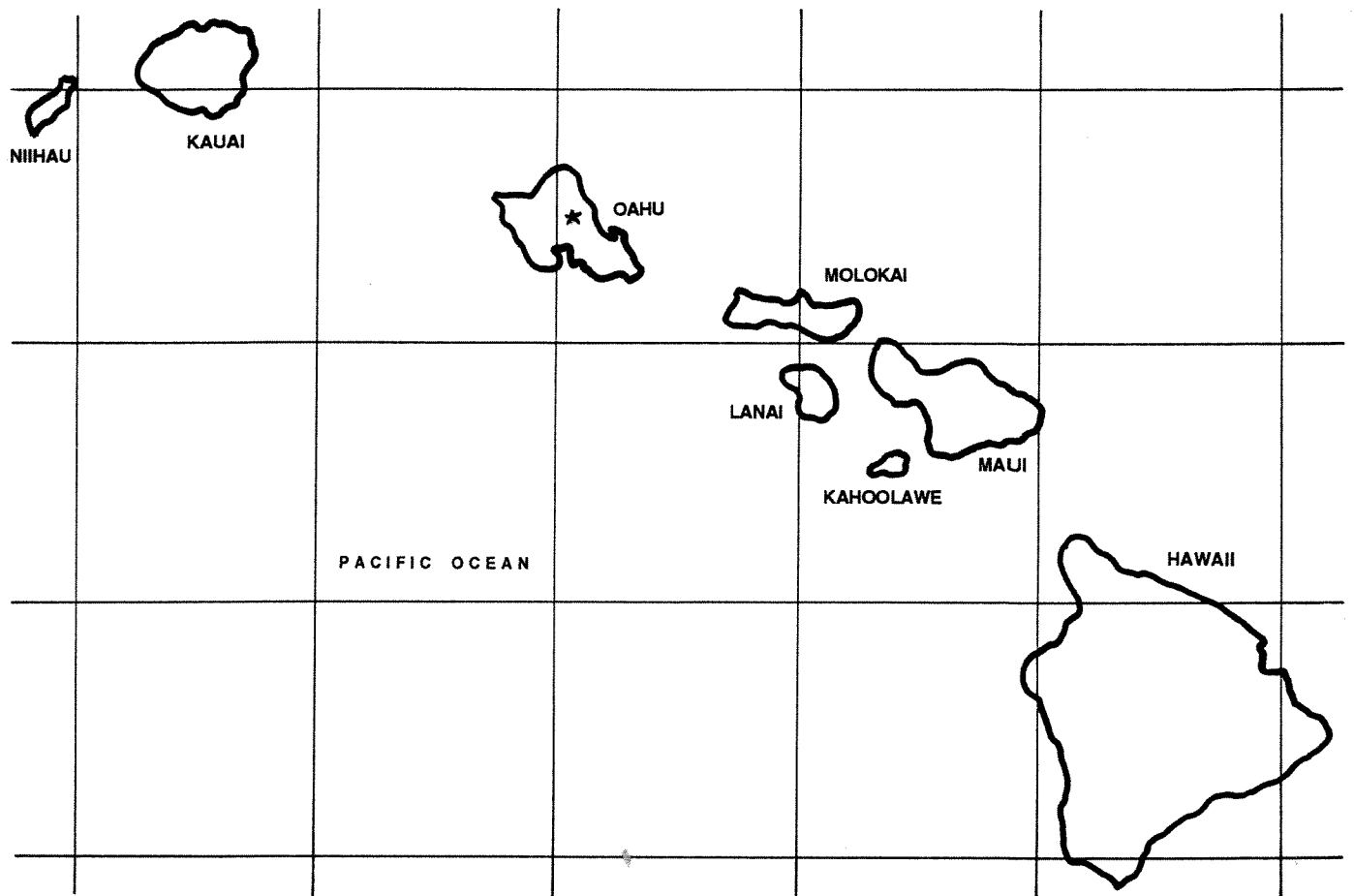


# DERP-FUDS Inventory Project Report



Pacific Jungle Combat Training Center  
Kahana and Punaluu Valleys,  
Island of Oahu, Hawaii  
Site No. H09H1027400

U.S. Army Engineer District  
Pacific Ocean Division  
Fort Shafter, Hawaii

## SITE SURVEY SUMMARY SHEET

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM  
FOR  
FORMERLY USED DEFENSE SITES  
PACIFIC JUNGLE COMBAT TRAINING CENTER  
KAHANA AND PUNALUU VALLEYS, ISLAND OF OAHU, HAWAII  
SITE NO. H09HI027400  
3 DECEMBER 1993

**SITE NAME(S):** Pacific Jungle Combat Training Center, also known as Unit Jungle Training Center; Unit Combat Training Center; Pacific Combat Training Center; Jungle Training; Punaluu Training Camp; and Green Valley Jungle Training Camp.

**LOCATION:** Kahana and Punaluu Valleys, District of Koolauloa, Island of Oahu. TMKs 5-2-02; various parcels; 5-3-04,05, and 1: various parcels.

**SITE HISTORY:** Pacific Jungle Combat Training Center consisted of approximately 2,266.77 acres of land located in two valleys along the northeast coast of the island of Oahu, Hawaii. The Army acquired 485.25 acres in Kahana Valley by license in November 1944 retroactive to May 1943. Leases, license, and informal agreements were executed by the Army between October 1943 and March 1947, several instruments retroactive to October 1943, to acquire approximately 1,781.52 acres in neighboring Punaluu Valley. The valleys were established and used as a unit jungle combat training center in September 1943 in response to a directive from the Commanding General, Hawaiian Department to establish a school on Oahu to supplement Department Ranger and Combat School training. Training was divided among Blue, Red, and Green Courses. Basic jungle warfare training was conducted at Blue and Red Courses while advanced jungle warfare training and the Instructor Jungle Training School were conducted on Green Course. All jungle training centers became known as Unit Combat Training Centers in March 1945 and Pacific Combat Training Centers the following month in a move to de-emphasize jungle warfare. Parcels in Kahana Valley were returned to its landowner in August 1946 while leases and licenses for parcels in Punaluu Valley were officially terminated from April 1945 to November 1950. De-dudding efforts were conducted by an engineer search and range clearance team in Punaluu Valley in 1949 as a result of the use of live ammunition during training. Unexploded ordnance continues to be discovered in both Kahana and Punaluu Valleys which are now a state park and agricultural community, respectively.

**SITE VISIT:** A site visit was conducted in Kahana Valley on 14 April 1992 by Randall Kurashige (CEPOD-ED-EH), Farley Watanabe (CEPOD-ED-ES), Senior UXO Supervisor Byron Donaldson (Donaldson Enterprises, Inc.), and Derek Yasaka (Wil Chee - Planning). They discovered concrete pillboxes and numerous tank traps in the rear of the valley. OEW discovered near the pillboxes include the tail section to a 2.36-inch bazooka round and what may be a portion of an expended 105 mm AP projectile. A second site visit was conducted on 22 January 1993 in Punaluu Valley by Louis Fung (Wil Chee - Planning) and Messrs. Donaldson and Yasaka. Observed military remnants include a coralline road, earthen bunkers, and a concrete bunker. Messrs. Donaldson and Yasaka returned to Punaluu Valley on 9 February 1993 to meet with and interview a valley resident whose son claims to frequently encounter OEW items while hiking in the valley. In the son's possession were unexpended .30 caliber bullets, expended M1 and M2 cartridges, and a 75 mm AP or HE projectile. The resident was advised to contact the Honolulu Police Department for proper disposal of the 75 mm round. Messrs. Donaldson and Yasaka were then guided to the location of a live 81 mm mortar wedged in some tree roots. The lessee was apprised of its existence and the item subsequently removed by an EOD team.

SITE SURVEY SUMMARY SHEET

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SITE NO. H09HI027400  
3 DECEMBER 1993  
(continuation)

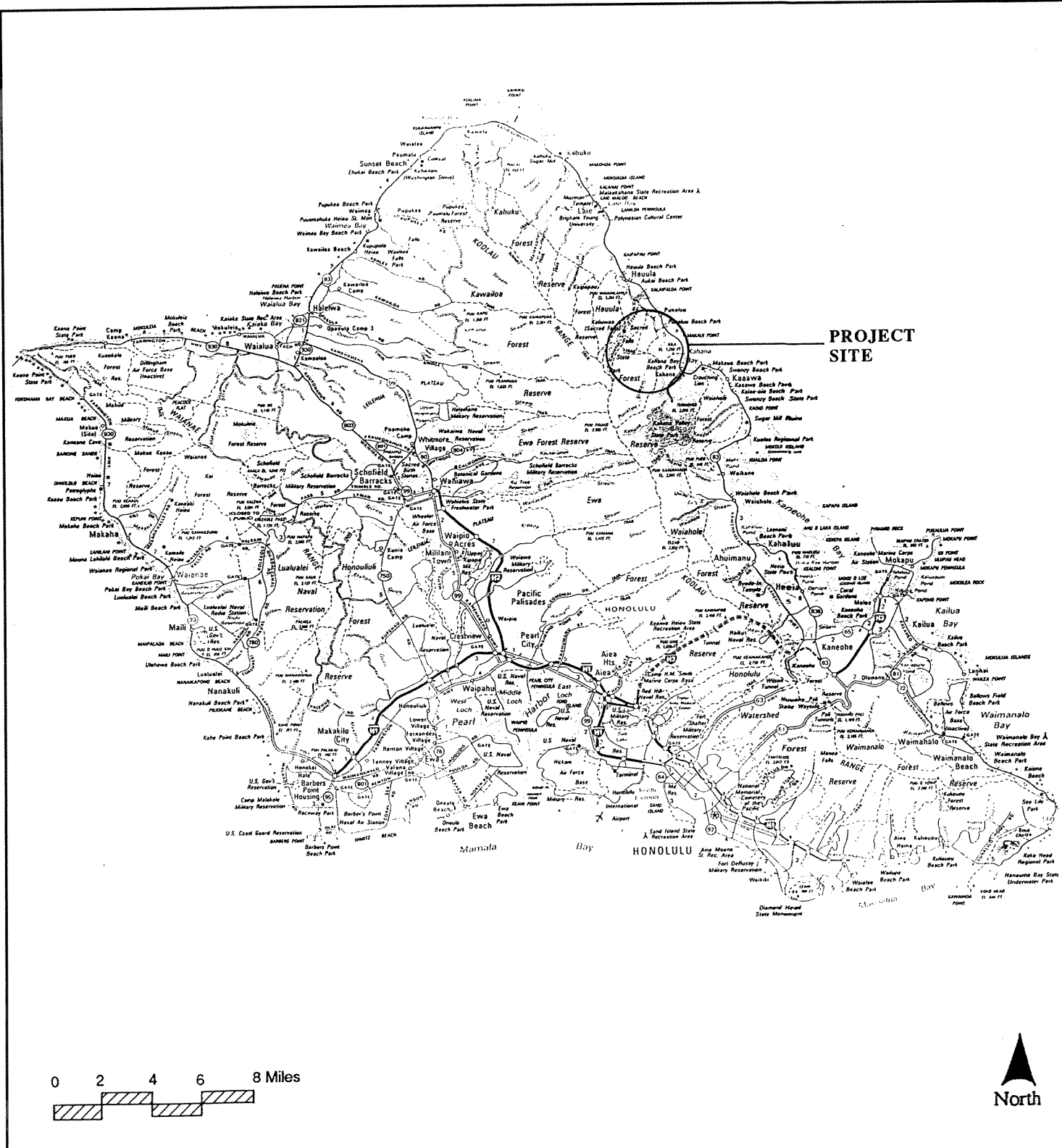
CATEGORY OF HAZARD: OEW.

PROJECT DESCRIPTION: There is one potential project at this site.

a. OEW. Kahana and Punaluu Valleys were utilized as jungle combat training areas by the Army during World War II. Live ammunition was used during training exercises, consequently assorted OEW continue to exist and are occasionally discovered in both valleys. OEW discovered in Kahana Valley during performance of this preliminary site assessment include the tail section to a 2.36-inch bazooka round and what is surmised to be a portion of an expended 105 mm AP projectile. In Punaluu Valley, OEW discovered include a 75 mm AP or HE projectile, an 81 mm mortar, unexpended .30 caliber bullets, and expended M1 and M2 cartridges. A Risk Assessment Code (RAC) worksheet has been prepared and is attached herewith. The RAC for this site was determined to be 1. It is recommended that this INPR be referred to CEHND for final determination of the next appropriate action as it requires further investigation beyond the scope of this preliminary site assessment.

AVAILABLE STUDIES AND REPORTS: None identified.

PA POC: Helene Takemoto, CEPOD-ED-ES, 808-438-6931.



Prepared for:

U.S. Army Engineer District  
 Pacific Ocean Division  
 Fort Shafter, Hawaii

Prepared by:

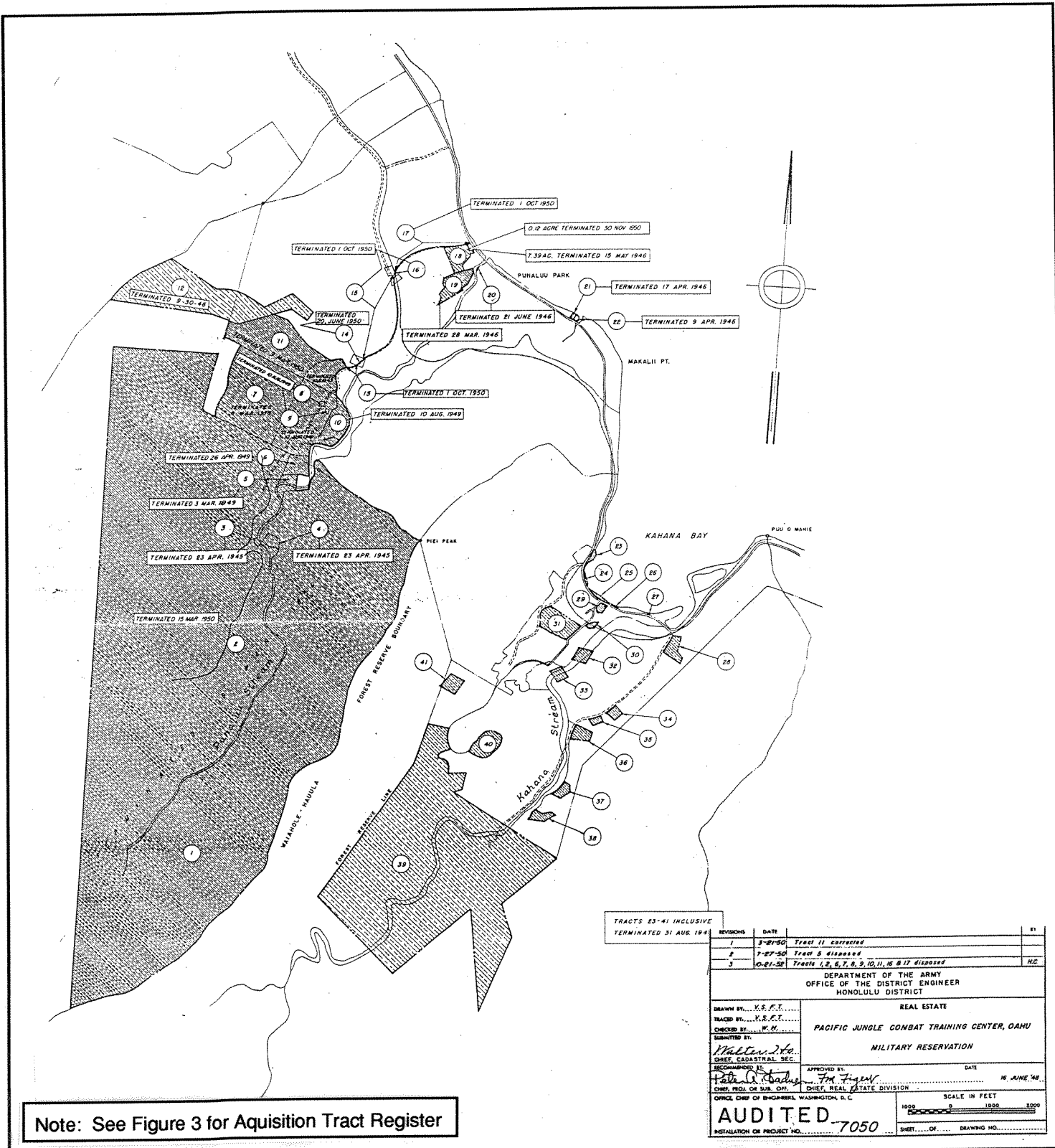
Wil Chee - Planning

DERP-FUDS Inventory Project Report

**Pacific Jungle Combat Training Center  
 Kahana and Punaluu Valleys,  
 Island of Oahu, Hawaii**

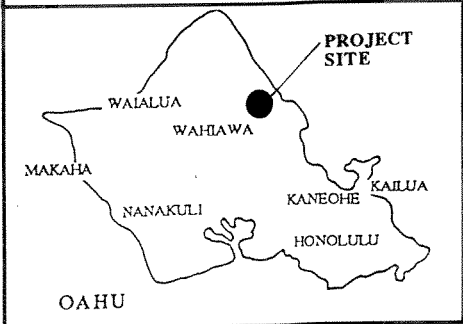
Site No. H09HI027400

Figure 1



Note: See Figure 3 for Aquisition Tract Register

DEPARTMENT OF THE ARMY OFFICE OF THE DISTRICT ENGINEER HONOLULU DISTRICT	
REAL ESTATE	
PACIFIC JUNGLE COMBAT TRAINING CENTER, OAHU	
MILITARY RESERVATION	
DRAWN BY: K.S.P.T.	APPROVED BY: [Signature] DATE: 16 JUNE '48
TRACED BY: K.S.P.T.	CHIEF, REAL ESTATE DIVISION
CHECKED BY: W.M.	CHIEF, CADASTRAL SEC.
RECOMMENDED BY: [Signature]	CHIEF, REAL ESTATE DIVISION
CHIEF, PROJ. OR SUB. OFF.	CHIEF, REAL ESTATE DIVISION
CHIEF, PROJ. OR SUB. OFF.	CHIEF, REAL ESTATE DIVISION
SCALE IN FEET 1000 0 1000 2000	
AUDITED 7050	
INSTALLATION OR PROJECT NO. 7050 SHEET OF DRAWING NO.	



Prepared for:  
U.S. Army Engineer District  
Pacific Ocean Division  
Fort Shafter, Hawaii

Prepared by:  
Wil Chee - Planning

DERP - FUDS Inventory Project Report

**Pacific Jungle Combat  
Training Center  
Kahana and Punaluu Valleys,  
Island of Oahu, Hawaii**

Site No. H09HI027400  
Figure 2

### ACQUISITION TRACT REGISTER

TRACT NO.	LAND OWNER	ACREAGE			REMARKS
		LEASE	LICENSE	INFORMAL PERMIT	
1	B P BISHOP ESTATE		1500.00		LIC. DTD. 7 AUG. '44, EFF. 1 OCT. '43 (800 AC.) S. A. NO. 1 DTD. 30 JUNE '46 (700 AC.)
2	" " " "				LIC. DTD. 23 OCT. '45 AREA INCLUDED IN TRACT NO. 1
3	ANTHONY AKI			0.40	INFORMAL PERMIT DATED 15 OCT. 1943
4	" " " "			1.82	" " " " " "
5	SARAH K. HOKE		5.25		LICENSE DATED 16 FEB. 1945 EFFECTIVE 15 OCT. 1943
6	OLIVER H. KUPAU ESTATE OF LINCOLN L. MCCANDLESS	6.70			15 OCT. '43 CONT. NO. W-414-ENG-6546 15 OCT. '43 CONT. NO. W-414-ENG-6538
7	KAHUKU PLANTATION COMPANY	58.00			CONT. NO. W-4M-ENG-6588 DATED 1 NOV. 1943
8	" " " "	0.25			S. A. NO. 1 DATED 15 NOV. 1944 TO CONT. NO. W-414-ENG-6588
9	" " " "	0.25			" " " "
10	" " " "	11.50			" " " "
11	EDWARD AUWAE ET. AL. KAHUKU PLANTATION COMPANY	57.00	57.00		CONT. NO. W-00-000-ENG-101, DTD. 1 MAR. '47 SUPERSEDES LIC. FROM E. AUWAE ET AL., DTD. 30 JAN. '43, TERM. 28 FEB. '47
12	REGINALD TREVENEN B ANNIE K. TREVENEN		62.00		LICENSE DATED 15 JAN. 1945
13	KAHUKU PLANTATION COMPANY			0.08	INFORMAL PERMIT DATED 15 OCT. 1943
14	REGINALD TREVENEN B ANNIE K. TREVENEN		0.09		LICENSE DATED 26 SEPT. 1944 EFFECTIVE 18 OCT. 1943
15	KAHUKU PLANTATION COMPANY			1.15	INFORMAL PERMIT DATED 15 OCT. 1943
16	KAHUKU PLANTATION COMPANY		0.07		LICENSE DATED 4 APR. 1944
17	KAHUKU PLANTATION COMPANY		0.75		LICENSE DATED 4 APR. 1944
18	CHUNG YAN HOON		7.51		LICENSE DATED 11 NOV. 1943 0.12 AC. ALSO COVERED BY LIC. 15 MAY '48
19	GORD TANAKA			9.87	INFORMAL PERMIT DATED 29 OCT. 1943
20	ELI E. KEOLANUI			0.75	INFORMAL PERMIT DATED 29 OCT. 1943
21	DOUGLAS S. GUILD JACK R. REED	0.46			CONT. NO. W-414-ENG-6575 DATED 10 MAR. 1944
22	JOHN LAI ELLEN L.L.I.		0.62		LICENSE DATED 15 JAN. 1944
23	HUI OF KAHANA, ET. AL.		0.47		LICENSE DATED 1 NOV. 1944 EFFECTIVE 20 MAY 1943
24	" " " "		0.20		" " " "
25	" " " "		0.37		" " " "
26	" " " "		0.23		" " " "
27	" " " "		0.04		" " " "
28	" " " "		4.22		" " " "
29	" " " "		1.20		" " " "
30	" " " "		0.66		" " " "
31	" " " "		12.85		" " " "
32	" " " "		3.44		" " " "
33	" " " "		2.52		" " " "
34	" " " "		2.28		" " " "
35	" " " "		1.60		" " " "
36	" " " "		3.40		" " " "
37	" " " "		6.19		" " " "
38	" " " "		5.05		" " " "
39	" " " "		428.83		" " " "
40	" " " "		8.72		" " " "
41	" " " "		2.98		" " " "

Prepared for:

U.S. Army Engineer District  
Pacific Ocean Division  
Fort Shafter, Hawaii

Prepared by:

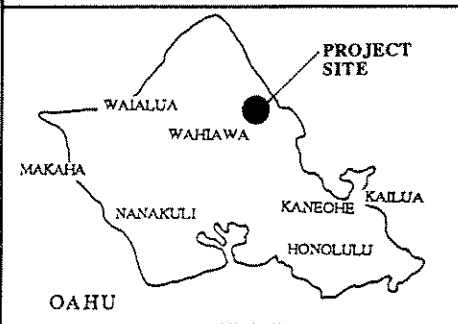
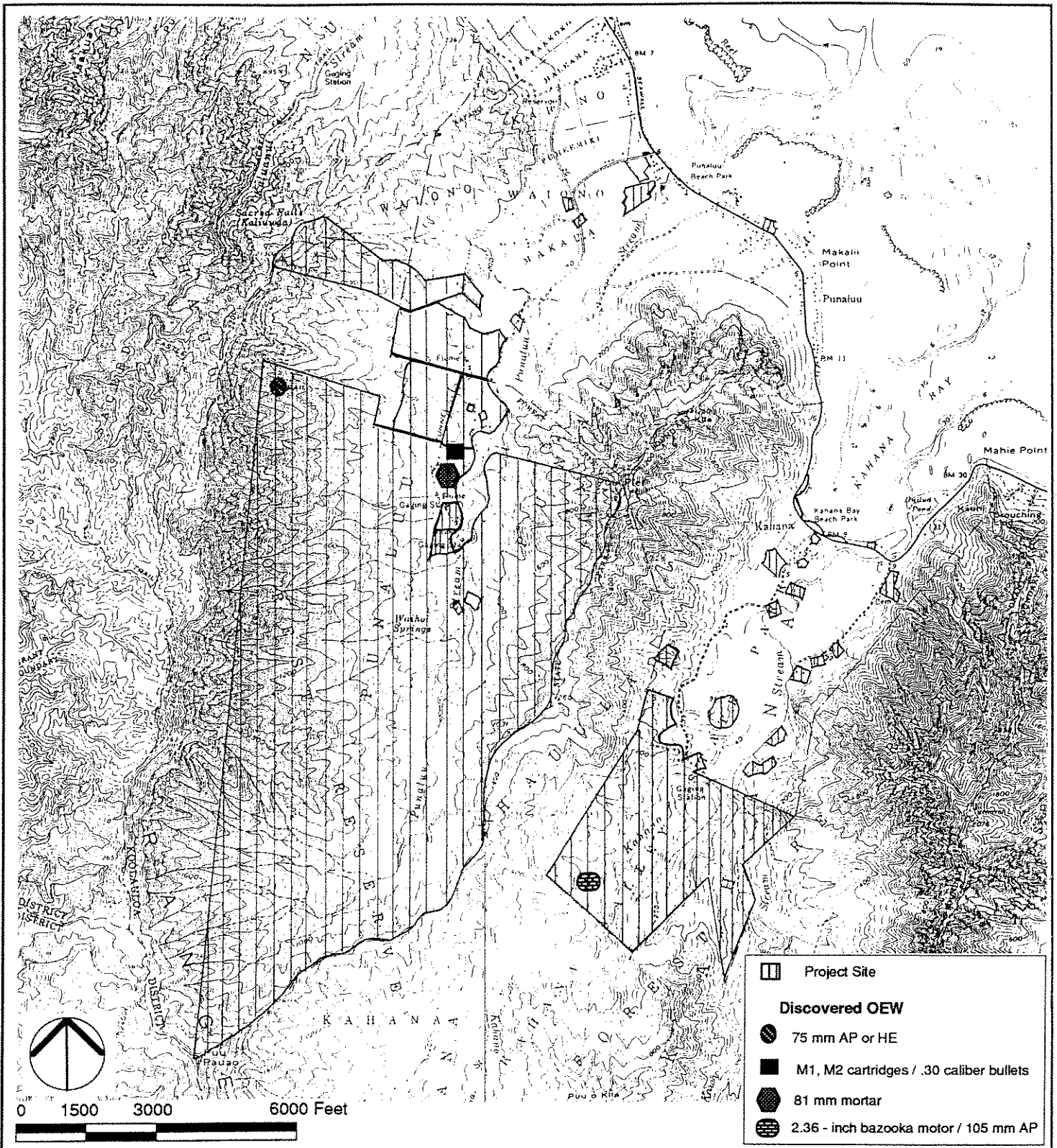
Wil Chee - Planning

DERP - FUDS Inventory Project Report

Pacific Jungle Combat  
Training Center  
Kahana and Punaluu Valleys,  
Island of Oahu, Hawaii

Site No. H09HI027400

Figure 3



Prepared for:  
 U.S. Army Engineer District  
 Pacific Ocean Division  
 Fort Shafter, Hawaii

Prepared by:  
 Wil Chee - Planning

DERP - FUDS Inventory Project Report

**Pacific Jungle Combat  
 Training Center  
 Kahana and Punaluu Valleys,  
 Island of Oahu, Hawaii**

Site No. H09HI027400  
 Figure 4

## FINDINGS AND DETERMINATION OF ELIGIBILITY

### DEFENSE ENVIRONMENTAL RESTORATION PROGRAM FOR FORMERLY USED DEFENSE SITES PACIFIC JUNGLE COMBAT TRAINING CENTER KAHANA AND PUNALUU VALLEYS, ISLAND OF OAHU, HAWAII SITE NO. H09HI027400

#### FINDINGS OF FACT

1. Pacific Jungle Combat Training Center was located in Kahana and Punaluu Valleys along the northeast coast of the island of Oahu, Hawaii.<sup>1,6,7,9,14</sup> The Hui of Kahana et al. issued a license dated 1 November 1944, retroactive to 20 May 1943, to the Army for use of approximately 485.25 acres of land in Kahana Valley. Approximately 1,781.52 acres in neighboring Punaluu Valley west of Kahana Valley were acquired by the Army through leases, licenses, and informal permits issued by various valley landowners between 15 October 1943 and 1 March 1947. Several instruments were executed retroactively to 1, 15, and 18 October 1943. The largest landowner, licensing approximately 1,500 acres of Punaluu Valley, was Bernice Pauahi Bishop Estate.<sup>10</sup> Documentation evidencing property acquisition could not be located following research at the United States Army Corps of Engineers, Directorate of Real Estate; City and County of Honolulu Department of Finance, Real Property Assessment Division; Hawaii Department of Land and Natural Resources, Bureau of Conveyances; Hawaii Department of Accounting and General Services, Division of Archives, and Kamehameha Schools / Bernice Pauahi Bishop Estate.

2. Kahana and Punaluu Valleys were utilized as a unit jungle combat training center commencing on 6 September 1943 in response to a 9 August 1943 directive from the Commanding General, Hawaiian Department to establish a school on Oahu to supplement Department Ranger and Combat School training.<sup>1,6,7,13</sup> Training emphasized basic jungle warfare subjects and was divided among three courses, Blue, Red, and Green, accommodating battalion combat teams. Basic jungle warfare training was conducted at Blue and Red Courses while advanced jungle warfare training and the Instructor Jungle Training School were conducted at Green Course. Subjects taught during a one-week course at the training center included jungle first aid and evacuation; hand to hand combat; construction and passage of wire entanglements; booby traps and demolitions; patrolling and ambushing; hip shooting and infiltration; stream crossing expedients; assault with bayonets; assault of Japanese fortified areas; combat reaction proficiency; and jungle living.<sup>3,7,14</sup> The Army reportedly constructed Japanese villages and pillboxes with pop up dummies for training purposes. They also erected temporary barracks, a mess hall, a bakery, and shower facilities all of which no longer exist.<sup>3,5,8,14</sup> Advanced training on Green Course was discontinued on 28 May 1944 after only its second class as it became necessary to utilize the course for basic jungle warfare training of divisions being staged for the Western Carolines operations. Jungle warfare was de-emphasized as the war progressed from tropical regions to areas where jungle fighting was not a primary consideration. A change in training policy brought about redesignation of all jungle training centers on 1 March 1945 to become known as Unit Combat Training Centers. Redesignation occurred again on 10 April 1945 when the centers were referred to as Pacific Combat Training Centers.<sup>7</sup> In all, over 241,000 Army, Marine Corps, and Navy troops underwent basic jungle training at this center, with over 300,000 men receiving either basic, advanced, or instructor training there.<sup>1,7,9,14</sup> Postwar plans called for the closing of the majority of Pacific Jungle Combat Training Center except for Green Course in Punaluu Valley which was to be retained to fulfill the Army's postwar training requirements. Punaluu Valley was abruptly reopened by the Army on 1 April 1946 to provide emergency shelter for area residents whose homes were damaged by a tsunami which struck the island of Oahu. Tents were erected for sleeping quarters, to render medical treatment, and to feed the approximately 1,700 displaced individuals.<sup>14</sup> De-dudding efforts were conducted by an engineer search and range clearance team in at least Punaluu Valley in 1949 as a result of the use of live ammunition during training.<sup>2</sup>



FINDINGS AND DETERMINATION OF ELIGIBILITY  
DEFENSE ENVIRONMENTAL RESTORATION PROGRAM  
FOR  
FORMERLY USED DEFENSE SITES  
PACIFIC JUNGLE COMBAT TRAINING CENTER  
KAHANA AND PUNALUU VALLEYS, ISLAND OF OAHU, HAWAII  
SITE NO. H09HI027400  
(continuation)


Unexploded ordnance continues to be discovered in both Kahana and Punaluu Valleys.<sup>4</sup> OEW discovered during performance of this preliminary assessment include the tail section to a 2.36-inch bazooka round and a portion of an expended 105 mm AP projectile in Kahana Valley, and a 75 mm AP or HE projectile, 81 mm mortar, unexpended .30 caliber bullets, and expended M1 and M2 cartridges in Punaluu Valley. Most of the concrete bunkers and pillboxes constructed by the Army in both valleys continue to exist.<sup>3,5,8</sup>

3. Licenses for usage of Kahana Valley were terminated on 31 August 1946. Leases, licenses, and informal permits comprising the various Punaluu Valley parcels were terminated commencing on 23 April 1945, and the final license terminated on 30 November 1950.<sup>10</sup> Documentation evidencing property disposal could not be located following research at the United States Army Corps of Engineers, Directorate of Real Estate; City and County of Honolulu Department of Finance, Real Property Assessment Division; Hawaii Department of Land and Natural Resources, Bureau of Conveyances; Hawaii Department of Accounting and General Services, Division of Archives, and Kamehameha Schools / Bernice Pauahi Bishop Estate. Kahana Valley is presently under the purview of the Hawaii Department of Land and Natural Resources, and was set aside as a state park in the 1960s.<sup>11</sup> Punaluu Valley is comprised of numerous small landowners and Kamehameha Schools / Bernice Pauahi Bishop Estate lessees engaged in the cultivation of diversified agricultural crops.<sup>5</sup> The interior section of Punaluu Valley is located within Hauula Forest Reserve.

DETERMINATION

Based on the foregoing findings of fact, the site has been determined to be formerly used by the Department of Defense. It is therefore eligible for the Defense Environmental Restoration Program - Formerly Used Defense Sites established under 10 USC 2701 et seq.

12 January 1994  
Date

  
RALPH V. LOCURCIO  
Brigadier General, USA  
Commanding

PROJECT SUMMARY SHEET

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM  
FOR  
FORMERLY USED DEFENSE SITES  
PACIFIC JUNGLE COMBAT TRAINING CENTER  
KAHANA AND PUNALUU VALLEYS, ISLAND OF OAHU, HAWAII  
DERP - FUDS OEW PROJECT NO. H09HI027401  
SITE NO. H09HI027400  
3 DECEMBER 1993

**PROJECT DESCRIPTION:** Pacific Jungle Combat Training Center consisted of approximately 2,266.77 acres of land located in Kahana and Punaluu Valleys on the northeast coast of the island of Oahu. It was established as a unit jungle combat training center during World War II teaching basic and advanced jungle warfare, as well as instructor training. A public warning was issued in October 1949 not to enter an impact area in Punaluu Valley being cleared of OEW.

Kahana Valley was set aside and established as a state park during the 1960s. Thirty-one families presently live in Kahana Valley in support of the living park concept whereby residents are regarded as park personnel portraying traditional Hawaiian cultural practices for visitors. Family residences are clustered primarily near the valley and park entrance off Kamehameha Highway and just inland of Kahana Bay. The valley is open to the public for cultural enrichment as well as for hiking and hunting. A former military jeep trail toward the rear of the valley is presently utilized as a foot trail. Vegetation is dense and valley walls are steep.

Residential dwellings in Punaluu Valley are generally located at the valley mouth near Kamehameha Highway, along Green Valley Road, and just inland of the Hauula Forest Reserve boundary along Punaluu Stream. An irrigation system service road extends approximately halfway into the valley terminating at an irrigation ditch intake. This service road also serves as an Oahu Civil Defense Agency evacuation route for coastal inhabitants to move to higher ground in the event of a tsunami. Foot trails ascend further into the valley. Although hunters are allowed in Punaluu Valley, access is generally restricted only to valley residents and guests, and landowner and lessee personnel.

Live ammunition was reportedly utilized during jungle warfare training scenarios. This was corroborated by a senior UXO supervisor during site visits to Kahana and Punaluu Valleys in association with preliminary assessment of the Pacific Jungle Combat Training Center. OEW items discovered in Kahana Valley include the tail section of a 2.36-inch bazooka round and a portion of a 105 mm AP round. A 75 mm AP or HE round, an 81 mm mortar round, unexpended .30 caliber bullets, and expended M1 and M2 cartridges were discovered in Punaluu Valley.

**PROJECT ELIGIBILITY:** Hui of Kahana et al. issued a license to the Army in November 1944 retroactive to May 1943 for use of Kahana Valley for training purposes. Numerous leases, licenses, and informal permits were issued by various landowners, including Bernice Pauahi Bishop Estate, to the Army for use of Punaluu Valley. Leases, licenses, and permits were terminated from April 1945 to November 1950, and the land in both valleys reverted to their owners.

**POLICY CONSIDERATIONS:** Although extant residential dwellings on former training center grounds are small in number, at least one area resident in Punaluu Valley reports occasionally unearthing small arms munitions (e.g., .30 caliber bullets) around her property. Much of the former training area in Kahana and Punaluu Valleys is within Hauula Forest Reserve, with all of Kahana Valley also being designated a state park. Both the forest reserve and park are under the purview of the Hawaii Department of Land and Natural Resources (DLNR). OEW survey and clearance efforts may require conservation district use permits in addition to consultations with the DLNR Division of Historic Preservation for potential impacts to archaeologically significant

PROJECT SUMMARY SHEET

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FOR  
FORMERLY USED DEFENSE SITES  
PACIFIC JUNGLE COMBAT TRAINING CENTER  
KAHANA AND PUNALUU VALLEYS, ISLAND OF OAHU, HAWAII  
DERP - FUDS OEW PROJECT NO. H09HI027401  
SITE NO. H09HI027400  
3 DECEMBER 1993  
(continuation)

resources. An ancient wet taro system is believed to have dominated Kahana Valley at one time. Remnants of the system include as many as 120 small wet terraces and 12 irrigation canals. A temple or *heiau* is located in Kahana Valley in addition to three fishing shrines.<sup>8</sup> Huilua Fishpond at the mouth of Kahana Valley is listed on both the National and Hawaii registers of historic sites.<sup>8,12</sup>

The Hawaiian Coot (*Fulica americana alai*) and Hawaiian Gallinule (*Gallinula chloropus sandvicensis*) inhabit Huilua Fishpond and lowland areas of Kahana Valley. The upper regions of both valleys supports native bird species such as the 'Apapane (*Himatione sanguinea*) and the Oahu 'Amakihi (*Himignathus v. chloris*).<sup>8</sup> Consultation with the United States Fish and Wildlife Service would, therefore, be required.

PROPOSED PROJECT: A surface sweep and clearance of approximately 2,000 accessible acres of Kahana and Punaluu Valleys is proposed utilizing a team of ten UXO specialists and technicians under the guidance of a senior UXO supervisor. Discovered OEW would be prepared for off-site transport and disposal. Render safe procedures (RSP) would be employed to the greatest extent possible during OEW access and recovery. Blast mitigation techniques in accordance with Blow In Place (BIP) protocol would be utilized to minimize habitat damage when an OEW item must be detonated in place. Training pertinent DLNR personnel and area residents in OEW recognition and notification protocol is also proposed to effect proper safety precautions subsequent to the survey and clearance effort. It is recommended that this INPR be referred to CEHND for final determination of the next appropriate action.

RAC: The Risk Assessment Code for this site is 1. The RAC worksheet is attached herewith.

DD FORM 1391: Attached herewith.

DISTRICT POC: Helene Takemoto, CEPOD-ED-ES, 808-438-6931.

RISK ASSESSMENT PROCEDURES FOR  
ORDNANCE AND EXPLOSIVE WASTE (OEW) SITES

Site Name: Pacific Jungle Combat Training Center      Rater's Name: Byron Donaldson  
Site Location: Kahana/Punaluu Valleys, Oahu, Hawaii      Phone No.: (808) 235-2662  
DERP Project #: H09HI027401      Organization: Donaldson Enterprises Inc.  
Date Completed: 3 Dec 93      RAC Score: 1

OEW RISK ASSESSMENT:

This risk assessment procedure was developed in accordance with MIL-STD 882B and AR 385-10. The RAC score will be used by CEHND to prioritize the remedial action at this site. The OEW risk assessment should be based upon best available information resulting from records searches, reports of Explosive Ordnance Disposal (EOD) detachment actions, and field observations, interviews, and measurements. This information is used to assess the risk involved based upon the potential OEW hazards identified at the site. The risk assessment is composed of two factors, **hazard severity and hazard probability**. Personnel involved in visits to potential OEW sites should view the CEHND videotape entitled "A Life Threatening Encounter: OEW."

Part I. Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel exposure to various types and quantities of unexploded ordnance items.

TYPE OF ORDNANCE  
(Circle all values that apply)

A. Conventional Ordnance and Ammunition

	VALUE
Medium/Large Caliber (20 mm and larger)	(10)
Bombs, Explosive	10
Grenades, Hand and Rifle, Explosive	10
Landmines, Explosive	10
Rockets, Guided Missiles, Explosive	10
Detonators, Blasting Caps, Fuzes, Boosters, Bursterns	6
Bombs, Practice (w/ spotting charges)	6
Grenades, Practice (w/ spotting charges)	4
Landmines, Practice (w/ spotting charges)	4
Small Arms (.22 cal. - .50 cal)	(1)
Conventional Ordnance and Ammunition Value (Select the largest single value)	<b>10</b>

What evidence do you have regarding conventional OEW? See Part IV of this worksheet.

B. Pyrotechnics (For munitions not described above)

	VALUE
Munition (Container) Containing White Phosphorus or Other Pyrophoric Material (i.e., Spontaneously Flammable)	10
Munition Containing a Flame or Incendiary Material (i.e., Napalm, Triethylaluminum Metal Incendiaries)	6
Flares, Signals, Simulators	4
Pyrotechnics Value (Select the largest single value)	<b>0</b>

What evidence do you have regarding pyrotechnics? \_\_\_\_\_

---

C. Bulk High Explosives (Not an integral part of conventional ordnance; uncontainerized)

	VALUE
Primary or Initiating Explosives (Lead Styphnate, Lead Azide, Nitroglycerin, Mercury Azide, Mercury Fulminate, Tetracene, etc.)	10
Demolition Charges	10
Secondary Explosives (PETN, Compositions A, B, C, Teteryl, TNT, RDX, HMX, HBX, Black Powder, etc.)	8
Military Dynamite	6
Less Sensitive Explosives (Ammonium Nitrate, Explosive D, etc.)	3
Bulk High Explosives Value (Select the largest single value)	<b>0</b>

What evidence do you have regarding bulk explosives? \_\_\_\_\_

---

D. Bulk Propellants (Not an integral part of rockets, guided missiles, or other conventional ordnance; uncontainerized)

	VALUE
Solid or Liquid Propellants	6
Propellants Value	<b>0</b>

What evidence do you have regarding bulk propellants? \_\_\_\_\_

---

E. Radiological/Chemical Agent/Weapons

	VALUE
Toxic Chemical Agents (Choking, Nerve, Blood, Blister)	25
War Gas Identification Sets	20
Radiological	15
Riot Control and Miscellaneous (Vomiting, Tear, Incendiary and Smoke)	5
Radiological/Chemical Agent (Select the largest single value)	<u>0</u>
What evidence do you have of chemical/radiological OEW? _____	

Total Hazard Severity Value **10**  
 (Sum of Largest Value for A through E – Maximum of 61)

**Apply this value to Table 1 to determine Hazard Severity Category.**

TABLE 1  
HAZARD SEVERITY\*

Description	Category	Value
CATASTROPHIC	I	≥21
<u>CRITICAL</u>	<u>II</u>	<u>≥10 &lt;21</u>
MARGINAL	III	≥5 <10
NEGLIGIBLE	IV	≥1 <5
**NONE		0

**\* Apply Hazard Severity Category to Table 3.**

\*\* If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC Score of 5 to determine your appropriate action.

Part II. Hazard Probability. The probability that a hazard has been or will be created due to the presence and other rated factors of unexploded ordnance or explosive materials on a formerly used DOD site.

AREA, EXTENT, ACCESSIBILITY OF OEW HAZARD  
(Circle all values that apply)

A. Locations of Contamination

	VALUE	
On the surface	(5)	
Within Tanks, Pipes, Vessels or Other Confined Locations.	4	
Inside Walls, Ceilings, or Other Parts of Buildings or Structures	3	
Subsurface	(2)	
Location (Select the single largest value)		<u>5</u>

What evidence do you have regarding the location of OEW? Ordinance was observed on the surface during a site visit. Anecdotal information from knowledgeable persons also indicates surface discoveries of OEW. Unearthing of small arms by a Punaluu Valley resident corroborates the existence of subsurface contamination.

B. Distance to nearest inhabited locations or structures likely to be at risk from OEW site (roads, parks, playgrounds, and buildings).

	VALUE	
Less than 1250 feet	(5)	
1250 feet to 0.5 mile	4	
0.5 mile to 1.0 mile	3	
1.0 mile to 2.0 miles	2	
Over 2 miles	1	
Distance (Select the single largest value)		<u>5</u>

What are the nearest inhabited structures? Unpaved roads, foot trails, and residential dwellings.

- C. Number of buildings within a 2-mile radius measured from the OEW hazard area, not the installation boundary.

	VALUE
26 and over	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0
Number of Buildings (Select the single largest value)	5

Narrative. Buildings are situated within and adjacent to the OEW hazard area. Numerous buildings of mixed use are situated along Kamehameha Highway which fronts both valleys, follows the coastline, and serves as valley residents'/visitors' primary artery to and from the island's urban areas. Nearby rural residential communities situated along the coastline include Kaaawa, Punaluu, and Hauula.

- D. Types of Buildings (within a 2-mile radius)

	VALUE
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers	5
Industrial Warehouse, etc.	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0
Types of Buildings (Select the single largest value)	5

Describe types of buildings in the area. Residential dwellings are situated within the project site as well as agricultural warehouses and the Kahana State Park administration office. Public facilities include a hotel, restaurants, and park pavilions and comfort stations.



E. Accessibility to site refers to access by humans to ordnance and explosive wastes. Use the following guidance:

	VALUE
No barrier or security system	(5)
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier (any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated site	1
A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility; or An artificial or natural barrier (e.g., a fence combined with a cliff) which completely surrounds the facility; and a means to control entry at all times through the gates or other entrances to the facility (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the facility).	0
Accessibility (Select the single largest value)	<u>5</u>

Describe the site accessibility. Kahana Valley is a state park open to the public. Punaluu Valley is privately owned and access is restricted. Punaluu Valley residents and guests, however, are capable of traversing the site with little impedance. Hunters are allowed in both valleys.

F. Site Dynamics - This deals with site conditions that are subject to change in the future, but may be stable at the present. Examples would be excessive soil erosion by beaches or streams, increasing land development that could reduce distances from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	(5)
None Anticipated	0
Site Dynamics (Select largest value)	<u>5</u>

Describe the site dynamics. Kahana Valley continues to be developed into a park, thus patronage is anticipated to increase over time. Agricultural activities, which predominate in Punaluu Valley, may expand to interior sections of the valley.

**Apply this value to Hazard Probability Table 2 to determine Hazard Probability Level.**

TABLE 2  
HAZARD PROBABILITY

Description	Level	Value
<u>FREQUENT</u>	A	<u>≥27</u>
PROBABLE	B	≥21 <27
OCCASIONAL	C	≥15 <21
REMOTE	D	≥ 8 <15
IMPROBABLE	E	<8

**\* Apply Hazard Probability Level to Table 3.**

Part III. Risk Assessment. The risk assessment value for this site is determined using the following Table 3. Enter with the results of the hazard probability and hazard severity values.

TABLE 3

Probability Level		FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Category:						
CATASTROPHIC	I	1	1	2	3	4
CRITICAL	II	1	2	3	4	5
MARGINAL	III	2	3	4	4	5
NEGLIGIBLE	IV	3	4	4	5	5

RISK ASSESSMENT CODE (RAC)

- RAC 1 Imminent Hazard – Expedite INPR – Immediately call CEHND-ED-SY commercial 205-955-4968 or DSN 645-4968.
- RAC 2 High priority on completion of INPR – Recommend further action by CEHND.
- RAC 3 Complete INPR – Recommend further action by CEHND.
- RAC 4 Complete INPR – Recommend further action by CEHND.
- RAC 5 Recommend no further action. Submit NOFA and RAC to CEHND.

Part IV. Narrative. Summarize the documented evidence that supports this risk assessment. If no documented evidence was available, explain all the assumptions that you made.

From Part I.A. - Live ordnance was reportedly used at the site. The tail section to a 2.36 bazooka round and a portion of a 105 mm AP projectile were discovered in Kahana Valley during a site visit. A 75 mm AP or HE projectile, an 81 mm mortar, unexpended .30 caliber bullets, and expended M1 and M2 cartridges identified by a senior UXO supervisor were discovered in Punaluu Valley by area residents. A 21 October 1949 newspaper article announced the clearance of dud shells in Punaluu Valley by the Army and warned the public to avoid the area being searched. At least one area resident reports occasional discovery of OEW while hiking in the valley.

Refer to additional narration in Parts I and II above.

## TRIP REPORT

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM  
FOR  
FORMERLY USED DEFENSE SITES  
PACIFIC JUNGLE COMBAT TRAINING CENTER  
KAHANA AND PUNALUU VALLEYS, ISLAND OF OAHU, HAWAII  
SITE NO. H09HI027400

DATES OF SITE VISIT: 14 APRIL 1992; 22 JANUARY 1993; 9 FEBRUARY 1993

Individuals participating in the site visit of Pacific Jungle Combat Training Center, Kahana Valley included Randall Kurashige (CEPOD-ED-EH), Farley Watanabe (CEPOD-ED-ES), Senior UXO Supervisor Byron Donaldson (Donaldson Enterprises, Inc.), and Derek Yasaka (Wil Chee - Planning). Kahana Valley is located approximately 26 miles from Honolulu along Kamehameha Highway between Kaneohe and Laie. It is presently under the purview of the Hawaii Department of Land and Natural Resources, Division of State Parks as a "living park".

The team met with A. L. Rogers, manager of Kahana Valley State Park, upon arrival. Mr. Rogers informed the team that 31 families presently reside within Kahana Valley on land leased to them from the State of Hawaii, though the valley is open to the public for hiking and hunting. When queried about World War II military artifacts, he described the presence of a bakery, mess hall, and showers at the mouth of the valley which have since been demolished. Mr. Rogers also indicated the existence of concrete bunkers and tank traps located along a hiking trail near a City and County of Honolulu Board of Water Supply water reservoir approximately two miles in the valley. When asked about the presence of OEW, Mr. Rogers stated that during his tenure as park manager (approximately two years), the only reported findings were of live .30 caliber rounds. Mr. Rogers further explained that said rounds could have post-dated the Army training center as the valley is a hunting area.

Mr. Rogers then referred the team to "Aunty" Lydia Dela Cerna, a longtime Kahana Valley resident. She reiterated the existence of concrete bunkers in the valley, though was unsure if anyone had ever discovered any OEW. Admittedly, her recollection of Kahana Valley as a military training center was vague.

Upon acquisition of gate keys from Mr. Rogers, the team then proceeded by vehicle to a Kawa Stream weir approximately 1.4 miles into the valley from the park office. Observed on the banks of the stream at the weir were two 2-foot tall concrete piers and a 7-foot tall wood timber A-frame support, reportedly remnants of a trolley that at one time traversed the stream to pass materials and personnel from one side to the other. The system's steel cable was discovered underwater adjacent to the west bank of the stream. According to a park representative, the trolley was dismantled by the Division of State Parks following injury to a park visitor. She did not know if said weir and trolley were installed by the Department of the Army.

Upslope and north of the weir at a gate leading to the above mentioned Board of Water Supply water reservoir is a loop hiking trail approximately three miles long. The trail leads to four concrete pillboxes situated at a former military jeep trail crossroad. Exterior dimensions of two quadrangular pillboxes are 10 feet by 10 feet by 6.5 feet tall with 1-foot thick walls. Unlike these, the remaining two pillboxes each have three flat sides and one side which is curved. Their exterior dimensions are 13 feet by 7 feet by 6.5 feet tall with 1-foot thick walls. Their pockmarked walls indicate these pillboxes were frequently fired at. Discovered OEW at the base of one pillbox include the tail section of a 2.36-inch bazooka round and what is surmised to be a portion of a 105 mm armor piercing (AP) round.

Near the pillboxes and obscured by fallen lauhala leaves are as many as 50 rusting tetrahedron angle iron tank traps. The 3.5-foot tall tank traps are, in general, neatly aligned in rows.

Upon returning to the park office, the secretary informed the team that several more remnant concrete structures exist along the east face of the valley. Names of long time residents were provided to the team to contact for more information.

A visual survey of the valley mouth revealed concrete curbing, a floor slab, and large concrete footings adjacent to a park comfort station. Their weathered appearance and predominance of aggregate suggests these remnants to be of World War II Army construction.

## TRIP REPORT

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM  
FOR  
FORMERLY USED DEFENSE SITES  
PACIFIC JUNGLE COMBAT TRAINING CENTER  
KAHANA AND PUNALUU VALLEYS, ISLAND OF OAHU, HAWAII  
SITE NO. H09HI027400

DATES OF SITE VISIT: 14 APRIL 1992; 22 JANUARY 1993; 9 FEBRUARY 1993  
(continuation)

On 22 January 1993, Louis Fung (Wil Chee - Planning), and Messrs. Donaldson and Yasaka performed a site visit of Punaluu Valley, also a part of Pacific Jungle Combat Training Center. They were met by John Primacio, Jr., vice president and manager of Koolau Agricultural Company, Ltd. who also escorted the team throughout the valley. The agricultural cooperative leases approximately 3,400 acres of Punaluu Valley from Kamehameha Schools / Bernice Pauahi Bishop Estate. Mr. Primacio explained that prior to World War II, the basic valley crops were taro and rice. Following the cessation of wartime hostilities, Kahuku Sugar Plantation began propagating sugar cane in Punaluu Valley.

Mr. Primacio recalled Punaluu Valley being referred to as "Green Valley" by the Army while Kahana Valley was designated "Red Valley" during utilization of the valleys as a training area. An Army-built coralline surfaced service road is still referred to as "Green Valley Road" by area residents. This road is also designated by Oahu Civil Defense Agency as an evacuation route to allow coastal inhabitants access to higher ground in the event of a tsunami.

While restoring and maintaining Punaluu Valley's irrigation ditches and tunnels, Mr. Primacio discovered remnants of several Army-constructed buildings including barracks, latrines, a mess hall, and a concrete bunker. He guided the team to one area in the rear of the valley in the vicinity of the cooperative's irrigation Tunnel No. 6. Observed by the team was a coral aggregate road partially obscured by fallen leaves and low lying vegetation. Near the road were segments of steel piping purportedly used to convey water to facilities downslope of Tunnel No. 6 where the Army tapped the irrigation ditch for its water supply. Rotting upright timbers set into the ground bear possible evidence of a barrack.

Observed alongside the irrigation system service road were several collapsed earthen bunkers. Still visible were wood beams and corrugated sheet metal siding. A visual search of these bunkers by Mr. Donaldson confirmed the absence of surficial OEW.

At the southern end of the irrigation system service road toward the rear of Punaluu Valley and near Koolau Agricultural Company's west irrigation ditch intake is a quadrangular concrete bunker. This structure measures eight feet square and four feet tall. Metal rings at each corner indicates the structure to have been fabricated off-site, then transported to its present location. Discarded food wrappers and packaging litter the interior. Reconnaissance performed by Mr. Donaldson again failed to locate any surficial OEW.

Prior to departure from Punaluu Valley, Mr. Primacio informed the team of the existence of a "Japanese tank" located on property in the valley not leased by Koolau Agricultural Company. He suggested contacting the Fely family who lease that parcel for authorization to conduct a reconnaissance of the premises.

On 9 February 1993, Messrs. Donaldson and Yasaka returned to Punaluu Valley to meet with Debbie Fely and visually survey the 6.7-acre parcel (TMK 5-3-011: 005) for remnants associated with the former training center. As stated by Mr. Primacio, a Japanese tank does indeed exist on this parcel. Upended, it resides approximately 100 years north of the Fely home. Although pockmarked, expended projectiles were not visually observed by the team nor detected with a Schonstedt Instrument Company Model GA-52C flux gate magnetometer. Mr. Donaldson surmises the tank was transported into the valley as a prop during jungle training.

## TRIP REPORT

### DEFENSE ENVIRONMENTAL RESTORATION PROGRAM FOR

### FORMERLY USED DEFENSE SITES PACIFIC JUNGLE COMBAT TRAINING CENTER KAHANA AND PUNALUU VALLEYS, ISLAND OF OAHU, HAWAII SITE NO. H09HI027400

DATES OF SITE VISIT: 14 APRIL 1992; 22 JANUARY 1993; 9 FEBRUARY 1993  
(continuation)

Mrs. Fely informed the team that her son Keola frequently discovers OEW items both on their property and in other areas of Punaluu Valley. Keola allowed the team to peruse his collection of unexpended .30 caliber rounds, and expended M1 and M2 cartridges discovered while preparing garden plots around the Fely house. Another item in his possession was a 75 mm AP or high explosive (HE) round. Citing her concerns about the potential for detonation, Mr. Donaldson advised Mrs. Fely that the Honolulu Police Department be notified to properly dispose this OEW item.

Keola stated that he and his friends have encountered other OEW items in the valley while hiking. He escorted the team to the location of a live 81 mm mortar round wedged between the roots of a Java plum tree. The tree is located along the north edge of Green Valley Road near the Tukuafu residence on land leased by Koolau Agricultural Company. According to Mr. Donaldson, the round was fired but failed to detonate.

On 11 February 1993, Mr. Yasaka telephonically apprised Valerie Mendes, president of Koolau Agricultural Company, regarding the existence of said 81 mm round. She was instructed to contact the Honolulu Police Department that would in turn notify the 6th EOD Detachment for proper action. The telephone conversation was followed by written correspondence dated 16 February 1993, a copy of which is attached herewith.

Ms. Mendes telephoned Mr. Yasaka on 18 March 1993 that the OEW item was removed by an Army EOD detachment.



February 16, 1993

Ms. Valerie L. Mendes  
Koolau Agricultural Company, Ltd.  
915 Fort Street  
6th Floor  
Honolulu, HI 96813

Dear Ms. Mendes:

As per our telephone conversation on February 11, 1993, a fired, but unexploded, 81 mm mortar round was discovered by the undersigned and explosive ordnance specialist Byron Donaldson (Donaldson Enterprises, Inc.) on property belonging to the Bernice Pauahi Bishop Estate and leased by Koolau Agricultural Company, Ltd. The discovery was made during visual reconnaissance of Punaluu Valley on 9 February 1993 pursuant to the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS). The mortar round is lodged between the roots of a tree situated along the north edge of the valley's irrigation system service road approximately 50 yards southwest of the Tukuafu residence driveway (map enclosed).

We recommend you notify the Honolulu Police Department to report the existence and location of said unexploded mortar round. They will likely in turn contact the Army's explosive ordnance detachment for assistance.

This discovery suggests that more unexploded ordnance may continue to exist in the valley despite earlier clearance efforts by the U. S. military. We therefore recommend that Koolau Agricultural Company advise its personnel, valley residents, and occasional valley users to this potential hazard, to exercise caution, and to immediately report any unexploded ordnance discoveries to local authorities for mitigation. We also recommend that ordnance not be handled whatsoever as such items can still detonate causing serious injury or death.

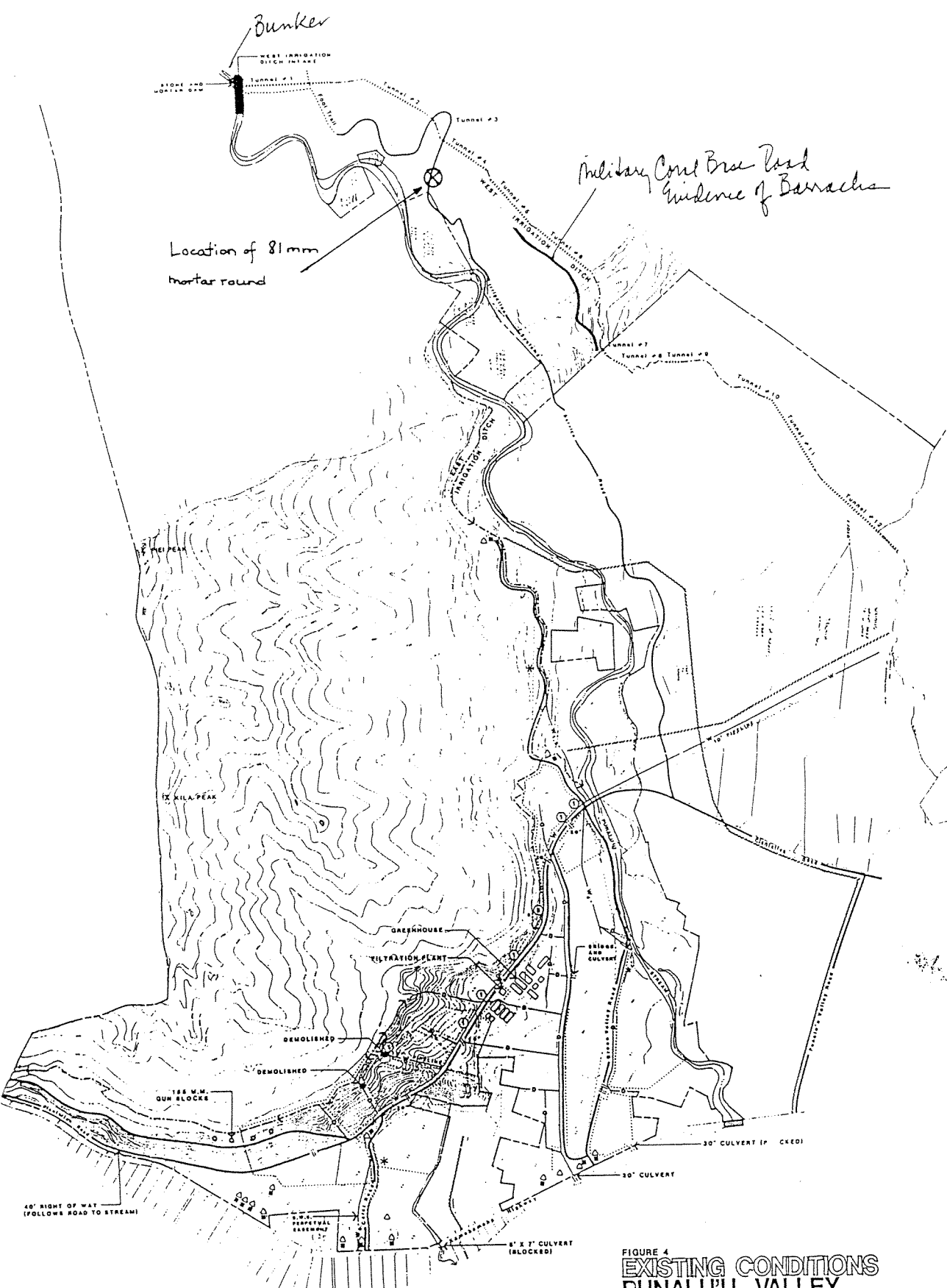
Sincerely,

Derek Yasaka  
Environmental Scientist

Enclosure

WIL CHEE - PLANNING  
*Land Use Planners and  
Environmental Consultants*

Ala Moana Pacific Center  
1585 Kapiolani Boulevard  
Suite # 818  
Honolulu, HI 96814  
Phone 808-955-6088  
FAX 808-942-1851



**LEGEND**

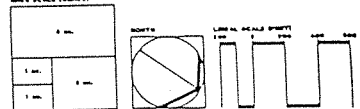
- ROADS
- ELECTRICAL LINE
- CESSPOOL
- RESIDENTIAL
- FENCE

- IRRIGATION WATER SYSTEM**
- WATER LINE
  - VALVE (NO. OF VALVES)
  - IRRIGATION DITCH
  - WELL
  - WATER TANK BASE

- DRAINAGE SYSTEM**
- DRAINAGE DITCH
  - CULVERT

**FIGURE 4  
EXISTING CONDITIONS  
PUNALU'U VALLEY**

AREA SCALE (FOOT)



ISLAND OF OAHU



## SOURCES OF INFORMATION

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM  
FOR  
FORMERLY USED DEFENSE SITES  
PACIFIC JUNGLE COMBAT TRAINING CENTER  
KAHANA AND PUNALUU VALLEYS, ISLAND OF OAHU, HAWAII  
SITE NO. H09HI027400  
3 DECEMBER 1993

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14. Wreckfinders. Post Office Box 1554, Kailua, HI 96734. Telephone 808-254-4891.

**DONALDSON ENTERPRISES, INC.**  
EOD Services  
45-645 Pua AloWalo Street  
Kaneohe, Hawaii 96744  
Tele/Fax (808) 235-BOMB

2-9-93

**WIL CHEE PLANNING**  
1585 Kapiolani Blvd, Suite 818  
Honolulu, Hawaii 96814  
ATTN: Derek Yasaka

**SUBJ: PACIFIC JUNGLE WARFARE TRAINING CENTER TRIP REPORT (UXO).**


A uxo survey was conducted at the former Pacific Jungle Warfare Training Center located in Kahana Valley (Blue) and Punaluu Valley (Green). The survey was conducted on 4-19-92, 1-22-93, and 2-9-93. It consisted of a visual walk-through search for surface oew/uxo and a ferro-magnetic locator (Schonstedt GA-52) search for subsurface uxo.

On 4-19-92 Kahana Valley was investigated to determine the extent and magnitude of uxo contamination. Both of what appeared to be the military trails were searched and portions of the river that runs through the valley was also searched. The trails had indications of what appeared to be fighting holes which were probably loacations of ambush sites. At the apex of the two trails were three (3) portable concrete pillboxes of the type that are found on the beaches surrounding Oahu. Lying partially buried (found with the Schonstedt) was a 2.36 bazooka motor and base of a low order 105mm which was empty. Also the pillboxes appeared to have been fired upon with rifle fire. My first reaction was that this was a target in a impact area. After my interview with a former resident in the Valley, Mr. Howard Furuya ( 247-0969, born in the valley in 1933 and had a lease till 1979) these rounds and bunkers may have been brought to this location and destroyed. No warnings were given in newspapers that this area was going to be dedudded as was the normal practice at that time.

Punaluu Valley (Green Valley) was investigated on 1-22-93 in the same manner as Kahana Valley. This valley only had one (1) trail which ended at a steep dropoff over looking the Punaluu Stream. Located at this point was a single concrete pillbox buried partially in the ground which is of the same construction as those found in Kahana valley. At various points along the trail were covered fighting holes that supported each other and were probably utilized as ambush points. In september 1949 warnings were posted in the newspaper that this valley was being "dedudded". The portion of this valley that may have been the impact area was not accessible at this time.

Page 2/PJWTC

On 2-9-93 a uxo survey was conducted at the kuleana belonging to the Eve family. During the previous investigation this area had been pointed out as containing a WW II Japanese tank but was inaccessible to the investigating party. The current resident (Mrs Fealy) met us upon arrival at her property and briefed us on what she had seen during their 1 year stay on the site. Her son displayed his collection of smallarms (M1 rifle/M2 Carbine) which he found in the garden in front of the house, a 75mm ap-t and an expended MK 28 sea marker, all of which he found on the property. Also, he directed us to a 81mm mortar that appeared to be HE filled. A tree root had grown around it and identification was difficult but I was able to determine it was in the fired condition with the safety pin missing (indicating it was probably fired there and not discarded). We then visited a WW II Japanese tank and searched the area but failed to locate any oew/uxo. I feel this tank was probably placed at this site for instruction purposes, however, it had sustained rifle fire of a unknown caliber. The search continued until late in the afternoon with nothing further being located.

  
BYRON L DONALDSON  
VICE PRESIDENT



1. Concrete curbing, a floor slab, and footings located next to a parking lot and comfort station at the entrance to Kahana Valley State Park. View facing southwest.



2. View of Kahana Valley facing north towards its mouth. The viewpoint is approximately 2.1 miles inland from the park headquarters.



3. Concrete footings and a timber A-frame located along the west bank of Kawa Stream in Kahana Valley. The items are surmised to be remnants of a trolley which conveyed individuals and supplies across the stream.



4. View of Kawa Stream and a weir from the location of the trolley remnants pictured above. Submerged near the bank is a length of steel cable which was likely strung across the stream and which supported the trolley.



5. Three of four concrete pillboxes situated just off a loop hiking trail in the rear of Kahana Valley near a Honolulu Board of Water Supply reservoir.



6. Tail section of a 2.36-inch bazooka round located at the base of a concrete pillbox in Kahana Valley.



7. Possible section of a 105 mm AP projectile located at the base of a concrete pillbox in Kahana Valley.



8. Rows of tetrahedron tank traps situated within a stand of lauhala trees in Kahana Valley.



9. Coral aggregate service road in Punaluu Valley reportedly constructed by the Army.



10. Upright timber footings to a military structure near the coral aggregate service road pictured above.





11. Corrugated sheet metal and timber bunker located along the side of Koolau Agriculture Company's irrigation system service road in Punaluu Valley.



12. Quadrangular concrete bunker located near Koolau Agriculture Company's west irrigation ditch intake at Punaluu Stream.



13. Upended Japanese tank located at the Fely residence in Punaluu Valley.



14. Expended M1 and M2 cartridges, and an unexpended .30 caliber round unearthed at the Fely residence.



15. Portion of a 75 mm AP or HE in the possession of K. Fely. The round was reportedly discovered along the west face of Punaluu Valley.



16. Live 81 mm mortar wedged in the roots of a Java plum tree located along Green Valley Road in Punaluu Valley.



17. Java plum tree, at center in the photograph, where the 81 mm mortar was wedged. View facing west from across Green Valley Road.



18. View of Green Valley Road facing south with the Tukuafu residence driveway visible at left center in the photograph. The 81 mm mortar was discovered approximately 25 yards past (south of) the driveway entrance on the right side of Green Valley Road.