **Remedial Investigation (RI)** for the site. (*USAE 2011*)
- **2011-2013** – The RI was performed to evaluate the nature and extent of MC at the site. It included soil, groundwater, sediment, and surface water sampling, and assessment of risks to human and ecological receptors (*Photo 2*). The RI activities also included limited MEC clearance of three 50-foot by 50-foot grids at the center of the site to evaluate the potential presence of small arms MEC and estimate the amount of munitions debris remaining at the site (*Photo 3*).

## SITE CHARACTERISTICS

The Former Trap and Skeet Range site covers approximately 42 acres of the Nuupia Ponds WMA, consisting of



Photo 2: Drilling Groundwater Monitoring Well MW-1



Photo 3: Conducting MEC Clearance



Photo 4: Pickleweed Marshes

open-water ponds, mudflats, dense pickleweed flats and scrub forest (Photo 4). The site is fenced along the unpaved road on its southern boundary. Dense *kiawe* stands also line the southern and western boundaries. Two locked gates provide access into the site (Photo 5).

Other than some broken concrete pads, little remains of the former range. Shotgun pellets, expended shotgun primers and abundant clay pigeon fragments litter the ground surface in portions of the site (Photo 6).

The Nuupia Ponds WMA includes nesting and feeding habitat used by the endangered Hawaiian Stilt (Photo 7) and Wedge-Tailed Shearwater. Two other endangered water birds and various additional bird species such as the *Pueo* (Hawaiian Owl) frequent the WMA. No military training, storage, or other activities are currently conducted or planned for the site. However, joggers and MCB Hawaii personnel conducting physical training use the unpaved road along the southern boundary.

Surface and subsurface soil, sediment, surface water, and groundwater were sampled during the RI and analyzed for the MC compounds antimony, lead, arsenic, and PAHs. The RI sampling results indicated that MC concentrations exceeding project action levels were limited to lead, antimony, arsenic, metals and PAHs in surface soil (0-6 inches **below ground surface [bgs]**) (AECOM 2013).

Lead, antimony, arsenic, and PAH concentrations exceeding project action levels were detected in surface soil samples collected across the center of the site (i.e., in the area of greatest shotfall). Elevated PAH concentrations were also detected in surface soil near the former firing points. The MC concentrations reported for surface soil samples collected near the edges of the site, and for subsurface soil, groundwater, surface water, and sediment samples were below the project action levels.



Photo 5: Existing Fence and Gate at Site UXO 0003



Photo 6: Clay Pigeon Fragments

The RI identified the sources of metals and PAHs in the surface soil as lead shot and clay pigeon debris.

### SCOPE/ROLE OF RESPONSE ACTION

The LUCs recommended as the preferred remedy for the site would protect human health by warning authorized site users (i.e., wildlife biologists) of the health risk associated with exposure to MC in the surface soil, restricting access by unauthorized personnel (e.g., joggers and trespassers), and prohibiting disturbance of site soil or development and use of the property for anything other than a wildlife management area.

### SUMMARY OF SITE RISKS

**Human Health Assessment (HHRA):** A baseline HHRA was conducted as part of the RI to evaluate whether MC released at the former trap and skeet range could pose ex-

cessive risk to human health (AECOM 2013). The HHRA concluded that exposure to lead, antimony, and PAHs in surface soil across the center of the site and near the access road could pose risks above acceptable limits for one or more hypothetical future human receptor groups, including occupational workers, construction workers, and residents.

**Ecological Screening Risk Assessment (ERA):** An ERA was conducted for the RI to evaluate risks to ecological receptors (wildlife). The ERA concluded that while potentially unacceptable risk existed to terrestrial plants, invertebrates and small terrestrial birds and mammals, no unacceptable risks were identified for the endangered shorebirds such as the Hawaiian Stilt (Photo 7). Further, the effects of a remedial action to excavate or remove contaminated soil may result in possible adverse effects on the endangered shorebirds and water birds. As a result, remedial action is not warranted to address risk to ecological receptors.

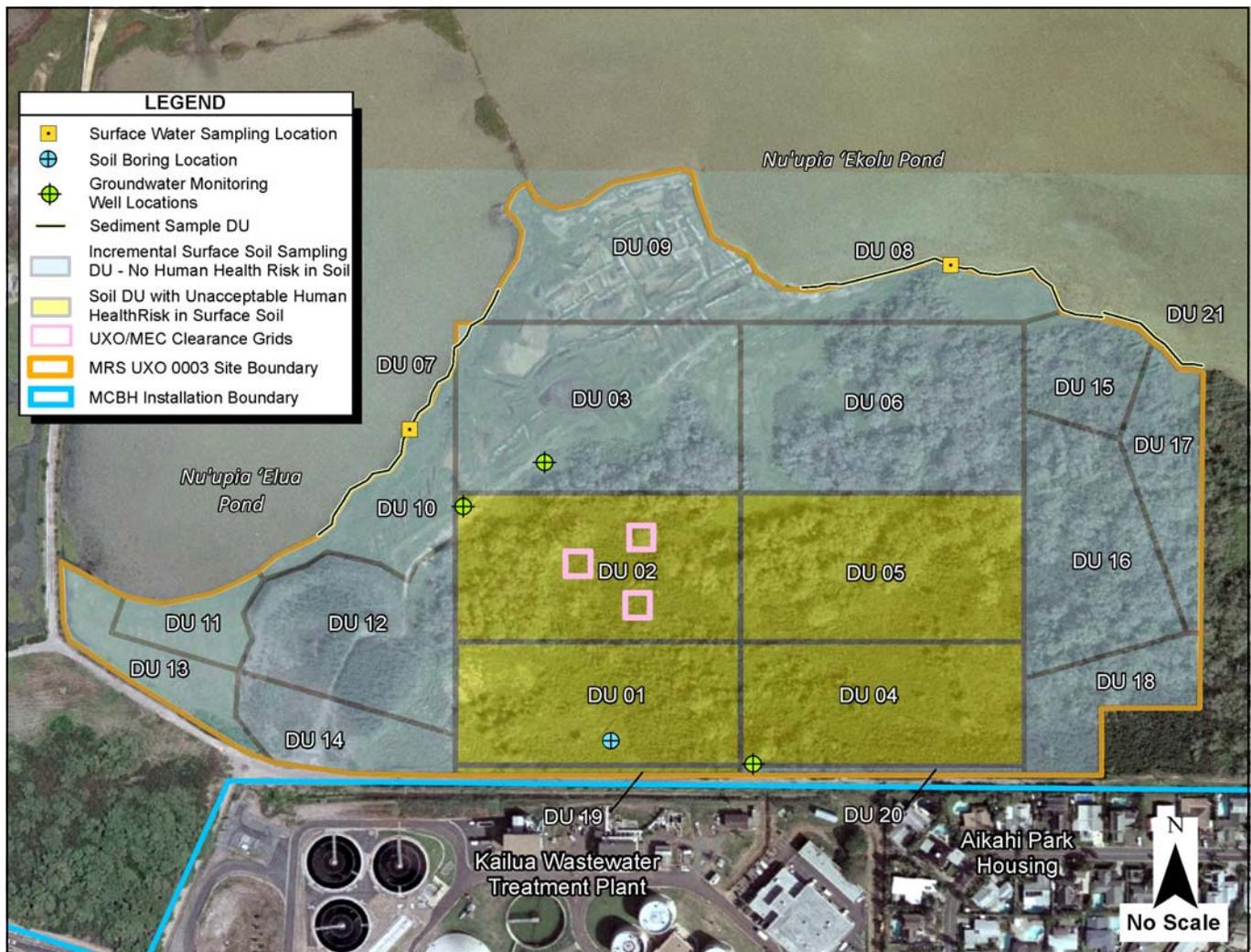


Figure 2: RI Sampling Locations

**Risk Assessment Summary:** The risk assessments concluded that the MC chemicals detected in surface soil (0–0.5 feet bgs) in four areas of the site (*Figure 2*) could pose unacceptable risks to current on-site workers such as wildlife biologists, as well as hypothetical future construction workers and child trespassers. Further action is necessary to ensure the protection of human health and the environment at the site (*AECOM 2013*). The RI report therefore recommended a **Feasibility Study (FS)** to evaluate alternatives for remedial action.

## REMEDIAL ACTION OBJECTIVES

The following remedial action objectives were developed for the site.

- Reduce the potential for exposure of human receptors to surface soil containing chemicals that could pose unacceptable health risks.
- Protect habitat and wildlife from unnecessary impacts during implementation of remedial action.

## REMEDIAL ALTERNATIVES

The FS evaluated three alternatives (*AECOM 2014*):

- **Alternative 1:** No Further Action. The no further action alternative is required by CERCLA as a baseline to reflect current conditions (assuming that site conditions would be left in their current state).
- **Alternative 2:** LUCs. LUCs, consisting of ICs and ECs, would prevent soil disturbance and potential exposure to MC. The ICs would be implemented to warn current and future users of the area (i.e., wildlife biologists) of the MC hazard at the site and deter other individuals (e.g., joggers and trespassers) from entering the area. The ICs would include deed notifications and restrictions including prohibitions on the disturbance of site soil and development or use of the property for anything other than a wildlife management area. The ECs would include installing signs at strategic locations along the perimeter of the site to restrict access and deter trespassing. Five-year reviews would be conducted to ensure the LUC mechanisms remain in place over the long-term.
- **Alternative 3:** LUCs with Perimeter Access Deterrence. Alternative 3 is identical to Alternative 2, except and additional fencing would be installed along the southern and eastern site boundaries. The fencing would create a more permanent and obvious obstruction indicative of a restricted area (*Photo 5*).

## EVALUATION OF ALTERNATIVES

The remedial alternatives were evaluated against the nine criteria specified by the NCP (40 Code of Federal Regulations 300.430(e)(a)(iii)) and U.S. Environmental Protection Agency guidance for conducting an RI/FS under CERCLA (*EPA 1988*). *Table 1* shows the rating scale for the nine criteria (5=Excellent and 1=Poor). *Table 2* lists the alternatives and evaluates the relative performance of each alternative against the nine criteria.

Table 1: Rating Scale for the Nine Criteria

Criterion	5-Tiered Scale
<b>Threshold Criteria</b>	
1. Overall Protectiveness of Public Health/Environment	(5) Excellent if highly protective (1) Poor if not protective
2. Compliance with <b>Applicable or Relevant and Appropriate Requirements (ARARs)</b>	(5) Excellent if compliant (1) Poor if non-compliant
<b>Primary Balancing Criteria</b>	
3. Long-Term Effectiveness and Permanence	(5) Excellent if highly effective (1) Poor if not effective
4. Reduction of Toxicity, Mobility, or Volume through Treatment	(5) Excellent if reduces all contaminants of concern (1) Poor if no reduction
5. Short-Term Effectiveness	(5) Excellent if highly effective (1) Poor if not effective
6. Implementability	(5) Excellent if highly feasible and available (1) Poor if not feasible and available
7. Cost	(5) Excellent if < \$1,000,000 (1) Poor if > \$4,000,000
<b>Modifying Criteria</b>	
8. State Acceptance	(5) Excellent if highly acceptable (1) Poor if not acceptable
9. Public Acceptance	(5) Excellent if highly acceptable (1) Poor if not acceptable



Photo 7: Hawaiian Stilt

## Proposed Plan

Table 2: Evaluation of Remedial Alternatives

Criteria	Alternative 1 No Action	Alternative 2 LUCs	Alternative 3 LUCs with Perimeter Access Deterrence
1. Overall Protectiveness of Public Health/Environment	<b>Rating=1</b> Provides no additional protection of human health.	<b>Rating=3</b> The LUCs would reduce the potential for exposure to MC. The ICs would prohibit soil disturbance activities, while the ECs would deter trespassing and warn of MC in site soils.	<b>Rating=3</b> Additional fencing would not significantly increase overall effectiveness. Dense vegetation serves as a natural barrier against human entry.
2. Compliance with ARARs	<b>Rating=1</b> Does not comply with ARARs.	<b>Rating=5</b> Complies with ARARs.	<b>Rating=4</b> Complies with ARARs.
3. Long-Term Effectiveness and Permanence	<b>Rating=1</b> Provides no long-term effectiveness or permanent protection.	<b>Rating=3</b> Provides long-term effectiveness. LUCs, periodic site inspections, and five-year reviews would be required as long as MC remain in place at the site. The LUCs would ensure that the site is not disturbed, and land use does not change.	<b>Rating=3</b> Provides long-term effectiveness. LUCs, periodic site inspections, and five-year reviews would be required as long as MC remain in place at the site. The LUCs will ensure that the site is not disturbed, and land use does not change.
4. Reduction of Toxicity, Mobility, or Volume through Treatment	<b>Rating=1</b> Does not reduce the toxicity, mobility, or volume of contaminants at the site.	<b>Rating=1</b> Does not reduce the toxicity, mobility, or volume through treatment.	<b>Rating=1</b> Does not reduce the toxicity, mobility, or volume through treatment.
5. Short-Term Effectiveness	<b>Rating=1</b> Not effective over the short term.	<b>Rating=3</b> The installation of signage would provide immediate protectiveness by deterring trespassing and restricting site access. However, LUCs would not decrease MC concentrations at the site.	<b>Rating=3</b> The installation of signage and fencing would provide immediate protectiveness by deterring trespassing and restricting site access. However, LUCs would not decrease MC concentrations at the site.
6. Implementability	<b>Rating=5</b> Easily implemented as no action is taken	<b>Rating=5</b> This alternative is technically feasible and readily implemented.	<b>Rating=4</b> This alternative is technically feasible and could be readily implemented; however installation of fencing along the eastern boundary of the site would require vegetation clearing that could disturb the endangered bird habitat.
7. Cost (i.e., capital, O&M, and net present value)	<b>Rating=5</b> \$0	<b>Rating=4</b> \$2,216,064	<b>Rating=4</b> \$2,378,387
8. State Acceptance	<b>Rating=</b> HDOH would not accept the No Action alternative.	<b>Rating=</b> HDOH concurs with this alternative.	<b>Rating=</b> Regulatory agencies generally prefer actions that include treatment technologies. However, the available options for treatment would disturb the endangered bird habitat.
9. Public Acceptance	<b>Rating=</b> It is anticipated that the public would not accept this alternative.	<b>Rating=</b> It is anticipated that the public would support this alternative.	<b>Rating=</b> It is anticipated that the public would support this alternative.
Overall Rating	<b>Rating=2.1</b>	<b>Rating=3.4</b>	<b>Rating=3.1</b>

## PREFERRED ALTERNATIVE

As the lead agency, the Marine Corps recommends Alternative 2, LUCs, as the preferred remedial alternative for Site UXO 0003.

The rationale for selecting Alternative 2 is as follows:

- Alternative 1 is an unacceptable solution because it cannot fulfill the NCP threshold criteria for overall protection of public health and the environment and compliance with ARARs.
- While the LUCs specified for Alternative 2 will not reduce or remove MC from the site, they are considered sufficient to protect the human and ecological receptors of concern. The LUCs will provide an effective and implementable alternative with minimal impact to the habitat at the site, which is an important part of the Nuupia Ponds WMA. Furthermore, Alternative 2 is the most cost-effective of the alternatives.
- The additional fencing specified for Alternative 3 would not significantly increase overall protectiveness because the dense vegetation combined with the existing fence are considered sufficient to protect against unauthorized human entry.

## GLOSSARY

**Applicable or Relevant and Appropriate Requirements (ARARs):** Requirements, including cleanup standards, standards of control, and other substantive environmental protection requirements and criteria, for hazardous substances as specified under Federal and state laws and regulations, that must be met when complying with CERCLA and SARA.

**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):** Also known as Superfund, CERCLA is the federal law that regulates the environmental investigation and cleanup of sites that could endanger public health, welfare, or the environment.

**Human Health/Ecological Risk Assessment (HHRA/ERA):** Qualitative or quantitative evaluation of the risk posed to human health and/or the environment by the actual or potential presence or release of hazardous substances, pollutants or contaminants (source: EPA Glossary).

**Institutional Control (IC):** An administrative or legal mechanism designed to protect public health and the envi-

ronment from residual contamination at environmental restoration sites. For example, land use restrictions imposed by the property owner in a property deed would limit access to or use of the property.

**Land Use Control (LUC):** Physical, legal, or administrative mechanisms that restrict the use of, or limit access to, contaminated property in order to reduce risk to human health and the environment.

**Munitions Constituents (MC):** MC include any material originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

**Munitions and Explosives of Concern (MEC):** Distinguishes specific categories of military munitions that may pose unique explosives safety risks including: (1) Unexploded ordnance (2) Discarded Military Munitions, or (3) Munitions constituents present in high enough concentrations to pose an explosive hazard.

**National Oil and Hazardous Substances Contingency Plan (NCP):** The federal regulation that guides determination of the sites to be corrected under both the Superfund program and the program to prevent or control spills into surface waters or elsewhere.

**Polynuclear Aromatic Hydrocarbons (PAHs):** A group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, wood or other organic substances. PAHs are usually found as a mixture containing two or more of these compounds. They are also contained in asphalt used in road construction and as a binder in clay pigeons. They are found throughout the environment in the air, water, and soil.

## REFERENCES

- 40 Code of Federal Regulations (CFR) 300. *National Oil and Hazardous Substances Pollution Contingency Plan*. Available: <http://ecfr.gpoaccess.gov>.
- AECOM Technical Services, Inc. (AECOM). 2013. *Remedial Investigation, Former Trap and Skeet Range, Marine Corps Base Hawaii, Oahu, Hawaii*. JBPHH, HI: Naval Facilities Engineering Command, Hawaii. October.
- AECOM. 2014. *Feasibility Study Former Trap and Skeet Range, Marine Corps Base Hawaii, Oahu, Hawaii*. JBPHH, HI: Naval Facilities Engineering Command, Hawaii. November.

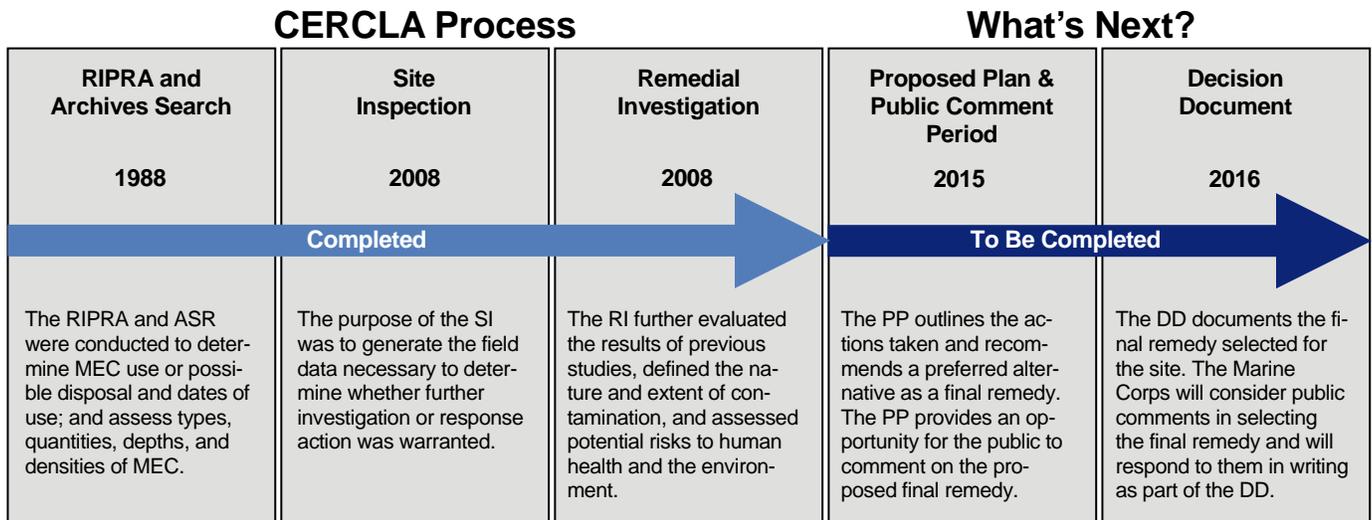


Figure 4: CERCLA Process and What's Next in the Process

Environmental Protection Agency, United States (EPA). 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. Interim Final. EPA/540/G-89/004. Office of Emergency and Remedial Response. October.

United States Army Corps of Engineers (USACE). 1998. *Range Investigation and Preliminary Range Assessment and Archives Search Report*, Marine Corps Base Hawaii and Associated Sites.

USA Environmental, Inc. (USAE). 2011. *Final Site Inspection Report, Munitions Response Sites, Marine Corps Base Hawaii, Kaneohe Bay, Kaneohe, Hawaii. Pearl Harbor, HI: Naval Facilities Engineering Command, Hawaii*. April.

## COMMUNITY PARTICIPATION

The Marine Corps encourages the public to gain a comprehensive understanding of the site and the activities that have been conducted there.

Community members and regulatory agencies have provided input by reviewing and commenting on reports/documents. The Marine Corps has provided information to the community through posting site reports and related documents in the information repository for the site, and announcements published in the *Honolulu Star-Advertiser*.

## WHAT'S NEXT

The Marine Corps encourages all interested parties to review and comment on this PP. Comments received from community members are valuable in helping the Marine Corps select the final remedy for this site. Based on new information or public comments, the Marine Corps may revise the proposed final remedy.

After carefully considering all comments received during the public comment period, the Marine Corps will select a final remedy for the Former Trap and Skeet Range Site, in coordination with the HDOH. The selected final remedy for the site will be presented in a DD. *Figure 3* depicts the CERCLA process and upcoming steps in that process.

There are two ways for you to provide your comments during the 30-day public comment period:

1. Send written comments to:

COMMANDING OFFICER  
ATTN LE  
BOX 63062 ENVIRONMENTAL  
KANEHOE BAY, HI 96863-3062

Phone: 808-257-6920  
Fax: 808-257-2794

2. Provide your comments during the public meeting. A court reporter will be present to record comments.

**Public Comment Period:**  
October 5, 2015—November 5, 2015

For More Information:

All site-related documents are available for review at the Navy information repositories established at the Kailua Library, Kaneohe Library, and University of Hawaii's Hamilton Library.