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Environmental Assessment

MAKANI LANDFILL CLOSURE

For The Department
of
Public Works

County of Maui

Prepared by
Parametrix, Inc. and
Environmental Communications, Inc.

August, 1991

I. SUMMARY

CHAPTER 343, HRS
ENVIRONMENTAL ASSESSMENT (EA)

Action:	Agency Department of Public Works County of Maui
Project Name:	Makani Landfill Closure
Project Description:	The proposed project consists of planning, design, and actual closure of the Makani Sanitary Landfill.
Project Location:	The Makani Landfill is located adjacent to Kailua Gulch, west of Makawao Town. Haliimaile Road is below the site and access is via Makani Road.
Tax Map Key:	2-4-01: 3
Area:	13.6 acres
State Land Use Designation:	Agriculture
County Zoning Designation:	Agriculture
Landowner:	County of Maui (via Maui Land & Pineapple, Inc.)
Agent:	Parametrix, Inc.
Contact:	c/o Environmental Communications, Inc. P.O. Box 536 Honolulu, Hawaii 96809 Phone: (808) 521-8391

II. PROJECT DESCRIPTION

A. Technical Characteristics

1. The proposed project consists of the two-phase program to close the Makani Sanitary Landfill. The initial phase will consist of a site investigation and design which will include: **the surveying of the site** to determine the existing topographical contours; **geologic borings and groundwater monitoring wells** to investigate site hydrogeology; **methane gas probes** to determine quantity of methane being generated and potential offsite migration; **a final closure plan** that will establish the final finish grade; and the proposed future land uses for the Landfill upon final closure. **The second phase will be the actual construction of the closure elements**, with planned improvements for future land uses. During the design phase, the installation of leachate migration controls and methane gas management systems will also be evaluated in accordance with investigation results. Finally, the closure plan will provide supporting elements to protect public health and the environment and ensure compatibility of the closed landfill with land uses in the vicinity.

2. The proposed closure plan for the Makani Landfill is designed to provide an operations and closure plan in accordance with the Maui County Solid Waste Management Plan and includes the following criteria:

a. A final grading plan - Existing terrain features at the Makani Site indicate that due to adjacent slope features in the gulches and ravines, the final grading plan will require an engineering design that allows for the existing steep grades near the gulch. Existing grades at the Site range from nearly flat to 45%. The final grades will provide at least 5% slopes and lessen the steep slopes to the extent possible. Final cover design and final land use will consider the need to maintain a 45% slope in order to limit refuse excavation and re-grading.

b. An operations plan to build the final approved grades will require the County Public Works Solid Waste Division to control the refuse disposal stream within design constraints so as not to exceed the maximum final grade.

c. Evaluation of potential environmental impacts will include the control of surface water runoff. This is

fundamental to the effective operation of the landfill cover system. Proper management of runoff will limit infiltration into placed solid waste, reduce erosion, and prevent downstream impacts. The surface water management program also prevents the run-on of off-site water onto the landfill.

d. Design of the closure measures to protect the general public health and environment, and convert the landfill to open space use. Vital to the above mentioned public health and environmental protection will be the design of erosion control measures. Sediment loading to the adjacent stream/gulch from the landfill site, and leachate migration are potential design control hazards which must be controlled.

e. Required post-closure operations and maintenance. These will include the erosion control measures necessary to protect and enhance the final cover system. These will include the planting of vegetation to reduce impacts from occurring when significant precipitation takes place. Also, critical planting of steep slopes or other areas with high erosion potential are proposed.

3. Design criteria were established by existing and proposed regulations and sound engineering practices. The principal engineering design criteria are as follows:

a. **Landfill development** - Evaluate remaining capacity of the landfill and establish minimum-maximum slopes in accordance with the County's restrictions.

b. **Surface water management** - Determine surface runoff drainage patterns and design drainage facilities to accommodate peak runoff from the 50-year, one-hour storm (3.0 inches).

c. **Cover** - The design of a solid waste landfill final cover typically consists of a low permeable barrier to impede the percolation of precipitation into the placed refuse. The low permeability of the cover increases surface runoff and evapotranspiration, and reduces the volume of leachate generated. Final cover will be at least three feet thick and using local soils with compacted laboratory permeability less than 1×10^{-6} cm/sec or an equivalent design. The HELP2 Model will be used to

determine the effectiveness of the final cover system. This model was developed by EPA researchers and enables the evaluation of both the cover material properties and the configuration of the cover system.

d. **Landfill gas control** - A passive methane ventilation system is currently proposed for the Makani Landfill. Due to the presence of sub-surface fires, the gas venting system and final cover system will be designed to limit intrusion of air. A contingency plan for an active methane migration control system will be developed if offsite migration occurs.

4. Permit Requirements - The following Permit requirements will be adhered to by the applicant, Maui County, in submittals to the Director, State Department of Health for their review and approval.

a. State Department of Health Administrative Rules, Title 11, Chapter 58, "Solid Waste Management Control".

b. Environmental Protection Agency - 40 Cfr, 257-258*, sub-title D. (*section 258 proposed, not final at this time).

In addition to the above regulations, the applicant shall submit a closure plan to the Director, State Department of Health, at least one year prior to planned termination of the landfill operation. Further, within sixty (60) days of the permanent termination of the landfill operation, the applicant shall notify the Director in writing of the termination action. Because of the impending clossure of the Landfill and available capacity at other County landfills, the closure plan may be submitted less than one year before termination of operations.

B. Social and Economic Characteristics

The proposed closure is to meet both current and proposed solid waste management regulations that will protect the general public health and the affected environment. The County Solid Waste Management Plan will accommodate the current refuse stream that presently is being disposed of at the Makani Landfill with planned improvements, i.e. transfer stations, centralized landfill sites, and recycling of refuse constituents. The County Solid Waste Management Plan (GBB 1989) stated that the Makani Landfill received 64 tons per day of mixed municipal waste in 1989. A recent survey showed a disposal rate of about 38 tons/day (October, 1990 to February, 1991). The decrease is

consistent with the termination of dumping by commercial haulers. The landfill regulations expressly prohibit the disposal of hazardous waste at County facilities.

C. Environmental Characteristics

The Makani Landfill has been in active use since 1966 and provides refuse disposal to the communities of Pukalani and Makawao in upcountry Maui. Present day disposal rates are estimated at 64 tons per day

Located adjacent to the Kailua Gulch, the landfill site will reach capacity in late 1991. The discontinued use of this location will result in increased demand for an alternative solution to the solid waste management demands of Pukalani and adjacent upcountry Maui communities. The closure will provide on completion, an open space area that will mitigate both existing and potential future environmental impacts resulting from leachate migration, migrating methane gas generation, and emissions from subsurface fires.

III. AFFECTED ENVIRONMENT

A. Geographical Characteristics

1. Topography

The Pukalani Region in upcountry Maui is located below the 2,000-foot elevation on the northwestern slopes of Haleakala. Haleakala is the younger of the two shield volcanoes that make up the island of Maui. The West Maui Mountains are the older, and are characterized by numerous valleys and peaks, caused by stream erosion. Haleakala is a giant dome, and still shows the classical rounded form of the typical shield volcano . Lava flows from the two volcanoes have formed the isthmus between them, which is the location of some of the most fertile and productive soils as well as its' largest concentrations of population in the contiguous towns of Wailuku and Kahului. Other urbanized areas are Pukalani and Makawao, upslope of Kahului on the Haleakala shield. These communities serve as residential communities for many residents who work in Kahului and Wailuku, as well as Lahaina, Kihei, and Napili-Honokawai, which have grown in the past decade as tourist centers.

2. Soils

Soils in the project area were identified through soil classification maps from the Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii by the United States Department of Agriculture Soil Conservation Service, 1972. The soils on the project site are a soil type having the symbol rRR. This soil type is described as follows: "Very rough, steep land, numerous intermittent drainage channels, gulches, and mountain side. Slope 40 to 70 percent. Local relief 20 to 500 feet. Runoff rapid, erosion active. Soils variable, 20 to 60 inches deep over soft weathered rock. Colluvium and alluvium in gulches."

3. Vegetation

Natural vegetation consists of Guava, Indigo, Koa Haole, Lantana, Natal Redtop, and Yellow Foxtail. Vegetation in

the gulch areas are also characterized by large stands of trees such as Mango, Java Plum, Tamarind, Kiawe, and Kukui.

4. Fauna

a. Terrestrial Fauna

The Makani Landfill site is not representative of critical wildlife habitat and the terrestrial fauna found on the property mostly consist of exotic or introduced species of avifauna. The bird type most usually associated with landfills is the white Cattle Egret, while the common Indian Mynah, the English Sparrow, Brazilian Cardinal, and the Gray Dove are also seen. Feral dogs and cats will also be seen as well as the Indian Mongoose, brown field mouse, and the black rat. The only endemic bird that may been seen near the project area is the Hawaiian Owl, or Pueo.

B. Hydrological Characteristics

1. Drainage

The existing surface water drainage pattern in the vicinity of the Makani landfill site travels from southeast to northwest across the site. The runoff drains towards the Kailua Gulch and ultimately runs into the coastal waters of Kahului Bay. Final closure design will provide for drainage mitigation so as to control peak flow across the closed landfill site and reduce the potential for percolation into the landfill.

2. Flood Plain

The Kailua Gulch location is identified in the Flood Insurance Rate Map as Zone C, areas of minimal flooding. This is on panel number 150003 0195B, June 1, 1981.

3. Coastal Zone Management Program

Implementation of this proposed project will not violate any of the provisions or objectives of the Hawaii Coastal Zone Management Act.

IV. SUMMARY OF MAJOR IMPACTS AND MITIGATIVE MEASURES

Groundwater

- Complete hydrogeologic study to determine groundwater flowrates, depth to groundwater, and possible groundwater contamination.

- Install groundwater monitoring wells based upon hydrogeologic study, and implement groundwater monitoring plan with semi-annual or quarterly monitoring.

- Design and construct a final grading plan that provides adequate slopes to reduce ponding of rainwater on the final cover on the top of the landfill, and stabilizes the steep slope leading into Kailua Gulch.

- Design and construct a surface water management system that prevents runoff from offsite from flowing onto the landfill and potentially infiltrating into the solid waste.

- Design and construct a final cover system, integrated with the final grading and surface water controls, that greatly reduces infiltration of rainfall into the landfill and enhances evapotranspiration.

Surface Water

- Prepare and implement a surface water monitoring plan to ensure that offsite surface waters are not impacted by the landfill.

- Design and construct a final grading plan that provides adequate slopes to drain surface water from the site and reduce ponding of rainwater on the final cover, and prevents onsite surface water from flowing onto adjacent properties.

- Design and construct a surface water management system that prevents runoff from the site from causing offsite impacts because of high flowrates or sediment loading. Measures may include installation of a sediment pond, checkdams on ditches, armoring of ditches, and special vegetative plantings to stabilize ditches and the Kailua Gulch stream bank.

- Design a final cover system and final vegetation plan that stabilizes the topsoil layer and reduces erosion of topsoil and underlying soil materials. Measures may include special seed-mixes that are drought resistant and have fibrous roots to hold soils, and armoring of some steep slopes.

Landfill Gas and Fires

- Install landfill fire grid monitoring system to determine the areal extent and depth of landfill fires, and to use in designing a final cover system and possible interim fire suppression measures.

- Install landfill gas monitoring probes at the landfill property line to determine if or to what extent landfill gas migration is occurring.

- Design and construct a landfill cover system that reduces the infiltration of rainwater and air into the landfill. The moisture from rainwater can greatly increase aerobic decomposition and landfill fires and landfill gas generation. Air infiltrating the landfill can greatly increase the potential for landfill fires by providing the oxygen necessary to support combustion.

- Design and construct a passive landfill gas collection and flaring system to reduce landfill gas pressures in the landfill and reduce the potential for offsite landfill gas migration.

Final Land Use

- Design a final grading plan and a final cover system that provide the drainage and soil horizon required to support native and select introduced species of vegetation that will blend with the surrounding land uses in the area.

- Final land use will be natural open space, with the inclusion of passive recreational facilities possible in the future.

V. ALTERNATIVES CONSIDERED

Maui County's Solid Waste Management Plan provides for solid waste disposal through July, 1991. The proposed landfill closure for the Makani Landfill will implement that Plan by closing the site when it reaches capacity in July 1992, thus reducing the potential for environmental impacts. The establishment of new landfill sites will help relieve the growing refuse stream that the residential communities are generating. The County intends to begin the siting of a new landfill on the island in the next year, with operation of a new site beginning in 1995-96.

VI. DETERMINATION, FINDINGS, AND REASONS SUPPORTING DETERMINATION

After completing an assessment of the potential environmental effects of the proposed project, it has been determined that an Environmental Impact Statement (EIS) is not required. Therefore, this document constitutes a Notice of Negative Declaration.

Reasons supporting the Negative Declaration determination are as follows, using as the criteria, the policy, guidelines and provisions of Chapters 342, 343, and 344, *Hawaii Revised Statutes*.

1. The proposed action will close an existing sanitary landfill that has potentially significant environmental impacts to the adjacent gulch and drainage areas. These areas ultimately drain into the coastal zone and the closure will mitigate runoff impacts in terms of surface runoff quality.

2. The existing ambient air quality will experience improvement when the closure is completed since the closure will extinguish the sub-surface fires that are presently active.

3. The closure will also enable the County to landscape the existing site into a more aesthetically pleasing finish grade. Ultimate end uses could provide passive recreational facilities for the adjacent communities of Pukalani and Makawao.

4. There are no known endangered species of flora or fauna within the project limits.

5. There are no natural, historic, or archaeological sites within the project limits. In the event that sites are discovered, the State Historic Preservation Office will be notified immediately and work will be halted, pending a review of the sites or finds uncovered.

6. Site grading will be limited to the final design grading plan to be developed in conjunction with the County Department of Public Works. Borrow material will also be evaluated in terms of suitability and source so as to minimize the impacts to the borrow site.

7. Implementation of the County Solid Waste Master Plan will be the principal objective of this proposed closure. The refuse stream currently generated, will be accommodated by a central landfill site designated and approved by the County.

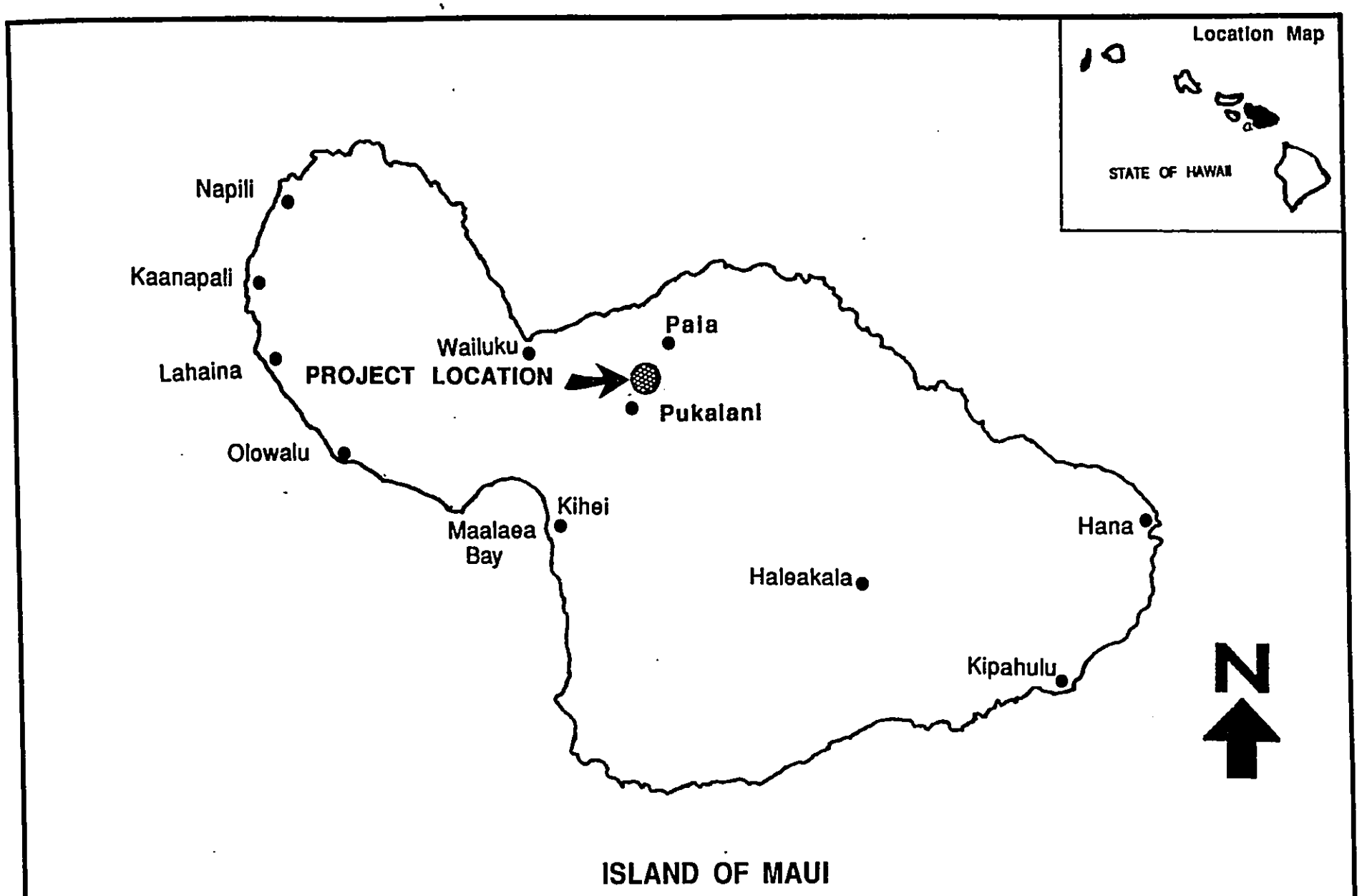
VII. LIST OF PREPARERS

Department of Public Works
County of Maui
Proposing Agency

Parametrix, Inc.
Solid Waste Management Design Consultants
Groundwater Hydrology
Engineering

Mink & Yuen
Ground Water Hydrology Consultants

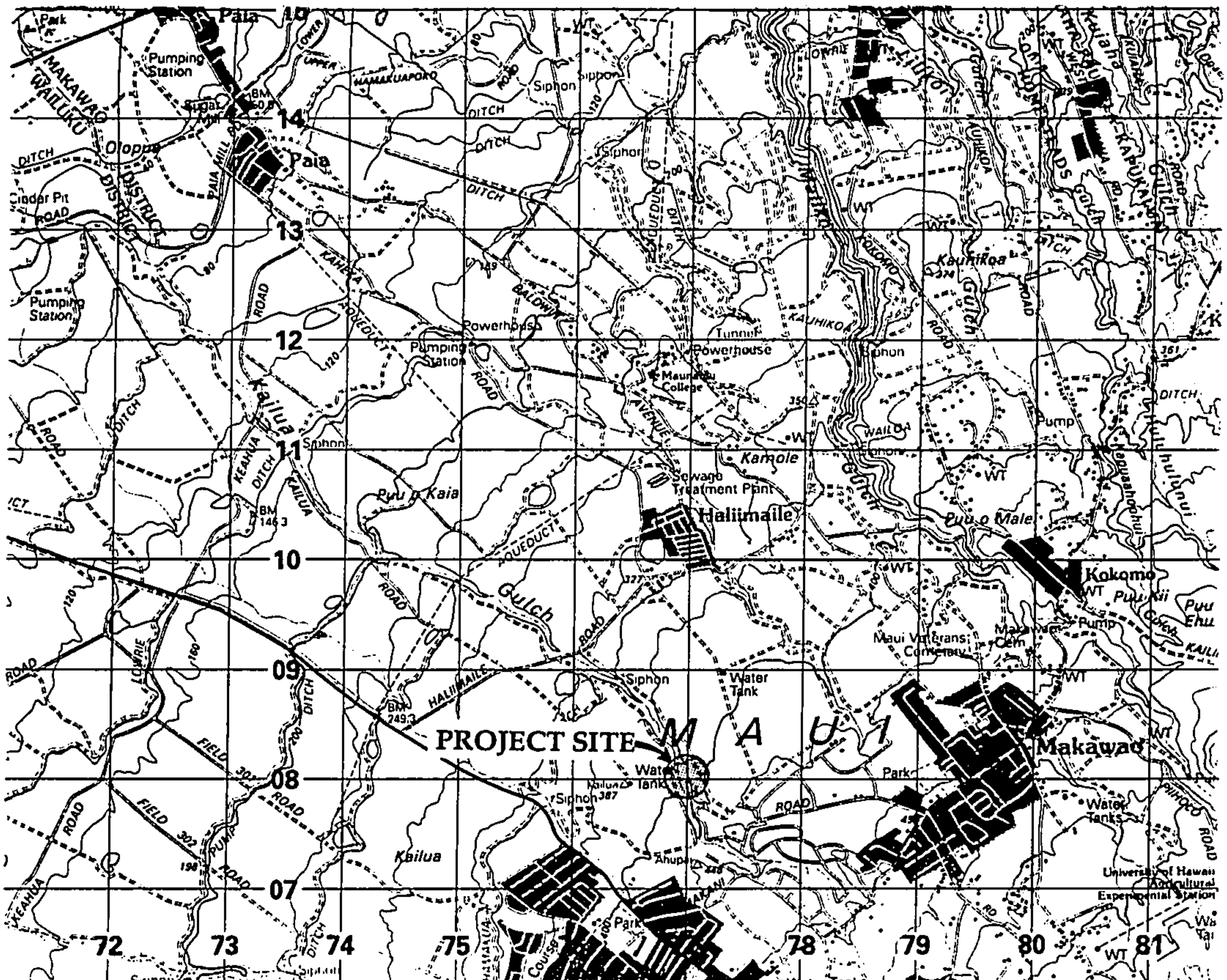
Environmental Communications, Inc.
Environmental Consultant



PROJECT LOCATION

FIGURE 1

MAKANI LANDFILL CLOSURE
MAUI, HAWAII



MAKANI LANDFILL CLOSURE
MAUI, HAWAII
PROJECT SITE
FIGURE 2