

# Use of Islands by Armed Forces Leaves Few Stones Unturned

Hundreds of thousands of acres in Hawai'i have been, at one time or another, under the control of the armed forces in Hawai'i. That much is known. What is not so well known is what the military has done with that land. Or, to put it another way, has past use of the land rendered it unfit for any future use, even when the military has no further need of it?

The question is especially pertinent inasmuch as pressures of growth make it likely that lands formerly controlled by the military will be targeted for development. In fact, this has already begun to occur, with predictable consequences. Land that the Navy wanted to turn over to the state or the City and County of Honolulu for use as possible low-cost housing (in the Manana area) turned out to be contaminated by chemicals the Navy had stored on the site over the years. Effecting the proposed simple exchange of city land for Navy land has taken years and is still not completed. (For a fuller discussion of contaminated Navy lands, readers may wish to review the December 1991 edition of *Environment Hawai'i*.)

But even if a given military site is itself not considered for development, the question as to what was done on it is appropriate. More and more, environmental scientists realize that pollution cannot be confined to the scene of the crime. Plumes of chemicals moving underground can contaminate water supplies off-site. Ordnance shot into the high reaches of mountains can be washed downstream. Soil loss and erosion in the mauka lands can harm streams and foul bays with siltation. The potential consequences are infinite.

## *Hundreds of Sites...*

Since 1984, the Defense Environmental Restoration Program has been in place. It is intended to address contamination at both existing defense installations (the part of the program called installation restoration, or IR) and formerly used defense sites — or FUDS. The program extends to cleaning up contamination associated with past Defense Department activities, even when that contamination lies outside the boundaries of the property under military control. Charged with administering the FUDS program is the Army Corps of Engineers. Responsibility for clean-up at existing installations falls to the services using them.

The Department of Defense is required to provide Congress with an annual report on progress in meeting the goals of DERP, including lists of existing installations where contamination has been identified; FUDS are not in-

cluded. The DERP report for fiscal 1990 (delivered to Congress in February 1991) identifies 235 contaminated sites at 46 separate installations in the Hawai'i area. (Johnston Island is included as an Hawai'i installation. It is said to have five contaminated sites.) Waikane Valley Impact Area — not technically yet a FUDS — shows up as a Navy installation, with one contaminated site listed. (Installations can be as large as Schofield Barracks, with 19 sites. Pearl Harbor turns up in the report as at least nine separate installations — for example, the shipyard, the submarine base, the Public Works Center, etc. The total number of contaminated sites is placed at 40 for those nine installations.)

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*"Of the total 235 sites in Hawai'i identified as contaminated, exactly one had been cleaned up at the time of the Pentagon's 1990 report."*

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The DERP report also gives the status of clean-up operations at each contaminated installation. For all the 235 sites identified, preliminary assessments were completed or in progress at the time of the report. (In fact, this is almost a tautology: Only after a preliminary assessment is done does a facility make it onto the list of contaminated sites.)

The next step in cleaning up contaminated sites is preparation of a site investigation report. A total of 156 of the 235 sites have made it to this stage.

When it comes to the preparation of what is called a Remedial Investigation/Feasibility Study

(RI/FS, where the actual method of clean-up is discussed), the Defense Department can point to just six sites where this has been done. A Remedial Design has been prepared for exactly one.

And of the total 235 sites identified as contaminated, exactly one had been cleaned up at the time of the 1990 report (the most recent available).

## *... And More to Come?*

It goes almost without saying that the list of contaminated sites is probably incomplete. Every year that the Pentagon has prepared a DERP report, the number of contaminated sites grows, at a pace that has been almost exponential. This is described by Seth Shulman in his book, *The Threat at Home*.

"The report of fiscal year 1988 ... listed 8,139 potentially contaminated sites at 897 installations. The report contained roughly 100 pages. The following year (the report) ... documented 14,401 potentially contaminated sites at 1,579 installations. That year's volume came to about 150 pages.

"The latest report, covering fiscal year 1990, ... runs about 250 pages. The military now says it has some 17,482 potentially contaminated sites at 1,855 installations."<sup>1</sup>

As Shulman notes, these figures do not include formerly used defense sites, nor do they represent contamination at U.S. military installations nor on U.S. soil.

Helene Takemoto of the Honolulu office of the Army Corps of Engineers stated that Corps now has cleaned up a total of three sites in Hawai'i: underground fuel storage tanks were pulled out at Ka'ena Point and Pohakuloa.

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<sup>1</sup> See page 14 of Shulman's book, which is reviewed elsewhere in this issue of *Environment Hawai'i*.

## Note to Map

These sites appear on a 1946 map of training areas prepared by the Army and contained in a report titled "TRAFAC: Training Facilities and Data Relative Thereto" (no date). The G-3 History, to which the TRAFAC report is annexed, acknowledges that "certain facilities established during the war were closed prior to the cessation of hostilities and are, therefore, omitted from these maps." Some of the omissions are significant. The G-3 History lists them as follows:

- (1) Maui:
  - (a) Maui Amphibious Training Center on the East shore between Blue Beach and Navy Lavender Beach;
  - (b) Underwater obstacle course on the East shore between Navy Violet and Lavender Beaches;
- (2) Hawai'i:
  - (a) Maneuver and impact area in Kilauca Crater, near Kilauca Military Camp, utilized for artillery and general training;
  - (b) Anti-tank range and a large artillery range and impact area near Camp Pohakuloa, adjacent to Mauna Kea;
  - (c) A large jungle warfare and maneuver area in the vicinity of Camps Kilohana, Furness, and Ola'a, south of Hilo;
  - (d) A jungle training area on the North Shore where the Marine amphibious course is presently located; and another east of this location inland from Waipi'o Bay;
  - (e) A combat training center near Mountain View (approximate coordinates 1310-2464) with the following courses: combat, infiltration, bayonet, obstacle, combat in cities, and grenade;
  - (f) A combat firing range, with a fortified position area included (coordinates 1345-2460) nearly due east of Mountain View.

**Molokai**

1. Bombing range
2. Impact areas
3. Rocket target range
4. Training areas
5. Moku Ho'onihiki bombing range

**MauI**

1. Army living point
2. Marine training areas
3. Maneuver area
4. Impact area
5. Maneuver area
6. Nahiku maneuver area

**Kauai**

1. Jungle training areas
2. Anahola-Molokai's impact area
3. Waialeale impact area
4. Waimea impact area
5. Grove Farm impact area
6. Knudsen's Gap training area
7. Kapunahua training area

**O'ahu**

1. Waimea AAA firing point
2. Pupukea training area
3. Kahuku training camp & area
4. Waimea Bay training area
5. Kawaika training area
6. Eucalyptus Forest training area
7. Kaiaka Bay training center
8. Pu'uhiki training area
9. Mokuheia training area
10. Ko'ena AAA firing point
11. Pacific Combat training center
12. 13th Repl Det Wrens training center
13. Schofield Range

29. Barber's Point training area
30. Fort Barrett
31. Little Schofield camp
32. Fort Weaver
33. Salt Lake NBS
34. Fort Kam
35. Fort Shafter
36. Paoli training camp & areas
37. Kaelepulu Pond training area
38. Waimanalo training school
39. Sand Island
40. Fort Armstrong
41. Fort DeRussy
42. Diamond Head
43. Fort Ruger
44. Marconi impact area
45. Waikupe impact area
46. Koko Head training center



**Island of Hawaii**

1. Navy rocket range
2. Marine amphibious course
3. Navy off-shore bombing ranges
4. Marine combat range
5. Navy bombing ranges
6. Kilauea army camp
7. Army bombing range (Ka'u descent)
8. Palani Iki bombing range (Army)
9. Morse field

**TRAINING AREAS AND CAMPS 1942 TO 1945**

This map primarily depicts training areas. It does not reflect all areas used by other services. Boundaries are approximate.

## Contamination

from page 4

At South Point, a fuel tank was removed and a cover was placed over a 30-foot-deep cesspool. No list of contaminated FUDS in Hawai'i was available, Takemoto stated, citing computer problems on the Mainland. Moreover, the list of FUDS generated by the Honolulu office of the Corps of Engineers was an "internal document," she said.

In any event, any inventory generated by the military will probably not be complete. That this should be so may be traced generally to the Defense Department's overall lackadaisical approach to record-keeping, particularly when wartime exigencies forced all other considerations to take a back seat.

The number of sites used by the military during World War II and since is large indeed, as the accompanying map shows.<sup>2</sup> There is no way of knowing precisely what hazards are present at each of these sites. Unexploded ordnance is but one of many different types of contamination that may make land unfit for some, if not all, human activities. Other sites may be damaged by improper disposal of hazardous wastes, by careless use of cleaning agents or pesticides, or by leaking petroleum pipelines and fuel storage tanks. By some accounts, chemical weapons (including nerve gas) dating back to World War II may still be stored on O'ahu.

### Ordnance and Explosive Waste

When asked if the Corps of Engineers had tackled any sites involving ordnance — or what the Pentagon calls OEW, for ordnance and explosive waste — Takemoto said it had not. Sites with ordnance are last on the Corps' list of clean-up priorities, she said. In line before that are sites with hazardous and toxic waste and those with unsafe debris that poses an immediate threat to public safety or health.

Over the years, unexploded ordnance has posed just such a threat, however. In the two decades following World War II, the state's newspapers carried regular accounts of people being injured by grenades or shells of various types. At least 11 civilian deaths — most of them children — have been attributed to World War II "duds."

In the years immediately following the war, the armed forces conducted sweeps of land where ordnance had been used. No one claimed then or claims now that those clearing opera-

tions gathered up all the unexploded bombs, grenades, shells or mortar rounds that littered the islands following the departure of most troops stationed here during the war.

In September 1946, for example, *The Honolulu Advertiser* reported that bomb disposal squads conducted "an almost superhuman effort to rid the [Windward O'ahu] shore and ocean bottom of missiles which were fired during wartime practice games." The sweep extended from Koko Head to Kahuku.

"Because an area is completely cleared of duds one day does not mean that the same area will be free of such danger a day, week, or even a year later," the newspaper reported. Currents, tides, and even a 1946 tsunami were blamed for bringing to the surface ordnance hidden during previous sweeps. That particular clearing operation was prompted by a dud exploding on

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*"The crew was taken five miles off the island in a launch to watch the explosion. When it came, it blew the whole of one side of Molokini into the sea. Boulders were blown more than a mile from the island."*

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Rabbit Island two months earlier, which killed one boy and injured four fishing companions.

The unreliability of ordnance sweeps was underscored a decade later, when a ranch hand at Parker Ranch on the Big Island was killed by an exploding dud. The death occurred after 91,000 acres of land at Waikoloa, most of it owned by Parker Ranch, had been the subject of one of the largest "de-dudding" operations in the military's history. The Marines had used the land as a training area during World War II and conducted the sweep prior to returning it to the use of Parker Ranch. The heirs of the killed ranch hand sued the United States, but lost. Parker Ranch had known of ongoing discovery of ordnance, it was determined at trial, but had not let the U.S. know of this. For that reason, the United States was absolved of culpability in the death.

### What Now?

Waikane Valley was used as a military training area from 1942 to the early 1960s. Only now is the matter of its future utility coming to a head, with a trial over the government's proposal to condemn the property scheduled for late September of this year.

Among the many questions raised by the Waikane Valley condemnation case is this: Is the usefulness of other land — apart from the well-known problems of Kaho'olawe — likely to be similarly affected by the problem of unexploded ordnance?

Any discussion of land use should bear in mind that as development pressures grow, land values increase — and so, too, does the determination to encroach on land that had in the past been deemed too difficult to permit of settlement. Thus, areas that no thinking person would have considered potential growth targets two decades ago now sprout million-dollar houses with commanding views.

As the accompanying map shows, hardly any valley was untouched by the military during World War II. Like the Kamaoka property in Waikane Valley, much of the land used for training was — and remains — in private ownership. Much of the Kawaihoa and virtually all of the Kahuku training areas are privately owned — by Bishop Estate and Campbell Estate, respectively.

The mere fact of military use does not suggest the presence — then or now — of explosives. However, nearly all training areas had associated "training aids" that entailed the use of explosives. Examples include grenade courts, mortar ranges, anti-aircraft target ranges, and artillery impact areas. Coastal areas used for amphibious landing training might include impact areas for the firing of mortars and large-caliber artillery from the sea inland.<sup>3</sup>

Nearly all off-shore islands were used as bombing ranges. On June 24, 1948, the *Honolulu Star-Bulletin* reported on a warning from Col. James L. Guion, the Army's officer in charge of ordnance service. "Vacation time is danger time for anyone who ventures into dud-filled ranges," the colonel was quoted as saying. Rabbit Island and Kaho'olawe were both "kapu," the paper stated. Areas that had been used but cleared could be entered "with caution," according to Guion. Those areas included Kawaihoa range, "Fr. Hase range" (Ulupao peninsula, now occupied by the Kane'ohe Marine Corps Air Station); Ioleka'a Valley (above the State Hospital in Kane'ohe); Marconi impact area (above Koko Head and Makapu'u); Waikane Valley, He'eia Range, Waiupe Range, and the islands of Mokoli'i (known also as Chinaman's Hat, off Kualoa Point), Kaohikaipu (the small island near Rabbit Island, or Manana), Mokolua (actually two small islands off Lanikai), Moku Manu, and Mokuaiua (off La'ie).

"Two smaller islands, Molokini and Mokuiea, have been cleared, but more duds will probably appear," the report stated.

Also on the warning list were these areas in Kaua'i: Waimea impact area; Kaua'i desert; Waiialua; Grove Farm; Anahola-Maloo'a, and Knudsen's Gap, and the rocket ranges at Asaki

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<sup>3</sup>This information is based on the "G-3 History," Volume II, which contains an exhaustive account of all the training areas and their associated facilities.

<sup>2</sup>The map is drawn from maps included in a document entitled "History of G-3, Headquarters, Army Forces, Middle Pacific, Functions and Activities, 7 December 1941 - 2 September 1945," prepared under the direction of the commanding general, Lt. Gen. Robert G. Richardson, Jr. For years after the war, this document was classified as secret. It is available in microfilm at the University of Hawai'i's Hamilton Library.

## Waikane

from page 1

those areas best suited to agricultural and residential use.<sup>3</sup> McCandless' Waiahole Water Company built a tunnel through the Ko'olau range and sold the water rights to the O'ahu Sugar Company in Waipahu. McCandless' daughter Elizabeth Marks eventually acquired title to most of the McCandless land in the valley.

In 1943, the Army began using 1,061 acres in Waikane Valley and the adjoining Waiahole Valley as a training area and for air-to-ground ordnance delivery practice (that is, it was a bombing range). The McCandless heirs granted the government a lease for this purpose, which was continued after the war ended. In 1953, the U.S. Marine Corps took over the lease, putting the land to much the same purpose. The lease was renewed in 1961, although by most accounts, the Marines' use of the area as a firing range ceased soon after.

A decade later, the McCandless heirs sought

<sup>3</sup> Just how McCandless consolidated his holdings in the valley — as well as his vast landholdings throughout the state — is a matter of conjecture. According to several accounts, he won the hearts of Hawaiian women who turned over to him title to their *kuleana* lots. These accounts are given some credibility by a reference to McCandless in Lawrence Fuchs' *Hawaii's Pono* (Harcourt Brace Jovanovich: San Diego, New York, London, 1961). Fuchs describes McCandless' disparaging remarks at the idea that President Roosevelt would, in 1933, appoint a Hawaiian as territorial governor. (McCandless himself, at age 74, desired the position.) "A part-Hawaiian ... denounced McCandless for saying that it was a mistake to appoint a Hawaiian as governor. He wondered how Linc would dare raise such a question, charging that McCandless had spent a lifetime 'debauching Hawaiian women'" (p. 193).

to put their land to a more profitable use. To do so, clear title was needed, and the Kamakas' acknowledged interest (at least 3 percent) was an impediment. Action to quiet title was brought, and the result was a settlement that gave members of the Kamaka family the diamond-shaped parcel of 187 acres that, unknown to them at the time, was the impact area — the ground most intensively shelled during the two decades that Waikane Valley served as a military training ground.

*"From 1976 to 1983, members of the Kamaka family occupied the land and the government never once informed the Kamakas that the property would never be ordnance-free."*

In 1975, the Kamakas and the McCandless heirs gave the Marines notice to vacate, which they did July 1, 1976. In the time since then, the McCandless heirs have sold part of their holdings to SMF Enterprises, a Japanese-owned corporation well on its way toward developing a golf course on its part of the valley floor.

The Kamakas have not done so well. Between 1976 and 1983, they farmed about 17 acres of their land, planting it in Japanese cucumbers, string beans, long beans, papayas, eggplant, taro and bananas as well as potted plants and red ginger. Several families lived on the land as well in eight extremely modest living units. According to a Navy environmental assessment, the shelters were "three converted buses, two single-

room wooden structures, and three sheds."

Since 1983, the Kamakas have been able to do almost nothing with their land. Torrential winter rains in 1983 washed soil from the hillsides denuded after years of shelling, leaving exposed thousands of rounds of unexploded ordnance. The Kamakas' attempts to get the United States to make good on its promise in the lease to clear their land and leave it in the same condition as that in which they found it has resulted not in compliance with lease terms, but in the condemnation action.

*... But No More?*

Under terms of the lease — specifically, paragraph eight — the land was to be returned to the owners cleared of all unexploded ordnance. The first sweep of the Kamakas' property was conducted between August 9 and September 13, 1976.

A Marine Corps "after action report" stated that 42 explosive items were disposed of by detonation on site. More than 24,400 pounds of practice ordnance and scrap from the area were taken off-site for disposal. Dense ground cover and the extreme slope of much of the land were mentioned as obstacles to further ordnance clearing work. The report concluded that the area "can never be certified free of duds, practice ordnance, etc."

But, according to a memorandum filed on behalf of the Kamakas in U.S. District Court, the Kamaka family was never told by the Marines that the land was not certifiably free of duds. Instead, the memo states, two months

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## Contamination

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ranch and Barking Sands.

On the Big Island, visitors were cautioned to "beware of the following areas: Pohakuloa, Kilauea and Pakiniiii" — the latter probably a reference to Pakini Iki (at South Point). They were all described as artillery areas.

### Is It Safe?

Most, if not all, of the off-shore islands are protected from any sort of development. Still, they are frequently used by hikers, picnickers, and people fishing. Ordnance will probably be on these islands forever, waiting for the right trigger to explode.

A bomb disposal professional, in private practice, told *Environment Hawai'i* that he would not set foot on Rabbit Island. Evidence persists that other islands, too, are not ordnance-free. A few years ago, a bomb was found off Molokini, which regularly was pounded by 1,000-pound and 2,000-pound anti-ship bombs

during the war. Indeed, when ordnance was being removed from Molokini following World War II, the operation was described by *The Hawaii Weekly* of June 20, 1954, as follows:

"The squad was put ashore early one morning with dynamite and fuses. By late afternoon, it had unearthed dozens of bombs the size of a single bed. The smaller ones were detonated together with a common fuse. The larger ones were laced together and exploded with a 45-minute fuse.

"The crew was taken five miles off the island in a launch to watch the explosion. When it came, it blew the whole of one side of the island into the sea. Boulders were blown more than a mile from the island and into the sea."

### On Fast Land

That same article in *The Hawaii Weekly* describes clean-up areas elsewhere on the islands. "The gulches and firing ranges of O'ahu were the hardest to clear," it reported. "The men scaled steep slopes through lantana and actually dug into the face of red earth cliffs seeking out

bazooka and rifle grenades. In Makua Valley, O'ahu, they found everything from 100-pound aerial bombs to whole cases of machine-gun ammunition.

"Private property in the middle of a residential district was no exception. On the grounds and in guava bushes surrounding a wartime service club in the Coconut Grove in Kailua, O'ahu, the bomb disposal team found more than 50 hand grenades."

Coconut Grove and a good many of the other areas used during World War II as cantonment areas or training areas have been developed for decades. The likelihood of finding ordnance on those sites is remote.

But as development extends into hillsides that were target areas for live-ammunition ranges or aerial bombardment, the possibility grows that ordnance left over from World War II will be discovered. Private owners — like the Kamakas — wanting to use training areas for other purposes, and expecting fully that, under lease terms, they will be able to do so, may be in for a rude discovery.

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before the sweep was conducted, the Marine Corps was maintaining that the area was ordnance-free.

"For the next seven years, from 1976 to 1983," the memorandum continues, "members of the Kamaka family occupied the land for farming purposes. They excavated the land to levels of more than five feet, using tractors, plows and various other farm implements. During these seven years, the government never once informed the Kamakas that [it] determined that the property would never be ordnance-free."

After the winter rains in 1983, the Marines sent out an Explosive Ordnance Disposal (EOD) team to survey the land. Their "walk-through," according to the court brief, "yielded a total of 480 3.5 inch rockets from three tracts of 50 feet by 125 feet." The After Action Report concluded that the valley would be difficult and time-consuming to sweep and that a sweep would fail to effectively eliminate all ordnances. It also urged that the Marine Corps consider purchasing the Kamaka portion of the Waikane Valley Training Area.

From February 2 to April 13, 1984, personnel from the Marine Corps, Army, Navy and Air Force conducted further sweeps of the area, collecting 16,000 tons of practice ordnance. According to the Navy's Final Environmental Assessment for its proposal to deal with the Kamaka land — by fencing it off and erecting warning signs — "the After Action Report estimated that 85 percent of the visible surface ordnance was cleared. However, vegetation was not cleared prior to the sweep and it can be assumed that a significant amount of ordnance is covered by vegetation or located below the surface."

Only following this second effort to clear the land did the representatives of the Marines begin discussions with the Kamakas on alternatives to clearing their property. The government claimed it had no land available for exchange and, ac-

ording to the court memorandum of the Kamakas, the government "rejected the possibility of a lease arrangement with no further or intermittent clearing operations."

The Kamakas approached the government then with a proposal to release the government from its obligations under paragraph eight of the lease under three conditions: first, that the government pay the family part of the cost of certifying the land ordnance-free; second, the government agree to pay for a civilian bomb

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*"You either clean it now, or later,  
but never — never."*

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crew to sweep the land once a year for the next 20 years; and third, that the government share with the Kamakas responsibility for public liability. The government rejected the proposal and continued to pursue acquisition of funds for purchase of the land, culminating in condemnation January 1989.

### *A 'Public Purpose'*

The United States contends that condemnation is appropriate inasmuch as it constitutes a taking for a public purpose. In briefs filed in U.S. District Court, government attorneys state that "the taking in this case is necessitated by the need to isolate a dangerous area and prevent public access to it. In order to prevent injuries from unexploded ordnance on the subject land, the United States seeks to take the land, then erect fencing around it and post signs warning of the dangerous condition of the land."

The Kamakas' argument that the government is obligated by its lease to clear the land upon termination of the lease is beside the point, U.S. attorneys state. "The claims of defendants that the United States has breached its lease agreement is (sic) not relevant to this condemnation action and should be pursued, if

at all, in a U.S. Court of Claims."

The fair-market appraisal used by the government in setting the value of the land at \$735,000 has been disputed by the Kamakas. In negotiations with the Navy and the Marines, family members pointed out that the adjoining parcel, where the 27-hole golf course is planned, sold for \$7.5 million. Navy representatives were quick to point out the differences in the utility of the two parcels. The golf-course land is 505 acres, of which 433 were in the Agriculture District; the Kamaka land is 187 acres, with 52 acres in Agriculture. The golf-course land has frontage along Kamehameha Highway and utility access; the Kamaka land is accessible only by a rugged jeep road, with no utility service.

### *Cleaning Up*

With the government seeing relatively little value in the Kamaka land, it can more easily justify the decision not to spend money to clear the land of ordnance. But precisely how much ordnance clearance would cost is debatable — as, too, is the government's fundamental contention that by purchasing the land it will never be faced with paying for its cleanup.

The Navy, which has assumed responsibility for disposition of the Waikane site, states that its investigations show that ordnance clearing activities are all but impossible:

"In June 1990, the Navy's ordnance research and development agency, the Navy Explosive Ordnance Disposal Technology Center (EODTECHCEN), evaluated five ordnance locators and three geophysical instruments, representing the spectrum of known ordnance detection technology. The EODTECHCEN determined that under existing site conditions, there is a strong possibility that ordnance items will be buried beyond the detection range of the passive or active locators. The likelihood of at least some migration of remaining unexploded ordnance to the surface, such as

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## Editorial

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Getting the funds for the clean-up will not be easy — all the more reason, then, for the public to be kept fully informed by the military about the degree of contamination existing at both formerly used defense sites and currently used installations. Gone are the days when the military could hide its dirty work behind a cover of national security. Now, if full disclosure does not occur, it more likely results from fear of embarrassment than from legitimate concerns of disclosing state secrets.

While the public has a right to know, the

state has a fiduciary duty to pursue inquiries about military use of state land. Many of the acres occupied by the military are ceded lands. Already, concerns exist that the state has broken faith with the beneficiaries of ceded lands by leasing state lands at token, 51-per-term fees. If those lands are additionally rendered forever useless by the military lessees, that fiduciary responsibility has been broken irreparably.

In his book *The Threat at Home*, Seth Shulman describes an approach taken by the federal agencies to sites where clean-up is deemed too costly or difficult. "Sacrifice zones" they are called, a term that captures the approach of the military to too many of its lands.

The notion that any piece of this Earth can

be sacrificed rather than undertaking the effort to make it whole is repugnant. In Hawai'i, it is more: it is impossible. No land is so remote or so isolated as to be erased from the map, as it were, without consequence. Yet this is exactly what the government would do with the Kamaka land and who knows how many other parcels yet to come. It must be stopped.

### *Mahalo*

Research for this issue was financed in part by a grant from The People's Fund and The Pohaku Fund. A special thanks to Tim Officer of For Color Publishing, Inc., for the painstaking effort required to produce the map of World War II training sites.

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following severe inclement weather, would prevent declaration of the site as cleared to any degree of confidence."<sup>4</sup>

The Navy contracted with Belt Collins & Associates to do an independent assessment of what would be required to clear the area of ordnance. Belt Collins concluded that "soil processing" was the only certain way of dealing with the problem, but that this "involves removal of all surface vegetation and excavation and sifting the soil to the desired depth." Soil processing by hand would be required on the steepest slopes. Sifting the soil by machine might be practical in flatter areas, but would be difficult given the tendency of the soils at the site to clump when wet... The Hanalei series soils, characteristic of lower areas of the site where mechanical processing is practical, may not lend itself to screening because of wetness and possible clumping."

An alternative to sifting would be to "spread the soil in shallow lifts on flat terrain," Belt Collins reported. With the soil spread to a depth no more than 12 inches, ordnance detectors would be able to pick up the presence of even the smallest rounds (37 mm).

The cost of this combined manual and machine clearing operation was placed at more than \$7 million. Apart from the cost, Belt

<sup>4</sup> Letter of January 13, 1992, to Hawai'i's Thousand Friends from Gary Brown, for the U.S. Marine Corps.

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Program (DERP) annually, despite the extent of the problem that lies ahead. Complicating matters further, Wash says, the Army Corps often operates 'in the dark.' It frequently lacks access to information about past practices at sites used by Navy or Air Force personnel. Often little or no documentation about such practices even exists."

## In Our Back Yard

As well as providing a context for understanding the Pentagon's approach to environmental problems, Shulman provides case studies of pollution at military sites around the country. No Hawai'i site is discussed — but from all that I have been able to see of military operations in this state, this is more a matter of dumb luck than it is any lack of problems whose complexity and gravity are comparable to those recounted by Shulman.

More than a description of this dismal state of affairs, Shulman's book is a guide to action. In

Collins identified further drawbacks to ordnance removal. The extensive excavation required would result in soil instability, especially on higher slopes. This, in turn, "could jeopardize uses of the lower slopes below, and pose a threat of significant degradation to water quality in Waikane Stream and Kane'ohe Bay. Soil loss after removal of vegetation from these zones is estimated to be 2,363.85 tons/acre/year, an 8,988 percent increase from the present estimated amount of 26 tons/acre/year."

Belt Collins did note, however, that manual clearing of the 45 or so acres of arable land would not inflict any "unacceptable environmental damage to the land." It did not provide a cost estimate for this more limited project.

## A Third Approach

In 1976, Staff Sergeant B.L. Donaldson was one of the Marines in the EOD team that conducted the first sweep of the Kamakas' land. In 1988, Donaldson — now head of his own company that provides ordnance clearing services throughout the Pacific Ocean area — submitted to the Navy a proposal to clear the Kamaka land.

Donaldson's approach differs in significant ways from the Belt Collins method. A surface sweep would be conducted on the arable portions of the land. It would involve removing most of the vegetation — but, Donaldson notes, most of that is weed species in any case. (Donaldson says he was told by a Kamaka kupuna that the Java plum and koa haole trees have ruined the valley — and that the former

his epilogue and in several appendices, he provides information that is intended to be of help to people wanting to learn more about potentially contaminated sites in their own communities. He lists addresses and telephone numbers of military agencies, EPA offices around the country, and national organizations that, in his words, "have contributed to the debate over the military's environmental legacy." He reprints pertinent passages of environmental laws and executive orders verbatim and has prepared a glossary of the sometimes arcane terminology one comes upon in discussions relating to military practices. Indeed, the last 90 pages of the book are devoted to appendices and references, including a section entitled "Strategies for Action."

Shulman, a science writer by profession, recounts his own personal history of involvement with a military site in his home town of Watertown, Massachusetts. One cannot help but think that this has taken him from the armchair to the streets, figuratively speaking. For anyone wishing to repeat his journey, the book he has written will be invaluable.

— Patricia Tummons

were actually introduced by the Marines in a misguided effort to restore the land.)

The three- or four-foot deep excavation needed to clear all buried ordnance would be undertaken only in those areas most likely to yield results. The areas around what Donaldson calls "Mortar Hill" would be scraped back by bulldozer until no more ordnance is uncovered. Following that, "periodic validation tests will be made." (Donaldson notes that "the use of machinery in an impact area normally makes EOD men cringe, but if one studies the cases of even here in Hawai'i, it then becomes apparently how successfully machinery can be utilized.")

Donaldson's plan would require seven to 10 years to carry out, with costs ranging from \$13 million (the seven-year plan) to \$16 million (the 10-year plan).

The Marine Corps' response to Donaldson's proposal was cool. In a memo from the Commandant of the Marine Corps (in Washington) to the Marine Corps commander at Camp Smith (Hawai'i), dated December 21, 1989, the proposal was first described as costing more than acquisition of the property — and for that reason alone, warranting dismissal.

But as though that were not enough, a second reason was given. "Any decision to fully decontaminate the property" — as Donaldson was proposing — "would require an alternatives analysis under the National Environmental Policy Act... Such an analysis would have to fully address the site's highly erosive nature, the major surface and subsurface disturbances from decontamination, and protection of the sensitive watershed and riparian habitat, as well as any species issues. It is questionable that this analysis would favor decontamination even if it was economic."

Donaldson's analysis of the problem may have its flaws. Nonetheless, it raises some disturbing questions. "As more areas are opened to the public for recreational and residential usage," he wrote, "I believe that many more areas that were utilized during World War II will be uncovered and will have to be dealt with, i.e., Kahana, Ka'a'awa, and Punalu'u to name a few." Elsewhere he lists other areas in Hawai'i with similar problems: Moloka'i's Ilio Point; "Kania Range" (probably Kanaio) on Maui (described as a National Guard range near King's Road); and Waikakalaua, on O'ahu. In this last area, Donaldson writes, in the 1940s, "an ammo magazine blew up and littered the area with rifle grenades. No clearance, or only a portion, was done. This area is now being considered for housing."

On the matter of ordnance clearing in general, Donaldson wrote: "There is no state-of-the-art, star wars, or magic technology available now to do this work. One thing is very clear. You either clean it now, or later, but never — never."