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MAYOR



AN EQUAL OPPORTUNITY EMPLOYER  
COUNTY OF KAUAI  
DEPARTMENT OF PUBLIC WORKS  
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LIHU'E, KAUAI, HAWAII 96766

March 27, 1998

Mr. Gary Gill  
Office of Environmental Quality Control  
236 South Beretania Street  
State Office Tower, Suite 702  
Honolulu, Hi. 96813

Dear Mr. Gill:

Subject: Negative Declaration for Kekaha Landfill, Phase II Vertical Expansion,  
TMK 1-2-02:9, Kekaha, Kauai, Hawaii

The County of Kauai, Department of Public Works, is proposing to vertically expand the existing Kekaha Landfill to meet the short-term landfill demands of the island. A draft environmental assessment (EA) was completed and a notice of availability was published by your office on March 8, 1997. We have responded to the comments received during the 30-day public comment period for the draft EA and have completed the final EA. The lapse in time to complete this process occurred because of the uncertainties over the issue of privatization.

Based on the findings in the EA and the comments received, we have determined that this project will not have significant environmental effects and have issued a negative declaration. Please publish this notice in the April 8, 1998 edition of *The Environmental Notice*.

Our consultant, Belt Collins Hawaii, will be submitting the OEQC Bulletin Publication Form, four copies of the final EA, and a diskette that contains the electronic version of the project description. Should you have any questions, please contact Mr. Troy Tanigawa at (808) 241-6880.

Sincerely,

  
CESAR C. PORTUGAL  
County Engineer

TKT/vw

cc: Russell Sugano/Acting Deputy County Engineer  
Sanifill of Hawaii, Inc.

Kekaha Landfill  
Phase II Vertical Exp.   
CESAR C. PORTUGAL  
COUNTY ENGINEER  
TELEPHONE 241-6800  
04/03/98

RUSSELL SUGANO  
ACTING DEPUTY COUNTY ENGINEER  
TELEPHONE 241-6631

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1998-04-08- KA- FEA- Kekaha Landfill  
Phase II Vertical Expansion ~~XXXXXXXXXX~~

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**FILE COPY**

**FINAL ENVIRONMENTAL ASSESSMENT**

**KEKAHA LANDFILL  
PHASE II VERTICAL EXPANSION**

**Kauai, Hawaii**

**Prepared for:  
County of Kauai  
Department of Public Works**

**Prepared by:  
Belt Collins Hawaii Ltd.**

OFFICE OF  
QUALITY CONTROL

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March 1998

**FINAL ENVIRONMENTAL ASSESSMENT**

**KEKAHA LANDFILL  
PHASE II VERTICAL EXPANSION**

**Kauai, Hawaii**

**Prepared for:  
County of Kauai  
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Belt Collins Hawaii Ltd.**

**March 1998**

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## CHAPTER 1 INTRODUCTION

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Kekaha Landfill is located on the west side of the island of Kauai, Hawaii. It consists of two refuse fill areas, associated buildings, and infrastructure on 98 acres of State land set aside for County landfill use. Approximately 63.2 acres of the site comprise the Phase II refuse area and the subject area of the County of Kauai's proposed action to vertically expand the landfill (Figure 1-1). This expansion would extend the operating life of the existing landfill, but would not change the existing operations. The Phase II area of the Kekaha Landfill is managed by Sanifill of Hawaii, Inc. (USA Waste Services, Inc.), a professional waste management company, under contract with the County of Kauai.

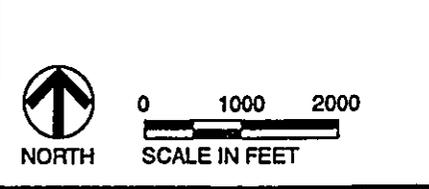
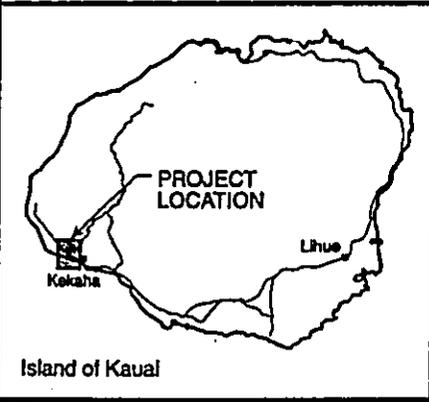
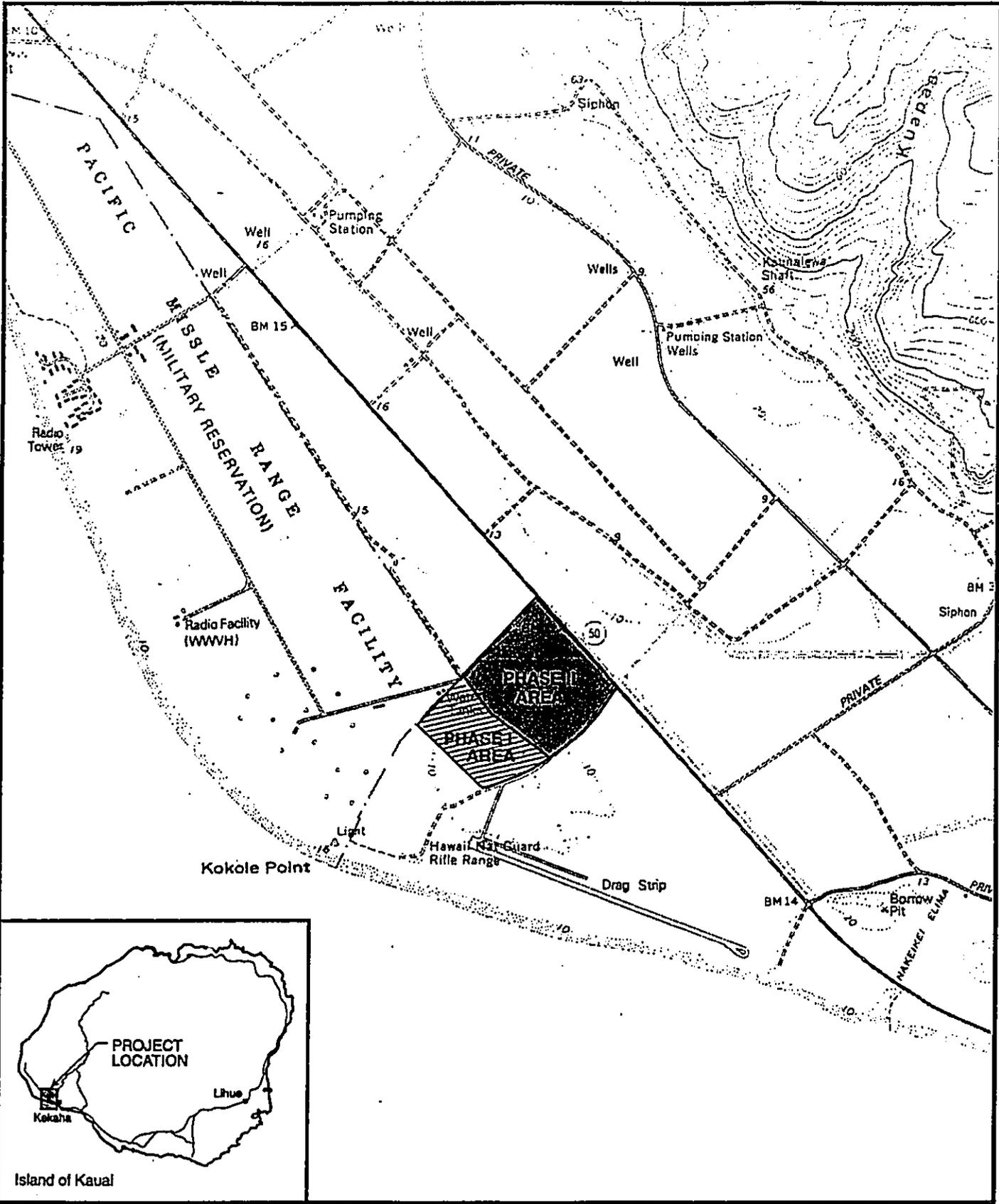
### 1.1 PURPOSE AND NEED

The purpose of the proposed vertical expansion of the Kekaha Landfill is to provide additional landfill capacity to meet the short-term solid waste disposal needs of the island. Expansion is needed because the only operating landfill on the island of Kauai—Kekaha Landfill—is estimated to reach capacity in approximately 6 months, during the summer of 1998, and no other landfill sites have been selected and approved for use. The need for a short-term solution for the County's disposal of solid waste is primarily due to the debris created by Hurricane Iniki in 1992. Debris landfilled from this single natural disaster filled an area that would otherwise have taken four to five years to fill, unexpectedly shortening the operating life of the landfill.

The proposed action serves as a short-term solution. Longer-term solutions will involve identifying new sites and obtaining approvals, a process typically requiring at least five years. The County has not yet commenced the process because of more immediate needs resulting from the destruction caused by Hurricane Iniki in 1992, and the resulting shift in focus of the County's staff to these needs. A request to appropriate monies for the 1999 fiscal year for landfill siting and feasibility studies is being submitted by the Mayor for County Council approval. In addition to focusing on identifying additional landfill sites, requests for proposals to identify alternative solid waste disposal options are planned. Until longer-term solutions are identified and implemented, the vertical expansion of the Phase II area would provide the most economically, socially, and environmentally advantageous option to meet short-term landfill needs and would provide the County with the necessary time to select another appropriate site.<sup>1</sup>

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<sup>1</sup> Harding Lawson Associates (April 1994) *Kauai Integrated Solid Waste Management Plan*, p. 5-16.



**Figure 1-1**  
**SITE LOCATION**  
Environmental Assessment  
Kekaha Landfill Phase II Vertical Expansion  
Prepared by: Belt Collins Hawaii  
March 1998

## 1.2 HAWAII REVISED STATUTES (HRS), CHAPTER 343 REQUIREMENTS

This Environmental Assessment (EA) has been prepared in compliance with Chapter 343, Hawaii Revised Statutes (HRS) as amended, and in accordance with the implementing rules contained in Title 11, Chapter 200, Hawaii Administrative Rules (HAR), as revised (August 1996). The Chapter 343 process is required because the proposed action involves State lands set aside to the County of Kauai for landfill use, and County funds would be required for this proposed action. This "agency action" is being proposed by the County of Kauai, Department of Public Works, who will also serve as the approving agency.

## 1.3 ORGANIZATION OF DOCUMENT

Chapter 1 provides the purpose of, and need for, the proposed action, and Chapter 343, HRS, requirements. Chapter 2 provides an overview of the existing facility and environment. Chapter 3 presents the proposed action and alternatives. Potential environmental impacts and recommended mitigation measures are presented in Chapter 4. Potential socioeconomic impacts and mitigation measures are identified in Chapter 5. Land use plans, policies, and controls associated with the proposed project are described in Chapter 6. The significance determination is presented in Chapter 7, followed by consulted party comments and applicant responses in Chapter 8, and references in Chapters 9.

## CHAPTER 2

# OVERVIEW OF EXISTING FACILITY AND ENVIRONMENT

The Kekaha Landfill is located on the southwest side of the island of Kauai, Hawaii (Figure 1-1). It is located approximately 1.3 miles northwest of the town of Kekaha, and is situated between Kaunualii Highway and approximately 3,000 feet mauka of the shoreline. The site is bounded by the property used by the U.S. Lighthouse Service to the northwest, and lands leased from the State by the Kekaha Sugar and Northrup-King Seed Companies to the northeast and southeast, respectively (Figure 2-1). Other uses in the vicinity include a state agricultural park to the northwest, the Pacific Missile Range Facility (PMRF), for military use, to the west, and the Hawaii National Guard rifle range to the southwest. All State lands are administered by the Department of Land and Natural Resources (DLNR) or the Department of Hawaiian Home Lands.

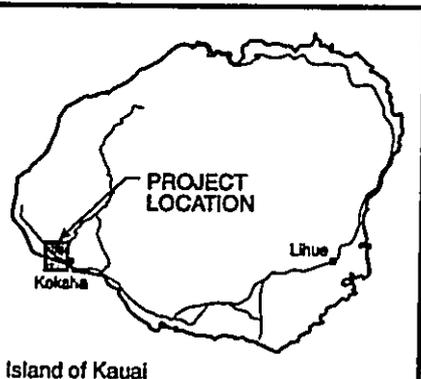
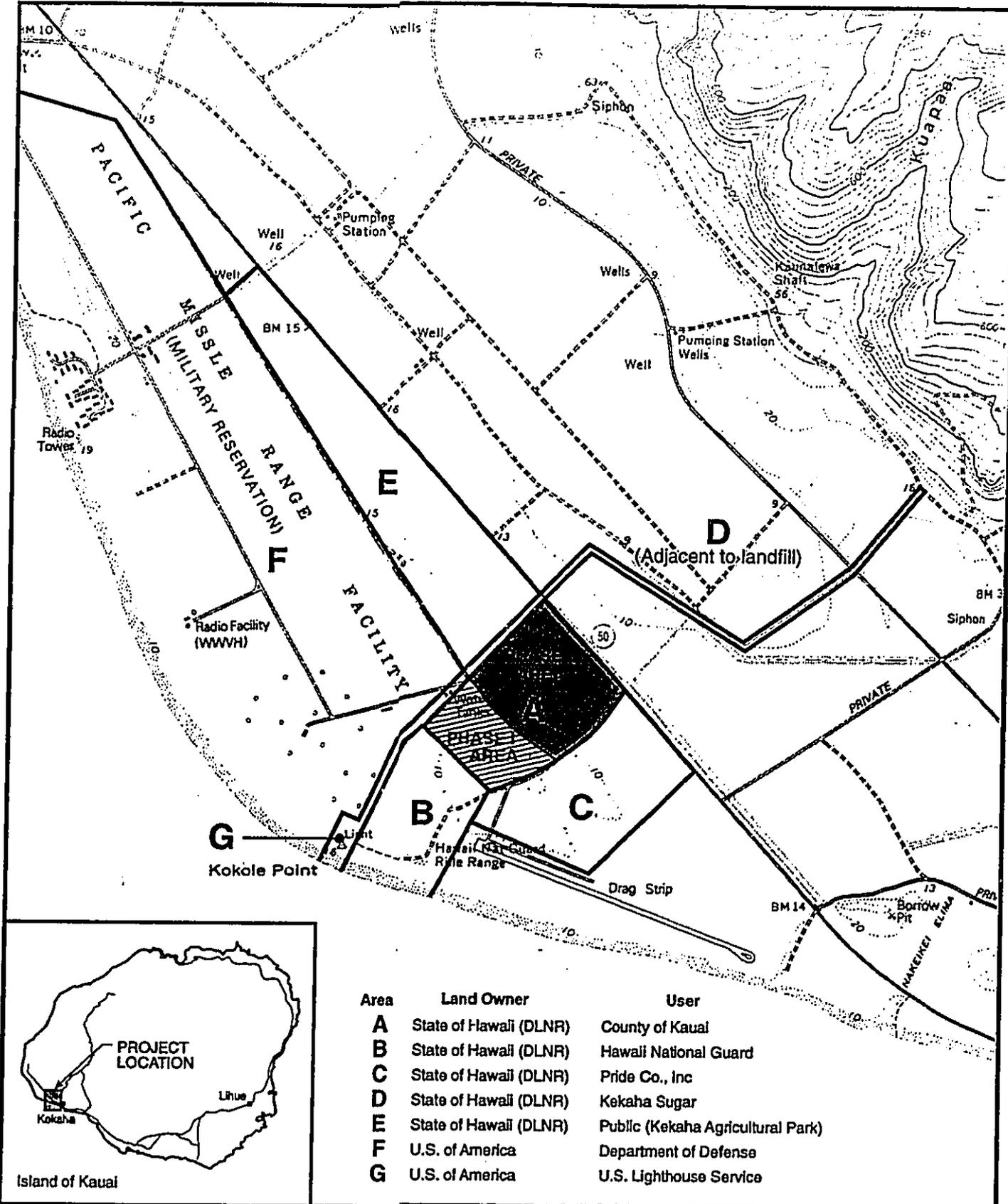
### 2.1 EXISTING LANDFILL FACILITIES AND OPERATIONS

The Kekaha Landfill is a 98-acre site consisting of two refuse fill areas, associated buildings, and infrastructure. Landfill activities in the 35.7-acre area that comprise the Phase I area, located in the southwesterly portion of the site, began in 1953 and continued until 1993. In 1992, an additional 63.2-acre piece of land, Phase II, was set aside by the State for County landfill use. Prior to Hurricane Iniki, the Phase I and Phase II areas would have met the County's landfill needs through the year 2003; however, debris generated by Hurricane Iniki in 1992 reduced this projection by approximately four to five years. The Phase II refuse area is the subject area of the proposed vertical expansion of the landfill (the proposed action).

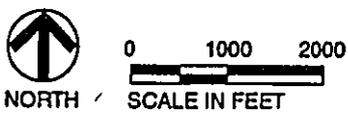
Unless otherwise noted, information provided in the following subsections were obtained from the Kekaha Landfill *Operations Manual* (Harding Lawson Associates, revised June 1994), and draft *Addendum to Operations Manual for Kekaha Sanitary Landfill-Phase II* (EMCON, January 30, 1997), which describes on-site facilities and operations.

#### 2.1.1 Site Layout and Utilities

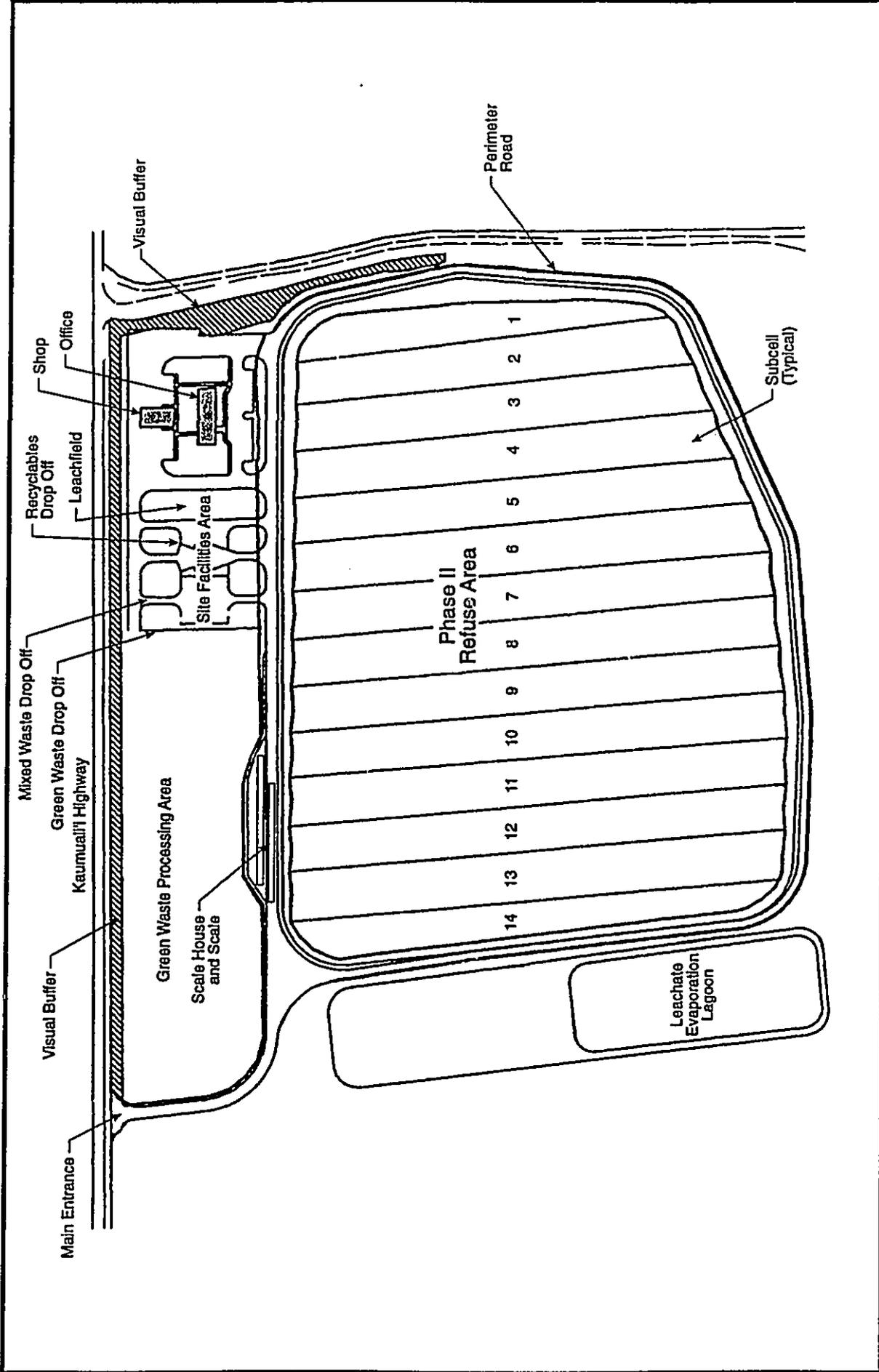
The 63.2-acre Phase II area consists of a 32-acre lined fill area, an office and small maintenance shop, a scale house, various waste drop-off areas, a perimeter road, and a leachate evaporation lagoon. The refuse area is subdivided into 14 subcells, each approximately 100 feet wide and between about 800 feet to 1,100 feet long. Figure 2-2 illustrates the layout of the Phase II area.



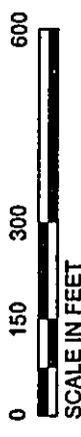
Source: County of Kauai, Revised Environmental Impact Statement  
Kekaha Sanitary Landfill Expansion Project, December 1983



**Figure 2-1**  
**LAND OWNERSHIP AND USE**  
Environmental Assessment  
Kekaha Landfill Phase II Vertical Expansion  
Prepared by: Belt Collins Hawaii  
March 1998



Source: Harding Lawson Associates (1994) Operations Manual for  
 Kekaha Sanitary Landfill—Phase II, Kekaha, Kauai, Hawaii



**Figure 2-2**  
**SITE LAYOUT PLAN**  
 Environmental Assessment  
 Kekaha Landfill Phase II Vertical Expansion  
 Prepared by: Belt Collins Hawaii  
 March 1998

**CHAPTER TWO**

Potable water is supplied to the office building, scale house, and maintenance shop. The water is obtained from the County water system serving the town of Kekaha, and then piped into the facility via a Navy-owned water main that serves PMRF (the County does not provide water service in the vicinity of the site). Nonpotable water for irrigation, dust control, and fire protection is obtained from a Kekaha Sugar irrigation ditch via a pump station and a 12-inch PVC pipe, filtered, and chlorinated. Wastewater generated from onsite restrooms is disposed via a leachfield located between the administration/maintenance area and the materials drop box area (see Figure 2-2). Electricity for on-site use is supplied by Kauai Electric; a 105 kilowatt, diesel-powered emergency standby generator automatically operates when normal power is interrupted.

**2.1.2 Landfill Capacity and Operations**

The total design capacity of the existing Phase II landfill area is 1,035,267 cubic yards.<sup>2</sup> At the time of design in 1993, the estimated service life of the landfill was five years. Based on the current average rate of fill of 200 tons per day (tpd), Phase II will be filled to capacity in 1998.

Phase II of the Kekaha Landfill operates under the provisions of permit number LF0073-93, issued by the State of Hawaii, Department of Health (DOH). The facility consists of a 32-acre, lined Municipal Solid Waste (MSW) landfill, a 4-acre public drop-off area, and appurtenant facilities, e.g., groundwater and landfill gas migration monitoring systems. In accordance with the permit conditions, as directed by federal and state regulations, compliance with the following rules and regulations have and must continue to be demonstrated:

- Chapter 342H, Hawaii Revised Statutes;
- Title 11, Chapter 58, Solid Waste Management Control (repealed with the promulgation of Chapter 58.1 on January 13, 1994); and
- 40 Code of Federal Regulations, Part 258.

Compliance with the above referenced rules requires that the Phase II landfill area be lined and equipped with a leachate collection, groundwater monitoring, landfill gas migration monitoring, and surface water management systems. In addition to the landfill permit requirements, a landfill gas collection system controls gases, primarily methane, generated from decomposing wastes. This system is described in Section 4.4.1.2.

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<sup>2</sup> The total design capacity includes all wastes, along with daily and intermediate cover; final cover is excluded.

Daily operations consist of spreading the waste in two-foot layers up a 4 to 1 slope, to a height of 10 feet, while maintaining a working face with maximum dimensions of 100 feet by 75 feet.<sup>3</sup> Each two-foot layer is compacted to a minimum of 1,100 pounds per cubic yard. Waste is covered daily to minimize exposure of the working face to vectors, wind, and rainwater, thus minimizing odors, vectors, windblown trash, and leachate. Daily cover consists of soil or geosynthetic (plastic) tarp. The cover soil, fine clays, is obtained from the Kekaha Sugar Company mill wastewater settling basin and is used when the design grade of the working lift is achieved. The tarp is used when the design grade of the working lift is not yet met; its use serves to minimize soil use and maximize landfill capacity.

*Other operations include groundwater and landfill gas monitoring. Groundwater is sampled on a semi-annual basis, to monitor for possible landfill related impacts. Landfill gas (methane) and oxygen are monitored monthly via five permanent landfill gas probes located approximately 1,000 feet apart along the perimeter of the Phase II area (Figure 2-3).*

## 2.2 EXISTING ENVIRONMENT

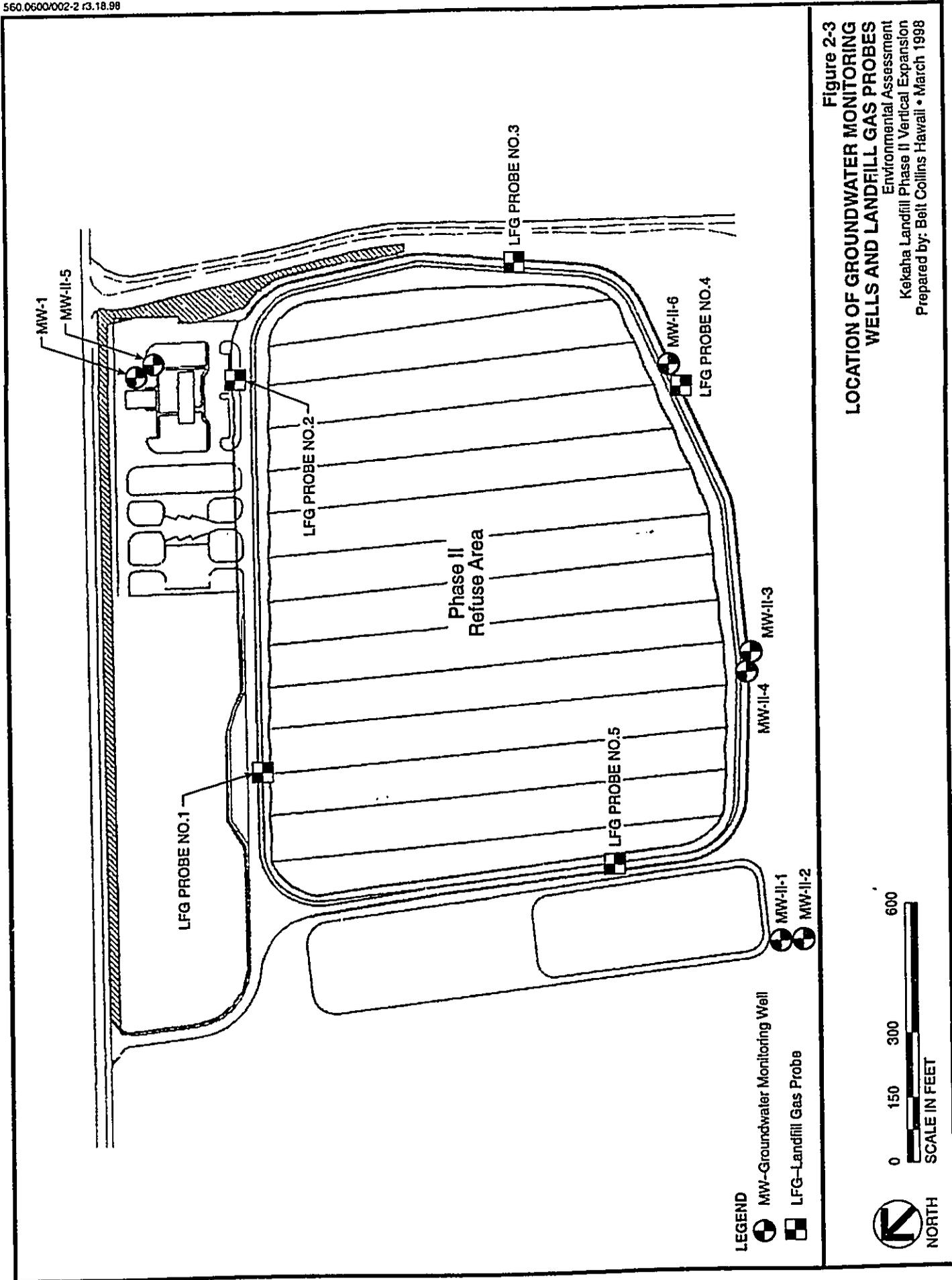
The site is located on a raised dune area, approximately 3,000 feet northeast of the ocean, on the coastal plain of southwestern Kauai (see Figure 1-1). The coastal plain was once a large marshy area, its waters trapped between inland volcanic cliffs and a slightly elevated area of sand dunes along the coast. The former marsh (the Mana Plain) is now used for sugarcane cultivation. The site is essentially level, with an elevation of roughly 10 feet mean sea level (msl).

### 2.2.1 Land Ownership and Use

The 63.2 acres of land which comprise the Phase II area of the Kekaha Landfill (TMK 1-2-02: portion of 1) are owned by the State of Hawaii and administered by the Department of Land and Natural Resources (DLNR). In 1992, these lands were set aside to the County of Kauai for landfill use through an executive order. As such, and in accordance with HRS 171-11, these lands are managed by the County of Kauai, which is "authorized to exercise all of the powers vested in the board of land and natural resources in regard to the issuance of leases, easements, licenses, revocable permits, concessions, or rights of entry covering such lands for such use as may be consistent with the purposes for which the lands were set aside on the same terms, conditions, and restrictions applicable to the disposition of public lands...."

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<sup>3</sup> Sanifill of Hawaii, Inc. Facsimile from Jeff Martin of Sanifill to Lesley Matsumoto of Belt Collins, July 22, 1996.



**Figure 2-3**  
**LOCATION OF GROUNDWATER MONITORING**  
**WELLS AND LANDFILL GAS PROBES**  
 Environmental Assessment  
 Kekaha Landfill Phase II Vertical Expansion  
 Prepared by: Belt Collins Hawaii • March 1998

Sanifill of Hawaii, Inc. (USA Waste Services, Inc.), a service contractor for the County of Kauai Department of Public Works, provides management oversight of the landfill.

Use of State lands comprising the Phase II area for landfill purposes was approved by the State Land Use Commission on July 1, 1993, signified by the granting of a Special Permit. The Special Permit allows land classified in the State Agricultural district to be used for landfill purposes. It does not establish a time limit for use, but does require that the use of the land follow specific conditions provided by the County of Kauai Planning Department, County Planning Commission, and the Special Permit approving agency, the State Land Use Commission (see section 6.2.1).

### 2.2.2 Soils, Groundwater, Surface Water, and Flood Potential

**Soils.** Soil in the vicinity of the site is classified as Jaucus loamy fine sand, an excessively drained calcareous soil.<sup>4</sup> This soil is too permeable to allow for surface water ponding or runoff; as a result, the potential for vertical migration of water is great, but erosion by surface water runoff is unlikely. Wind erosion is a severe hazard without the presence of vegetation. The Jaucus loamy fine sand soil type is considered suitable as foundation for low buildings, but unsuitable for embankments or as highway foundation.<sup>4</sup> Soil borings and test pits excavated at the site in February of 1993 indicate that subgrade soils consist of fine to coarse, medium dense to very dense calcareous sands to a depth of approximately 55 feet below grade.<sup>5</sup>

**Groundwater.** Three brackish (nonpotable) aquifers are known to exist below the western coast of Kauai.<sup>6</sup> The upper aquifer water table is in beach sand. Below that is the caprock aquifer—several hundred feet of less permeable coastal sediments, consisting of carbonate sand and mud interlayered with alluvial clay weathered from the nearby cliffs. The alluvial layers confine the caprock aquifer, keeping it effectively out of hydraulic contact with the beach sand aquifer (above) and the basalt aquifer (below). The basalt aquifer is in contact with seawater at its base, and is pumped for drinking water at only one location, approximately two

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<sup>4</sup> U.S. Department of Agriculture Soil Conservation Service (August 1972) *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.*

<sup>5</sup> U.S. Department of Agriculture Soil Conservation Service (August 1972) {Harding Lawson Associates (1993) Geotechnical Investigation, Kekaha Landfill Development, Phase II Design}, *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.*

<sup>6</sup> Mink, John (1985) "Hydrology Survey of Potential Agricultural Lands" in Botanical Consultants *Flora, Fauna, and Water Resources Report of the Pacific Missile Range Facility, Hawaiian Area, Kauai, Hawaii.*

miles north northeast of the site, at the base of the cliffs. Overpumping and the resulting saltwater intrusion has degraded the basalt aquifer nearer to the ocean.

Groundwater in the upper aquifer (in beach sand) at the site is brackish and flows toward the ocean.<sup>7</sup> Water levels in monitoring wells (which define the upper level of the groundwater saturated zone) at the site have been measured at elevations of 2.8 to 3.6 feet msl (see Figure 2-3 for location of groundwater monitoring wells). The groundwater saturated zone lies approximately five feet beneath the base of the Phase II area landfill liner and approximately seven feet below the refuse.<sup>8</sup>

Inland from the Kekaha Landfill, the Kekaha Sugar Company pumps groundwater from the caprock aquifer to draw down the brackish water table under the sugarcane fields. Pumping controls the caprock water table inland (mauka) of the site to a level up to approximately ten feet below its natural level, but does not affect the upper aquifer (in beach sand) underlying the Kekaha Landfill.

**Surface Water.** The only surface water near the site is the network of agricultural drainage ditches maintained by the Kekaha Sugar Company, mauka of the site. As mentioned above, the local soil is too permeable to collect surface water in the immediate vicinity of the site. Stormwater falling on the site is diverted by a drainage system described in Section 4.3.2.

**Flood Potential.** According to the Flood Insurance Rate Maps (FEMA Panel 150002 0152 D, Kauai County, Hawaii, revised September 30, 1995), the site is at least 2,000 feet inland of the coastal high hazard area for 100-year coastal floods and tsunamis.

### 2.2.3 Climate and Air Quality

**Climate.** The climate of the Hawaiian Islands is generally mild due to its latitudinal position and the moderating effects of the Pacific Ocean. In Kekaha, temperatures are similar to the climatological temperature ranges of the state. Climatological temperatures range from 70 to 88 degrees Fahrenheit in the summer months (May through October). In the winter months (November through April), temperatures range from 60 to 83 degrees Fahrenheit. The rate of evaporation (based on pan evaporation measured by Kekaha Sugar Company in 1911) for the

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<sup>7</sup> Sanifill Pacific Region (September 1995) *Kekaha Sanitary Landfill, Kauai, Hawaii: Third Quarter Groundwater Monitoring*.

<sup>8</sup> Sanifill of Hawaii, Inc. (January 13, 1998) *Groundwater Elevation Map: First Semiannual Groundwater Monitoring 1998*.

area is 53.33 inches per year. On a monthly basis, the greatest evaporation occurs in July (6.66 inches in 1911); the least evaporation occurs in January (1.89 inches in 1911).<sup>9</sup>

The effects of local topography are exhibited on both wind and precipitation. The presence of the local mountains modify the regional northeasterly trade winds and result in predominant winds with an easterly component. Figure 2-4 illustrates the average wind directions and wind speeds measured at nearby PMRF, approximately five miles northwest of the site. Similarly, precipitation (rainfall) varies considerably throughout the island because of orographic lifting of air masses which result from variations in topography — the lee side of the island receives considerably less precipitation than the windward side. At Kekaha, the median rainfall is less than 20 inches per year, most occurring during the winter months from November through April.<sup>10</sup>

**Air Quality.** Air quality is determined by comparing ambient air concentrations of specific pollutants to national and state ambient air quality standards (AAQS). In Hawaii, concentrations of these pollutants are less than the national AAQS (are in "attainment") and are generally less than the state AAQS. Exceptions to the state AAQS are due to localized exceedances of the carbon monoxide (CO) standard resulting from vehicular traffic on heavily traveled roadways. In the vicinity of Kekaha, the air quality is generally better than the state average air quality because of the lack of industrial/manufacturing and vehicular emission sources.

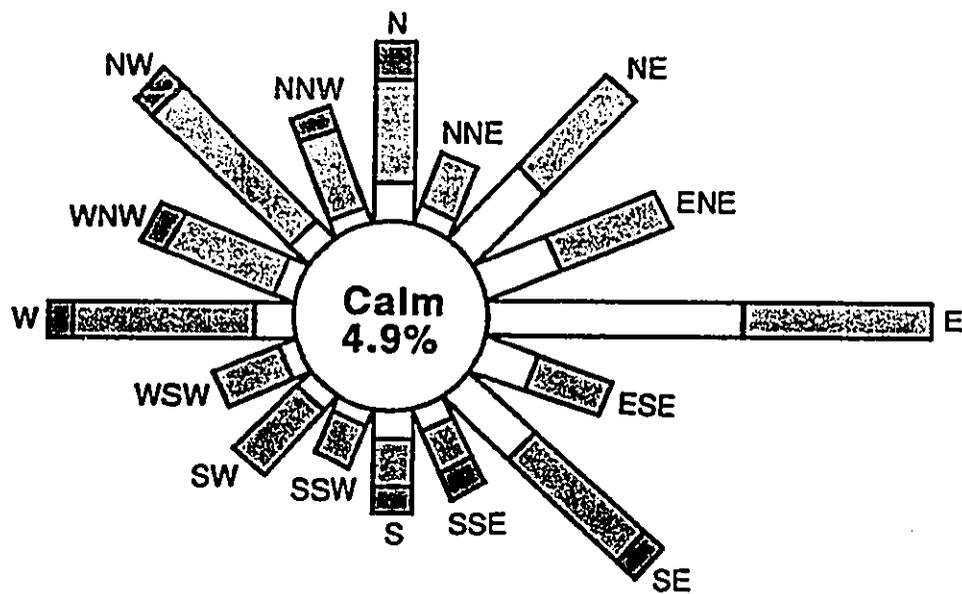
#### 2.2.4 Visual Aesthetics

The site is located in a relatively flat undeveloped portion of Kauai. Situated between Kaumualii Highway and the ocean, it is located in an area dominated by agricultural fields. The Phase I portion of the landfill is approximately 50 feet above grade (60 feet msl); the Phase II portion is currently designed to attain a height of about 27 feet above grade (37 feet msl). The site is screened from Kaumualii Highway by 10-foot high kou trees and five-foot high oleander shrubs. The distance from the nearest on-site building to the highway is approximately 70 feet. The distance between either the Phase I or Phase II areas and the highway is more than 300 feet. While the 25-foot-high maintenance shop is evident from the highway, the Phase I and Phase II fill areas of the landfill are much less evident and can go

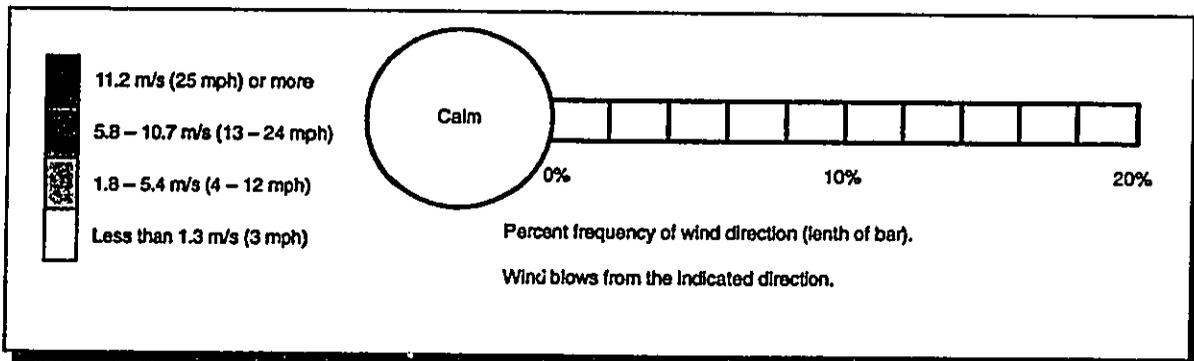
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<sup>9</sup> State of Hawaii Department of Land and Natural Resources (September 1961) *Pan Evaporation Data State of Hawaii*.

<sup>10</sup> University of Hawaii (1983) *Atlas of Hawaii, Second Edition*.



Trade Wind Conditions



Source: U.S. Army Strategic Defense Command, *Draft Environmental Impact Statement for the Strategic Target System*, February 1992

**Figure 2-4**  
**WIND ROSE, PMRF, KAUAI**  
 Environmental Assessment  
 Kekaha Landfill Phase II Vertical Expansion  
 Prepared by: Belt Collins Hawaii  
 March 1998

unnoticed by motorists. From the Kekaha community, approximately 1.3 mile southeast of the landfill, views of the landfill are prevented by distance and an ancient sand dune located just northwest of the Kekaha community.

Views of trash from Kaumualii Highway are limited to the active landfill working face. Wind-blown trash is controlled by 4-foot high chicken-wire fencing placed around the working area. These fences are moved in relation to the working face and the wind direction. The number of times trash is removed from the fence is dependent upon the wind conditions. Wind-blown trash that gets trapped by the fences is generally removed once or twice a day. The fence has been effective in preventing wind-blown trash from leaving the lined landfill area.

### 2.2.5 Noise

Sources of noise at and near the site include waste hauling delivery vehicles, equipment used to operate the landfill, and highway traffic. At the site perimeter, landfill operational noises are generally not much greater than the natural wind-induced noises at the site. The nearest residential population is located 1.3 miles away in the community of Kekaha.

### 2.2.6 Odor

Odors typically associated with MSW landfills result from the breakdown of organic compounds and include sulfur- and nitrogen-containing compounds. Good sanitary landfill practices, such as compaction and daily covering of refuse at the end of the working day, are effective in controlling these odors and are used at the site. Additional housekeeping practices are described in the *Operations Manual for Kekaha Sanitary Landfill—Phase II* (Harding Lawson Associates, June 23, 1994).

### 2.2.7 Traffic

Approximately 30 refuse hauling trucks enter the landfill each day to deliver waste. These trucks use the Kaumualii Highway, the only route to the western side of the island, and enter the landfill immediately after turning off of the highway. Traffic along the highway in the site vicinity is light due to the lack of residential and commercial developments further west. Highway use is primarily associated with PMRF, Polihale State Park, and Kekaha Sugar Company cane fields.

### 2.2.8 Flora and Fauna

A survey of the site prior to construction of Phase II found only exotic (introduced) flora

species. No uncommon or rare native plants were observed.<sup>11</sup> Kekaha Sugar Company irrigation ditches provide a limited amount of wetland habitat in the project vicinity. A fauna survey at the site in 1982 did not record the presence of any endangered bird species.

More recent surveys at the nearby PMRF have identified federally listed endangered bird species, as well as endemic bird species. These include the federally listed Hawaiian duck (*koloa*), Hawaiian or American coot (*alaeke'oke'o*), Hawaiian or black-necked stilt (*ae'o*), and Hawaiian gallinule or common moorhen (*alae'ula*), and the state-listed Hawaiian owl (*pueo*).<sup>12</sup> Non-listed migratory and resident indigenous bird species observed at the PMRF include the golden plover (*kolea*), black-crowned night heron (*auku'u*), wandering tattler (*ulili*), brown booby ('a), wedge-tailed shearwater, and Laysan albatross.<sup>13</sup> These species are expected to congregate at the proposed Kawai'ele Waterbird Sanctuary under development by the State, approximately one and one-half miles north of the site. No instrument of adverse effect, as a result of the existing landfill operations, has been identified on the sanctuary or protected birds.

### 2.2.9 Historical and Archaeological Resources

Kauai's west coast and the Mana Plain have been surveyed by archaeologists over the last sixty years, beginning with Bennett's island-wide investigation and including many surveys of PMRF.<sup>14</sup> Before sugarcane was cultivated, much of the Mana Plain was a marsh bounded by cliffs on the east and sand dunes on the west. Pre-Contact Hawaiians built houses on the mauka side of the dunes and cultivated taro in the nearby marsh. Temporary shelters were located on top and on the makai side of the dunes during the fishing season.<sup>15</sup> Human

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<sup>11</sup> Letter from Thomas C. Telfer, Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife, Kauai District, to Henry Morita, County of Kauai Department of Public Works, August 6, 1982.

<sup>12</sup> Traverse Group, Inc. (1988) *Natural Resources Management Plan, Pacific Missile Range Facility, Barking Sands*.

<sup>13</sup> Bruner, Phillip L (1990a) *Field Survey of the Avifauna and Feral Mammals at a Proposed Housing Site at the Pacific Missile Range Facility, Barking Sands, Kauai*; Bruner (1990b) *Field Survey of the Avifauna and Feral Mammals at Three Sites Located on the Pacific Missile Range Facility at Barking Sands and at Kokee Park Geophysical Observatory, Kauai*; Bruner (1991) *Field Survey of the Avifauna and Feral Mammals for a Proposed Air National Guard Project Site at the Pacific Missile Range Facility, Barking Sands, Kauai*.

<sup>14</sup> Bennett, W.C. (1931) *Archaeology of Kauai*. Bernice P. Bishop Museum Bulletin 80.

<sup>15</sup> Flores, E. Kalani and Kaolu, Aletha G. (1992) *Final Draft Hawaiian Cultural and Historical Survey of the Nohili, Mana, Kona District, Island of Kaua'i, State of Hawai'i*.

remains were buried in the dunes all along this coastline; remains have been found in numerous locations at PMRF, just north of the site.

An archaeological reconnaissance survey of the site, performed in 1982, found no evidence of archaeological or historic resources. The survey report indicated that the area has been bulldozed and otherwise modified many times since the 1930s. Prior to its use as a landfill, it was used for horse and cattle pens and later became a site for dumping bagasse from the nearby sugar mill.

Subsurface testing of the Phase II area was performed in 1993 with DLNR oversight. This investigation led to the DLNR's finding that no significant features are present.

## **CHAPTER 3**

### **PROPOSED ACTION AND ALTERNATIVES**

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Chapter 3 presents the alternatives considered to meet the purpose and need described in Chapter 1. The agency-preferred alternative or proposed action is presented in Section 3.1. Other alternatives that have been considered to meet the short-term landfill needs of the County of Kauai are summarized in Section 3.2. Potential impacts associated with each of the alternatives are presented in Section 3.3.

#### **3.1 PROPOSED ACTION (AGENCY-PREFERRED ALTERNATIVE)**

The agency-preferred alternative, the proposed action, is the vertical expansion of the existing Phase II area of the Kekaha Landfill. This action would increase the original total design capacity of 1,035,267 cubic yards to 1,769,467 cubic yards, and provide an additional six to eight years of landfill life.<sup>16</sup> All activity would occur over the existing 32-acre "footprint" of the lined landfill area and would increase the existing design elevation from 37 feet mean sea level (msl) (27 feet above grade) to 60 feet msl (50 feet above grade). The approximate elevation of the surrounding area is 10 feet msl.

The proposed action will require a modification to the existing grading plan. No new construction will be performed. A landfill gas collection system and flare is separately planned for construction, but will be constructed as part of the existing Phase II area, regardless of whether or not the proposed expansion is approved. No changes in landfilling rates, waste haul trips to and from the landfill, leachate volumes, or other daily operations will result from the proposed expansion. Because the vertical expansion would be within the existing landfill footprint, it would not create an additional area for potential leachate, surface run-off, truck travel, or impact on the public.

The estimated cost to expand the existing Phase II area is approximately \$220,000. This estimate includes design, permitting, and additional closure costs.

#### **3.2 SUMMARY OF OTHER ALTERNATIVES CONSIDERED**

Four alternatives, including the proposed action described in Section 3.1, were considered to meet the short-term needs of the County of Kauai's landfill demands. These alternatives include:

- Alternative 1: vertical expansion of the Kekaha Landfill (Phase II area);

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<sup>16</sup> Total design capacities include all wastes, along with daily and intermediate cover; final cover is excluded.

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- Alternative 2: horizontal expansion of the Kekaha Landfill;
- Alternative 3: use of off-island landfill(s); and
- Alternative 4: no action.

Summaries of these other alternatives are presented in Section 3.2.1 through 3.2.3.

### 3.2.1 Alternative 2: Horizontal Expansion of the Kekaha Landfill

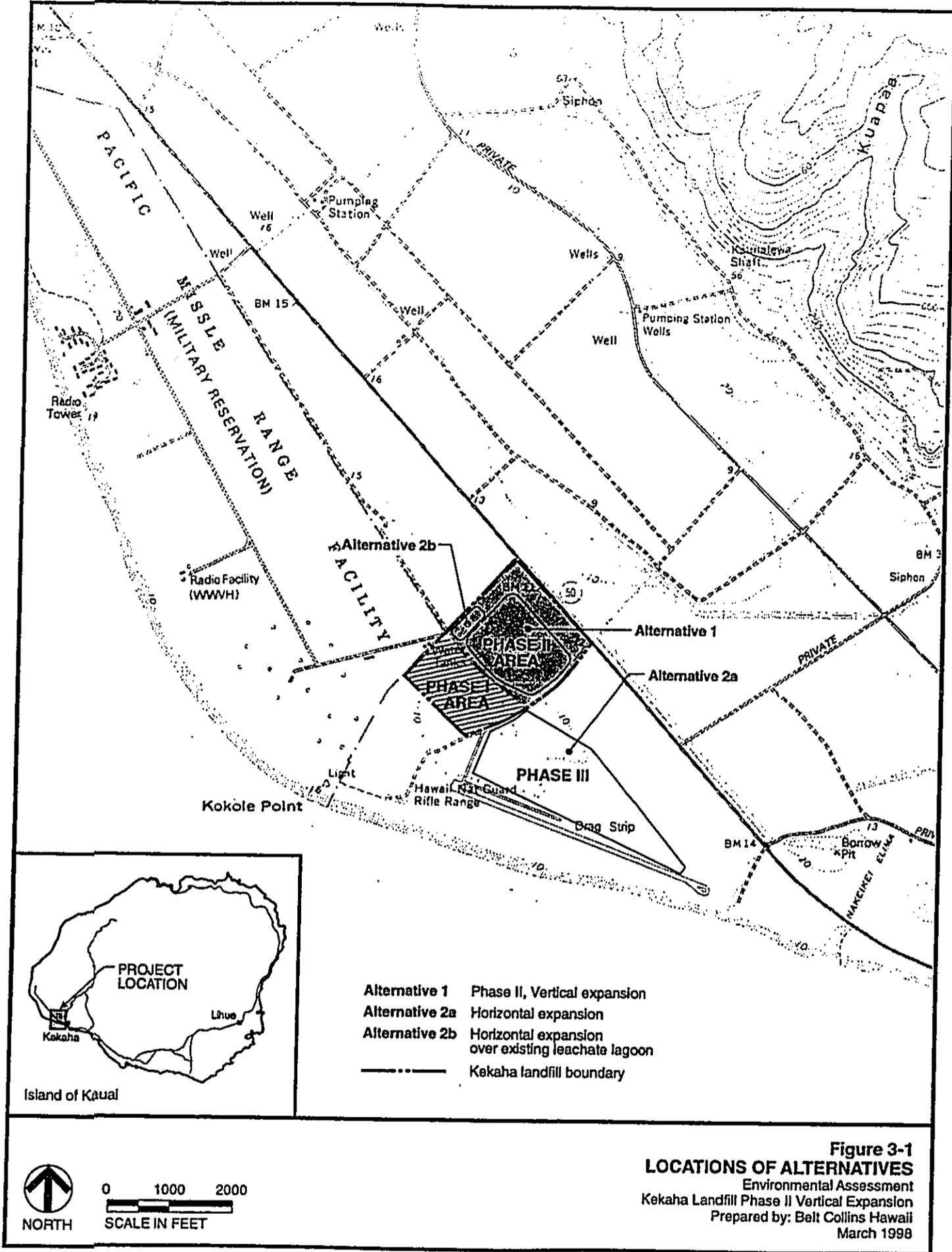
Two areas adjacent to Kekaha Landfill have been considered for a horizontal expansion of the Kekaha Landfill. The first area, Phase III, is a 72.2-acre site adjacent to the southeast boundary of Phase I (Alternative 2a on Figure 3-1). Phase III, recognized in the County's *Integrated Solid Waste Management Plan*, was identified as a reasonable option at that time because it would not involve development of a new landfill location and would, therefore, require less time to obtain approvals and permits. Phase III was estimated to provide approximately 15 years of landfill service to the island of Kauai.

The second area considered for horizontal expansion is the 1.9-acre site of the existing leachate lagoon (Alternative 2b on Figure 3-1). Development of this area would require that the existing leachate lagoon be re-sited. The proposed landfill would need to be modified to meet the existing regulations for MSW landfills and would include liners, leachate collection system, and provisions for landfill gas collection. The proposed horizontal expansion is a 5-acre area that would add approximately 200,000 cubic yards of landfill space, the equivalent of an additional two years of landfill life.

The estimated costs for the Alternative 2 options, range from more than \$2.5 million for expansion into the leachate lagoon, to \$18 to 20 million for expansion into Phase III. These estimates are based primarily on the cost of the liner and leachate systems, cover, and gas control systems.

### 3.2.2 Alternative 3: Use of Off-Island Landfill Sites

This alternative would require shipping of island MSW to off-island landfills. Such a plan would require a transfer station and additional monies to support the transfer costs (interisland shipping and off-island land hauling). Additional risks to the environment are presented with this alternative because of the additional lengths of travel required between the source of the waste and the landfill.



### 3.2.3 Alternative 4: No Action

The no-action alternative would leave the County of Kauai without a landfill facility and without a final step in the management of solid waste—landfilling. The Kekaha Landfill provides the only disposal site for all MSW generated on the island of Kauai. Without the proposed action, the Kekaha Landfill will reach capacity in 1998, and the County of Kauai will be left without a means for MSW disposal. The lack of a permitted MSW landfill would result in adverse effects on the environment and public health. Wastes would not be properly disposed, would create unsanitary conditions that would propagate vectors, and pose a serious risk to public health.

### 3.3 ANALYSIS OF ALTERNATIVES

Alternative 1 (proposed action), vertical expansion of the existing Phase II area, would utilize the existing liner and leachate management system within the existing Phase II footprint. Hence, additional leachate and surface runoff would not result, additional controls would not be required, and additional liner expenses would be avoided. The potential for encountering a potentially significant historical or cultural artifact would be eliminated. Vertical expansion of the existing landfill will also allow for the use of the gas collection system that is being installed in the existing Phase II area, thus creating an economic efficiency that would not be possible with development of a new site. Landfill operations have been evaluated and are not expected to cause a significant adverse effect on the environment or human health. The lack of populations in close proximity to the Kekaha Landfill make this site preferable from a land use compatibility perspective.

Alternative 2, horizontal expansion, is not likely to cause any significant environmental impacts as long as there is compliance with the existing solid waste management rules. However, the time and expenses that would be needed to develop new sites, e.g., new liner, leachate and gas management systems, makes this alternative less attractive than Alternative 1. In addition, each of the two sites considered as horizontal expansion locations carry specific disadvantages. Since the publication of the County's *Integrated Solid Waste Management Plan*, the Phase III area has been reclassified by the State as Conservation. While construction of a landfill within a flood plain is technically feasible, obtaining approvals to use lands designated as Conservation may not be. Moreover, the use of Conservation land for landfill use and the uncertain prospect of obtaining State approval makes this alternative less attractive than others. For these reasons, the use of Phase III was not further pursued as a short term solution for landfill expansion.

In the case of the second area considered for horizontal expansion, the existing leachate lagoon, the disadvantages are similar to those associated with siting a new landfill. The use of a new area for landfilling purposes requires provisions to manage leachate (e.g., liners) and landfill gas. Moreover, because this option would provide the equivalent of two additional years of landfill life, it would not meet the purpose and need for expansion and would be too expensive for its relative benefits.

Alternative 3, use of off-island landfill sites, could introduce additional environmental risks, e.g., accidental releases during transportation, because of the increase distance for hauling. However, the overriding consideration that makes this alternative infeasible is the high cost associated with inter-island transportation.

Lastly, Alternative 4, no-action, would not present potential environmental impacts at the proposed site of the landfill operations; however, the extent of environmental impacts over the island of Kauai would be great. The no action alternative would leave Kauai without an operating landfill which would force the County to look at other means of disposal, such as shipping wastes off-island. Such activities would increase the cost of disposal and would cause waste generators to look for other noncompliant means of waste disposal to avoid such costs. The no-action alternative is not a reasonable alternative.

## **CHAPTER 4**

# **POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

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Chapter 4 presents a comprehensive list of environmental and socioeconomic concerns, and identifies those issues that may be significant and require further discussion. This approach provides focus to the EA and eliminates unnecessary discussion of insignificant issues. Section 4.1 presents the comprehensive list of potential issues. Sections 4.2 through 4.6 present evaluations of the issues with potentially significant impacts. Short-term effects associated with site preparation activities and cumulative effects associated with the vertical expansion are discussed in Sections 4.7 and 4.8, respectively.

### **4.1 SUMMARY OF POTENTIAL IMPACTS AND DETERMINATION OF SIGNIFICANCE**

A list of environmental and socioeconomic issues with the potential to be associated with the proposed action is presented as Table 4-1. These issues were compiled based upon the information presented in Chapter 2, a site visit, and discussions with the agencies and organizations identified in Chapter 7. The table summarized the relationship between the proposed action and the various consideration(s) or criteria used to determine significance of effects. Each potential impact is analyzed for significance to determine whether further evaluation is required. In cases where further evaluation is required, condition(s) influencing this determination are underlined in the table.

Based on the findings summarized in Table 4-1, the following potential impacts will be addressed in subsequent sections:

- Stability;
- Groundwater and leachate;
- Air emissions from landfill gas flare; and
- Visual aesthetics.

**Table 4-1  
Summary of  
Potential Issues and Determination of Potentially Significant Impacts that  
Require Further Discussion**

Potential Area of Effect	Consideration(s) Used to Determine Potential for Significant Impact	Relationship of Proposed Action to Consideration(s) Used to Determine Potential for Significant Impact	Further Discussion Required?
<b>Soils, Groundwater, Stormwater Runoff, Leachate</b>			
Stability	Implementation of sound grading plan and proper compaction of refuse.	<ul style="list-style-type: none"> <li>• Static slope stability analyses, seismicity evaluation, and a final cover evaluation have been conducted; results have been used to develop a sound grading plan. <u>Discussion of design based on these results are presented in Chapter 4.</u></li> <li>• Compaction of refuse will continue.</li> </ul>	Yes.
Groundwater	Increases in GW level such that levels reach the bottom of the Phase II area. Consider change in groundwater table level due to anthropogenic influences (e.g., lack of pumping from nearby sugar mills)	<ul style="list-style-type: none"> <li>• GW level is not affected by changes in nearby GW use.</li> <li>• Bottom of existing Phase II area is above the groundwater saturated zone and the vertical expansion would have no effect on this relationship.</li> </ul>	No.

Potential Area of Effect	Consideration(s) Used to Determine Potential for Significant Impact	Relationship of Proposed Action to Consideration(s) Used to Determine Potential for Significant Impact	Further Discussion Required?
Groundwater (cont'd):	Presence of a liner and leachate collection system that will contain waste and provide means of removing leachate from the landfill.	<ul style="list-style-type: none"> <li>Capacity of the existing leachate system is questioned since leachate volumes in the lagoon reached 80% of capacity during the winter of 1995.</li> </ul> Proposed action will not generate additional leachate.	Yes.
Stormwater management system	Presence of a stormwater management system that can adequately handle any additional stormwater from expansion	<ul style="list-style-type: none"> <li>No additional impermeable surface areas will be created from the proposed expansion; therefore, no increase in stormwater runoff will occur (expansion will occur within the existing landfill footprint).</li> </ul>	No.
Additional leachate resulting from expansion	Presence of a leachate collection and liner system that can adequately handle any additional leachate from expansion	<ul style="list-style-type: none"> <li>Capacity of the existing system is questioned since leachate volumes in the lagoon reached 80% of capacity during the winter of 1995.</li> <li>Proposed expansion will not significantly increase the amount of leachate generated, since the surface area is not significantly increased.</li> </ul>	Yes.

Potential Area of Effect	Consideration(s) Used to Determine Potential for Significant Impact	Relationship of Proposed Action to Consideration(s) Used to Determine Potential for Significant Impact	Further Discussion Required?
<b>Air Quality</b>			
Lateral migration of landfill gas	Presence of landfill gas collection system or perimeter monitoring.	<ul style="list-style-type: none"> <li>• Potentially significant levels of landfill gas have been detected along the perimeter of the Phase II area near the unlined Phase I area. No landfill gas has been detected at the property boundary.</li> <li>• A landfill gas collection and control (flare) system is planned as part of the existing Phase II area and the proposed vertical expansion.</li> </ul>	No.
Air emissions from landfill gas flare	Compliance with state and national ambient air quality standards.	<ul style="list-style-type: none"> <li>• <u>An increase in landfill gas flow and duration due to the proposed expansion will increase the combustion-related flare emissions and potentially affect concentrations of criteria pollutants (those pollutants with ambient air quality standards).</u></li> </ul>	Yes.
	Protection of human health	<ul style="list-style-type: none"> <li>• A landfill gas collection and control (flare) system will reduce the toxic emissions by approximately 90% or greater.</li> </ul>	No.

Potential Area of Effect	Consideration(s) Used to Determine Potential for Significant Impact	Relationship of Proposed Action to Consideration(s) Used to Determine Potential for Significant Impact	Further Discussion Required?
<b>Visual Aesthetics</b>			
	Visual impact of elevated (60' msl) landfill and windblown trash.	<ul style="list-style-type: none"> <li>• <u>Increased height of landfill may be evident.</u></li> <li>• Windblown trash has been and will continue to be adequately contained.</li> </ul>	Yes.
<b>Noise</b>			
	Net increase in noise levels and incompatibility with surrounding neighbors.	<ul style="list-style-type: none"> <li>• Daily landfill operations will not change; therefore, no net increases in noise will occur.</li> </ul>	No.
<b>Odors</b>			
	Assurance that existing procedures to control odors (e.g., compaction and daily cover) will continue.	<ul style="list-style-type: none"> <li>• Odors are not a nuisance because of the existing daily operations (e.g., daily cover) employed to minimize them.</li> <li>• No changes in landfill operations will occur; hence, no changes in odors will result.</li> </ul>	No.
<b>Traffic</b>			
	Degradation of existing LOS; dust.	<ul style="list-style-type: none"> <li>• No changes in landfill operations will occur; hence, no increase in landfill related traffic or dust will result.</li> </ul>	No.

Potential Area of Effect	Consideration(s) Used to Determine Potential for Significant Impact	Relationship of Proposed Action to Consideration(s) Used to Determine Potential for Significant Impact	Further Discussion Required?
<b>Flora and Fauna</b>			
Adjacent bird sanctuary	Adverse effects on protected bird species.	<ul style="list-style-type: none"> <li>No change in operations; hence, the adjacent bird sanctuary and protected bird species will not be affected.</li> </ul>	No.
Vectors	Procedures to control vectors (e.g., daily compaction and cover) will continue.	<ul style="list-style-type: none"> <li>Current procedures such as compaction and daily cover of wastes are effective in controlling vectors.</li> </ul>	No.
<b>Historic and Archaeological Resources</b>			
	Effects on cultural resources listed or eligible to be listed on the National Register of Historic Places.	<ul style="list-style-type: none"> <li>No significant features have been identified on the site as a result of subsurface investigations.</li> <li>Concurrence of no-effect determination has been obtained (see Appendix A).</li> </ul>	No.
<b>Landfill Related Hazards</b>			
Landfill fires	<p>Compaction and covering of waste to minimize air space.</p> <p>Load checks to prevent "hot" loads from going to landfill.</p>	<ul style="list-style-type: none"> <li>Daily compaction will continue to limit oxygen needed to support underground fires.</li> <li>Visual checks of incoming loads will continue to prevent "hot" loads from entering landfill.</li> </ul>	No.

Potential Area of Effect	Consideration(s) Used to Determine Potential for Significant Impact	Relationship of Proposed Action to Consideration(s) Used to Determine Potential for Significant Impact	Further Discussion Required?
Wind-blown refuse	Assurance that proper maintenance (e.g., daily cover) and upkeep of the landfill is occurring.	<ul style="list-style-type: none"> <li>Blowing refuse is sufficiently contained through the use of moveable fences and manual trash pick-ups as necessary.</li> </ul>	No.
<b>Socioeconomics</b>			
Economic effects of vertical expansion to community and Kauai	Presence of other waste disposal alternatives for existing and future activities in the community and throughout the island.  Impact on tourism.	<ul style="list-style-type: none"> <li><u>Limited short-term waste disposal alternatives are available.</u></li> <li><u>Lack of an on-island landfill will increase disposal costs and negatively affect businesses and residents.</u></li> <li><u>Unightly stockpiles of trash are expected to negatively impact tourism.</u></li> </ul>	Yes.

## 4.2 STABILITY

### 4.2.1 Existing Conditions

The natural soil at the site, Jaucus loamy fine sand, is an appropriate foundation material for low buildings.<sup>17</sup> An analysis performed for the original Phase II design indicated that the landfill is in a seismic impact zone, as defined by the Resource Conservation and Recovery Act (RCRA) regulations at Subtitle D. Therefore, the Phase II landfill was designed to resist the maximum expected horizontal acceleration in lithified earth material. The Phase II design incorporates refuse side slopes of 3.5 (horizontal):1 (vertical). With these conditions, a slope

<sup>17</sup> USDA Soil Conservation Service (December 1973) *Soil Survey of Island of Hawaii, State of Hawaii.*

stability factor of safety of at least 1.5, defined as "stable," was estimated with computer models. A factor of safety of 1.5 represents conditions where imminent danger to human life or major environmental impact due to slope failure is low, whereas a factor of safety of 1.0 reflects impending slope failure.<sup>18</sup> Estimated earthquake-induced soil settlement is estimated to be minimal—up to 1.5 inches of the natural sand deposits.<sup>19</sup>

#### 4.2.2 Potential Impacts and Mitigations

The proposed grading plan for the vertical expansion to 60 feet msl was designed based on a static slope stability analyses, a seismicity evaluation, and a final cover evaluation.<sup>20</sup> These analyses consider the structural properties of the landfill components having the greatest effect on design criteria. Such components include the soil foundation, base liner, sideslope liner, and refuse. Landfill components such as daily and intermediate soil covers are not incorporated into the model analyses because they are insignificant factors relative to the modeled components. The findings of these analyses are presented herein.

Based on the results of the above referenced analyses, the proposed grading plan consists of side slopes of 3.5 (horizontal):1 (vertical), similar to the existing design. In addition, 30-foot-wide benches of varying lengths (most around 200 feet) at an elevation of 37 feet msl are included to increase stability. With these benches, the static slope stability analysis met the EPA-recommended criteria of 1.5, and the imminent danger to human life or major environmental impact due to slope failure is low.

The Code of Federal Regulations Section 40 (Subtitle D), Part 258.14, and Title 11, Chapter 58.1, Section 13(e), HAR, require that "new MSWLF units and lateral expansions shall not be located in seismic impact zones unless the owner or operator demonstrates that all containment structures are designed to resist the maximum horizontal acceleration in lithified earth material for the site." "Seismic impact zone" is defined as an area with a 10 percent or greater probability that the maximum horizontal acceleration in lithified earth material (rock), expressed as a percentage of the earth's gravitational pull (g), will exceed 0.1 g in 250 years. "Maximum horizontal acceleration in lithified earth material" is defined as the maximum

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<sup>18</sup> U.S. Environmental Protection Agency (November 1993) *Solid Waste Disposal Facility Criteria*, Technical Manual, EPA/530-R-93-017.

<sup>19</sup> Harding Lawson Associates (1993) Engineering Report, *Kekaha Landfill Phase II, Kekaha, Kauai, Hawaii*.

<sup>20</sup> EMCON (October 1996) *Draft Kekaha Landfill Phase II Vertical Expansion Slope Stability, Cover Stability, and Seismicity Evaluations County of Kauai, Hawaii*.

horizontal acceleration depicted on a seismic hazard map with a 90 percent or greater probability that the acceleration will not be exceeded in 250 years, or the maximum expected horizontal acceleration based on a site specific risk assessment.

EMCON contracted with Dr. Norman A. Abrahamson, a seismology consultant, to determine the maximum horizontal acceleration at the Phase II landfill. Dr. Abrahamson prepared a report, for the Kekaha site based on the Subtitle D and HAR approach. (This report is contained in *Addendum to Operations Manual for Kekaha Sanitary Landfill-Phase II.*) Based on this report the controlling horizontal peak ground acceleration (PGA) is 0.06 g on rock with an associated mean magnitude earthquake of 6.2 (Richter scale). The PGA at the Kekaha site is less than the 0.1 g threshold requiring an evaluation of seismic effects for both foundation soil and waste stability under seismic loading (U.S. EPA, 1993). Therefore, an evaluation of seismic loading effects on the stability of the Phase II landfill vertical expansion is not required.

The potential effects of earthquakes with regard to liquefaction, a condition that may cause ground failures such as settlement or lateral spreading, has been evaluated. The estimated settlement during the design earthquake is about 1 inch; hence, the potential for lateral spreading and seismic settling is negligible.

Lastly, an infinite slope stability analysis was conducted to assess the stability of the proposed cover designs. Findings from this analysis indicate that a static factor of safety of 1.55 would occur if no seepage occurs, and a factor of safety greater than 1.44 would occur with seepage (represented by a 1-inch water depth thickness in the soil drainage layer). A value of 1.0 represents a condition where impending slope failure is expected. Because the static factor of safety of 1.55 is greater than the EPA-recommended minimum static factor of safety of 1.5, the proposed cover design is considered stable.

### 4.3 GROUNDWATER AND LEACHATE

#### 4.3.1 Existing Conditions

##### 4.3.1.1 Groundwater

Groundwater monitoring has been conducted in accordance with the provisions set forth in Title 40, Part 258—EPA Criteria For Municipal Solid Waste Landfills (40 CFR 258), Subtitle D, and the proposed state rules —HAR Title 11, Chapter 58—that were being revised during the Phase II design to reflect Subtitle D requirements.

Seven groundwater monitoring wells are located onsite, as shown in Figure 4-1. Of the seven on-site groundwater wells, downgradient wells MW-II-2, 4, and 6 are sampled on a semi-annual basis, and upgradient well M-II-5 and the leachate are sampled annually. The remaining three wells (MW-I, MW-II-1, and 3) are for assessment purposes only. Groundwater analyses conducted to date have not detected any landfill-related groundwater impacts.<sup>21</sup> No potable groundwater is known to exist beneath the site.

#### 4.3.1.2 Leachate and Stormwater Management Systems

40 CFR 258, Subtitle D, provides design criteria for new MSW landfill units and lateral expansions. These criteria along with the proposed State rules at the time of design—August 1993—were used to develop the existing Phase II area liner and leachate collection system, which will serve the needs of the proposed vertical expansion. These regulations require that the design:

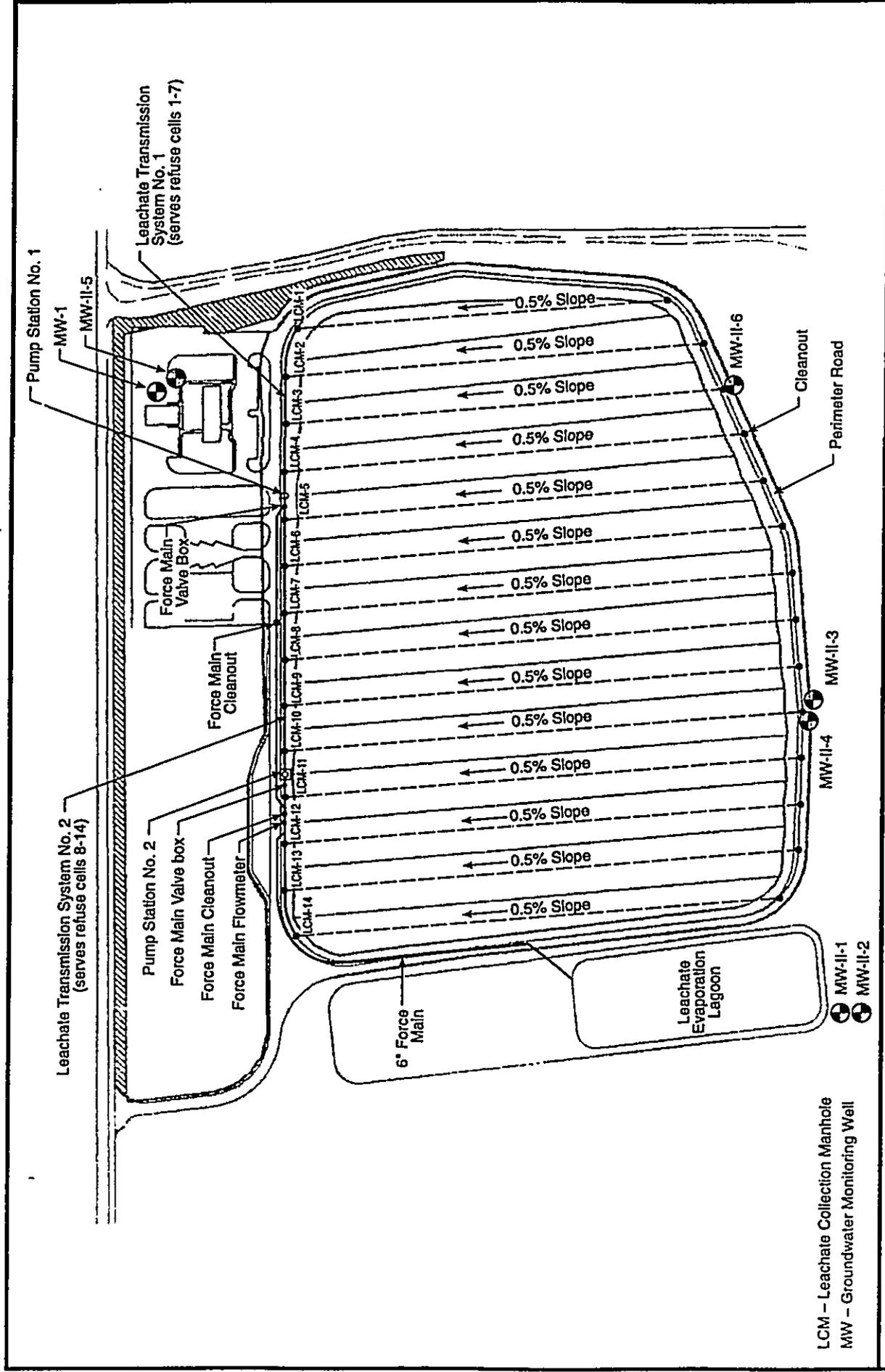
- ensure that specific chemical concentrations at a relevant point of compliance (as defined by Subpart D) are not exceeded in the uppermost aquifer; or
- use a composite liner and leachate collection system that is designed and constructed to maintain less than a 30-cm depth of leachate over the liner.

Subtitle D further specifies that the composite liner must consist of two components: the upper component comprised of a minimum 30-mil flexible membrane liner (FML), installed in direct and uniform contact with the compacted soil; and the lower component comprised of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  centimeters per second. A composite liner and leachate collection system has been used in the Phase II area of the landfill and is described herein.

The existing landfill containment system includes a landfill liner, leachate collection system, collection manholes, and an evaporation lagoon (Figure 4-1). The multi-layered liner consists of a geosynthetic clay layer (bentonite [a material that has a high shrink-swell potential]) overlain by a geomembrane liner (60-mil high-density polyethylene [HDPE]). Above this is a two-foot layer of sand containing perforated HDPE pipes at 100-foot intervals.

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<sup>21</sup> Sanifill Pacific Region (September 1995) *Kekaha Sanitary Landfill, Kauai, Hawaii: Third Quarter Groundwater Monitoring*.



**Figure 4-1**  
**LEACHATE COLLECTION SYSTEM**  
 Environmental Assessment  
 Kekaha Landfill Phase II Vertical Expansion  
 Prepared by: Belt Collins Hawaii  
 March 1998

These pipes convey leachate into collection manholes at the perimeter of the landfill area. Leachate from these manholes is fed via a pump station to the lined leachate evaporation lagoon. Electronic sensors are used to detect when leachate levels reach predetermined levels and then trigger the pumps to operate.

The lagoon is lined with a six-inch foundation layer, a geosynthetic clay liner covered with a 60-mil HDPE geomembrane and geotextile (HDPE net), and six inches of concrete (listed in ascending order). The 1.9-acre lagoon, with a maximum depth of 5 feet with an additional 2 feet of freeboard, was designed to completely evaporate all leachate collected from the landfill during a normal precipitation and evaporation year. Two floating paddle-wheel aerators are used to accelerate evaporation. In the unlikely occurrence that the leachate lagoon reaches capacity, leachate can be pumped with the trailer-mounted pump from the lagoon to water trucks. Leachate can be applied over the lined, landfill area for dust control.

To ensure that the leachate collection system operates properly, the system and backup equipment is checked and maintained regularly. Leachate lagoon levels are recorded once per month and daily when rain occurs; valves controlling the leachate from the pump stations to the lagoon are inspected once per month; and leachate collection lines are cleaned out annually to prevent an excessive buildup of solids. Backup equipment include an aerator, a wet well pump, and a trailer-mounted pump for pumping leachate from the wet wells or the lagoon.

All stormwater is collected onsite and infiltrated into the soil. Stormwater from the facilities area is collected in catch basins, directed through oil-water separators, and discharged into infiltration ditches or perforated culverts (Figure 4-2). Stormwater from inactive (unused) refuse area subcells is discharged through the leachate collection piping into the stormwater disposal system via storm drain piping connected to the leachate collection manholes (once the subcell is active, a flanged coupling used to direct the flow to the stormwater disposal system is removed; this modification redirects the flow, now considered leachate, to the leachate collection manhole). Stormwater falling on active subcells is directed into the sand-lined infiltration ditch that surrounds the Phase II area of the landfill.

#### 4.3.2 Potential Impacts and Mitigation

The primary potential impact of any landfill on groundwater quality is the possibility of a leachate release from the landfill impacting the underlying groundwater. Although groundwater at the site is not a source of drinking water, the possibility of groundwater impact

will be mitigated by rigorous adherence to waste containment measures required by federal and state landfill regulations.

The leachate collection system and liner used for the existing Phase II area will be sufficient for the proposed vertical expansion, since the expansion will not significantly increase the surface area of the fill area or, hence, the amount of additional leachate. During the winter of 1995, the leachate lagoon was filled to near capacity due to stormwater runoff which should have been diverted to the on-site infiltration ditches. This will not occur in the future, as culverts to divert stormwater runoff into infiltration ditches have since been installed (see Figure 4-2).

In order to detect the presence of landfill-related groundwater impacts at the site, semi-annual groundwater monitoring will continue to be carried out, in accordance with federal and state regulations and the site's Monitoring and Reporting Program.<sup>22</sup> One upgradient and three downgradient groundwater monitoring wells are sampled and analyzed for a variety of chemical constituents to detect landfill-related groundwater impacts. If chemical constituents are detected in statistically significant concentrations at any of the downgradient monitoring wells, the Hawaii DOH will be notified and groundwater monitoring efforts will be increased to evaluate the nature and extent of impact. This will be followed by an evaluation and implementation of remedial measures designed to protect human health and the environment, attain specified groundwater protection standards, and reduce or eliminate the source of impact.

#### 4.4 AIR QUALITY AND LANDFILL GAS

##### 4.4.1 Existing Conditions

###### 4.4.1.1 Air Quality

The federal Clean Air Act and amendments of 1970 established the first uniform set of ambient air quality standards (AAQS); current national AAQS are provided in 40 CFR, Pt. 50, National Primary and Secondary Ambient Air Quality Standards (July 1991). Similarly, states such as Hawaii established their own set of AAQS which must be as stringent and tend to be more stringent than their federal counterparts. AAQS established by the State of Hawaii are provided in the DOH's HAR Chapter 11-59. These standards are compared to measured concentrations of criteria pollutants (carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>),

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<sup>22</sup> Sanifill, Inc. (1996) *Monitoring and Reporting Program, Kekaha Landfill Phase II Facility, Kauai, Hawaii.*



particulate matter less than 10 microns in diameter (PM10), ozone (O<sub>3</sub>), and lead (Pb)) to characterize the quality of the air.

Based upon the pollutant concentrations measured throughout the state, Hawaii is in attainment of all federal AAQS, and is generally compliant with the state standards. Exceedances of the state 1-hour standard for CO, which is approximately one-fourth of the federal standard, have been measured near heavily traveled roadways and are a result of vehicular tailpipe emissions of CO.<sup>23</sup>

In the vicinity of Kekaha, all national and state AAQS are expected to be achieved because of the lack of stationary and mobile sources. The relatively undeveloped area is not heavily impacted by CO emissions from vehicular traffic. At the landfill, air emissions result from the operation of landfill equipment, refuse transfer trucks, methane resulting from the decomposition of refuse in the landfill, and lesser amounts of various organic emissions from the refuse.

#### 4.4.1.2 Landfill Gas

Landfill gas is generated from the decomposition of organic material and can migrate either laterally in the subsurface or vertically to the atmosphere, depending upon environmental and physical constraints. Landfill gas monitoring is conducted once per month as required by the landfill permit provisions and in accordance with state DOH and federal landfill gas monitoring requirements. The purpose is to monitor horizontal migration of landfill gas.

Title 11 HAR 58.15 and 40 CFR 258.23 require that the concentration of methane gas generated does not exceed the lower explosive limit for methane gas (5 percent by volume) at the facility boundary.<sup>24</sup> No exceedances of this criteria have occurred at the facility boundary; however elevated methane concentrations have been measured within the facility. Results from monthly subsurface landfill gas monitoring during the period of September 11, 1994 to February 28, 1996 indicate that concentrations of methane at LFG Probe No. 4 frequently exceed 5 percent, by volume. One exceedance of this concentration was also observed at LFG Probe No. 3 on November 30, 1995. The maximum concentration of

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<sup>23</sup> The federal standard is based upon a level at which toxicological effects have been observed. The state 1-hour standard is more stringent and is not based upon toxicological effects.

<sup>24</sup> Sanifill of Hawaii, Inc. Facsimile from Jeff Martin of Sanifill to Lesley Matsumoto of Belt Collins. February 4, 1997.

methane measured at any location was 22 percent and occurred at LFG Probe No. 4 on January 3 and February 8, 1995. Probe No. 4 is located along the perimeter of the Phase II area that abuts the unlined, closed, Phase I area (see Figure 2-3). Elevated methane concentrations at Probes Nos. 3 and 4 are probably due to the migration of landfill gas from the unlined Phase I area or bagasse residue from previous on-site activities. Unlike the Phase I area, the Phase II area has a composite liner that significantly minimizes lateral LFG migration. Concentrations of methane at LFG Probes No. 1, 2, and 5 are consistently below the 5 percent criterion.

Lateral migration of landfill gas is expected to be minimal, if at all, due to the presence of the composite liner and the landfill gas (LFG) collection system within the Phase II area. The LFG collection system will reduce methane gas and significantly lessen amounts of nonmethane organic compounds (NMOC) that could otherwise pass through the landfill surface to the atmosphere or migrate horizontally through the soil. Reported collection efficiencies for LFG collection systems range from 60 to 85 percent, with an average of 75 percent most commonly used.<sup>25</sup> Collection efficiencies for landfills with synthetic covers are greater than 85 percent.<sup>20</sup> Once collected, the gases are burned in a flare where destruction efficiencies are estimated at approximately 90 percent or greater for various landfill gas constituents.<sup>26</sup> For methane, the destruction efficiency is estimated to be greater than 98 percent. The LFG collection system is comprised of a network of perforated PVC pipes (wells) and a flare for burning landfill gas (primarily methane). The layout of this system is illustrated in Figure 4-3.

#### 4.4.2 Potential Impacts and Mitigation

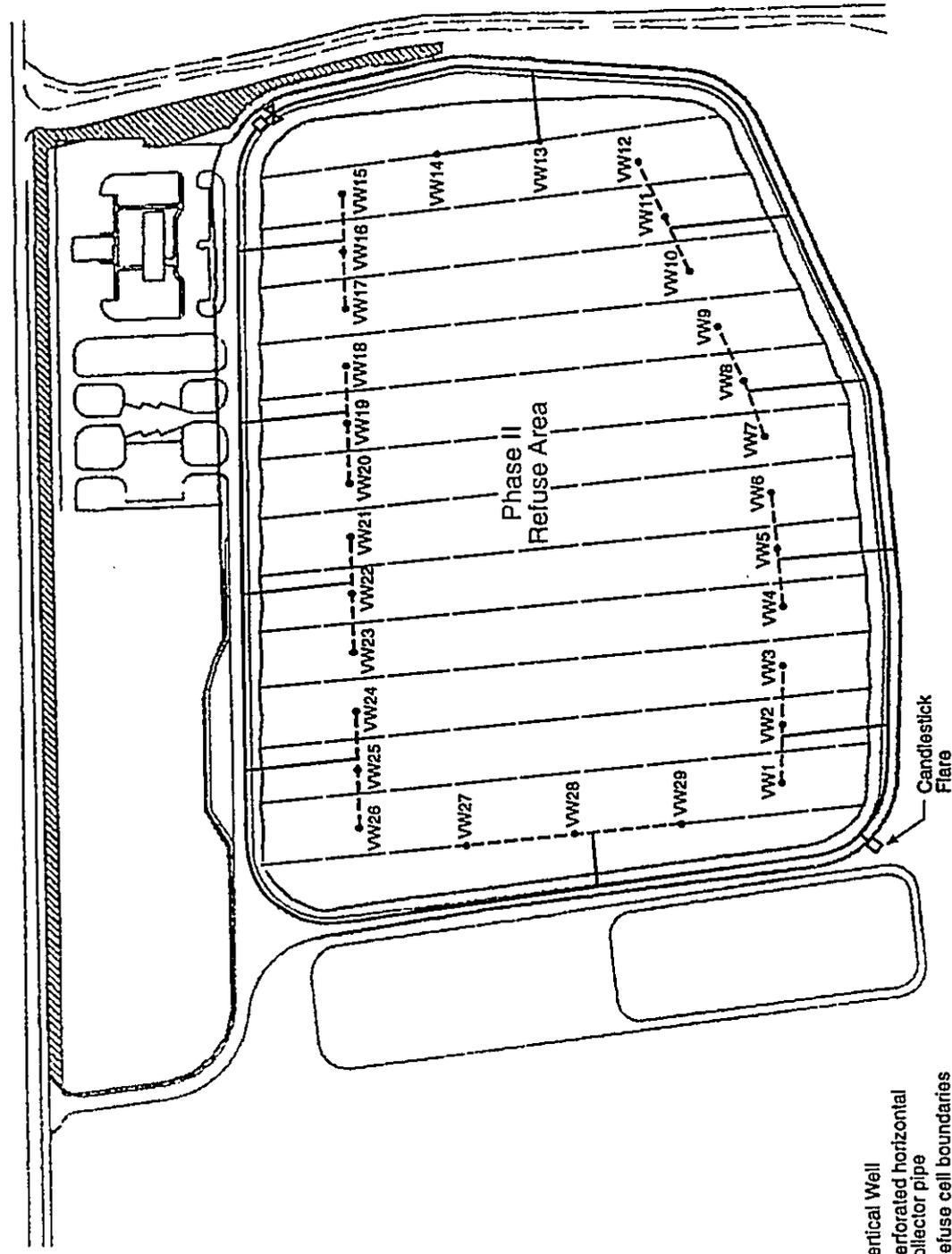
The proposed vertical expansion of the landfill will generate additional landfill gas that can be adequately accommodated and combusted in the existing flare. Flare emissions consist primarily of carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), and oxides of sulfur (SO<sub>x</sub>) – products of combustion. Emissions of these pollutants have been estimated based on the design flow rate of landfill gas entering the flare and EPA emission factors. Flare emissions under existing and proposed conditions have been estimated to evaluate the relative change due to the proposed action (see Table 4-2).

The EPA-approved SCREEN3 air dispersion model was used to estimate downwind

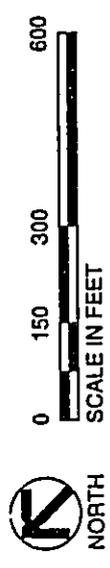
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<sup>25</sup> U.S. EPA (January 1995) Section 2.4-8 of AP-42. *Office of Air Quality Planning and Standards, Clearing House for Inventories and Emission Factors Bulletin Board System.*

<sup>26</sup> U.S. EPA (September 1995) Draft Section 2.4 for AP-42. *Office of Air Quality Planning and Standards, Clearing House For Inventories and Emission Factors Bulletin Board System.*



**LEGEND**  
VW Vertical Well  
--- Perforated horizontal collector pipe  
--- Refuse cell boundaries



**Figure 4-3**  
**LANDFILL GAS COLLECTION SYSTEM**  
Environmental Assessment  
Kekaha Landfill Phase II Vertical Expansion  
Prepared by: Belt Collins Hawaii  
March 1998

concentrations of criteria pollutants (CO, NO<sub>2</sub>, SO<sub>2</sub>) and methane (CH<sub>4</sub>). Table 4-3 presents the maximum modeled downwind concentrations and their relationship with state and national AAQS.

As summarized in Tables 4-2, the net change between the existing and proposed flare emission conditions is about 43 percent. However, these net increases in emissions are not expected to cause an exceedance of either state or national AAQS (Table 4-3). For this reason, no significant adverse impacts on air quality are expected from the additional increase in flare emissions resulting from the proposed vertical expansion of the landfill.

## 4.5 VISUAL AESTHETICS

### 4.5.1 Existing Conditions

The area surrounding the landfill is not heavily developed and primarily used for agriculture. Southeast and east of the landfill are agricultural enterprises, and north of the site is the PMRF. Agricultural machinery, farm buildings, and large cane trucks are periodically visible to passing motorists on Kaunualii Highway. The primary public views offered in the vicinity of the landfill are from the highway, but there are no significant views in the direction of the landfill and of the coastline. From the highway looking in the direction of the landfill and toward the coast, no particular natural objects or contrasting forms are present to provide views of interest; rather, the landscape appears featureless and flat. No public views from the makai side of the landfill are present because of elevated sand dunes between the Phase I area and the public shoreline. Similarly, views of the elevated landfill from the nearest residential community, located approximately 1.3 miles away, are prevented by the presence of ancient sand dunes located just northwest of the community of Kekaha.

Phase I and Phase II are located approximately 1,500 feet and 300 feet, respectively, from the highway. Phase I has a maximum height of approximately 60 feet msl, approximately 40 feet above grade. Phase II has a maximum height of 37 feet msl, approximately 50 feet above grade. The final cover over Phase I consists of crushed rock, with vegetated sideslopes. Phase II is covered with daily landfill cover and is partially vegetated. The earth-tone daily landfill cover is consistent in color with the surrounding agricultural areas and unpaved roads, and makes the landfill difficult to discern from the roadway.

**Table 4-2**  
**Estimated Pollutant Emissions from LFG Flare**  
**for the Existing and Proposed Conditions**

Pollutant	EMISSION RATE			
	Existing (without landfill expansion)	Proposed (with landfill expansion)	Change (Proposed - Existing)	Percent Change
	(tons/yr)	(tons/yr)	(tons/yr)	(%)
CO	27.59	39.42	11.83	42.9
NO <sub>2</sub>	3.86 (as NO <sub>x</sub> )	5.52	1.66	43.0
SO <sub>2</sub>	1.10	1.58	0.48	43.6
CH <sub>4</sub>	57.95	82.78	24.83	42.8
LFG entering (*) Flare	126 DSCFM	180 DSCFM	54 DSCFM	42.9

(\*) Source: Gas Control Engineering, January 16, 1997.  
 DSCFM - Dry Standard Cubic Feet per Minute.

**Table 4-3**  
**Estimated Air Quality Impact from Flare Emissions**

Pollutant/ (Averaging Period)	Maximum Modeled Impact				Exceeds Either State or National AAQS?
	Existing	Proposed	Change (Proposed - Existing)	Most Stringent AAQS	
	(ug/m <sup>3</sup> )	(ug/m <sup>3</sup> )	(ug/m <sup>3</sup> )	(ug/m <sup>3</sup> )	(yes or no)
CO (8-hour)	1,076	1,337	261	5,000	No
CO (1-hour)	1,537	1,909	372	10,000	No
NO <sub>2</sub> (Annual)	32	40	8	70	No
SO <sub>2</sub> (Annual)	12	17	5	80	No
SO <sub>2</sub> (24-hour)	23	34	11	365	No
SO <sub>2</sub> (3-hour)	53	75	22	1,300	No

#### 4.5.2 Potential Impacts and Mitigations

The proposed action would result in a finished landfill surface approximately 50 feet above grade extending about 1,200 feet parallel to the highway. This will match the height of the existing Phase I portion of the landfill. No significant visual impact is expected from this change as it will not be inconsistent with the surroundings. When completed, Phase II will be similar in appearance to Phase I.

Upon closure, the landfill will be vegetated and remain consistent with the surrounding agricultural area. Dunes and trees along the coast reach a height of 30 feet; when the landfill has been capped, the proposed vertical expansion will be a grassy mound rising 20 feet above the height of local dunes and trees, but set back from the road far enough so that the mound does not seem disproportionately high. Persons able to see the landfill will primarily consist of motorists on Kaumualii Highway, employees of the Pacific Missile Range and Kekaha Sugar Company, and from a distance, visitors heading north to the remote Polihale State Park. The vegetated landfill mound will not be visible from the town of Kekaha, 1.3 miles to the southeast. No significant impact on the existing visual aesthetics are expected.

#### 4.6 LANDFILL FIRES

##### 4.6.1 Existing Conditions

Landfill fires are prevented by employing good sanitary landfill practices which include compaction of wastes and daily cover. Only one surface fire has been identified and was due to a decomposing mattress that had been transferred from one of the Temporary Hurricane Debris Receiving sites. The mattresses had been placed in an adjacent cell awaiting daily cover when the fire began. No underground fires have occurred in the Phase II area to date.

##### 4.6.2 Potential Impacts and Mitigations

Landfill fires will continue to be prevented with compaction of wastes and daily cover. Load checking procedures will minimize the possibility of a "hot load" creating a fire.

#### 4.7 SITE DEVELOPMENT IMPACTS

Other than a revised grading plan and additional headers and pipe for the landfill gas collection system, no significant site development activities associated with the proposed

action will occur. Hence, no significant socioeconomic or environmental impacts are expected.

#### 4.8 SUMMARY OF CUMULATIVE IMPACTS

No adverse cumulative environmental impacts have been identified with the proposed project. With the exception of the slight increase in landfill gas generation and resulting flare emissions, which will not result in a significant impact to air quality, landfill activities/operations will not change.

The special circumstance under which this project is being proposed deserves additional discussion in the context of cumulative impacts. Without the implementation of the proposed project or one of its action-oriented alternatives, adverse environmental impacts will result and will have cumulative effects. No action would leave the island of Kauai without a landfill upon existing Phase II closure—in 1998. Such a condition would result in significant impacts to the island-wide environment. Environmental impacts could affect all mediums of the environment, e.g., air, water, soil, due to unregulated dumping of municipal solid waste that is anticipated.

## CHAPTER 5 POTENTIAL SOCIOECONOMIC IMPACTS AND MITIGATION MEASURES

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### 5.1 ROLE OF KEKAHA LANDFILL IN THE ISLAND OF KAUAI'S MANAGEMENT OF SOLID WASTE

With the closure of at the Halehaka landfill in 1991, the Kekaha Landfill became the only operating landfill on the island of Kauai. Because other means of solid waste management disposal such as incineration are not yet in place, landfilling provides the only means for final disposition of municipal solid wastes (MSW). Based on pre-Iniki records, landfilling rates at the Kekaha Landfill were approximately 80,000 tons per year (tpy) or 220 tons per day (tpd). Recent landfill records indicate that the demand is approximately 73,000 tpy or 200 tpd.<sup>27</sup>

Approximately 400,000 tons of debris were generated from Hurricane Iniki and disposed of in Kekaha Landfill. Approximately 96,000 tons of this debris were landfilled in the Phase I area, with the remaining being landfilled in Phase II. These wastes represent approximately four to five years of landfill capacity that would normally be used for MSW. Alternative means of disposal, such as incineration, continue to be evaluated as a means of reducing the volume of waste required to be landfilled, regardless of the set-backs encountered. (In 1995, upon completion of a cost-effectiveness evaluation, the Federal Emergency Management Agency [FEMA] rescinded their support of a plan to incinerate Hurricane Iniki debris for the production of electricity.)

### 5.2 ECONOMIC ANALYSIS

#### 5.2.1 Economic Effects of Kekaha Landfill

Proper waste disposal is required to provide a safe and attractive environment for both residents and the County's major industry, tourism. Without proper disposal of wastes, unsightly stockpiles of wastes and risks to public health (e.g., resulting from vectors) would be expected. Such sights would be expected to have negative repercussions on the island's struggling tourist industry and hence, significant adverse economic effects.

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<sup>27</sup> The apparent decrease in landfill demand has not been studied, but could be a result of the decline in the number of generators, primarily tourist, which occurred after Hurricane Iniki.

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### 5.2.2 Operation Costs and Sources of Operating Income

The County operates the Kekaha Landfill with money from tipping fees supplemented by the general fund. Monies in the general fund are derived from property, business, and other taxes. (Additional monies are provided from state grants for capital improvement projects; however, state grants will not be used for the proposed action.)

### 5.3 POTENTIAL SOCIOECONOMIC IMPACTS ON THE COMMUNITY OF KEKAHA

The community of Kekaha is located approximately 1.3 miles southeast from the landfill. Based on 1990 census data, 3,506 persons reside in the community.<sup>28</sup> Of the 14 employees at the landfill, 10 are from the community of Kekaha. Typical landfill related concerns such as odors and incompatibilities between pedestrians and refuse hauling trucks are not present at the Kekaha Landfill. Because of good sanitary landfill practices, distance from the community, and lack of impacts associated with refuse hauling and odors, the proposed vertical expansion of the Phase II area is not expected to negatively impact the community of Kekaha. Rather, the proposed expansion would continue to provide employment for members of the community, prevent the severe consequences of not having a regulated landfill for the island's wastes, and avoid increased waste disposal costs.

### 5.4 PUBLIC HEALTH

No adverse impacts on public health would result from the proposed landfill expansion. The expansion will comply with Department of Health regulations for MSW landfills. These regulations protect the environment, along with public health and welfare. The proposed action would serve to maintain the existing level of sanitary conditions on the island. Adverse effects to public health would result without the proposed action, the no action alternative; without it, sanitary conditions would be jeopardized along with public health.

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<sup>28</sup> State of Hawaii, The Department of Business, Economic Development & Tourism (June 1994) *Data Book* 1993-94.

## 5.5 SUMMARY OF CUMULATIVE IMPACTS

Without the implementation of the proposed project or one of its action-oriented alternatives, adverse socioeconomic impacts would result and would have cumulative effects. No action would leave the island of Kauai without a landfill upon existing Phase II closure—in 1998. Such a condition would result in significant impacts to the economy of the island. Unregulated dumping of municipal solid waste would create unsanitary conditions, create habitats for vectors (organisms or animals, such as rats, that transmit disease), and adversely affect public health.

## CHAPTER 6 CONSISTENCY WITH LAND USE PLANS, POLICIES, AND CONTROLS

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The proposed action is located on land owned by the State of Hawaii, managed by the State Department of Land and Natural Resources, and is regulated by the State of Hawaii, Department of Health, according to state and federal law. The relationship between the proposed action and land use plans, policies, and controls at the county, state, and federal levels are provided herein.

### 6.1 POLICY PLANS

General plans developed by the State of Hawaii and the County of Kauai provide the guide to physical, social, and economic development. These plans establish broad policies and objectives for development within the state and county.

#### 6.1.1 State Plan

The purpose of the Hawaii State Plan, Chapter 226, HRS, is to guide the future long-range development of the State; identify goals, objectives, policies, and priorities for the State; provide a basis for determining priorities and allocating limited resources, such as public funds, services, human resources, land, energy, water, and other resources; improve coordination of State and county plans, policies, programs, projects, and regulatory activities; and establish a system for plan formulation and program coordination to integrate all major State and county activities. Because of the integral role solid waste disposal has on society, all of the State's objectives could be affected by the proposed project. One particular section of the State Plan is directed at solid waste and is presented below.

*Section 226-15. Objectives and policies for facility systems – solid and liquid wastes*

*(a) Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:*

*(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.*

*(b) To achieve solid and liquid waste objectives, it shall be the policy of this State to:*

*(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.*

*(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.*

**CHAPTER SIX**

The proposed vertical expansion of the Kekaha Landfill would meet the objective and policy in Section 226-15(a)(1) since it would provide a means to maintain the basic public health and sanitation standards relating to disposal of solid wastes.

**6.1.2 County General Plan**

The 1982 Kauai General Plan Update (County of Kauai, June 1982) states the goals and objectives for Kauai's physical, social, and economic well-being. These general goals are in conformance with the theme, goals, objectives, policies, and priority directions documented in the Hawaii State Plan. Goals and objectives identified in the update and applicable to the proposed project include:

- To maintain the concept of Kauai as "The Garden Isle"; thus, insisting any growth be in consonance with the unique landscape and environmental character of the island.
- To ensure that all physical growth is consistent with the overall ecology of the island.
- To create opportunities for a greater diversity and stability of employment for residents of Kauai.
- To promote and protect the health, safety, and welfare of all residents and visitors.
- To promote the improvement and expansion of the island's economy, by recognizing and carefully utilizing land and water resources.
- To guide and control development to take full advantage of the island's form, beauty and climate and preserve the opportunity for an improved quality of life.
- To manage implementation through development of social and physical infrastructure based on growth targets, priorities and efficient utilization of facilities and services.

**6.1.3 Waimea-Kekaha Regional Development Plan**

The Waimea-Kekaha Regional Development Plan (County of Kauai, September 1977) relates the broad policies of the General Plan to the region. The County of Kauai Planning Department is in the process of updating the 1977 development plan; however, no completion date for this update has been projected. Goals and objectives identified in the 1977 development plan applicable to the proposed project include:

Goal: To insure that all physical growth is consistent with the overall ecology of the area.

Objectives:

- Assure the conservation and protection of natural, scenic, and historic resources in this region.
- Insure the preservation of flora and fauna, especially endangered species.
- Assure the preservation and protection of reefs, off-shore habitats, beaches, and sand dunes.

Goal: To promote and protect the health, safety, and welfare of all residents.

Objectives:

- Provide adequate water supply for domestic uses and develop new sources when needed.
- Assure development of compatible land uses.
- Control air and water pollution.

Goal: To promote the improvement and expansion of the region's economy, by recognizing and carefully utilizing land and water resources.

Objectives:

- Direct and concentrate urban expansion in physically and economically suitable areas.
- Maintain a program for water management in the region.

The proposed expansion of the Phase II area of Kekaha Landfill is consistent with these goals and objectives because it allows improvement and expansion of the region's economy to occur in a way that protects the environment and human health. Such protective measures are evident through the state and federal regulations which require protective landfill liners to prevent leachate from entering the groundwater and strict closure plan.

Without the presence of a landfill on Kauai, improvements and expansions would be restricted and alternative, less environmentally-sound methods for waste disposal may result.

## 6.2 LAND USE PLANS

### 6.2.1 State Land Use Districts

The State Land Use Law, enacted in 1961, resulted in the classification of all lands in the State of Hawaii into one of four categories: Urban, Conservation, Agriculture, and Rural.

The Phase II area of Kekaha Landfill is located on land designated Agriculture (Figure 6-1). Use of these Agricultural lands as a landfill was made possible through a Special Permit granted by the State Land Use Commission on July 1, 1993. Nineteen conditions of the Special Permit include provisions for:

- proper handling of wastewater and oil;
- complying with DOH permit programs; and
- complying with all applicable requirements of the State DLNR, Historic Preservation Division.

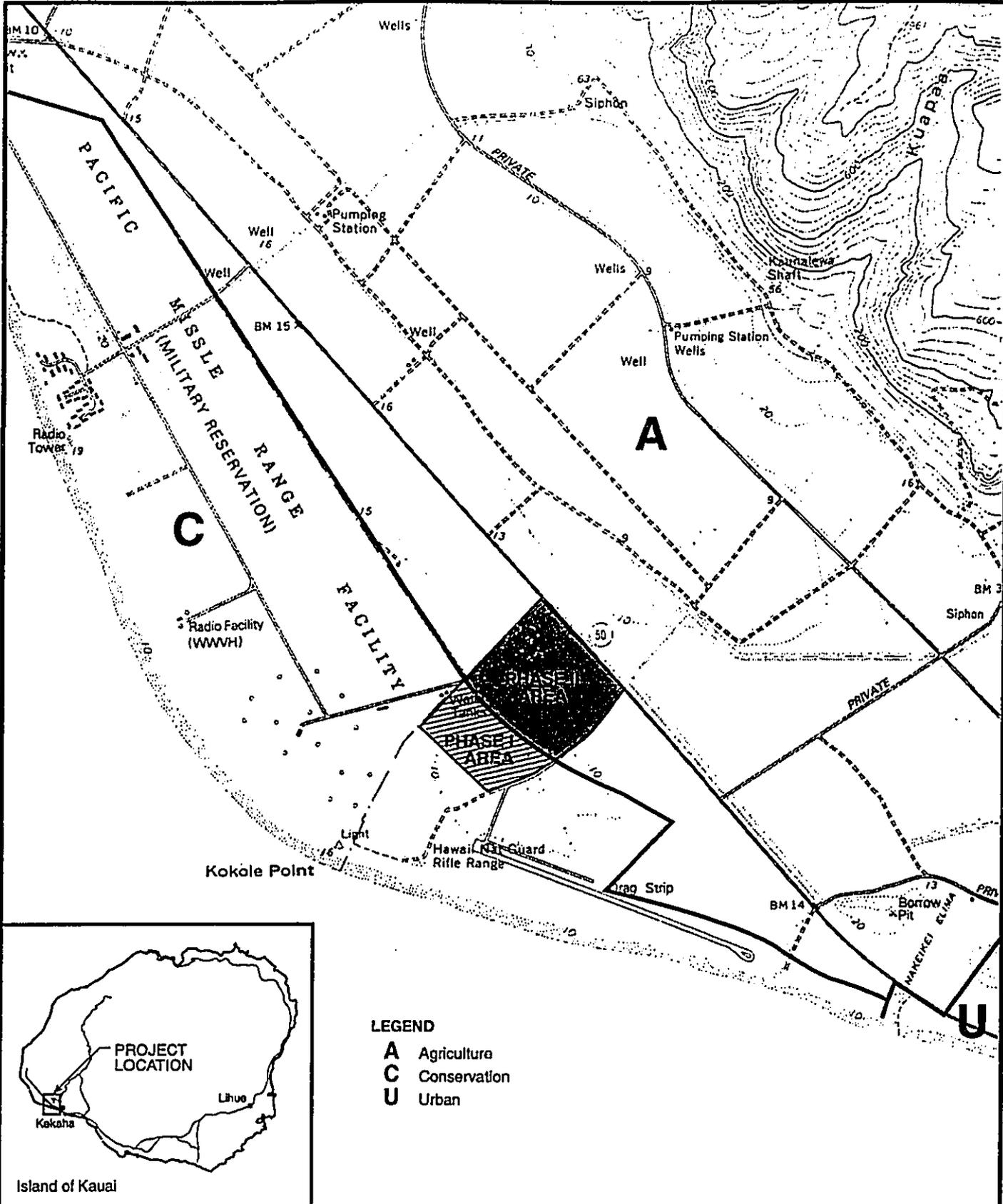
Annual reports on the status of these nineteen conditions are submitted to the Kauai County Planning Department and the Land Use Commission.

### 6.2.2 Comprehensive Zoning Ordinances

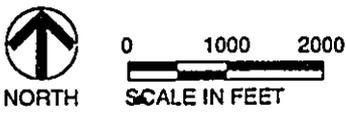
Comprehensive Zoning Ordinances were developed by the County of Kauai as an implementing tool for the General Plan long-range policy on growth and development. It regulates the use of land under the County's jurisdiction, under 23 sub-district designations. Major zoning districts are residential, resort, commercial, industrial, open, agriculture, and special treatment (public, cultural, scenic and ecological resources). Zoning districts in the vicinity of Kekaha Landfill are illustrated in Figure 6-2.

### 6.2.3 Special Management Areas

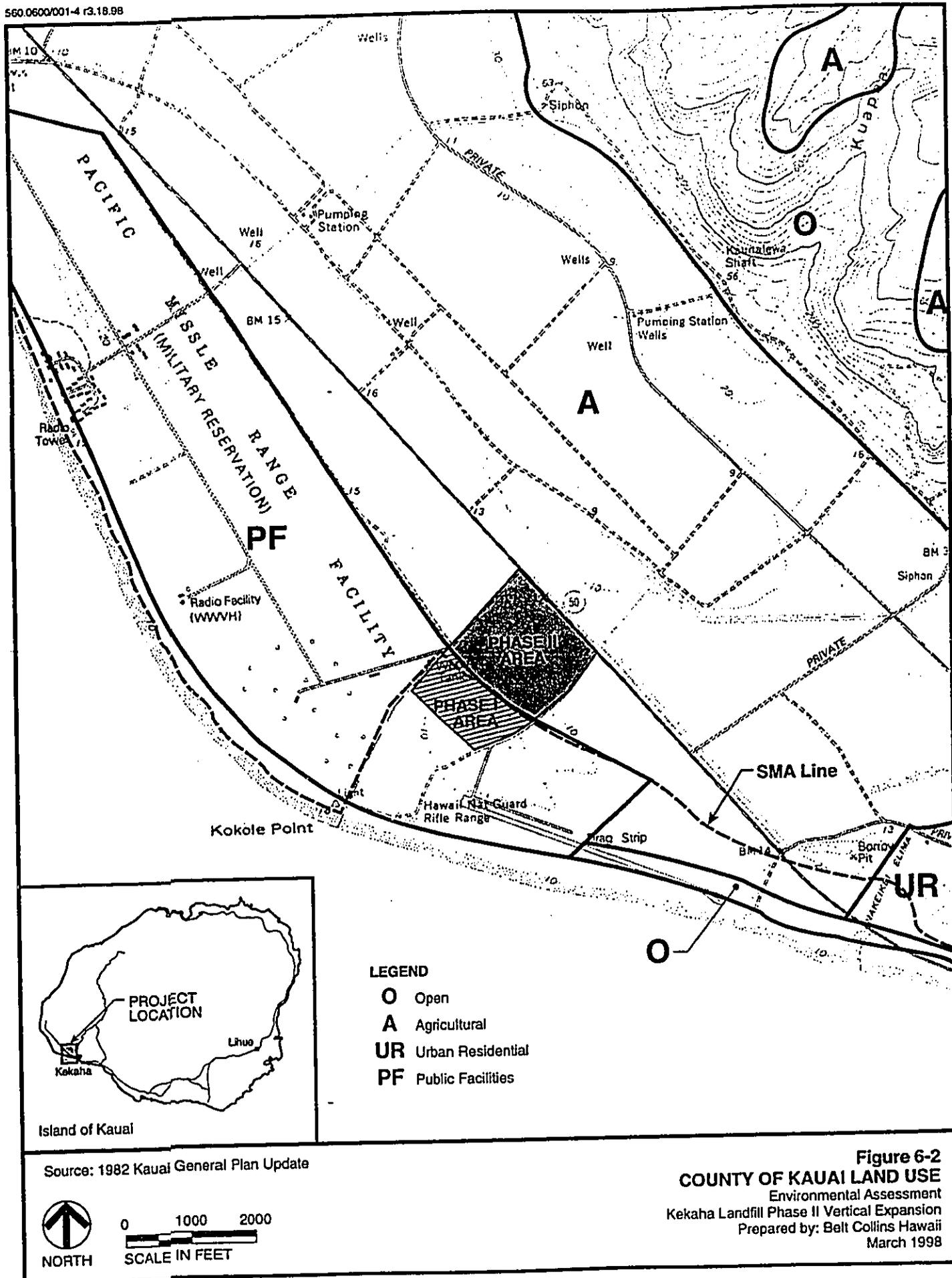
Special management areas (SMA) are established by the counties and are defined as areas between the shoreline and no closer than 100 yards inland. Areas on the shoreline side of this boundary require SMA permits for any development. As illustrated on Figure 6-2, the proposed action will occur just outside of the SMA.



Source: County of Kauai, Revised Environmental Impact Statement  
 Kekaha Sanitary Landfill Expansion Project, December 1983



**Figure 6-1**  
**STATE LAND USE DISTRICTS**  
 Environmental Assessment  
 Kekaha Landfill Phase II Vertical Expansion  
 Prepared by: Belt Collins Hawaii  
 March 1998



## 6.3 OTHER PROGRAMS AND CONTROLS

### 6.3.1 State Environmental Policy

The State of Hawaii's environmental review process was developed in 1974 to ensure that environmental consequences of proposed actions are considered. Hawaii Revised Statutes (HRS) Chapter 343, as amended, defines this review process. Projects subject to this review process include those that involve any one of approximately eight triggers identified in Chapter 343. The applicable trigger for the proposed landfill vertical expansion is:

*the use of state or county lands or the use of state or county funds...*

Preparation of this environmental assessment has been determined to be required by the proposing agency, County of Kauai, Department of Public Works, which will also serve as the approving agency. This EA has been prepared and will be processed in accordance with Chapter 343 and its implementing rules provided in Title 11, Chapter 200, HAR, as revised (August 1996). Processing requirements will include public notification through the Office of Environmental Quality Control (OEQC) in *The Environmental Notice*.

### 6.3.2 Hawaii Coastal Zone Management Program

The federal Coastal Zone Management Program is administered in Hawaii by the Office of Planning, Department of Business, Economic Development & Tourism, and affects all projects on federal lands and/or involving federal agencies. Because the proposed action does not involve federal land nor affect federal agencies, such as the Army Corps of Engineers, a review for consistency with Hawaii's Coastal Zone Management Program is not required.

### 6.3.3 Kauai Integrated Solid Waste Management Plan

In accordance with the State of Hawaii Solid Waste Management Act of 1991, the County of Kauai Integrated Solid Waste Management Plan was developed. This plan outlines a set of programs and facilities to make source reduction and recycling more convenient and economical for Kauai citizens. Programs and facilities are introduced in an effort to meet the overall goals of:

- reducing the amount of waste generated ("source reduction");
- recycling household materials;
- recycling materials in the workplace;

- composting organic materials to return to Kauai's land;
- diverting construction debris from the landfill; and
- using products made from recovered materials.

Implementation of the recommendations in the plan will assist in achieving the State's 1991 landfill diversion goal of 50 percent by the year 2000. Specific activities implemented at the Kekaha Landfill to divert materials from entering the landfill, and which are planned to continue with the proposed vertical expansion, include the following.

- Screening for hazardous wastes, white goods, and tires is conducted at the scale house and the working face of the landfill. If hazardous materials are identified in an incoming load, specific DOH notification procedures are followed. If white goods and tires are identified they are weighed and stockpiled atop the covered Phase I landfill area. Loads containing scrap metal only, i.e., no mixed waste loads, are also weighed and stockpiled atop the Phase I area.
- A drop-off area for the public to dispose of mixed wastes, green waste, and recyclables is provided. An attendant at the public drop-off area is present to identify hazardous wastes, white goods, and other materials that may be attempted to be dropped off and are banned from the landfill. Procedures previously identified for handling hazardous wastes and white goods are followed. Recyclables which include aluminum cans, glass, cardboard, and newspaper are collected in bins and taken off-site by a separate contractor.

Landfilling is the final disposition of materials that are not recycled or reused. Recognizing that landfills serve this, ever-present need, long-term landfill options were identified in the plan. These options include:

- Vertically expanding Kekaha Phase II above 37 msl;
- Engaging a landfill reclamation project to exhume MSW which was landfilled in the Phase I area;
- Laterally expanding the Kekaha Landfill into the Phase III area;
- Siting a new publicly-owned landfill;
- Challenging private solid waste management companies to site and construct new landfill capacity, and contracting for full service disposal; and
- Siting a construction and demolition debris landfill.

Hence, the proposed vertical expansion of the Phase II area and its operating activities are consistent with the landfill plans and waste diversion goals identified in the County's Solid

Waste Management Plan.

### **6.3.4 Landfill Related Regulations**

#### **6.3.4.1 Federal Regulations (40 CFR 258)**

Federal regulations governing municipal solid waste (MSW) landfills, developed to protect human health and welfare, are provided in 40 CFR 258. These regulations set minimum national criteria under the Resource Conservation and Recovery Act (RCRA), as amended, for all MSW landfill units. By October 9, 1993, the date in which 40 CFR 258 became effective for Kekaha Landfill, the Phase I area of the landfill was closed and landfilling operations in the Phase II area began. Phase II has been designed and operates in accordance with the following requirements of 40 CFR 258.

- Location restrictions (e.g., seismic criteria, flood plains)
- Operating criteria
- Design criteria
- Groundwater monitoring and corrective action
- Closure and post-closure care
- Financial assurance criteria

The State of Hawaii is responsible for administering and enforcing the solid waste management facility permit process (see Section 6.3.4.2), which incorporates the provisions of 40 CFR 258.

#### **6.3.4.2 State Regulations (Title 11, Chapter 58.1, HAR)**

State regulations governing solid waste disposal are provided in Title 11, Chapter 58.1, Solid Waste Management Control, HAR. These rules incorporate the requirements of the federal regulations associated with MSW landfills, 40 CFR 258, and are intended to:

- Prevent pollution of the drinking water supply or waters of the State;
- Prevent air pollution;
- Prevent the spread of disease and the creation of nuisances;
- Protect the public health and safety;
- Conserve natural resources; and
- Preserve and enhance the beauty and quality of the environment.

Phase II has been designed and operates in accordance with Title 11, Chapter 58.1. With the proposed vertical expansion, a modification to their existing Solid Waste Management landfill permit is required. All required information as stipulated within Title 11, Chapter 58.1, will be submitted to the Solid Waste Management branch of the DOH for review. The State DOH is responsible for permitting MSW landfills and enforcing these regulations.

#### 6.3.4.3 State Regulations Related to Airborne Emissions (Title 11, Chapter 60.1, HAR)

In addition to landfill related regulations, air pollution control regulations apply to the Kekaha Landfill because of the area-type releases of landfill gas and point-type (flare) exhaust emissions to the atmosphere.

Air emissions within the State of Hawaii are controlled by the DOH. The operating permit program is the mechanism for controlling emissions, in accordance with Title 11, Chapter 60.1, HAR. Chapter 60.1 provides many criteria to determine whether or not a permit is required and what type of permit (noncovered vs. covered) is required. Two such criteria include potential emissions from a stationary source (flare) and New Source Performance Standard (NSPS) applicability.

The recently promulgated regulation, "Standards of Performance for New Stationary Sources and Guidelines for Control of Existing Sources: Municipal Solid Waste Landfills" (40 CFR Parts 9, 51, 52, and 60, March 12, 1996), or NSPS, is intended to affect the larger landfills in the nation by requiring collection and controls that would significantly reduce landfill gas (methane) along with nonmethane organic gases. Rule applicability is first determined by the design capacity of the MSW landfill. If the design capacity equals or exceeds 2.5 million megagrams or 2.5 million cubic meters, provisions of the rule apply and ultimately lead to a determination as to whether or not a landfill gas collection system and control system is required. The design capacity of the Kekaha Landfill (Phase I and Phase II, with the proposed expansion) is estimated to be 1, 524,699 megagrams or 2.4 million cubic meters.<sup>29</sup>

Based on the emissions calculated in Section 4.4.2, the source is not "major" and will not trigger the covered source permit requirements. Therefore, a noncovered source operating

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<sup>29</sup>These figures are expected to overestimate design capacities for NSPS rule applicability, based on input Sanifill obtained from U.S. EPA Region IX. Input from U.S. EPA suggests that design capacity, as it relates to this NSPS, should include only the degradable component of the design capacity. Hence, actual design capacity figures for purposes of NSPS rule applicability are expected to be much less and are estimated to be 830,328 megagrams or 1.2 million cubic meters.

permit from the DOH Clean Air Branch is expected to be required.

#### 6.4 LIST OF REQUIRED PERMITS AND APPROVALS

The proposed vertical expansion of the landfill would require a modification to the existing State DOH Solid Waste Management landfill permit no. LF0073-93 (the existing permit allows a landfill height of 37 msl).

Approvals for the proposed vertical expansion include:

- State Historic Preservation Division's concurrence that the proposed expansion will have no effect on cultural and historical resources (see Appendix A); and
- County of Kauai's Planning Department approval that the increase in vertical height from 37 msl to 60 msl is allowed within the existing Special Permit (see Appendix B).

## **CHAPTER 7 DETERMINATION**

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Based on the results of the foregoing analysis, the proposed action is judged to have no significant impacts on the environment. This determination is based on the following findings with respect to significance criteria contained in Chapter 343, HRS, as amended, and Title 11, Chapter 200, HAR, as revised (August 1996).

- The proposed action does not involve a loss or destruction of any natural or cultural resource;
- The proposed action does not curtail the range of beneficial uses of the environment;
- The proposed action does not conflict with the State's long-term goals or guidelines as expressed in Chapter 344, HRS;
- The proposed action does not substantially affect the economic or social welfare of the community or state;
- The proposed action does not substantially affect public health;
- The proposed action does not involve substantial secondary effects, such as population changes or infrastructure demands;
- The proposed action does not involve a substantial degradation of environmental quality;
- The proposed action does not cumulatively have a considerable adverse effect on the environment, or involve a commitment to larger actions;
- The proposed action does not substantially affect a rare, threatened or endangered species or its habitat;
- The proposed action does not detrimentally affect air or water quality or ambient noise levels;
- The proposed action does not affect or is likely to suffer damage by being located in an environmentally sensitive areas, such as a flood plain, tsunami zone, beach, erosion-prone area, geological hazardous land, estuary, freshwater area, or coastal waters;

- The proposed action does not substantially affect scenic vistas and viewplans identified in county or state plans or studies; and
- The proposed action does not require substantial consumption of energy.

## CHAPTER 8 CONSULTED PARTY COMMENTS AND APPLICANT RESPONSES

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The following governmental agencies, private groups and interested individuals have been consulted during the preparation of this EA.

### State of Hawaii

Department of Land and Natural Resources, State Historic Preservation Division

### County of Kauai

Planning Department  
Department of Public Works

### Private Groups and Individuals

Sanifill of Hawaii, Inc. (USA Waste Services, Inc.)

Comments received during the mandatory 30-day public comment period were obtained from the following: State of Hawaii Department of Health and the State of Hawaii Office of Environmental Quality Control. Comment and response letters are provided in this chapter.

Comments received after the 30-day public comment period were provided by the University of Hawaii at Manoa Environmental Center. Their letter, along with the County's responding letter, are also provided in this chapter.

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TO

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BENJAMIN J. CAYETANO  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. BOX 3378  
HONOLULU, HAWAII 96901

LAWRENCE MIKE  
DIRECTOR OF HEALTH

In reply, please refer to

April 30, 1997

97-059/epo

Mr. Cesar C. Portugal  
County Engineer  
County of Kauai  
Department of Public Works  
4444 Rice Street, Suite 275  
Lihue, Kauai 96766

Dear Mr. Portugal:

Subject: Draft Environmental Assessment  
Kekaha Landfill, Phase II Vertical Expansion  
Kekaha, Kauai, Hawaii  
TMK: 1-2-02:9

Thank you for the opportunity to review and comment on the subject expansion. We have the following comments to offer:

Clean Air Branch

Section 6.3.4.3 of the Draft Environmental Assessment (DEA) states that the design capacity of the Kekaha Landfill (Phases I, II, and the proposed expansion) is less than 2.5 million cubic meters and thus is exempt from New Source Performance Standards (NSPS). However, some of the landfill capacity figures appear to differ from the information filed with the Clean Air Branch. It is recommended that further discussion or clarification be provided on the total design capacity of the landfill and the applicability of the NSPS requirements.

If you have any questions regarding this matter, please contact Mr. Kevin Kihara of the Clean Air Branch at 586-4200.

Office of Solid Waste Management

Section 6.3.4.2 of the DEA states that the vertical expansion will satisfy all of the appropriate sections contained within Hawaii Administrative Rules, Title 11, Chapter 58.1, "Solid Waste Management Control". While we are confident that the County will

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Mr. Cesar C. Portugal  
April 30, 1997  
Page 2

follow the Administrative Rules pertaining to solid waste management in the operation of the landfill, we would like to see that waste diversion measures are included at the landfill.

The Hawaii Revised Statutes and Hawaii's Integrated-Solid Waste Management Plan formalized the state's commitment to recycling and waste minimization as the first elements of a waste management strategy for the State and the Counties. Subsequently, the County of Kauai developed an Integrated Solid Waste Management Plan which addressed the necessary programs to achieve 50% waste diversion by the year 2000. The final EA should address waste reduction and recycling efforts which could be coupled with the vertical expansion of Kekaha Landfill to manage the volume of waste generated within Kauai County.

Should you have any questions on this matter, please contact Ms. Carrie McCabe with the Office of Solid Waste Management at 586-4243.

Groundwater Protection

It would be helpful if the final EA would address the maintenance of the leachate system: how often will the lagoon leachate be pumped and how will it be disposed, and what are the possible contingencies that might prompt additional evaporation and recirculation systems?

If you have any questions regarding these comments, please call Mr. Russell Kumabe with the Environmental Planning Office at 586-7550.

Sincerely,



Bruce S. Anderson, Ph.D.  
Deputy Director for Environmental Health

c: CAB  
OSWM  
EPO

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MARYANNE W. KUSAKA  
MAYOR



CESAR C. PORTUGAL  
COUNTY ENGINEER  
TELEPHONE 241-6600

RUSSELL SUGANO  
ACTING DEPUTY COUNTY ENGINEER  
TELEPHONE 241-6631

AN EQUAL OPPORTUNITY EMPLOYER  
COUNTY OF KAUAI

DEPARTMENT OF PUBLIC WORKS  
4444 RICE STREET  
MC'IKEHA BUILDING, SUITE 275  
LILU'U, KAUAI, HAWAII 96766

March 27, 1998

Dr. Bruce S. Anderson  
Deputy Director for Environmental Health  
State of Hawaii  
Department of Health  
P.O. Box 3378  
Honolulu, Hi. 96801

Dear Dr. Anderson:

**Draft Environmental Assessment, Kekaha Landfill Phase II Vertical Expansion,  
Kauai, Hawaii -- Response to Comments**

In compliance with Chapter 343 Hawaii Revised Statutes as amended and implementing rules contained in Title 11, Chapter 200, Hawaii Administrative Rules, as revised in August 1996, a *Draft Environmental Assessment, Kekaha Landfill Phase II Vertical Expansion, Kauai, Hawaii* (February 1997) was prepared by our office. A notice of availability of this draft environmental assessment was published by the State of Hawaii Office of Environment Quality Control (OEQC) in *The Environmental Notice* on March 8, 1997, and a copy was forwarded to your office for review and comment. Comments were provided by your office on April 30, 1997. Because of the uncertainties over the issue of privatization, we suspended completion of the EA pending clarification of the landfill status. We are now providing responses to your comments pursuant to completion of the process.

**Clean Air Branch.** The design capacity of the Kekaha Landfill, including Phases I and II (with proposed expansion), is estimated to be 1,524,699 megagrams (830,328 megagrams for degradable portion) or 2.4 million cubic meters (1.2 million cubic meters for the degradable portion). These estimates are based on data provided by EMCOR in November of 1996, and the Initial Design Capacity Report Form submitted by the County of Kauai Department of Public Works to U.S. EPA, Region IX, on June 5, 1996. Please note that some of the data in the Initial Design Capacity Report Form were erroneous and were corrected for use in the final EA. Corrections are reflected in the above design capacity figures and reflected in Section 2.1.2 and 6.3.4.3 of the final EA.

Using the New Source Performance Standards (NSPS) criteria for determining whether or not the rule applies (NSPS rule applies if design capacity is equal or greater than 2.5 million megagrams or

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Dr. Bruce S. Anderson

Page -2-

March 27, 1998

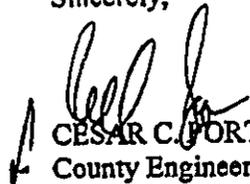
2.5 million cubic meters) and comparing these criteria with the design capacities provided (above), the Kekaha Landfill (with proposed expansion) is expected to be exempt from the NSPS rule.

**Office of Solid Waste Management.** Waste diversion methods at the landfill include providing a public drop-off area for green wastes, white goods, and recyclables. In addition, in-coming waste loads are inspected for prohibited wastes such as: hazardous wastes, white goods, and tires at the scale house and the working face of the landfill. In-coming loads containing white goods and tires are weighed and are stockpiled atop the Phase I landfill area. Waste reduction and recycling efforts at the landfill will be identified in Section 6.3.3, which is entitled "Kauai Integrated Solid Waste Management Plan."

**Groundwater Protection.** Additional information will be provided in Sections 4.3.1.2 and 4.3.1.3 of the final EA to describe maintenance activities associated with the leachate collection system. This information will address how the leachate in the lagoon is pumped and disposed, along with the contingencies that might prompt additional evaporation and recirculation systems.

The information presented will be incorporated into the final EA. If you should have any questions, please contact Mr. Troy Tanigawa at (808) 241-6880.

Sincerely,



CESAR C. PORTUGAL  
County Engineer

TKT/vw

cc: Russell Sugano/Acting Deputy County Engineer  
Sanifill of Hawaii, Inc.

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BENJAMIN J. CAYETANO  
GOVERNOR



GARY GILL  
DIRECTOR

STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET  
SUITE 702  
HONOLULU, HAWAII 96813  
TELEPHONE (808) 538-4185  
FACSIMILE (808) 586-4186

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April 4, 1997

Mr. Kenneth Kitabayashi, Acting County Engineer  
County of Kaua'i, Department of Public Works  
4444 Rice Street, Room 230  
Lihue, Hawai'i 96766

Dear Mr. Kitabayashi:

We submit for your response (required by Section 343-5(b), Hawaii Revised Statutes) the following comments on a February 1997, draft environmental assessment (DEA) prepared by Belt Collins Hawai'i Ltd. and entitled "Kekaha Landfill Phase II Vertical Expansion, Kaua'i, Hawai'i". The document was submitted by your February 24, 1997, letter to our office. Notice of availability of this draft environmental assessment was initially published in the March 8, 1997, edition of the *Environmental Notice*.

1. Please discuss history of regulatory compliance of the landfill with state and federal requirements.
2. In Chapter 2 (Overview of Existing Facility and Environment), please discuss the geometry of the groundwater saturated zone in relation to the proposed phase II vertical expansion. Will the expansion be situated in the saturated zone?
3. Section 1.1 acknowledges that the proposed action serves as a short-term solution. Please discuss what steps has the County taken to identify new landfill sites or long-term solutions to Kaua'i's solid waste problem.
4. Please consult with the U. S. Army Corps of Engineers to ascertain if any permits or approvals are required.

Please include a copy of this letter and your response in the final environmental assessment for this project. If there are any questions, please call Mr. Leslie Segundo, Environmental Health Specialist at 586-4185. Thank you.

Sincerely,

GARY GILL  
Director

c: Mr. Troy Tanigawa, Kaua'i Department of Public Works  
Ms. Lesley Matsumoto, Belt Collins Hawai'i

+

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MARYANNE W. KUSAKA  
MAYOR



CESAR C. PORTUGAL  
COUNTY ENGINEER  
TELEPHONE 241-8600

RUSSELL SUGANO  
ACTING DEPUTY COUNTY ENGINEER  
TELEPHONE 241-6531

AN EQUAL OPPORTUNITY EMPLOYER  
COUNTY OF KAUAI

DEPARTMENT OF PUBLIC WORKS  
4444 RICE STREET  
MC'IKEHA BUILDING, SUITE 275  
LIPIU'E, KAUAI, HAWAII 96788

March 27, 1998

Mr. Gary Gill  
Director  
State of Hawaii  
Office of Environmental Quality Control  
236 South Beretania Street, Suite 702  
Honolulu, Hi. 96813

Dear Mr. Gill:

**Draft Environmental Assessment, Kekaha Landfill Phase II Vertical Expansion,  
Kauai, Hawaii -- Response to Comments**

In compliance with Chapter 343 Hawaii Revised Statutes as amended and implementing rules contained in Title 11, Chapter 200, Hawaii Administrative Rules, as revised in August 1996, a *Draft Environmental Assessment, Kekaha Landfill Phase II Vertical Expansion, Kauai, Hawaii* (February 1997) was prepared by our office. A notice of availability of this draft environmental assessment was published by your office in *The Environmental Notice* on March 8, 1997. Comments on the draft environmental assessment were provided by your office on April 4, 1997. Because of the uncertainties over the issue of privatization, we suspended completion of the EA pending clarification of the landfill status. We are now providing responses to your comments pursuant to the above-referenced rules.

1) Your request to "discuss the history of regulatory compliance of the landfill with state and federal requirements" without regard to the specific requirements could require an investigation that extends beyond the information appropriate for the EA. To provide context, the history of regulatory compliance of the landfill as it relates to landfill-related regulations will be added. Section 6.3.4.1 of the document will be modified to incorporate this information.

2) The groundwater-saturated zone is approximately five feet below the bottom of the Phase II landfill and more than seven feet below the bottom of the refuse. Because the Phase II vertical expansion will use the footprint of the existing Phase II area, the expansion will not be situated in the saturated zone. Section 2.2.2 will be expanded to describe the relative location of the groundwater-saturated zone to the proposed Phase II vertical expansion.

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Mr. Gary Gill

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March 27, 1998

3) The County is planning to initiate studies to identify potential landfill sites. A request to appropriate monies for the 1999 fiscal year for landfill siting and feasibility studies is being submitted by the Mayor for County Council approval. In addition to focusing on identifying additional landfill sites, requests for proposals to identify alternative solid waste disposal options are planned. This information will be incorporated into Section 1.1 of the final EA.

4) No work in the waters of the U.S. will be undertaken with the proposed action; therefore, no permits or approvals from the U.S. Army Corps of Engineers are required.

The aforementioned information will be incorporated into the final EA. If you should have any questions concerning the above information, please contact Mr. Troy Tanigawa at (808) 241-6880.

Sincerely,

  
CESAR O. PORTUGAL  
County Engineer

TKT/vw

cc: Russell Sugano/Acting Deputy County Engineer  
Sanifill of Hawaii, Inc.

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University of Hawai'i at Mānoa

Environmental Center  
A Unit of Water Resources Research Center  
Crawford 317 • 2550 Campus Road • Honolulu, Hawai'i 96822  
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

EA:00158  
April 7, 1997

Mr. Troy Tanigawa  
County of Kauai  
Department of Public Works  
4444 Rice Street, Room 230  
Lihue, Hawai'i 96766

Dear Mr. Tanigawa:

Draft Environmental Assessment (DEA)  
Kekaha Landfill Phase II Vertical Expansion  
Waimea, Kauai

The County of Kauai proposes to expand vertically the existing Phase II portion of the Kekaha landfill to fulfill short-term solid waste disposal needs. The County intends to increase the height of the landfill from 37 feet means sea level (msl) to 60 feet msl.

Assisting in our review are Paul Ekern, Emeritus, Water Resources Research Center and Malia Akutagawa, Environmental Center. Overall, the DEA adequately meets the requisites for environmental review. However, we would appreciate a response to a few comments and questions as follows:

Conflict Of Interest Regarding DEA Acceptance

The applicant and accepting authority for the DEA are the entity: the County of Kauai. With no built-in accountability, this situation poses a conflict of interest. This kind of circumstance should be avoided so as to dispel any appearance of impropriety in the environmental review process.

### Climate and Air Quality

Since lagoonal evaporation is part of the process, the Climate section should discuss evaporation for the area. (See Chang & Ekern Report R74. DLNR Aug. 1985. Pan evaporation for Kekaha averages 77.6 in./year, 8 in./year in July, and 5 in./year in February. These values result from enhancement of positive advection along the leeward coast.)

The Air Quality section should indicate that there may be an increase in corrosive potentials and problems encountered in revegetating the fill cover from salt spray due to the site's proximity to the ocean and particularly the surf zone.

### Leachate and Stormwater Management Systems

Terms such as "geostatic clay" and "geomembrane liner" used to describe the existing landfill system are not generally known and should be defined here. For greater clarity and understanding, the DEA should explain what specific materials are used in the landfill containment system.

### Soils

What is the nature of the Kekaha washwater residues? Are they red clay from uplands as opposed to Jaucas sands? The slope stability may differ sharply between the two soil types.

### Waste Composition

Is there any information on the composition of the current trash and/or anticipated changes? For example, what toxic components are contained within the existing and future waste streams?

### Effect on Endangered, Native, and Migratory Birds

The Flora and Fauna Section discusses the results of recent surveys on the Pacific Missile Range Facility (PMRF) site adjacent to the Landfill, Phase I and II. The surveys indicate the presence of "the federally listed Hawaiian duck (*koloa*), Hawaiian or American coot (*alaeke'oke'o*), Hawaiian or black-necked stilt (*ae'o*), and Hawaiian gallinule or common moorhen (*alae'ula*), and the state-listed Hawaiian owl (*pueo*)." The surveys also reveal the presence of "the golden plover (*kolea*), black-crowned night heron (*auku'u*), wandering tattler (*ulili*), brown booby (*'a*), wedge-tailed shearwater, and Laysan albatross. (pp. 2-11 to 2-12) The DEA also notes that the Kawai'ele Waterbird Sanctuary is being developed by the State and will be located 1-1/2 miles north of the landfill area. (pp. 2-12).

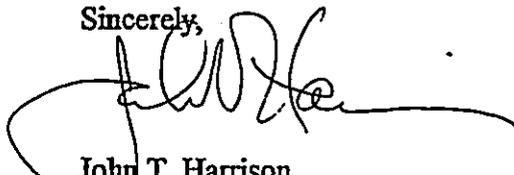
On page 4-6 of the DEA, the County concludes that the adjacent bird sanctuary will be unaffected by the proposed landfill expansion project, because there will be no change in existing operations. How has this conclusion been reached? Were the impacts on the endangered, native, and migratory birds assessed in earlier Environmental Assessments/Impact Statements for the initial Phase I and Phase II landfill development? Has monitoring of the effects of current landfill operations on these birds been conducted?

The federal and state Endangered Species Acts prohibit the "taking" of protected species. Taking has been defined and interpreted not only as an action which actually kills an endangered species, but also includes any conduct which alters behavioral, feeding, breeding, and nesting patterns of these species. Noise associated with landfill operations, degradation of air quality through chemicals, odors associated with solid waste disposal, and increased dust levels may have an effect on the ecology of these birds. These factors should be assessed in the DEA before a Finding of No Significant Impact (FONSI) is made.

Conclusion

We recommend that an adequate response to these comments and questions be provided prior to final approval of the Environmental Assessment.

Sincerely,



John T. Harrison  
Environmental Coordinator

cc: OEQC  
Roger Fujioka  
Lesley Matsumoto  
Paul Ekern  
Malia Akutagawa

+

DEPT. OF PUBLIC WORKS

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MARYANNE W. KUSAKA  
MAYOR



CESAR C. PORTUGAL  
COUNTY ENGINEER  
TELEPHONE 241-8600

RUSSELL SUGANO  
ACTING DEPUTY COUNTY ENGINEER  
TELEPHONE 241-8631

AN EQUAL OPPORTUNITY EMPLOYER  
COUNTY OF KAUAI

DEPARTMENT OF PUBLIC WORKS  
4444 RICE STREET  
MO' KEHA BUILDING, SUITE 275  
LHL 'E. KAUA'I, HAWAII 96786

March 27, 1998

Mr. John T. Harrison  
Environmental Coordinator  
University of Hawaii at Manoa  
Environmental Center  
Crawford 317  
2550 Campus Road  
Honolulu, Hi. 96822

Dear Mr. Gill:

**Draft Environmental Assessment, Kekaha Landfill Phase II Vertical Expansion,  
Kauai, Hawaii – Response to Comments**

In compliance with Chapter 343 Hawaii Revised Statutes as amended and implementing rules contained in Title 11, Chapter 200, Hawaii Administrative Rules, as revised in August 1996, a *Draft Environmental Assessment, Kekaha Landfill Phase II Vertical Expansion, Kauai, Hawaii* (February 1997) was prepared by our office. A notice of availability of this draft environmental assessment was published by the State of Hawaii Office of Environmental Quality Control (OEQC) in *The Environmental Notice* on March 8, 1997. The completion of the EA was delayed because of the uncertainties over the issue of privatization.

Comments were provided by your office in a letter dated April 7, 1997, but not received by us and our consultant (Belt Collins Hawaii) until approximately nine days later and after the close of the 30-day public comment period. However, responses to your comments are provided herein.

**Conflict of Interest Regarding DEA Acceptance.** The fact that this agency action is being proposed and approved by the same agency, the County of Kauai Department of Public Works is allowed under procedures of Title 11, Chapter 200, Hawaii Administrative Rules, as revised (August 1996). Because the EA is also being reviewed by all other relevant county and state agencies with jurisdiction, and because the comments of those agencies are being incorporated, a reasonable presentation of the impacts of the proposed action is assured.

**Climate and Air Quality.** Additional information concerning pan evaporation rates for the project site area will be added to the EA.

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Mr. John T. Harrison

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March 27, 1998

The supposition that "there may be an increase in corrosive potentials and problems encountered in revegetating the fill cover from salt spray due to the site's proximity to the ocean and particularly the surf zone" has no basis in fact. The surrounding area has a history of agricultural use, and there is no evidence of salt-stressed vegetation surrounding the project site. Vegetation selected for use as part of the final cover will be compatible with local conditions.

**Leachate and Stormwater Management Systems.** The terms used in Section 4.3.1.2 and elsewhere throughout the EA to describe the leachate and stormwater management systems will be defined.

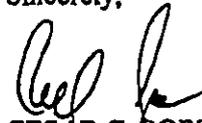
**Soils.** The daily cover -- sediment from the Kekaha Sugar Company mill wastewater settling ponds -- are fine clays. These soils were considered in the unit weight and strength of the landfill mass used in the slope analysis; however, daily cover soils are not significant factors in determining slope stability. Slope stability is generally controlled by the interface between the liner system and the underlying soil or the overlying refuse.

**Waste Composition.** Municipal solid waste stream composition estimates for Kauai in 1989 indicate that hazardous waste comprise 0.1 percent of the total waste stream (*County of Kauai Integrated Solid Waste Management Plan, April 4, 1994*). With the current diversion methods, and the inspection methods used at the landfill, the percentage of hazardous waste reaching the landfill is expected to be less than this amount.

**Effect on Endangered, Native, and Migratory Birds.** The existing landfill operations have been analyzed, and no instrument of adverse effect has been identified on the sanctuary or protected birds associated with it. Because the landfill operations associated with the proposed vertical expansion will remain essentially the same as the current operations, no effects on the bird sanctuary (approximately 1.5 miles from the landfill) or protected birds are anticipated.

Thank you for your comments in this matter. Should you have any further questions, please contact Mr. Troy Tanigawa at (808) 241-5880.

Sincerely,

  
CESAR C. PORTUGAL  
County Engineer

TKT/vw

cc: Russell Sugano/Acting Deputy County Engineer  
Sanifill of Hawaii, Inc.

RECEIVED TIME MAR. 27. 3:53PM

PRINT TIME MAR. 27. 3:58PM

## CHAPTER 9

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**Appendix A**

**State Historic Preservation Division, DLNR  
No Effect Determination**

BENJAMIN J. CAYetano  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION  
33 SOUTH KING STREET, 6TH FLOOR  
HONOLULU, HAWAII 96813

MICHAEL D. WILSON, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES

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CONVEYANCES  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
DIVISION  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

June 13, 1996

Ms. Lesley A. Matsumoto, Project Manager  
Belt Collins Hawaii  
690 Ala Moana Boulevard, First Floor  
Honolulu, Hawaii 96813-5406

LOG NO: 17341  
DOC NO: 9606SC04

Dear Ms. Matsumoto:

**SUBJECT: Historic Preservation Review of the Proposed Vertical Expansion of the Kekaha  
Landfill  
Kekaha, Waimea District, Kaua'i TMK: 1-2-2:9**

Thank you for your letter of inquiry, requesting a determination of "no effect" for the proposed vertical expansion of the Kekaha Landfill. According to your letter, the proposed expansion would use the existing Phase II footprint, increasing the final height from 37 feet above mean sea level (famsl) to 60 famsl. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the subject parcel.

An archaeological inventory survey with extensive subsurface testing was conducted at the Phase II expansion area for the Kekaha Landfill site by Cultural Surveys Hawaii in 1993 (*Archaeological Inventory Survey and Subsurface Testing at the Kekaha Phase II Landfill Site. [TMK: 1-2-02:9] 1993. Folk et al.*). No significant historic sites were found nor were any deemed likely to be present still, in view of the prior modification of the land for sugar cane agriculture. Given these findings, we believe that the proposed vertical expansion of the Kekaha Landfill will have "no effect" on significant historic sites.

Should you have any questions, please feel free to call Sara Collins at 587-0013.

Aloha,

*Don Hibbard*  
DON HIBBARD, Administrator  
State Historic Preservation Division

SC:jk

**Appendix B**

**Planning Department, County of Kauai  
Special Permit Amendment Determination**

MARYANNE W. KUSAKA  
MAYOR



COUNTY OF KAUAI  
PLANNING DEPARTMENT  
4444 RICE STREET, SUITE 473  
LIHUE, KAUAI, HAWAII 96766

DEE M. CROWELL  
PLANNING DIRECTOR

IAN K. COSTA  
DEPUTY PLANNING DIRECTOR

TELEPHONE (808) 241-6677  
FAX (808) 241-6699

June 4, 1996

Ms. Lesley A. Matsumoto  
Belt Collins Hawaii Ltd.  
680 Ala Moana Boulevard, First Floor  
Honolulu, Hawaii 96813-5406

Subject: Special Permit SP93-384, Department of Public Works,  
County of Kauai Request for Special Permit Amendment  
Determination for the Proposed Vertical Expansion of  
the Kekaha Landfill Phase II

In response to your letter dated April 30, 1996, this is to inform you that we have no objections to the proposed vertical expansion of the Kekaha Landfill Phase II of which the total height of the landfill may result in a maximum height of 60 feet, MSL (mean sea level). Furthermore, since the County did not place any restrictions on the height of the landfill during the review of the Use Permit, Special Permit, and Class IV Zoning Permit, we have determined that the proposed vertical expansion will not be subject to further review by the Planning Commission.

Thank you for providing the opportunity to review the proposal. If you have any questions, please contact Bryan Mamaclay of our staff at 241-6677.

A handwritten signature in cursive script, appearing to read "Dee M. Crowell".

DEE M. CROWELL  
Planning Director

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