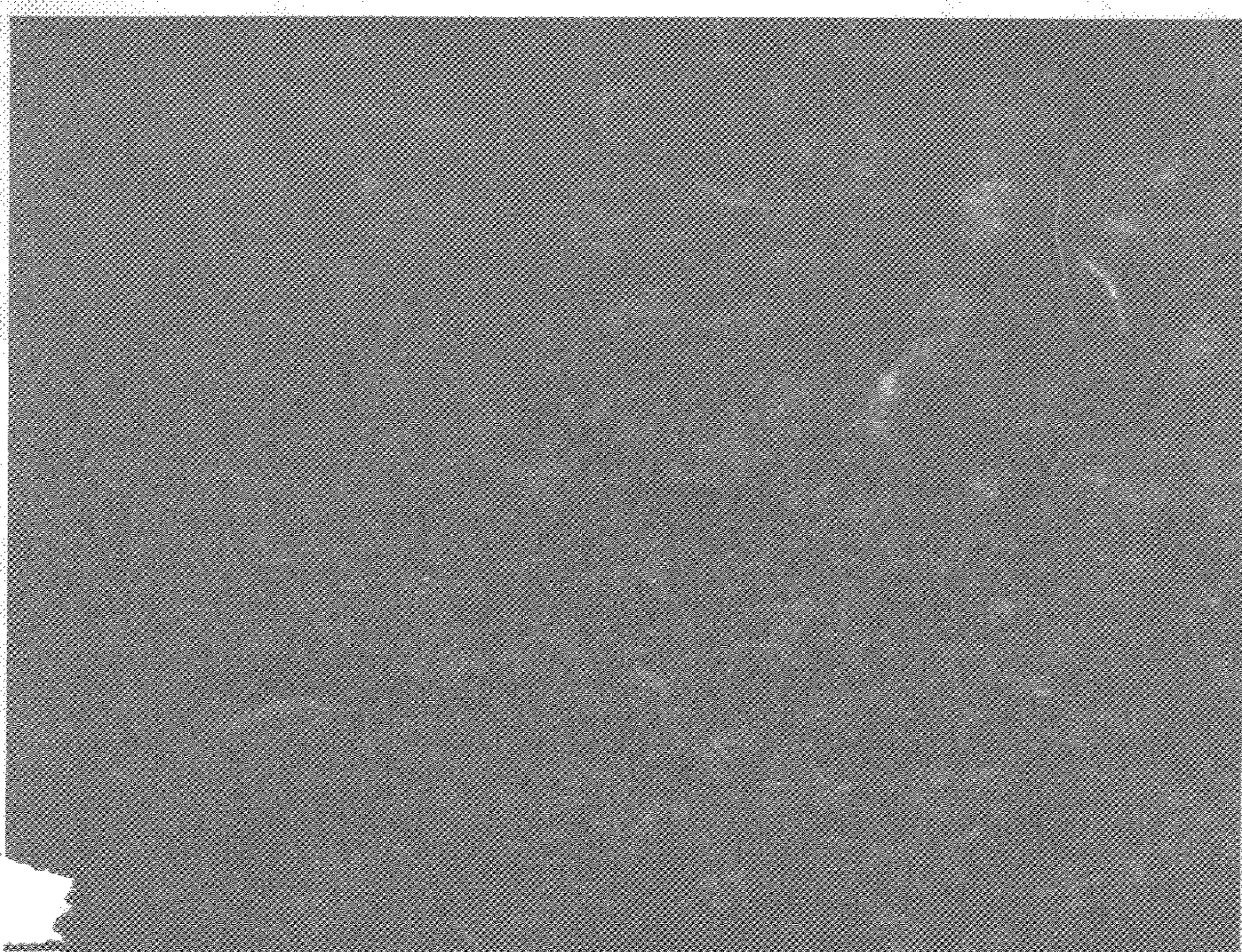
RESOURCE RECOVERY



Environmental Impact Statement

REVISED

8/1983

REVISED
ENVIRONMENTAL IMPACT STATEMENT

for the proposed

SOLID WASTE PROCESSING
RESOURCE RECOVERY FACILITY

submitted by: City and County of Honolulu
Department of Public Works

prepared by: Belt, Collins & Associates
Honolulu, Hawaii

accepting authority: Department of Land Utilization
City and County of Honolulu

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date: 8/18/83

This environmental document is submitted pursuant to Chapter 343, HRS

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CHAPTER I

SUMMARY

1.1 Background

The Department of Public Works, City and County of Honolulu, is proposing the development of a solid waste processing and resource recovery facility as a part of its overall solid waste disposal program. This project involves financing construction, operation, and maintenance of a facility that would accept solid waste generated by residents, commerce, and industry on the island of O'ahu and recover energy and other marketable products from it. Residue and ash from the facility, together with other materials not suitable for processing, would continue to be landfilled, but total landfill requirements would be significantly reduced. Revenues from sale of the recovered products, especially energy (in the form of electricity) and ferrous metal, would be used to lower overall solid waste disposal costs. Development of a resource recovery facility is believed to be the lowest-cost solid waste disposal alternative available to the City over the long term. It also provides a desirable re-use of materials now being wasted.

It is the City's intent to procure a solid waste resource recovery project via a full-service contract that entrusts a single contractor with full responsibility for financing arrangements, design, construction, shakedown, operation, and maintenance of the facility for a period of 20 years. Because of the complex issues that must be dealt with in the contract, a multiple-step, competitive bid procurement procedure is being used. The steps in the process are:

- A Request for Proposals (RFP) is issued by the City soliciting submittals from private industry.
- Step 1A - The City evaluates the qualifications and capabilities of interested contractors and determines which offerors are qualified to submit proposals.
- Step 1B - Offerors whose proposals are found acceptable participate in developing contract documents for construction and operation/maintenance of the facility.
- Step 2 - Qualified offerors prepare and submit detailed price bids and the City selects a contractor.

In the procurement process that is being used, the City establishes (in the RFP) the basic performance criteria that must be met by the facility. This includes such things as the minimum volume of refuse that must be handled (1,800 tons per day), and the environmental standards that must be met. The individual bidders are responsible for developing proposals that are responsive to these requirements and have the lowest possible cost consistent with them. Offerors whose proposals meet all of the non-cost objectives are invited to submit price bids, and the winner is the one with the lowest net present value cost to the City for the 20-year contract period.

This procurement approach allowed the different design teams considerable latitude in developing their proposals, including the selection of a site for the facility. Action taken by the City Council late in Step 1A, however, reduced the number of eligible sites to a single location in Campbell Industrial Park adjacent to the southern end of the existing Standard Oil Company refinery. The City has carried out an extensive public information program to inform the public about the proposed project and to respond to their concerns.

As this report is being written, two bidders are still competing for the resource recovery contract. They are Signal Resco and a partnership made up of Combustion Engineering, Inc. and Amfac (C-E/Amfac). Signal Resco originally submitted its proposal under the corporate name of Wheelabrator-Frye, Inc. but has since changed its name to Signal Resco to reflect its membership in the Signal Group of companies. Most of the public contacts made during the informational program conducted by the City were made under the Wheelabrator-Frye name, and to avoid confustion we have continued to use that title throughout this report.

1.2 Description of the Proposed Facilities

Both of the proposals still being considered would burn refuse in a waterwall boiler to generate steam. The steam would then be used to produce electricity which would be sold to the Hawaiian Electric Company. There are differences in the methods of waterwall incineration among the proposals. The Wheelabrator-Frye system involves burning the municipal refuse as received, i.e., without pre-treatment, while C-E/Amfac would convert the refuse into a "refuse derived fuel" (RDF) before burning it. The two approaches are referred to as "mass-burning" and "RDF" systems, respectively.

In Wheelabrator-Frye's mass-burning method, raw municipal refuse is dumped into a large concrete receiving pit where it is stored until fed into the boiler. The boiler itself is of waterwall design and employs a patented reciprocating stoker grate. The refuse burns slowly on the grate, and spent material is dropped into a water-filled quench pit. Following quenching, the ash is passed through a series of processes that extract ferrous metal. The remainder is landfilled. Heat from combustion is used to generate steam which is then used to generate electricity.

C-E/Amfac's RDF system is very similar to the mass-burning approach except that the raw refuse is first passed through a series of shredders, classifiers, magnets, and other sorting devices that remove non-combustibles and marketable materials <u>before</u> it is fed to the boilers. The combustible product of this process is referred to as refuse derived fuel, or RDF. It tends to burn more evenly than raw municipal refuse and requires a somewhat different configuration for the boiler and stoker. The energy recovery portion of the system is the same as that already described.

1.3 Consistency With Existing Governmental Plans and Policies

Implementation of the resource recovery project would be consistent with State and County policy plans, especially those relating to energy self-sufficiency and the use of renewable energy resources. The project would also be consistent with specific land use controls such as the 'Ewa Development

Plan and the Comprehensive Zoning Ordinance. A number of environmental permits will be required (see Chapter IX for a list), and it will be necessary for the City to demonstrate to the responsible agencies that the proposed project will be consistent with the objectives and policies governing each of these before permits will be issued. Based on the information currently available, it is believed that all such permits can be obtained without undue difficulty or delay.

1.4 Impacts of the Proposed Project

The proposed project would have a number of beneficial effects. The most important of these are that it would reduce the area required for sanitary landfill by about two-thirds, thereby greatly extending the life expectancy of the available sites, and would supply about five percent of the electrical power used on the island. Secondary benefits which derive from these include lower solid waste disposal costs, a reduction in emissions from powerplants operated by the Hawaiian Electric Company, and a postponement in the date when the utility will be forced to increase its generating capacity.

A complete summary of the expected adverse effects of the proposed project is presented in Chapter VI of this report. In general, analyses conducted as part of this study indicate that the proposed project would have relatively minor effects on vehicular traffic, water usage, water quality, and noise levels. Rare or endangered species are not present on the site, and it is not an important wildlife habitat. An archaeological reconnaissance survey suggests that no cultural remains requiring preservation *in situ* are present. Average potable water use from the Honolulu Board of Water Supply system would be on the order of 40,000 to 100,000 gallons per day, a level which the Board indicates can be accommodated by existing sources.

Federal and State air pollutant emission standards will be met, and preliminary air quality modeling shows that Federal ambient air quality standards for regulated pollutants will also be achieved. However, modeling indicates that emissions from existing and approved sources cause ambient concentrations of sulfur dioxide to exceed the much more stringent State ambient air quality standard for that pollutant. Hence, the facility will probably require a variance from the State Department of Health. A small increase in trace element emissions would also occur, but ambient concentrations of these elements would remain low. Air quality monitoring may be required as part of the permitting process.

1.5 Alternatives

A comparison of the technologies incorporated in the two proposals with other feasible alternative solid waste disposal methods is presented in Chapter V of this report. These alternatives include sanitary landfilling and landfilling combined with baling, shredding, incineration, composting, or pyrolysis. Only composting offered any benefits not available from the current proposals, i.e., increased recycling of organic material, but it does not provide an energy product. Overall, none of the alternatives had fewer adverse impacts than the technologies proposed by C-E/Amfac and Wheelabrator-Frye, and all promised to be significantly more costly.

CHAPTER II

BACKGROUND AND DESCRIPTION OF THE PROPOSED PROJECT

2.1 BACKGROUND

2.1.1 THE ISSUE

Each day, citizens of O'ahu generate approximately 4 million pounds of trash and garbage. There are very few ways to dispose of this solid waste, and existing methods are growing less satisfactory. Dumping in the ocean (even if the residents of Hawai'i were willing to do this) is prohibited for environmental reasons by the Federal government. Conventional incineration has grown increasingly expensive because of new air pollution control requirements. It is also uneconomical and wasteful, since waste heat which could be used for energy production is not recovered. Because of this, the City and County now has only one incinerator left in operation. It is located in Waipahu and burns about 20% of the municipal solid waste disposed of by the City each year. Currently, the only remaining option is to bury the solid waste at sanitary landfills. Eighty percent of O'ahu's refuse is presently disposed of at the City-operated landfills at Kapa'a, Kawailoa and Waianae, or at the private Palailai Landfill.

However, space in these sanitary landfills is rapidly being used up. It is projected that the Kapa'a site on Windward O'ahu, which receives the bulk of the island's refuse, will be filled by the end of 1984. The City is seeking new landfill sites, but the possibilities are severely limited by three factors. First, it is considered economically infeasible to site a landfill over potential sources of municipal water supply, and this rules out most of the accessible land on O'ahu. Second, the Federal government discourages landfilling of wetland areas. Third, residents of nearby communities traditionally object to creating new "garbage dumps" near their residences.

The City has evaluated a number of potential landfill locations (see Honolulu, City and County of, Department of Public Works, June 1979 and July 1982). These include: Waimanalo Gulch and 'Ohikilolo on the Leeward Coast and Kalaheo and Bellows located on the Windward side of the island. Based on the difficulties encountered in the past in securing landfill sites, it is highly unlikely that the City will be able to obtain all of the sites that have been identified. However, should all of them be obtained, the present method of landfill disposal would be effective for roughly 15 years. If two of the four sites were secured, only 10 years of use is expected.

The City and the State have conducted, commissioned, or sponsored a number of studies over the past 12 years to find a solution to the solid waste disposal problem. The most recent was the 1977 analysis by the MITRE Corporation (April 1977), which indicated that the most promising possibility was a "solid waste resource recovery" system. The City is currently embarked on a program to implement the recommendations contained in MITRE's final report.

2.1.2 WHAT IS "SOLID WASTE RESOURCE RECOVERY?"

The "solid waste resource recovery systems" under consideration for Honolulu involve the controlled combustion (burning) of refuse (or "municipal solid waste," as it is officially called). In some ways, such systems resemble the incinerators used by the City until the mid 1970's. However, unlike those incinerators, resource recovery units incorporate extensive air pollution control equipment, modern furnaces which insure complete burning, and provisions for the recovery of valuable resources. A more detailed description of how the system works is provided in Section 2.2 of this Chapter.

The principal <u>solid material</u> which can be recovered from Honolulu's municipal solid waste is scrap iron, although recovery of tin, glass, aluminum, aggregate, and other materials may eventually be economically feasible as well. However, by far the most important "resource" which would be extracted is energy. The heat produced from combustion of refuse--either raw waste or pre-processed refuse--can be used to generate steam and, ultimately, electricity. It is estimated that four to five percent of O'ahu's present electrical power needs could be supplied by such a solid waste resource recovery facility.

The recovery and sale of such resources are attractive aspects of this process from both environmental and economic viewpoints. However, the most important feature from the City's current perspective is the reduction in materials going into O'ahu landfills. Waste that cannot be burned (e.g., debris from demolished buildings) and ash or other process residue would still have to be landfilled, but much less space would be needed. Construction and operation of a major O'ahu resource recovery facility such as those proposed would at least triple future landfill life. In view of the very limited areas on this island that are suitable for landfills, the importance of this benefit is great.

2.1.2.1 Overview of Solid Waste Resource Recovery Systems

The "solid waste" which is processed in a resource recovery facility is basically the sort of refuse which citizens or business set out for collection by private or municipal garbage trucks, or that which a homeowner might now deliver to a landfill after landscaping work--i.e., tree and grass trimmings, paper, wood, food scraps, cans, glass, occasional old appliances, etc. Iron ("ferrous") materials are of particular importance in the resource recovery process because of the likelihood of sale to scrap iron dealers.

There are a number of different techniques for recovering iron, heat energy, and possibly other resources from solid waste, but they all start with the same basic steps of collection and storage. Trash collected by municipal garbage trucks or large private refuse trucks is transported directly or via transfer stations to the resource recovery facility. The waste is unloaded into enclosed storage areas capable of accommodating an amount of refuse which would require several days to process or burn, although most of the refuse would be burned or processed within a day or two.

What happens next depends on the particular technology employed. Broadly speaking, there are two general types of systems. The major difference between them involves whether the refuse is immediately burned or is first processed in some manner to produce a fuel which burns more efficiently. Following are brief descriptions of each type of system.

(1) Mass Burning. Mass burning systems feature combustion of all solid waste, with no prior processing of the materials (except for the removal of large and obvious non-combustibles, such as old refrigerators). The heat from the combustion is used to convert water in a boiler to superheated steam, which is then piped to a turbine generator for electricity production. A small fraction of this electricity would be used to power the plant's own operation, but most would be sold to the Hawaiian Electric Company.

In this process, ferrous materials are magnetically removed from the waste residue after burning for marketing to scrap iron merchants. Other residue and ash are trucked to a landfill. Over 99 percent of the particulate matter contained in the hot gases from the combustion chamber are removed by electrostatic precipitators before the exhaust gas is discharged into the air through a stack or stacks.

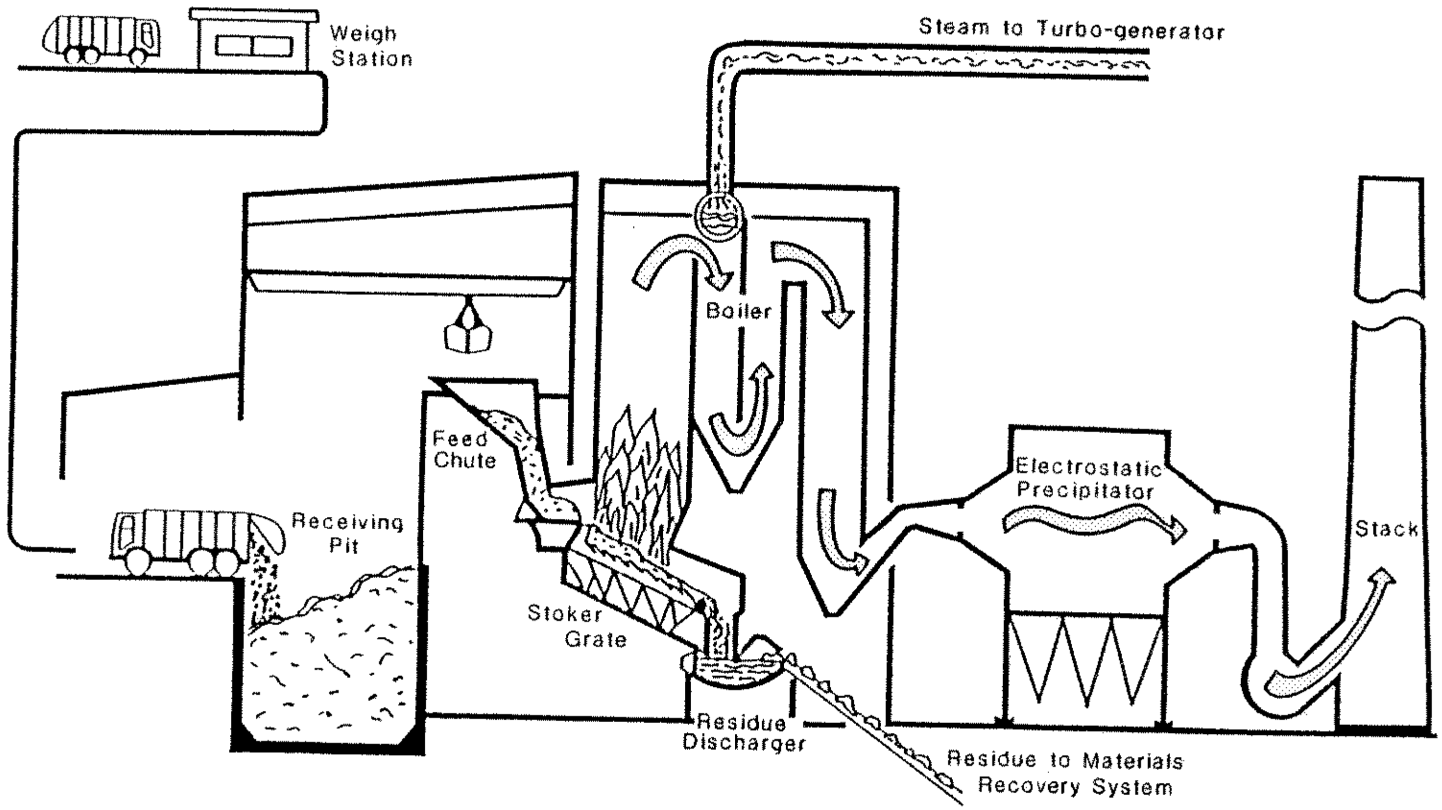
Figure II-1 shows the basic elements and processes of the mass burning operation.

(2) Refuse Derived Fuel (RDF) Systems. In RDF systems, the refuse is processed before burning to derive combustion fuel that has a higher heat value and burns more efficiently. The cost of pre-processing is thus offset by greater efficiency in combustion.

The processing involves a series of steps (e.g., shredding, screening, magnetic separation, etc.). After processing, the non-combustible materials are divided into two types--marketable materials which are sold, and other wastes which are trucked to a landfill. Meanwhile, the refined fuel is conveyed to the furnace. From this point on the process is similar to that found in mass burning (production of steam for electricity, purification of waste gases, transporting ash to landfills, etc.).

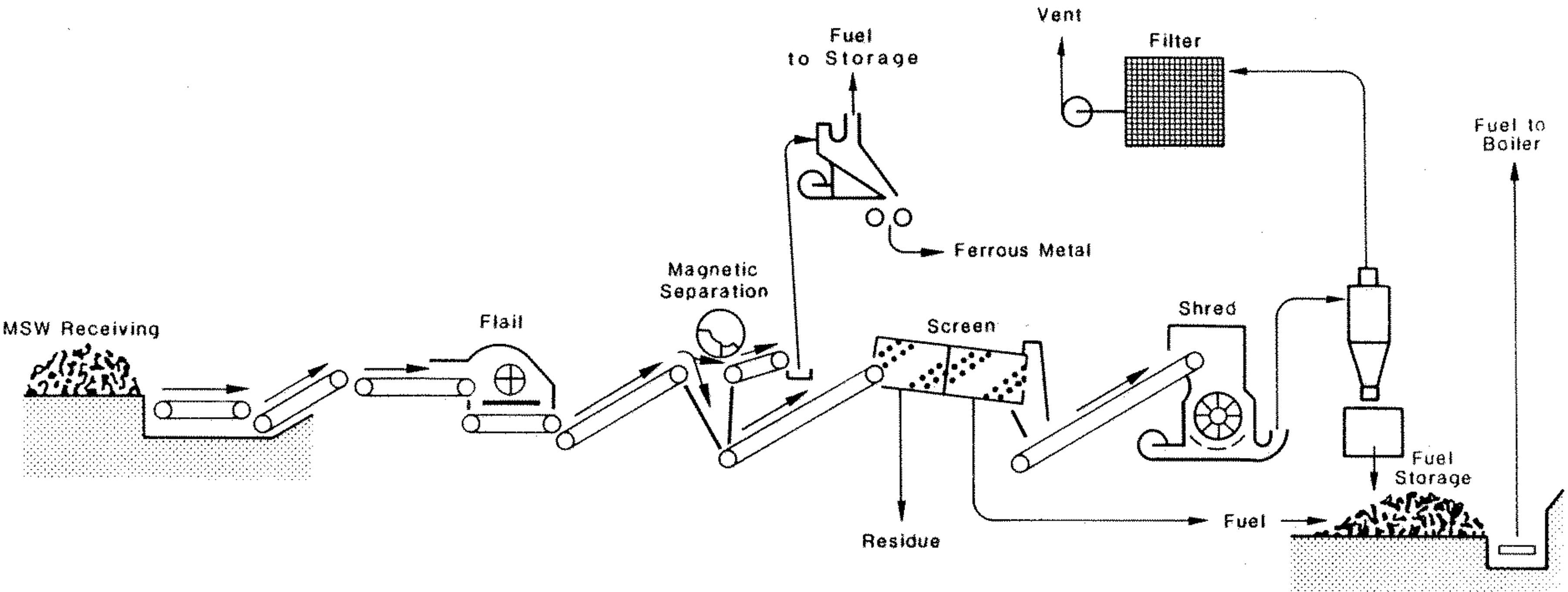
Figure II-2 schematically shows the processing operations typical of RDF systems. The combustion stage is not shown because of the similarity to the combustion process illustrated in Figure II-1.

A resource recovery facility interfaces with its outside environment in a number of ways. Water and trucks filled with refuse enter the facility; leaving it are electricity, cooling water, wastewater, hot combustion gases, and trucks.



Source: Belt, Collins and Associates, after Wheelabrator-Frye, December , 1982

Figure II-1. Mass Burning System Process Flow Diagram.



Source: Belt, Collins and Associates, after Combustion-Engineering/Amfac December, 1982

Figure II-2. Refuse Derived Fuel System Process Flow Diagram.

2.1.3 RECENT HISTORY OF RESOURCE RECOVERY PLANNING FOR O'AHU

The 1977 MITRE Corporation study referred to in Section 1.1 concluded that a resource recovery program was technically feasible, but that its economic feasibility could finally be determined only by asking potential contractors how much they would actually charge to build and operate such a facility. Consequently, in the summer of 1978, the City issued a Request for Proposals (RFP) for what was then referred to as HPOWER--the Honolulu Program Of Waste Energy Recovery. The RFP was directed toward obtaining a full-service contract for the engineering, design, construction, testing and operation of a solid waste resource recovery facility for a period of 20 years.

Following a procedure frequently used by the Federal government for "high-technology" projects, the City adopted a multiple-stage bidding process. First, potential contractors (generally referred to in this report as "offerors" because they have offered to design, build, and operate Honolulu's resource recovery facility) submitted technical proposals and statements of corporate qualifications. Each of the offerors submitted several alternative proposals. Offerors and proposals found qualified in that stage were then reviewed for compliance with the City's requirements concerning system design, system management, and environmental impacts. Finally, offerors qualified in the first two steps were invited to submit formal price bids, with the contract to be awarded to the low bidder.

In response to the City's 1978 RFP, 15 offerors initially submitted qualifications and technical proposals. Proposals from three offerors were found technically acceptable, but one dropped out during the contract negotiations. An environmental impact statement was prepared to cover various proposals from the two remaining offerors and was published in May 1980. It discussed the probable effects of potential HPOWER facilities that had been proposed for sites in Waipahu, Waipio Peninsula, and Campbell Industrial Park. The EIS was formally accepted in December 1980.

On the same date the Revised EIS was issued, the two bidders--UOP, Inc. and the team of Combustion Engineering and Amfac--submitted a total of six pricing proposals for various alternatives. It was determined that Combustion Engineering/Amfac submitted the low bid. Their proposal involved the construction of an 1,800-ton/day facility in Waipahu Town, adjacent to the O'ahu Sugar Mill. However, an appropriation request for financing was tabled by the City Council after local residents voiced considerable opposition to the project site, and the Mayor declined to go ahead with the project because of its close proximity to existing residential areas and the proposed financing method.

Because of the limited area on O'ahu suitable for use as sanitary landfills and the ever-increasing costs of this disposal alternative, a resource recovery program must be implemented. The City is therefore continuing its efforts to procure a resource recovery project. Landfills would still be required, for disposal of solid waste in excess of that which can be handled by the resource recovery facility, non-combustible materials, and residues from the resource recovery process. However, the acreage needed would be dramatically reduced with a resource recovery facility.

2.1.4 SELECTION PROCEDURE AND TIMETABLE AS SPECIFIED IN THE RFP

The timetable for the project laid out in the Request for Proposals (RFP) issued in August 1982, and in subsequent revisions, is reproduced in Table II-1. The end of December 1983 was set as the date for awarding the contract. Allowing three years for design, construction, testing, and start-up, the RFP set January 1987 as the date the facility would enter full-scale operation.

The RFP set a multiple procedure for selecting a contactor:

(1) Step 1A - Evaluation of Contractor's Qualifications and Proposals. This step involves evaluation of the qualifications of the offerors' organizations, the technical and environmental aspect of the proposed facilities, and the general characteristics of the financing programs. As shown in Table II-1, two separate decision points are incorporated in this step. One involves review of the proposals by the City and outside consultants to determine their financial stability and their technology proven. The second decision point follows a public information/input period and allows for final policy-level approval of the proposals (possibly with changes or attached conditions).

(2) Step 1B - Contract Development. During this stage, offerors whose proposals are found acceptable during Step 1A participate in developing a prototype contract for construction and operation/maintenance of the facility. This unsigned contract contains all the necessary information which the offerors require to develop price bids. Some potential bidders may be eliminated or choose to drop out in this step due to concerns over provisions in the prototype contract.

(3) Step 2 - Submission of Price Bids. In this step, offerors are invited to submit pricing proposals. Offerors may participate in Step 2 only after being found qualified in Steps 1A and 1B. The contract is awarded to the low bidder (with the low bid being formally defined as "the lowest net present value of the discounted cash flow for disposal over a 20-year period").

In addition to the foregoing, final award of the contract will be contingent on completion of all the following actions:

(1) Acceptance of the environmental impact statement (EIS) by the appropriate government authority.

(2) Execution of a long-term energy contract between the Hawaiian Electric Company and the winning bidder.

(3) Completion of site acquisition.

II-1. Original and Revised Timetables for Contract Award

Milestone	Original Completion Date	Revised Completion Date
(STEP 1A)		
*Issue Request for Proposals	8/30/82	
*Pre-Submittal Conference	9/30/82	
*Submit Names of Financial Participants	10/29/82	
*Submit Proposals	12/29/82	
*Initial Qualification of Proposals	2/22/82	
*EIS Preparation Notice Issued	3/07/83	
*Offerors Submit Draft Contract Documents	3/15/83	
Public Information Meetings Completed	4/15/83	Open
(STEP 1B)		
*Draft EIS Submitted for Public Review	6/20/83	7/05/83
*Revised EIS Submitted for Public Review	8/22/83	
Finalize Contract Documents	8/15/83	8/31/83
Final Acceptance of Proposals**	4/22/83	8/31/83
(STEP 2)		
Invitation to Bid	8/15/83	8/31/83
Notice of Intent to Bid	12/09/83	12/23/83
Submit Price Bids	12/15/83	12/29/83
Selection of Contractor	12/29/83	1/16/84

* Milestones marked with an asterisk have been passed; other dates are approximate.

** Revision of completion date involved moving this task from Step 1A to Step 1B.

Source: City and County of Honolulu, Department of Public Works

The City's Request for Proposals identified two sites (Sand Island and Campbell Industrial Park) which its preliminary analyses indicated were desirable. However, the RFP also allowed offerors to specify other sites. The original selection process provided for initial screening of these additional sites as part of the overall review of technical proposals scheduled to end in February 1982. This was to be followed by another screening of all proposed sites in the course of final acceptance of technical proposals later in the year. The initial focus of the public information program was on communities adjacent to proposed sites. It was expected that information emerging from these community contacts and from the environmental analyses conducted by the City and its consultants would indicate which sites were acceptable and eligible to continue in the selection process.

It may be noted from the foregoing description that the selection of a site for resource recovery operations was considered an integral part of the contract award process. Hence, the original model with regard to site selection involved:

- o Preliminary determination of two desirable sites (Sand Island and Campbell Industrial Park) by the City itself;
- o Review and screening of additional sites proposed by offerors in their proposals; and
- o Further screening based on community concerns expressed during the public information program and on information emerging from the EIS process.

Once this had been completed, all qualifying sites would be considered equally acceptable on technical, environmental, and socio-political grounds. The site actually selected would be the one specified by the offeror submitting the lowest price bid.

2.1.5 HISTORY OF ACTUAL DECISION PROCESSES

In December 1982, six offerors responded to the Request for Proposals. Their proposals did not include prices; they simply specified the means by which each offeror proposed to satisfy the requirements of the RFP.

As previously stated, the RFP allowed offerors to specify one or both of two sites named by the City, in Campbell Industrial Park adjacent to the Chevron Oil Company refinery and on Sand Island adjacent to the existing wastewater treatment plant. These two locations had been selected because they were in areas already characterized by industrial activity and were geographically apart from residential areas. Offerors were free to propose other sites, but were required to demonstrate that these alternative locations were environmentally acceptable. Offerors took advantage of this clause to propose two additional sites--one at the Hawaiian Electric Company's Waiau power plant in Pearl City and one on the site of the City's existing Ke'ehi Transfer Station on Shafter Flats. The locations of all sites specified in the six technical proposals are shown on Figure II-3.

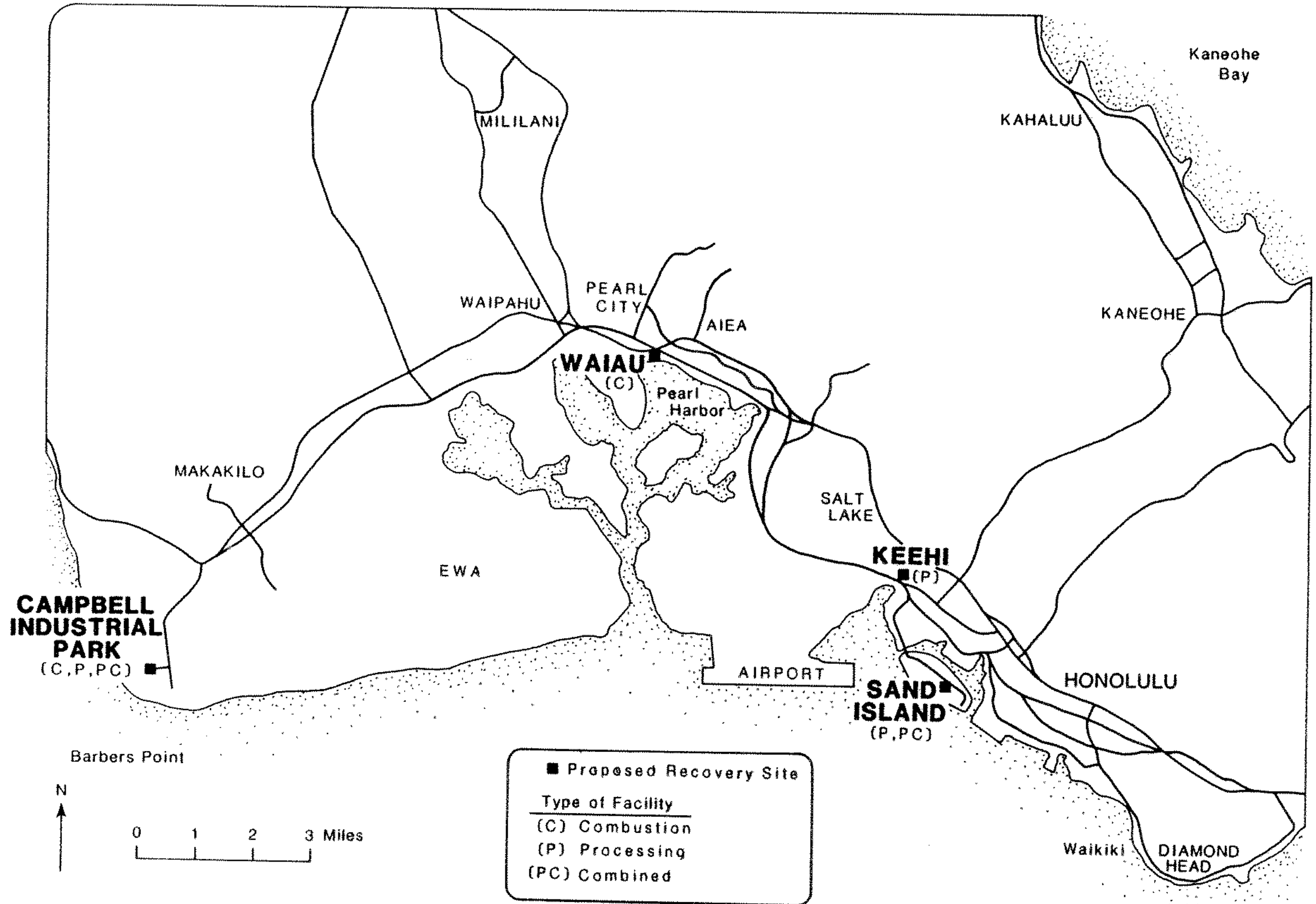


Figure II-3. Location of Sites Specified in Technical Proposals.

Source: Belt, Collins and Associates

In February 1983, at the first of two major decision points originally scheduled in Step One, the City Administration determined that three of the original six offerors did not meet all criteria and disqualified their proposals from further consideration. The City also rejected the proposed Keehi site because of its relatively small acreage.

At this point the following three offerors and sites remained under consideration (see Table II-2):

(1) The joint venture of Combustion Engineering and Amfac (C-E/Amfac) proposed three refuse derived fuel (RDF) options (see Section 2.1.2.1 of this chapter for a description of processes) involving various combinations of the Sand Island and Campbell Industrial Park sites. In two of these options, processing and combustion would take place on the same site (either Sand Island or Campbell Industrial Park); in the other it would occur at different sites (processing at Sand Island, combustion at Campbell Industrial Park.)

(2) Wheelabrator-Frye, Inc. proposed a mass burning facility at either Sand Island or Campbell Industrial Park.

(3) Hawaiian Electric Company (HECO) proposed several RDF options. Processing would take place at either Sand Island or Campbell Industrial Park, but combustion and electrical power generation would be sited at the company's existing Waiau power plant, replacing the oldest boiler units now there. Hence, approval of the Waiau site was critical to HECO's proposal. The City's action in qualifying HECO for further consideration did not constitute final approval of the Waiau site, but it did permit further exploration of the HECO proposal until the next scheduled decision point, which was final acceptance of technical proposals.

On April 18, the City extended the final acceptance of proposals from late April at the end of Step 1A, to the end of August to allow for more input to the EIS process. The public outreach program that had begun in March was continued. The Director and Chief Engineer of the Department of Public Works along with representatives of various departments of the City met with community associations, neighborhood boards, and businessmen's associations in the vicinity of each of the three sites. In addition, "regional" public information meetings were held on all parts of the island to allow residents to air their opinions. These meetings are listed in Table II-3.

In December 1982, as part of the annual review of the Development Plans for 'Ewa and the Primary Urban Center, the Chief Planning Officer of the City and County Department of General Planning recommended to the City Council that seven sites be approved for a resource recovery facility.

Table II-2. Proposals Found Initially Acceptable

	Sand Island	Campbell Industrial Park ("C.I.P.")	Waiau
RDF Options			
Processing Plant Only	C-E/Amfac (truck to C.I.P.) Hawn. Electric (truck or barge to Waiau)	Hawn. Electric (truck to Waiau)	
Combustion/ Energy Plant Only		C-E/Amfac (truck from Sand Island)	Hawn. Electric (truck or barge from Sand Island, or truck from C.I.P.)
Combined Facility	C-E/Amfac	C-E/Amfac	
Mass Burning Option			
Single Facility	Wheelabrator-Frye	Wheelabrator-Frye	

Source: Compiled by Belt, Collins & Associates

Table II-3. Public Information Meetings.

A. Targeted Organizations

Date	Organization
3/10/83	Ewa Beach Neighborhood Board
3/15/83	Campbell Estate
3/16/83	Kalihi-Palama Neighborhood Board
3/31/83	Sand Island Businessmen's Association
3/31/83	Pearl City Neighborhood Board
4/04/83	Kalihi-Palama Community Council
4/07/83	The Pearl City Clergy Committee
4/07/83	Makakilo Community Association
4/13/83	Kalihi Businessmen's Association
4/13/83	Newtown Community Association
4/21/83	Pearl City Community Association
5/20/83	Campbell Industrial Park business people
6/01/83	Chamber of Commerce
6/22/83	Construction and General Laborers Union
6/27/83	CILO Board

B. Regional Meetings

Date	Region	Place
4/25/83	Ewa	Campbell High School
4/26/83	Kalihi/West Honolulu	Farrington High School
5/03/83	Pearl City/Central Oahu	Pearl City High School
5/11/83	Windward Oahu	Kailua Library Auditorium
5/12/83	East Honolulu	Niu Valley Intermediate
5/17/83	Waianae Coast	Waianae Library Auditorium
5/18/83	Central Honolulu	Washington Intermediate
5/19/83	North Shore	Haleiwa Elementary School

Source: City and County of Honolulu, Office of Information and Complaints

Specifically, the recommendation was to enter these sites in the capital improvements "proposed funding" category of two to six years and to place them on the Development Plans' public facilities maps. The Chief Planning Officer subsequently withdrew the recommendation for four of the sites, leaving only the proposed sites at Sand Island, Waiau, and Campbell Industrial Park for consideration as potential additions to the Development Plans' public facilities maps.

In May 1983, the Council rejected the recommended Sand Island and Waiau sites, approving only the site at Campbell Industrial Park. Since 'Oahu's Development Plans are the guiding documents for islandwide land use planning, the Council's action effectively removed the two rejected sites from further consideration by the City. In addition, since all of the options specified in the Hawaiian Electric Company's proposal involved use of the Waiau site, the City Council's action eliminated HECO from the competition.

In a report by its Committee on Planning and Zoning (P & Z), the City Council explained its reasons for eliminating two of the three proposed sites. The Council noted that placement of planned public facilities on the public facilities map, years in advance of the actual funding and constuction, is intended to permit full public and governmental review of the proposals. The P & Z Committee concluded:

> ... Campbell Industrial Park is the only site currently under consideration which is appropriate for resource recovery at this time. It is removed from residential areas, which is consistent with the prior Administration's directions for resource recovery. The site is also removed from areas of public relaxation and from areas which have already been impacted by government projects.
>
> It is important to recognize that the appropriate process is one of site selection, identification of technologies for the site, and finally of private party bidding. (City and County of Honolulu City Council, Committee on Planning and Zoning, May 1983, pp. 3-6)

In keeping with the City Council's decision to eliminate two of the three proposed sites, this environmental impact statement covers only the proposals submitted by C-E/Amfac and Wheelabrator-Frye for Campbell Industrial Park.

The location of the 28-acre Campbell Industrial Park site is shown in Figure II-4. The parcel is designated as TMK No. 9-1-26:18. It is owned by the James Campbell Estate and leased to the Conoco-Dillingham Oil Company. In the early 1970s it was proposed as the site of a third oil refinery, but those plans were abandoned some time ago, and the lessee has placed the property on the market.

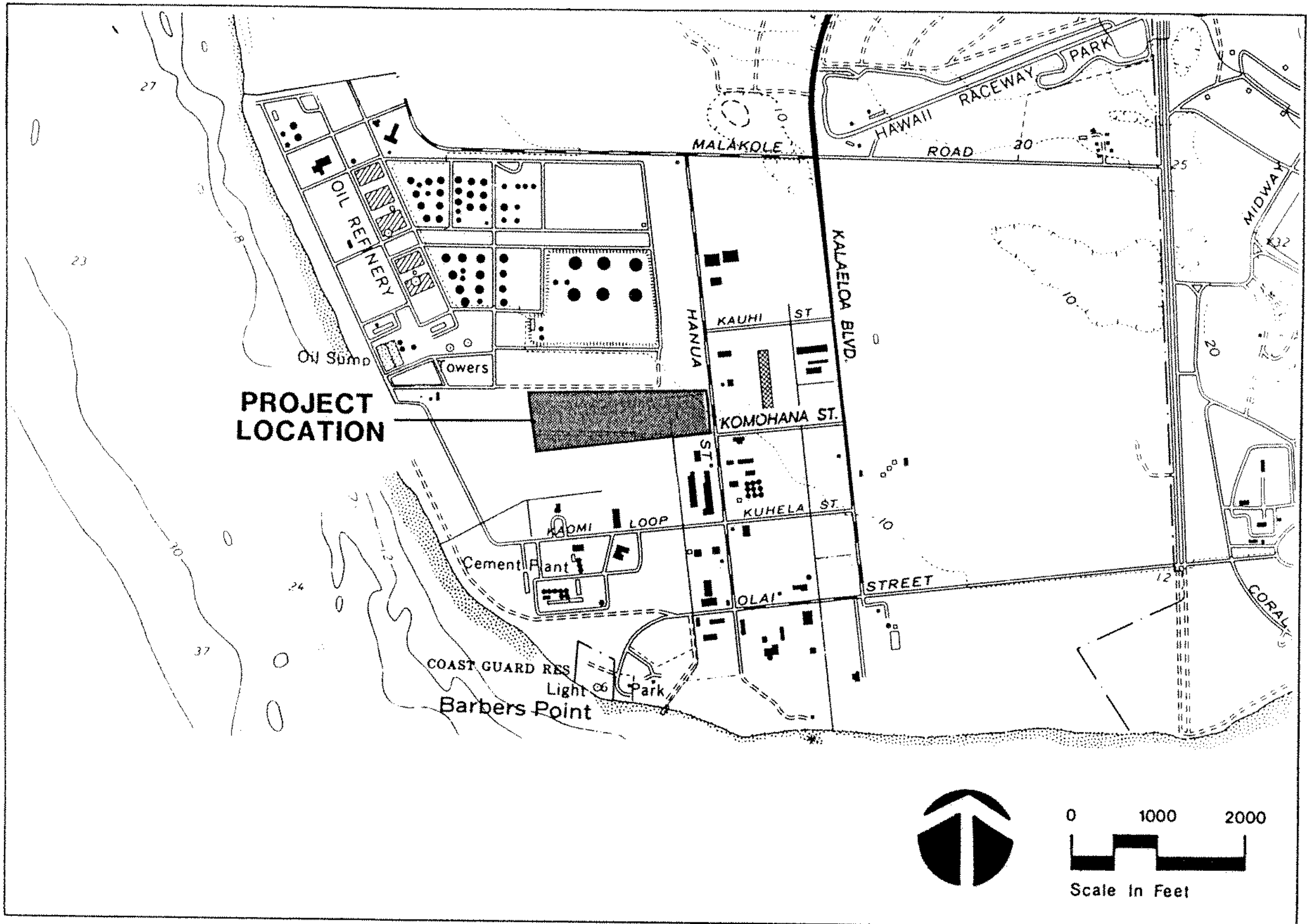


Figure II-4. Location of Campbell Industrial Park Site.

2.2 DESCRIPTION OF THE PROPOSED PROJECT

2.2.1 REQUIREMENTS ESTABLISHED BY THE REQUEST FOR PROPOSALS

The City and County's "Request for Proposals" (RFP) for this project was, in one major respect, unlike many other formal invitations to submit bids for government construction projects. Potential contractors were not given a set of plans or tightly-defined construction specifications. Rather, offerors were told in detail what the facility would have to achieve and what performance standards it would have to meet. How these performance goals would be achieved was a matter left to the expertise and creative ability of the offerors. The City has the responsibility of analyzing and evaluating the proposed technologies.

Some of the most important project prerequisites stated in the RFP are:

- Use of one of two facility sites found desirable by the City, or another site(s) chosen by the offeror and found acceptable by the City (see preceding discussion).

- Provide disposal service for municipal, commercial, and industrial solid waste delivered to the resource recovery facility, excluding demolition debris, pathogenic (health-endangering) or hazardous wastes, and agricultural solid waste.

- Accept an average of at least 1,800 tons per day (TPD) of solid waste, six days per week (i.e., 10,800 tons per week) and handle peak loads 20 percent higher than this. To place this in perspective, the 1,800 TPD figure represents the great majority of the waste now being generated on O'ahu. Additionally, the facility must be capable of expanding to accommodate 2,400 TPD.

- Produce at least 420 kilowatt hours of electrical energy per ton of solid waste (net, after consumption of some energy within the facility itself).

- Dry weight of all residues from the processing must be less than 25 percent of the weight of all original refuse.

- The use of landfill space for emergency back-up in the case of temporary facility outages must be minimized. No more than 30,000 tons of raw refuse per year should be landfilled once the facility begins operation.

- Storage capacity must be adequate for three days' accumulation of raw refuse and two days' accumulation of processed "refuse derived fuel" if a refuse derived fuel system is used. The plant must be designed for effective control of odors and pests (e.g., flies, rats, or cockroaches).

- The system must meet all applicable governmental laws and regulations regarding protection of the environment and of public health.

- Back-up systems shall be provided to ensure that a single equipment failure will not prevent the system from accepting solid waste and processing to at least 60 percent of design capability.

- The contractor must provide evidence of financial stability, in order to assure the City that there is a reasonable likelihood the company will keep operating throughout the 20-year period.

- The City prefers to have the project financed with private capital provided by the contractor. If this is not possible, the City is committed to finance the project by having either the City or State issue tax-exempt Special Purpose Revenue Bonds in the name of the contractor.

The technical proposals submitted by Wheelabrator-Frye, Inc. and by the partnership of Combustion Engineering and Amfac meet all of the requirements stipulated in the RFP. Their physical and operational characteristics are described in Sections 2.2.2 and 2.2.3 below.

2.2.2 WHEELABRATOR-FRYE, INC. PROPOSAL

Wheelabrator-Frye, Inc. is a large manufacturer of energy and environmental systems, as well as other industrial equipment. Sales in 1981 amounted to $1.5 billion. Wheelabrator-Frye is a member of the Signal Group of companies whose total 1981 sales were in excess of $5.3 billion. At present, Wheelabrator-Frye employs approximately 20,000 workers.

Wheelabrator-Frye's Energy Systems Division has as a primary objective the development of refuse-to-energy projects throughout the nation. While the company was not involved *per se* in the HPOWER project, UOP, Inc., another member of the Signal Group, was one of the two finalists in that competition. Wheelabrator-Frye, Inc. is the full service contractor for the resource recovery facility located in Saugus, Massachusetts. To date, that facility has processed over 2.5 million pounds of refuse. The company is currently under full-service contracts for the construction and operation of the 2,250 ton per day (tpd) Westchester resource recovery facility being erected in Peekskill, New York and for a 2,000 tpd resource recovery facility in Baltimore, Maryland financed recently by the sale of $157 million in revenue bonds. Two other resource recovery facilities constructed and operated by the Signal Group are located in Pinellas County, Florida with a design capacity of 2000 tpd and North Andover, Massachusetts with a design capacity of 1500 tpd.

Wheelabrator-Frye has proposed a "mass burning" approach to resource recovery. The principal components of its design are:

- a completely enclosed tipping area and refuse storage pit;

- three independent combustion trains, each incorporating a waterwall boiler, a patented Von Roll reciprocating grate, and a multi-field electrostatic precipitator;

- a metals recovery system which removes ferrous metal from the ash residue using rotating electro-magnets;

- a single turbine-generator set and electrical switchyard;
- an air-cooled or salt-water cooled steam condenser incorporating ocean intake and outfall structures; and
- an administration building, weigh scales, and parking area.

The site layout proposed by Wheelabrator-Frye is shown in Figure II-5, and Figure II-6 contains an artist's rendering of the plant. Figure II-1 is a schematic cross-section of the combustion unit of the facility, and a generalized process flow diagram for the plant is presented in Figure II-7.

2.2.2.1 Receiving

Municipal solid waste would be delivered to the facility by truck. Incoming vehicles would be weighed on a large scale before climbing a ramp up to the tipping floor. From there they would dump their loads into a 6,000 ton capacity (3 days storage) receiving pit. Two overhead cranes would be used to distribute waste within the pit and to load it into the boiler feed chutes.

2.2.2.2 Steam Generation

Hydraulic rams would push refuse from the feed chutes into the combustion chambers of the three boilers. The patented Von Roll grates on which the refuse would burn are inclined and have a reciprocating action that turns and tumbles the material as it moves through the furnace. Each of the three steam generators would be of the single-drum, single-pass water tube type. They would be designed to operate at 900 psig and 830 degrees F. Three multi-field electrostatic precipitators would be provided for particulate removal from the exhaust gases before their discharge through a stack. A 250-foot stack was assumed for air quality modeling; and the City has requested permission from the Federal Aviation Administration (FAA) for a stack up to 290 feet to minimize the proposed facility's effects on air quality. However, the exact height of the stack has not yet been determined. It will not exceed the limit set by the FAA. Their decision is expected shortly.

2.2.2.3 Electrical Power Generation and Distribution

Steam generated in the boilers would be piped to an adjacent straight condensing steam turbine with a rated capacity of 60,755 kilowatts (KW). The turbine would be connected to a 74,600 KVA cooled synchronous generator designed to operate at 13.8 KV with a 0.80 power factor. This, in turn, would feed power into a central station having a main step-up transformer and electrical switchyard.

2.2.2.4 Cooling

Wheelabrator-Frye has proposed the use of ocean water cooling to condense the turbine exhaust steam. The system would include an ocean intake structure and an outfall with diffuser capable of handling the 40,000 gallons per minute (approximately 50 million gallons per day) that would be required. No design studies have been conducted as yet, but it is

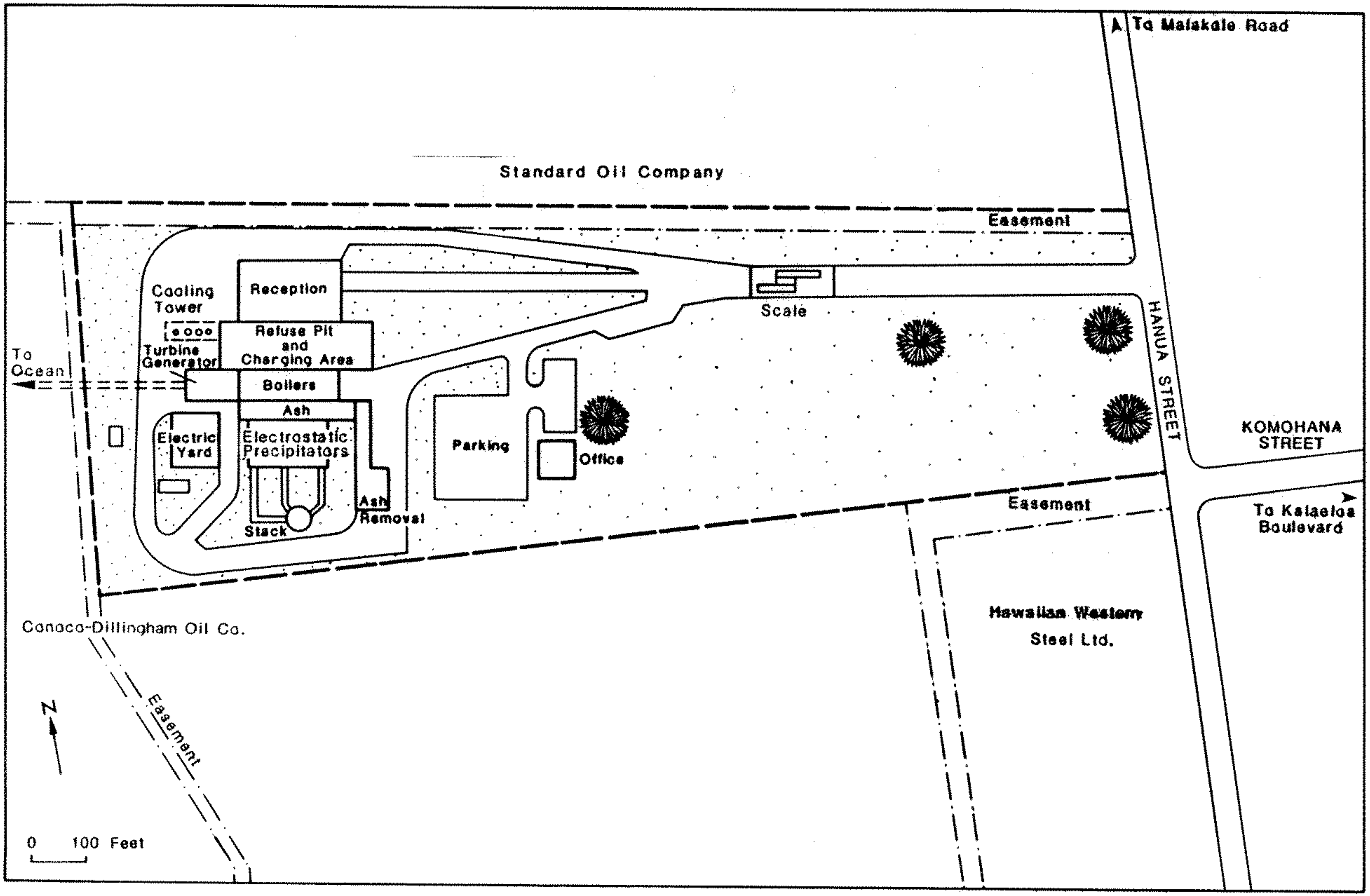


Figure II-5. Site Plan of Facility Proposed by Wheelabrator-Frye, Inc.

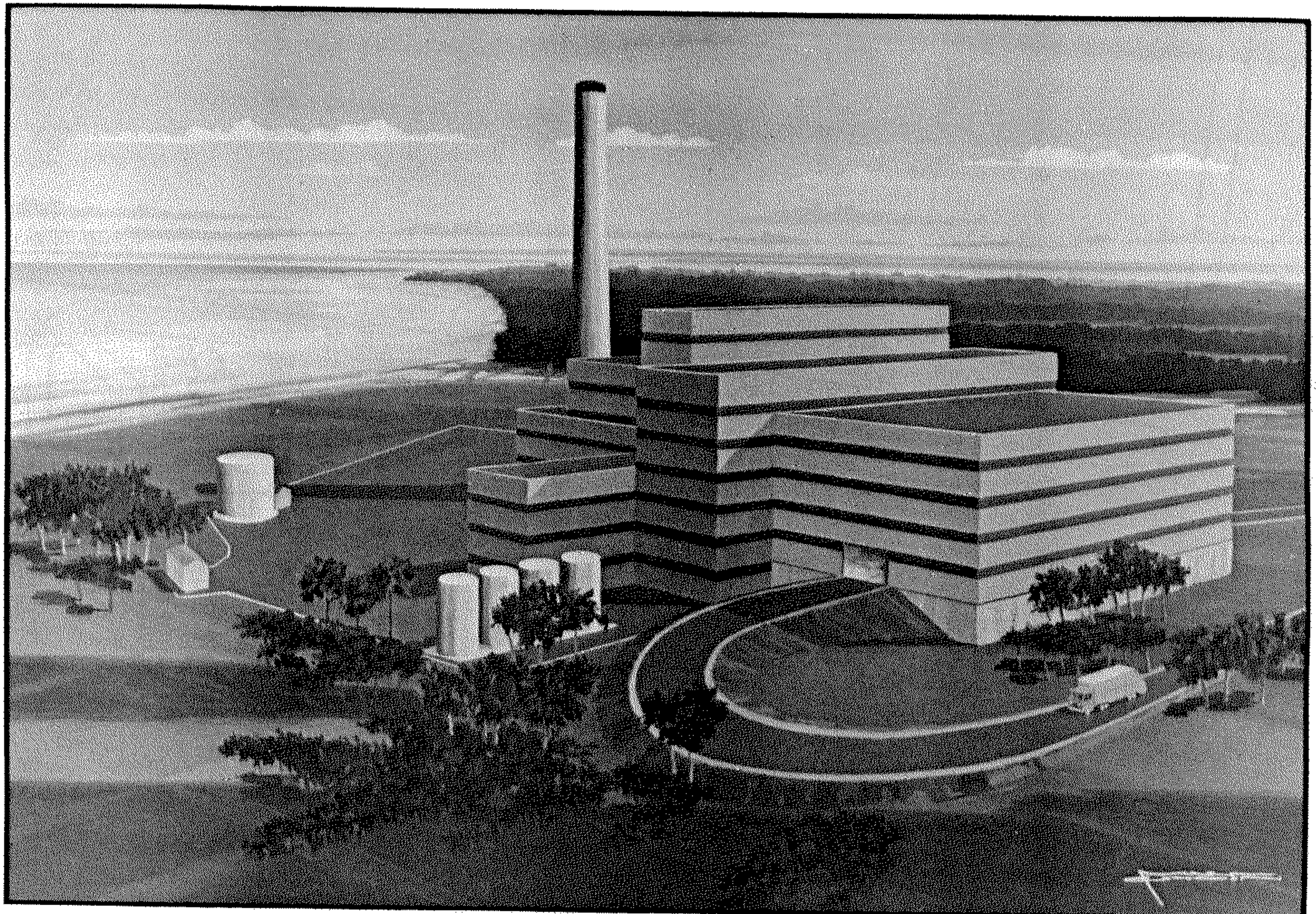


Figure II-6. Artist's Rendering of Mass Burning Facility Proposed by Wheelabrator-Frye, Inc.

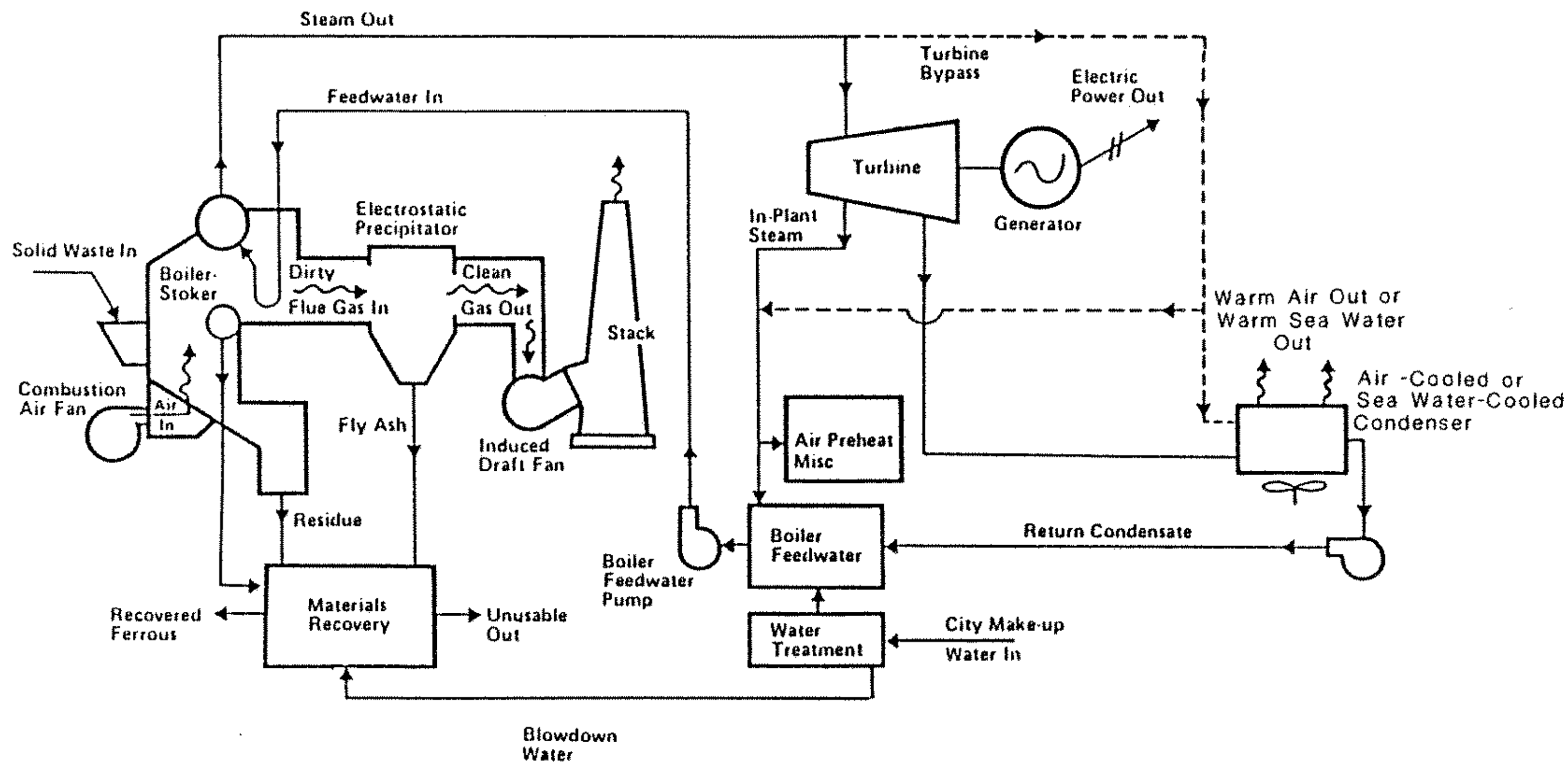


Figure II-7. Generalized Process Flow Diagram of Facility Proposed by Wheelabrator-Frye, Inc.

expected that the outfall would probably be of the velocity cap design. The system would be designed for a maximum temperature rise of 20 degrees Fahrenheit, but the average increase will be considerably less than this. Permits will be required from the U.S. Army Corps of Engineers; the State of Hawai'i Departments of Health, Land and Natural Resources, and Transportation; and the City and County Department of Land Utilization. If the use of ocean water for cooling proved impossible, the facility could utilize air-cooled condensers. However, this would result in a decrease in thermal efficiency.

<u>2.2.2.5 Materials Recovery</u>

Residue from the grates of each boiler would drop into a water-filled ash quench tank. Cooled ash would settle onto drag conveyors at the bottom of each tank. These would carry it up an inclined ramp and allow excess water to drain back into the quench tank. The dewatered ash would then be conveyed and discharged into an ash storage pit. Material would be removed from the storage pit by an overhead travelling bridge crane and dropped into a rotating trommel screen. Electro-magnets would remove ferrous metal from the residue, and conveyors would carry the recovered metal to waiting metal recovery trucks or trailers. Approximately 75 percent (by weight) of the solid waste would be consumed by combustion, about 5 percent consists of recoverable ferrous metal that would be removed by processing, and the remaining 20 percent would consist of ash and other residue that would be disposed of in landfill.

2.2.3 C-E/AMFAC PROPOSAL

As indicted earlier in this chapter, Amfac, Inc. and Combustion Engineering, Inc. have formed a partnership for the purpose of bidding on the Honolulu Resource Recovery facility contract. The partnership is referred to as C-E/Amfac throughout this report.

Combustion Engineering, Inc. (C-E) is internationally known as a supplier of energy systems and for the design and construction of major energy projects. Its 1981 sales were in excess of $3.8 billion. Design and construction experience includes fossil and nuclear steam generating systems, oil refineries, mining and petrochemical processing equipment, and related systems.

C-E is actively involved in solid waste-to-energy projects nationwide. It is negotiating a full-service contract with the Connecticut Resource Recovery Authority for the 2,000 tpd Mid-Connecticut Project and has been selected by the City of Detroit as the supplier of a 3,000 tpd facility. The company was also the low bidder on two facilities that have not been implemented because of external factors; these are the 1,800 tpd HPOWER project here in Honolulu and a 1,200 tpd facility in New Haven, Connecticut. In addition, the City of Madison, Wisconsin operates a resource recovery facility with a capacity of 50 tons per hour that utilizes C-E processing technology. The latter has been operating sucessfully for the past three years. Finally, C-E has extensive experience in the processing and burning of a wide range of other waste materials such as bark, bagasse, wood wastes, dried sludge, nut and rice hulls, and agricultural and industrial wastes.

Amfac, Inc. is a diversified, Hawaii-based company. It owns and operates five major sugar plantations which produce a total of 330,000 tons of sugar annually, about one-third of the state total. Amfac's plantations are leaders in the use of bagasse (the pulp remaining after the juice has been extracted from sugar cane) for power generation. Its bagasse-fueled power plant in Lihue, Kaua'i, furnishes 20 to 30 percent of the island's daytime electrical power needs and up to 80 percent of the off-peak demand.

The C-E/Amfac proposal utilizes a waterwall boiler burning a refuse derived fuel. Unlike the "mass-burning" method proposed by Wheelabrator-Frye, this approach involves processing municipal solid waste before it is burned. The processing results in a fuel which has a higher heat value per pound and more consistent burning properties than the untreated refuse delivered to the facility (hence the name "refuse derived fuel"). Conceptually, the system consists of the following elements:

- a receiving building containing the "tipping floor" from which incoming trucks empty their loads into a large storage area;
- two separate processing lines that extract ferrous metal, remove other non-combustible material destined for landfill disposal, and shred the remaining material into a size suitable for combustion in the facility's boilers;
- an RDF storage building;
- two combustion trains, each consisting of a waterwall boiler and an electrostatic precipitator for particulate removal from the exhaust gases;
- a single stack through which exhaust gases from the two combustion units are discharged;
- a single 62,744 kva condensing turbogenerator and electrical switchyard; and
- an evaporative cooling tower (air-cooled if necessitated by the unavailability of water).

The proposed site plan for the facility is shown in Figure II-8, and an artists's rendering of the plant as it might appear at Campbell Industrial park is shown in Figure II-9. Figure II-10 illustrates the processes that are involved.

2.2.3.1 Receiving

Municipal solid waste is delivered to the facility by trucks entering from Hanua Street. Transfer trailers would be routed to a ground level dumping area: City "Packer trucks" and private haulers would drive up a large ramp and dump their loads into the storage area. The pit can hold approximately 5,700 tons of waste, or about six percent more than the 5,400 tons that are required by the RFP.

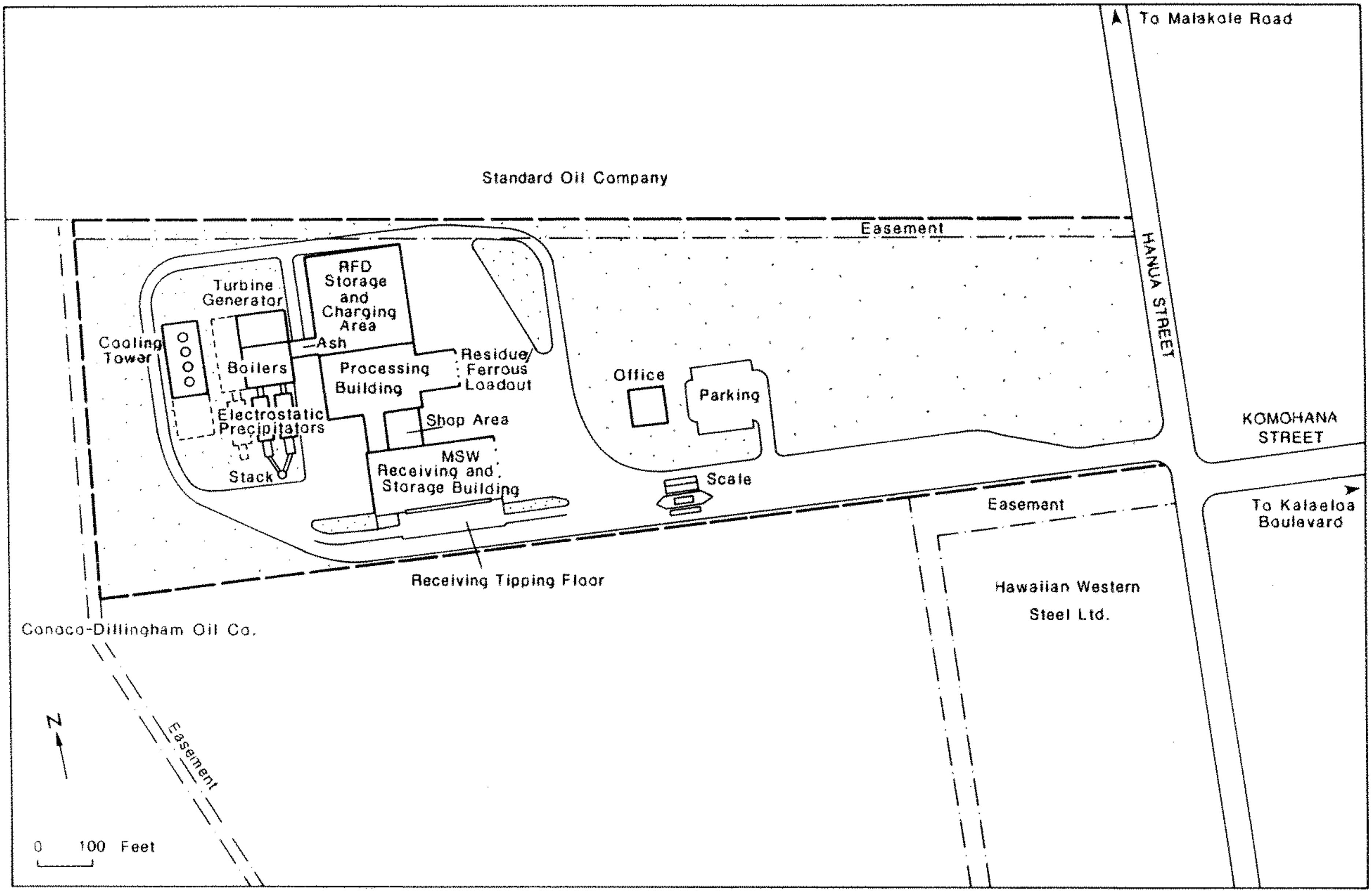


Figure II-8. Site Layout of the Proposed Combustion-Engineering/Amfac Resource Recovery Facility.

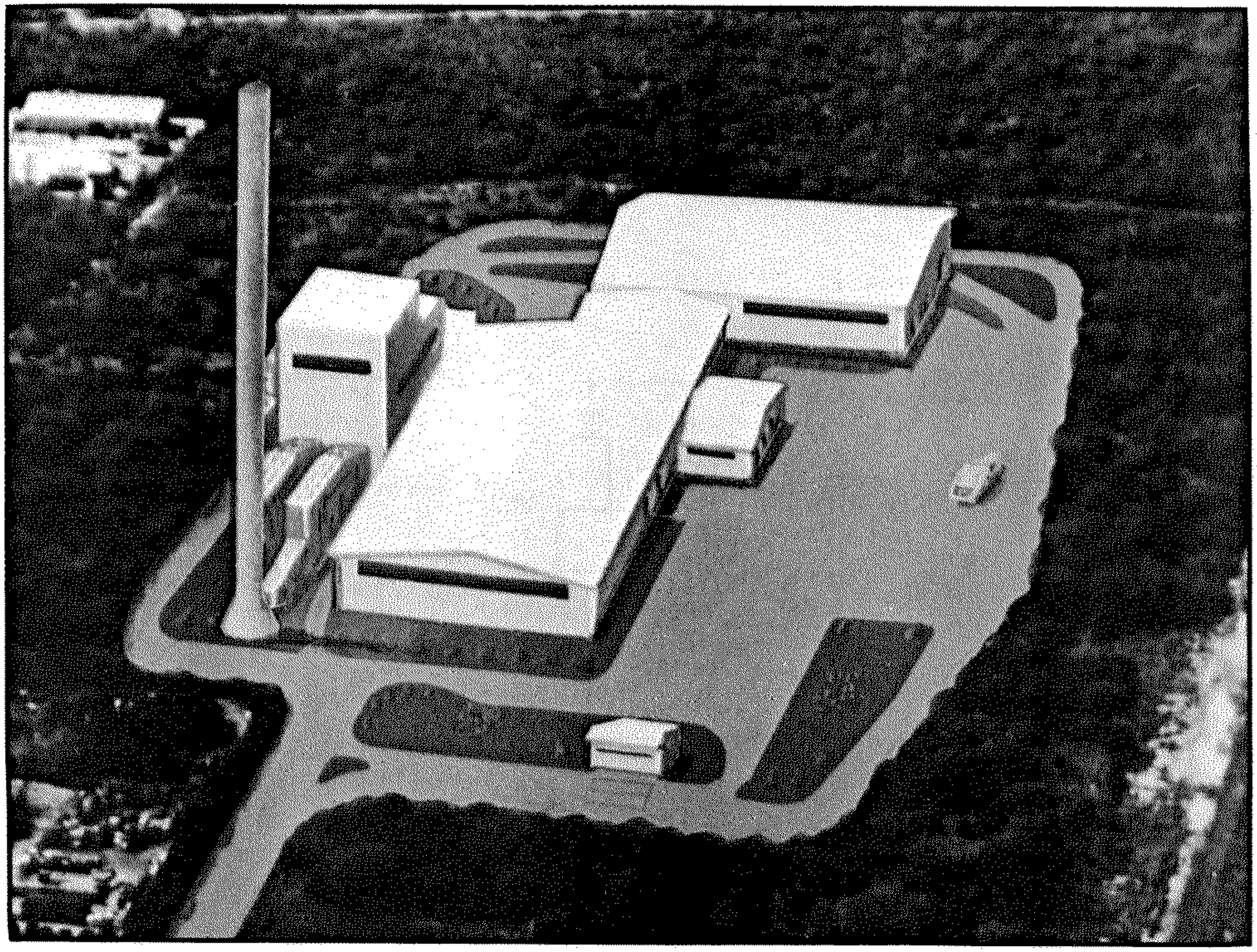
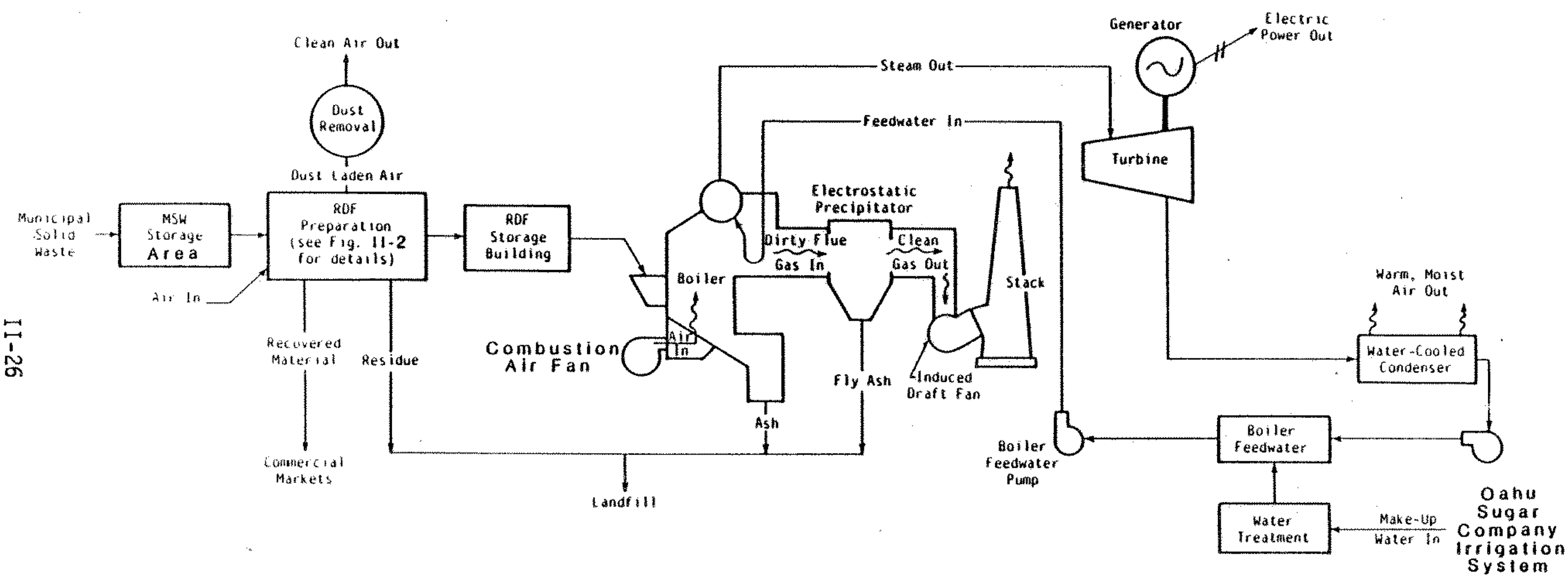


Figure II-9. Artist's Rendering of the Proposed Combustion-Engineering/Amfac Resource Recovery Facility.



Source: Combustion-Engineering/Amfac, December, 1982

Figure II-10. Generalized Process Flow Diagram of the Proposed Combustion-Engineering/Amfac Resource Recovery Facility.

Waste would be spread and compacted in the receiving area by tractor-dozers as it is received; a large front-end loader would be used to feed the conveyors that carry waste from the receiving area into the processing area. Under normal conditions, incoming refuse would be processed on the same day it arrives, and the receiving area would be completely emptied and cleaned. During periods of regular maintenance or equipment malfunction, the waste may remain for a longer period of time before it is processed. To minimize its residence time and the potential for problems from vectors and odors, the waste on the receiving floor would be segregated according to its time of arrival and handled on a "first-in/first-out" basis. Raw solid waste from the refuse storage area would be conveyed to the processing building by an enclosed conveyor belt.

2.2.3.2 Processing

In the processing building, primary shredders would break apart large pieces and prepare the material for ferrous metal recovery by large magnetic separators. Screens, trommels, secondary shredders, and other equipment are used to remove non-combustibles, reduce the average size of the pieces of waste, and otherwise enhance its performance as fuel. Each of the two process lines would be capable of handling 100 tons per hour. At this rate, the average load of 10,800 tons per week could be processed by operating the lines for 11 hours per day, 6 days per week (including scheduled maintenance).

In the system proposed by C-E/Amfac, about 80 percent of the incoming refuse (by weight) would emerge as refuse derived fuel: about 5.5 percent would be recovered as ferrous scrap, 11 percent would be non-combustible residue that is transported to landfill and 3.5 percent would be lost as moisture to the atmosphere. The air-cleaned, densified ferrous metal would be loaded into a trailer positioned below one of two discharge points.

2.2.3.3 Fuel Storage

Fuel storage capacity would be about 2,500 tons. This is sufficient to operate the power plant for two days. RDF would be conveyed from the processing area to the storage building. Once there, it could be fed directly into the boilers or stored. Large rubber-tired loaders would be used for stockpiling the fuel.

2.2.3.4 Steam Generation

Fuel would be fed from the RDF storage area to the boilers via dual conveyors. The boilers themselves would be manufactured by C-E and are of standard waterwall design. They would be equipped with spreader-stokers for semi-suspension firing of the RDF, and each would be designed for 830 degrees F./900 psig steam. Combustion gases would be passed through multi-field electrostatic precipitators for removal of particulate before being exhausted to the atmosphere through a single stack containing two flues. For air quality modeling a 195-foot stack was assumed. As mentioned in Section 2.2.2.2, the exact height will be determined after the FAA issues its decision on the stack height limit.

2.2.3.5 Electrical Power Generation and Distribution

Steam generated in the boilers would be piped to a turbine-generator set. The turbogenerator would be a heavy-duty, utility class model with a maximum continuous operating capability of 48,200 KW at a 0.85 power factor. The generation system would consist of the generator, a set of iso-phase bus connections, and a 13.8 KV to 44 KV transformer. Electrical service for start-up and export of energy would be provided.

2.2.3.6 Cooling

C-E/Amfac prefers to utilize a water-cooled steam condenser. Cooling water for the condenser would be provided by a four-cell, mechanical draft, cross flow cooling tower with four vertical-turbine circulating pumps. C-E/Amfac proposes to obtain the cooling water from its Oahu Sugar Company subsidiary's irrigation system. A new pipeline would be needed, and approval of the State Department of Land and Natural Resources would be required to divert the well water from its current agricultual use to the proposed resource recovery facility. C-E/Amfac's proposal indicates that it would also be possible for the facility to utilize air-cooled condensers.

2.2.3.7 Other Equipment and Buildings

In addition to the items noted above, the C-E/Amfac proposal also provides for:

- scales for weighing incoming and outgoing trucks; and
- transfer trailer parking.

2.2.4 ELECTRICAL POWER TRANSMISSION LINE

As part of the resource recovery project, a new 138-kv electrical power transmission line, running from the facility to the Hawaiian Electric Company's Campbell Industrial Park Substation, would be required. The route of the line is shown and discussed in Section 4.7.

CHAPTER III

THE RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AFFECTED AREA

There are a number of different State and County plans, policies, and controls that bear some relationship to the proposed resource recovery project. These fall into three categories: (1) policy plans, (2) land use plans, and (3) other programs and controls. The resource recovery facility's consistency with each of them is discussed below.

3.1 POLICY PLANS

Both the State of Hawai'i and the City and County of Honolulu have adopted policy plans to guide the physical, social, and economic development of the islands and O'ahu. These plans contain general objectives and policies which establish a framework for more detailed land use planning of regions and communities. They are also intended as the basis for functional plans covering such topics as transportation, housing, and economic development. Policy plans do not contain land use maps and, therefore, rarely become specific in their recommendations regarding a particular site. Hence, our discussion of them is necessarily general.

3.1.1 THE OAHU GENERAL PLAN

In 1977, the City and County of Honolulu adopted a new Oahu General Plan containing 180 policies designed to guide physical development, government operations, and social and economic programs for the island of O'ahu through the year 2000. The General Plan has since been amended to include 18 additional policies concerning energy use and conservation. Many of the policies in the General Plan have little or no relationship to the proposed resource recovery project. Listed below are those policies most relevant to it. Each is followed by a discussion of the proposed facility's conformance or non-conformance with it.

> Policy: Encourage the recycling of solid-waste materials...(Transportation and Utilities, Objective B, Policy 6).
>
> Policy: Encourage the development of new technology which will reduce ...the cost of waste disposal (Transportation and Utilities, Objective B, Policy 3).
>
> Policy: Provide safe and efficient...waste-disposal services (Transportation and Utilities, Objective B, Policy 5).
>
> > Discussion: Clearly, the intent of solid waste resource recovery is to apply new technology to the efficient conversion of "waste" into both energy and recoverable resources. Economically, the objective is to dispose of waste for a 20-year period at a cost below that of landfill, the next most economical method available. One of the goals stipulated in the Request for Proposals for the resource recovery project is that within five years of its opening

it can be operating at an annual cost less than or equal to that projected for landfill and that the total cost over the 20-year life of the project will be less than or equal to that of landfill. The City reserves the right to reject any proposal whose cost would exceed that projected for operation of a sanitary landfill.

In terms of resource recovery, ferrous metals would be retrieved and the potential (largely dependent upon market conditions) for the future recovery of glass, aggregates, and non-ferrous metals such as copper and aluminum would be provided. It would not recycle paper; instead, the facility would use it as a fuel.

Policy: Require the safe disposal of hazardous waste (Transportation and Utilities, Objective B, Policy 7).

Discussion: Solid waste resource recovery would not solve the problems of hazardous waste disposal and is not intended to do so. Hazardous waste would not be accepted at the facility. Hence, other provisions would still have to be made for the disposal of such material.

Policy: Plan for the timely and orderly expansion of utility systems (Transportation and Utilities, Objective B, Policy 3).

Discussion: Sale of electricity generated from combustion of refuse to the Hawaiian Electric Company would result in a reduced demand on HECO's power generation facilities. This, in turn, would postpone the time when additions to the facilities would be required and would lessen some of the burden of providing power for a rapidly growing population.

Policy: Evaluate the social, economic, and environmental impact of additions to the...utility systems before they are constructed (Transportation and Utilities, Objective D, Policy 4).

Discussion: Evaluation of the social, economic, and environmental impact of the resource recovery facility is the purpose of this statement, but it should also be pointed out that all of these factors were considered in screening the various technical proposals originally submitted, as well as in requiring changes in those proposals still under consideration (see Chapter II for a discussion of the procurement process being used). The social, economic, and environmental impacts have been considered not as an afterthought, but rather as an integral part of the design process.

Policy: Establish economic incentives and regulatory measures which will reduce Oahu's dependence on petroleum as its primary source of energy (Energy, Objective A, Policy 2).

Policy: Support programs and projects which contribute to the attainment of energy self-sufficiency on Oahu (Energy, Objective A, Policy 3).

Policy: Give adequate consideration to environmental, public health and safety concerns, to resource limitations, and to relative costs when making decisions concerning alternatives for conserving energy and developing natural energy resources (Energy, Objective A, Policy 5).

Policy: Work closely with the State and Federal governments in the formulation and implementation of all City and County energy-related programs (Energy, Objective A, Policy 6).

Discussion: Because of the many uncertainties that would face an entrepreneur attempting to construct and operate a private resource recovery facility, there is little likelihood that large-scale resource recovery would become a reality on O'ahu in the near future without direct City involvement. In reality, solid waste resource recovery is a program which provides the economic incentives and guarantees necessary to induce private industry to construct such a facility. As indicated in Chapter II, the resource recovery program is the culmination of years of cooperative efforts between the State and County governments. The two organizations still competing for the contract are the survivors of a rigorous screening process designed to insure that all environmental, public health, and safety concerns have been met. At the same time, it would generate about five percent of the electrical energy consumed on O'ahu. The implications of this are discussed in the "Energy" and "Economic" sections of Chapter IV.

Policy: Support the increased use of operational solid waste energy recovery and other biomass energy conversion systems (Energy, Objective C, Policy 2).

Discussion: The proposed solid waste resource recovery project is clearly consistent with this policy.

Policy: Allocate efficiently the money and resources of the City and County in order to meet the needs of Oahu's anticipated future population (Population, Objective B, Policy 1).

Discussion: As mentioned previously, the resource recovery program is designed to lower the cost of solid waste disposal over a 20-year period, with visible economic benefits beginning to accrue to the City and County within five years. It should also be noted that project financing would be via special purpose revenue bonds issued in the name of the winning bidder, not the City, and that a portion of the capital costs could be funded privately. Hence, capital risks would be assumed largely by private industry.

In terms of providing for population growth, the proposed resource recovery system is designed to meet an existing solid waste disposal need rather than one that would be generated only by further population growth. However, the City and County has required a future expansion capability of 33 percent in all designs. This insures that the facility will be able to respond to increased solid waste disposal needs brought about by further population growth.

Furthermore, if "the development of Ewa as a major residential, retail, and office center" is to be encouraged (as called for in the General Plan, Physical Development and Urban Design, Objective C, Policy 2), it can further be argued that the proposed resource recovery system will support such development.

Policy: Encourage the growth and diversification of Oahu's economic base (Economic Activity, Objective A, Policy 1).

Policy: Encourage the development of industries which will contribute to the economic and social well-being of Oahu residents (Economic Activity, Objective A, Policy 2).

Discussion: While not an industry as such, a solid waste resource recovery facility is more labor-intensive than landfill, the only available alternative. It is expected to employ 50 to 75 people on the site, as well as to contribute indirectly to the employment of others in the recovered materials industry. Though the size of the future market for recovered materials is unpredictable at present, recycling does keep jobs in the local economy to the extent that it is a form of import substitution. The energy produced by a resource recovery program can also be viewed as an import substitution -- in this case for oil. One might also justifiably anticipate future development of ancillary industries devoted to the recycling of metals (e.g., aluminum or tin), glass, or aggregates.

Policy: Maintain an adequate supply of water for both future residents and future visitors (Transportation and Utilities, Objective B, Policy 1).

Policy: Maintain an adequate supply of water for future agricultural and industrial needs (Transportation and Utilities, Objective B, Policy 2).

Discussion: Unlike landfill, the proposed resource recovery system requires water. Since the site is situated within the Pearl Harbor Basin Groundwater Control Area established by the State Department of Land and Natural Resources, minimizing consumptive use of water is of considerable concern. The C-E/Amfac system would employ an evaporative cooling system consuming about one million gallons per day. C-E/Amfac proposed to divert this water from its present consumer, the O'ahu Sugar Company, an Amfac subsidiary. The C-E/Amfac system, therefore, would not increase withdrawals from the Pearl Harbor Basin. Wheelabrator-Frye's facility would avoid the use of fresh water for cooling by employing a once-through ocean water cooling system.

Policy: Encourage the continuing development of Barbers Point as a major industrial center (Physical Development and Urban Design, Objective C, Policy 2).

Discussion: Clearly the establishment of a resource recovery plant in Campbell Industrial Park would be consistent with this policy of the City and County.

Policy: Preserve older communities through self-help, housing-rehabilitation, and other governmental programs (Housing, Objective C, Policy 6).

Policy: Encourage, wherever desirable, the rehabilitation of existing substandard structures (Physical Development and Urban Design, Objective E, Policy 2).

Policy: Preserve and restore, to the extent possible, buildings and sites of historic or cultural significance, including those on the State and National registers (Culture and Recreation, Objective A, Policy 3).

Policy: Encourage the restoration and preservation of early Hawaiian artifacts and landmarks (Culture and Recreation, Objective A, Policy 4).

> Discussion: The proposed site at Campbell Industrial Park presents no conflicts with the above policies. The site contains no structures. Limestone sinkholes which may contain artifactual and/or palaeontological remains are present on the site. Some archaeological salvage may be necessary before construction of the proposed facility. There appears to be nothing on the site worthy of preservation *in situ*.

Policy: Preserve agricultural land in Ewa, in Central Oahu, and along the North Shore to ensure the continuation of sugar and pineapple as viable industries (Economic Activity, Objective C, Policy 3).

> Discussion: In addition to the fact that the resource recovery facility site itself would utilize no agricultural land, it should also be noted that, by reducing landfill, solid waste resource recovery would greatly lessen the need to utilize arable land for that purpose.

Policy: Protect Oahu's scenic views, especially those seen from highly developed and heavily travelled areas (Natural Environment, Objective B, Policy 2).

Policy: Locate roads, highways, and other public facilities and utilities in areas where they will least obstruct important views of the mountains and the sea (Natural Environment, Objective B, Policy 2).

> Discussion: The proposed site is in an industrial park and is not close to a major road. Development of a resource recovery facility there would have no effect on significant views.

Policy: Protect Oahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development (Natural Environment, Objective A, Policy 1).

Policy: Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, and water-recharge areas (Natural Environment, Objective A, Policy 2).

Policy: Protect the natural environment from damaging levels of air, water, and noise pollution (Natural Environment, Objective A, Policy 6).

Policy: Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of Oahu (Natural Environment, Objective A, Policy 7).

Policy: Prohibit major sources of noise and air pollution from residential areas (Physical Development and Urban Design, Objective A, Policy 7).

Discussion: Many environmental factors were considered by the City during its review and evaluation of the offerors' proposals. As a result, numerous modifications have been made in order to eliminate or reduce adverse effects. The solid waste resource recovery proposals would comply with all City and County, State, and Federal environmental standards.

Policy: Design public structures to meet high aesthetic and functional standards and to complement the physical character of the communities they serve (Physical Development and Urban Design, Objective D, Policy 6).

Discussion: Though any resource recovery plant would look like the industrial facility it is, visual aesthetics have been a major design consideration. In addition to undergoing design review by the City, a plant constructed at Campbell Industrial Park would have to comply with design standards set by the Campbell Estate. The proposed plant designs call for an attractive vegetation screen to partially shield the facility from public view. Refer to the visual impacts section of Chapter IV for further discussion.

Policy: Design safe and secure public buildings (Public Safety, Objective B, Policy 3).

Discussion: Methods used to insure adequate safety would include:

- Fenced perimeter and controlled access.
- Detection of explosive material prior to refuse processing.
- Compliance with the Federal Occupational Safety and Health Act and all State Health Department standards.

3.1.2 THE HAWAII STATE PLAN

The Hawaii State Plan, adopted in 1978, consists of a series of broad goals, objectives, and policies which are to act as guidelines for programs that will determine the growth and development of the State. Because the goals, objectives, and policies are broadly stated, it is difficult to say conclusively that the proposed solid waste resource recovery project is or is not in conformance with any given policy, but three policies with which it seems clearly consonant stand out:

- Accelerate research and development of new energy-related industries based on wind, solar, ocean, and underground resources and solid waste (Section 10, Objective B, Policy 4).

- Promote the use of new energy sources (Section 18, Objective B, Policy 6).

- Encourage re-use and recycling to reduce solid and liquid wastes and develop a conservation ethic (Section 15, Objective B, Policy 2).

3.1.3 STATE FUNCTIONAL PLANS

State Functional Plans are intended to provide more detail to the State Plan by addressing specific topics, such as energy, water resources, conservation, and housing, on a statewide basis. As defined in the 1978 Hawaii State Planning Act, a functional plan is to set forth "the policies, programs and projects designed to implement the objectives of a specific field of activity when such activity or program is proposed, administered, or funded by any agency of the State." Adoption of the State Functional Plans has been delayed. At the Governor's directive, they serve only as administrative guides for State agency actions. However, the 1980 State Legislature did adopt a State Energy Plan that calls for increased utilization and commercialization of alternate energy sources (Objective II.A) and for greater energy recovery from commercial and industrial processes (Objective III.A.(2). The proposed resource recovery project is consistent with both of these objectives.

3.2 LAND USE PLANS

Land use plans are much more specific than policy plans, primarily because they contain maps relating to the particular area of concern. Three relatively specific land use plans and controls affect the project. These are: the State Land Use District Maps, the County Development Plan for the 'Ewa District, and the County Comprehensive Zoning Ordinance.

3.2.1 STATE LAND USE

The State Land Use Regulations establish four different districts into which all lands in the State fall: Conservation, Agricultural, Rural, and Urban. The proposed solid waste resource recovery facility site is within the Urban district. All types of urban activities are allowed within this district, and specific land use controls for the area are relegated to the County.

3.2.2 COUNTY DEVELOPMENT PLAN

The proposed site of the resource recovery facility is within a large area at Campbell Industrial Park that is designated for heavy industrial use on the 'Ewa Development Plan. It has also been designated for resource recovery use, 2-6 years category, on the Public Facilities map that is part of that Plan, and is consistent with its other provisions.

3.2.3 COUNTY ZONING

The site is zoned I-2 (Heavy Industrial District) and therefore qualifies as a suitable location for an industrial project such as the proposed solid waste resource recovery facility.

3.3 OTHER PROGRAMS AND CONTROLS

3.3.1 FEDERAL FLOOD INSURANCE PROGRAM

Several years ago, the Federal Government established a flood insurance program intended to make insurance available to homes and establishments in flood-prone areas and to reduce the need for the Federal Government to provide massive disaster relief funds following major riverine and coastal floods. Flood Insurance Rate Maps for the island of O'ahu prepared by the U.S. Department of Housing and Urban Development designate the site as an area of "undetermined, but possible, flood hazards" because no detailed studies of the area had been conducted at the time the maps were prepared. As indicated in Chapter IV of this report, further review as part of this study indicates that flooding of the site will not be a problem.

3.3.2 AGRICULTURAL LANDS OF IMPORTANCE TO THE STATE OF HAWAII

In 1977, the State Board of Agriculture, concerned with the seemingly inexorable shift of land use from agricultural to other uses, adopted a system for identifying and classifying the state's best agricultural lands. It then mapped those lands for the entire state, classifying them as either: (1) Prime Agricultural Land, (2) Unique Agricultural Land, or (3) Other Important Agricultural Land. Land considered for classification was not necessarily in agricultural land use at the time, nor does the classification of land as agriculturally important necessarily consign that land to agricultural use. Rather, the classification system serves the purpose of guiding state decision makers in long-range planning. As indicated in Section 4.1, the resource recovery facility site would not involve agriculturally significant lands.

3.3.3 SPECIAL MANAGEMENT AREA

Pursuant to the provisions of Chapter 205-A, Hawaii Revised Statutes, as amended by Act 176/1975, in November 1975, the Honolulu City Council adopted Ordinance No. 4529 establishing a Special Management Area (SMA). This ordinance contains maps which clearly define the geographic boundaries of the SMA, outlines procedures to be followed in granting permits for development within the management area, and establishes guidelines to be used in deciding upon the acceptability of a proposed action.

The site of the proposed resource recovery facility lies well outside the Special Management Area. However, if ocean water cooling were to be employed, the pipeline(s) between the facility and the shoreline would cross the SMA, and its construction would require and SMA permit.

The on-shore portion of the pipeline would be buried, but its construction would entail excavation and other above-ground work. This would not:

- affect the accessibility of beaches, recreation areas, or natural reserves (except brief periods during construction when temporary fences might have to be installed around open pits, and/or construction equipment, to maintain public safety);
- adversely affect the resources of the Special Management Area;
- significantly alter existing landforms and vegetation or increase dangers from natural hazards, such as flooding and landslides.

It is the City's intent that the pipeline be constructed in such a way as to minimize physical alterations, to preserve public recreation areas, to preserve the line of sight to the sea, and to maintain water quality, fisheries resources, and other natural and cultural values. Specific means of accomplishing this will be determined if the winning bidder elects to utilize ocean water cooling, and an SMA permit will be sought at that time.

CHAPTER IV

PROBABLE IMPACTS AND MITIGATION MEASURES

This Chapter is divided into twelve major parts:

- o 4.1 Impacts on Soils, Geology, and Physiography
- o 4.2 Noise Impacts
- o 4.3 Hydrologic Impacts
- o 4.4 Biological Impacts
- o 4.5 Traffic Impacts
- o 4.6 Energy Impacts
- o 4.7 Visual Impacts
- o 4.8 Impacts on Historical, Archaeological, and Palaeontological Resources
- o 4.9 Economic Impacts
- o 4.10 Social Impacts
- o 4.11 Air Quality Impacts
- o 4.12 Impacts on Air Navigation

In general, each of these sections contains a brief description of relevant project-related actions, describes the changes that these actions would cause, and assesses the significance of the impacts as judged against accepted standards and criteria. Where appropriate, unusual measures which have been incorporated into the design to mitigate potential adverse effects are noted. When substantial adverse impacts remain despite the mitigative measures that are now proposed, additional means of reducing or eliminating them are given.

The primary focus of the discussion is on the resource recovery facility itself. However, the analysis also covers a new 138-kv overhead line needed to carry electrical power from the proposed resource recovery facility to the existing Hawaiian Electric Company Campbell Industrial Park Substation. This power line would be constructed along existing roadways adjacent to a smaller transmission line. Because of its location within the area already cleared for the roadway, its erection would not involve significant construction activities, disruption to existing biota, or other adverse impacts. However, the poles and overhead power lines would be visible from nearby areas, and their effect on the visual environment is discussed in Section 4.7.

4.1 IMPACTS ON SOILS, GEOLOGY, AND PHYSIOGRAPHY

4.1.1 INTRODUCTION

In considering the effect that the proposed resource recovery project could have on the physiography, soils, and geological resources of the proposed site, our analysis focused on four broad topics or questions:

- Do soils or geology impose constraints on the design of a large industrial facility such as is proposed? If so, what are they?
- Would industrial use of the site prevent agricultural use of fertile soils or preclude the future use of valuable mineral resources?
- Would construction of the proposed facility lead to significant physiographic changes on the project site or in areas where borrow material might be obtained?
- Would the facility be subject to significant hazards from earthquakes or other soil or geological phenomena?

The subsections which follow contain a brief description of existing conditions and answers to these questions. They indicate that the proposed project would have no significant adverse impact in these areas.

4.1.2 OVERVIEW OF EXISTING PHYSIOGRAPHIC, SOIL, AND GEOLOGIC CONDITIONS

Campbell Industrial Park (CIP) is situated on the western portion of O'ahu's 'Ewa plain. It is quite flat, with the 20-foot contour being more than a mile inland. The surface elevation of the resource recovery facility site ranges from about six feet above mean sea level (msl) at its makai end to about ten feet above msl along Hanua Street.

The 'Ewa plain is made up of interbedded coral reef formations, marine sediments, and alluvium. The basement complex consists of basaltic lavas from the Waianae series. Both the coral reef formations and the basaltic lavas have generally high porosity and permeability; the marine sediments and alluvial deposits have much lower permeability. Because of this, they inhibit the movement of water. A relatively thick layer of these poorly permeable materials separates the basalt from the strata above and is commonly referred to as "caprock". Based on the site's distance from the Waianae Mountains and estimates that the average dip of lavas in the Waianae volcanic series is five degrees, these coastal plain formations are believed to have a thickness of 600 to 800 feet in the vicinity of the project site.

In the late 1960s, the CONOCO-Dillingham Oil Company proposed an oil refinery for the area now under consideration for the resource recovery facility. As part of their feasibility studies, CONOCO-Dillingham commissioned Dames & Moore to conduct limited subsurface investigations, including a test well situated just southwest of the proposed resource recovery site. Results of that study (Dames & Moore, September 19, 1972), together with generalized information from work conducted elsewhere on the

'Ewa plain were used as the basis of the cross-sectional drawing shown in Figure IV-1.

Sinkholes formed by dissolution of the limestone are abundant on the proposed site. However, many have been wholly or partially filled as a result of rough grading conducted in the early 1960s. In general, the sinkholes that are still visible are somewhat smaller and less numerous than those encountered further north in Campbell Industrial Park.

4.1.3 CONSTRAINTS IMPOSED BY SOILS OR GEOLOGY

4.1.3.1 Seismicity

A seismic risk map for the Hawaiian Islands was compiled by the U.S. Coast and Geodetic Survey (U.S.C. & G.S.) in 1949 as part of a nationwide study. All of O'ahu was placed in Zone 1, the next-to-lowest risk category. The maps were later withdrawn as a result of objections to the way in which some of the zone boundaries were drawn. However, the map for the Hawaiian Islands has continued to be part of the Uniform Building Code, and it is the basis for the earthquake design standards in the City and County of Honolulu Building Code. The resource recovery facility would be designed to comply with these standards.

Furumoto et al. (June 1972:43) note that the seismic zoning established by the U.S.C. & G.S. and later incorporated in the Building Code is probably based on the April 2, 1868 earthquake centered in Ka'u on the Big Island. They argue that earthquakes centered in the East Molokai Fracture Zone constitute a more serious threat to O'ahu and suggest that O'ahu might deserve a Zone 2 rating if this is taken into account. As of this date, the Honolulu Building Code structural design standards are still based on seismic Zone 1 forces, and they constitute a minimum to which the resource recovery facility must be designed.

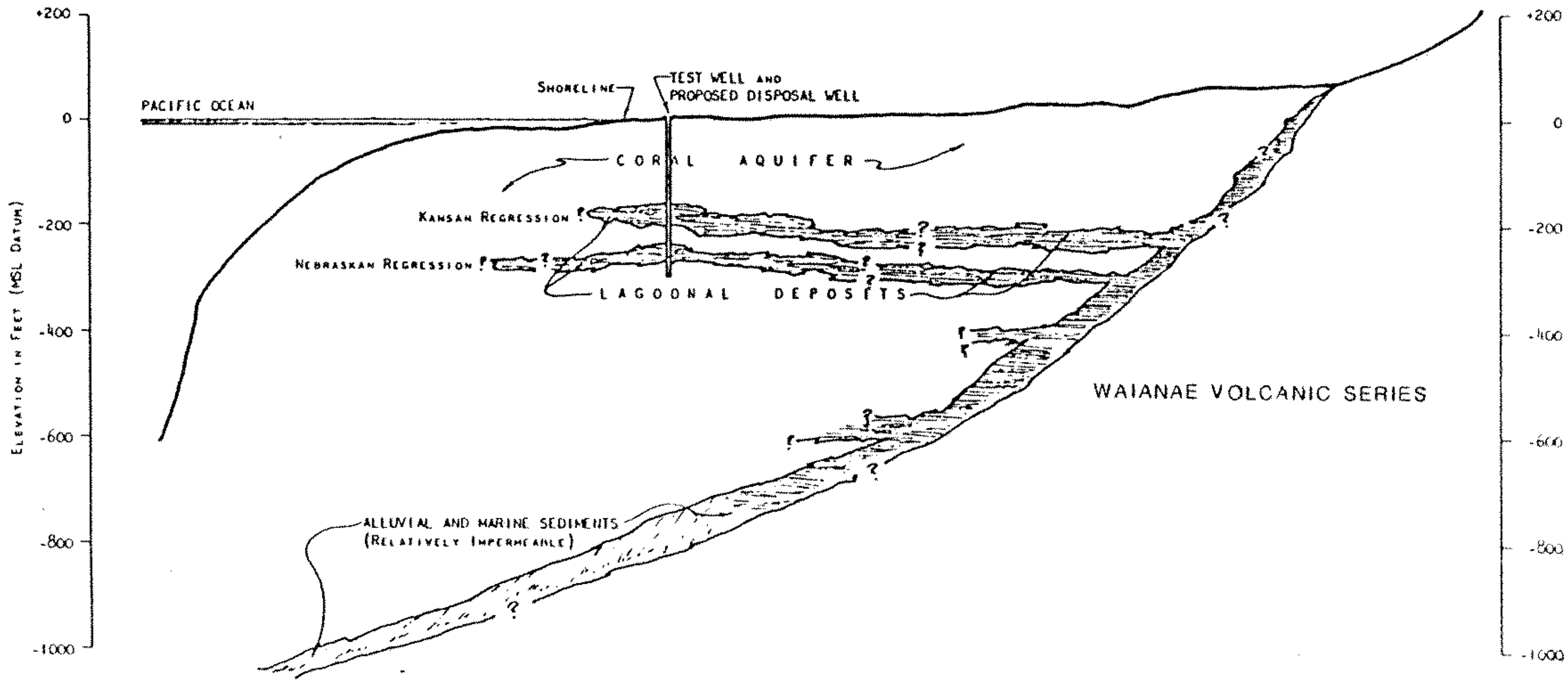
4.1.3.2 Foundation Conditions

Engineers familiar with soil and geologic conditions at Campbell Industrial Park report that the coral there typically has a bearing capacity of approximately seven tons per square foot. This is sufficient for all the facility designs under consideration. Because of the numerous sinkholes and solution channels that are present in the limestone, it is normal practice to investigage the proposed location of each column footing by boring. When voids in the coral are found, they are filled with concrete grout. The relatively large size of the resource recovery equipment and structures has led all the offerors to propose slab on grade foundations; spread footings would be used where necessary for major pieces of equipment, especially those imposing large dynamic loads. This approach appears adequate, and no foundation problems are expected.

4.1.4 OTHER POSSIBLE EFFECTS

4.1.4.1 Suitability of Soils for Agricultural Use

The extremely shallow calcareous soil mantle present on the site is classified by the U.S. Soil Conservation Service of the U.S. Department of



GENERALIZED GEOLOGIC CROSS-SECTION

FROM OAHU GEOLOGY IN CONJUNCTION WITH CORES FROM THE CONOCO-DILLINGHAM
OIL COMPANY TEST WELL AT BARBERS POINT

SCALE EXAGGERATED   VERTICAL/HORIZONTAL

Figure IV-1. Generalized Geologic Cross-Section

Agriculture (August 1972:29, 31) as "Coral Outcrop". It is not suitable for agricultural use (Hawaii, State of, Department of Agriculture, January 1977).

4.1.4.2 Physiographic Changes

In general, neither the C-E/Amfac nor Wheelabrator-Frye proposal would entail significant physiographic modifications to the site. From 25,000 to 35,000 cubic yards of fill might be imported to raise the receiving area above the water table and to form the approach and exit ramps. The source of this material is not known at this time. But the volume is small enough that nearby sources appear adequate.

4.1.4.3 Mineral Resources

The limestone on the 'Ewa plain has been used as a construction material for many years. Trucks ply regularly between the cement plant just to the south of the resource recovery facility site and a quarry located in the vicinity of the Barbers Point Deep Draft Harbor. However, the site under consideration for the resource recovery facility is an unlikely candidate for quarrying operations because of its low elevation and location in the midst of urban development. In view of the abundant supplies of limestone that are available elsewhere in the region, no adverse impact on the availability of mineral resources is expected as a result of the proposed project.

The proposed resource recovery facility would result in the recovery of significant quantities of metals and other materials from the City's refuse, to say nothing of the reduction in the use of fossil fuels which is one of its primary goals (see discussion in Section 4.6 of this chapter). Because of depressed market conditions, present plans call only for the recovery of the ferrous metal contained in such things as beverage and food cans, nails, screws, castings, tubing, and machine parts. Data contained in offerors' technical proposals suggest that a resource recovery facility with a throughput of 560,000 tons per year would yield nearly 30,000 tons of ferrous scrap metal annually.

In addition to the ferrous metal recovery, the potential also exists for the recovery of other materials if a financially viable market for them develops. Included in this group is aluminum (1,600 tons per year), heavy non-ferrous metals such as brass and copper (450 tons per year), and aggregate for road construction and other civil works (80,000 tons per year). The numbers in parentheses indicate the approximate amount present in a one year supply of refuse.

4.2 NOISE IMPACTS

4.2.1 INTRODUCTION

The proposed resource recovery plant is a major industrial facility, and many of the processes that are involved have the capacity to produce high noise levels. In addition, truck traffic to and from the facility is a significant noise source capable of affecting properties removed from the plant itself. Because of this, Darby-Ebisu & Associates, an O'ahu-based acoustical engineering firm, was commissioned to study the major noise-producing elements of the project. Results of their study, together with information developed during the firm's prior study of noise associated with the HPOWER project (Honolulu, City and County of, Department of Public Works, May 1980) form the basis for the following discussion.

The study of potential noise impacts involved several different tasks:

- o Extraction of relevant information from technical proposals and, where necessary, solicitation of supplementary data from the offerors.
- o Measurement of noise from refuse trucks and existing vehicular traffic, trucks in the tipping area of the Ke'ehi Transfer Station, and the electrostatic precipitators at the Waipahu Incinerator.
- o Measurement of existing background noise levels.
- o Calculation of property-line noise levels based on the equipment and site layout identified in each proposal.
- o Calculation of noise resulting from the addition of facility-related vehicular traffic to forecast non-project traffic.

The results of these tasks are discussed in the four sub-sections which follow. The first explains the noise descriptors that are used and indicates the land uses that are considered compatible with different noise levels. The second characterizes the existing noise environment of the site. The third section identifies and discusses expected impacts from fixed plant equipment, on-site movement of vehicles, and off-site vehicular traffic. The final paragraphs review the noise mitigation measures that may be required to insure compliance with State and County noise standards.

4.2.2 NOISE DESCRIPTORS AND THE RELATIONSHIP OF NOISE LEVELS TO LAND USE COMPATIBILITY

Increasingly, the "Day-Night Sound Level" (Ldn) is being used to describe general environmental noise. It is a 24-hour average sound level in which nighttime (10:00 pm to 7:00 am) noise levels are increased by 10 decibels before calculation of the 24-hour average. The Air Force, Army, and Navy adopted the Ldn metric in June, 1978. The current "HUD Environmental Criteria and Standards" adopted as a replacement for HUD Circular 1390.2 (a pioneer document) also uses this metric, and it is recommended by the American National Standards Institute (May 29, 1980) for determination of land use compatibility. Following the introduction of the Ldn metric, a consensus has developed among Federal agencies to the effect that an Ldn level of 65 is the upper limit of acceptable noise for residential areas. The U.S. Environmental Protection Agency's previous recommendation that Ldn 55 or less be used as the standard for residential areas has not been adopted by other agencies, but it is recognized as a desirable long-term goal.

The Ldn levels typical of different kinds of neighborhoods are illustrated in Table IV-1. That table indicates that levels of Ldn 60 or greater are common along city streets with daily traffic volumes in excess of 2,500 vehicles. Ldn values of 65 to 70 are typical of city business districts where vehicular traffic is the dominant noise source.

Noise regulations established by the State Department of Health (DOH) and the City and County of Honolulu Comprehensive Zoning Code (CZC) express their standards in terms of maximum allowable noise limits rather than Ldn. They are summarized in Table IV-2 for the cases of interest. Please note that these values represent short-term noise levels rather than 24-hour averages. Although they are not directly comparable to noise criteria expressed in Ldn, the following general statements can be made:

- State DOH limits for Industrial/Agricultural districts are approximately equal to 76 Ldn.
- For heavy-industrial or non-dwelling (e.g., agricultural) areas, the CZC limits equate to approximately 69 Ldn; these apply to the zoning district boundary rather than to individual parcel boundaries.
- No explicit Federal standards exist that are applicable to these land uses. However, there are Federal <u>guidelines</u> intended for land use planning purposes. These are generally consistent with the State and County regulations described above.
- Compliance with CZC noise regulations (expressed as octave band noise limits) insures that objectionable pure tones or concentrated bands of noise are not generated and that the project would be compatible with its adjoining industrial neighbors.

The proposed site is at least 1,500 feet from the I-2 zoning district boundary at which the County limits are applicable. Therefore, the State limits, which are applicable at the parcel boundary, are considered the most stringent for this project.

4.2.3 EXISTING NOISE ENVIRONMENT

Background noise measurements were made at two locations in Campbell Industrial Park near the proposed site:

- 50 feet from the center of Malakole Road at Hanua Street, and
- 50 feet from the center of Hanua Street at the proposed facility site.

Table IV-1. Typical Values of Yearly Day-Night Average Sound Level for Various Residential Neighborhoods Where There Are No Well-Defined Sources of Noise Other Than Usual Transportation Noise.

Description	Ldn
Rural (Undeveloped)	35
Rural (Partially Developed)	40
Quiet Suburban	45
Normal Suburban	50
Urban	55
Noisy Urban	60
Very Noisy Urban	65

Source: National Research Council, National Academy of Sciences (1977).

TABLE IV-2. Noise Standards Applicable to the Proposed Project.

Noise Regulation	Zoning District Adjoining Project Site	Daytime/Nighttime Allowable Noise Level	Measurement Location
State Dept. of Health	Industrial/ Agricultural	70/70 dB (A-weighted)[1]	Facility site property line
Honolulu CZC	I-2, Heavy Industrial District	See octave band limits below[2]	At or beyond I-2 district boundary line.

[1] Levels not to be exceeded for more than 10 percent of the time within any 20-minute period.

[2] Octave Band Noise Limits:

OCTAVE BAND CENTER FREQUENCY (HZ)

63 or Below	125	250	500	1,000	2,000	4,000	8,000
79/79dB	74/74dB	66/66dB	59/59dB	53/53dB	47/47dB	41/41dB	39/39dB

Source: Compiled by Darby-Ebisu & Associates.

The existing noise environment along Malakole Road in Campbell Industrial Park is controlled by heavy truck traffic on Malakole Road and by aircraft noise. The roadway is relatively quiet between passes of vehicles and aircraft, with background levels of approximately 50 dB(A). The Day-Night Sound Level probably ranges from 55 to 60. Noise measurements made adjacent to the proposed resource recovery facility site indicated that noise levels there are 45 to 50 dB(A) between passes of vehicles and aircraft; this is very similar to that near Malakole Road. These levels are relatively low for heavy industrial areas, primarily due to the undeveloped nature of the surrounding lands.

4.2.4 PROBABLE NOISE IMPACTS

4.2.4.1 Noise Impacts Resulting From Fixed Plant Equipment

Fixed plant equipment, such as forced draft fans, transformers, steam release valves, electrostatic precipitators, and circulating pump motors, has the potential to generate adverse noise impacts if adequate noise control measures are not incorporated into the plant design. A study of community complaints regarding power plant noise (Hoover, 1976) found that at least half the complaints involved pure tones (i.e., noise with a narrow frequency range) such as would be generated by rotating equipment or transformers. Approximately 80 percent of the complaints resulted from sound levels of 45 dB(A) or greater.

Because of the potential problems associated with fixed plant equipment noise, noise contours for sound levels of 75, 70, and 65 dB(A) were constructed for each of the facility configurations. These were based on generic source noise level information from the Edison Electric Institute (1978) and noise measurement data supplied by the offerors. This data also made it possible to calculate noise levels at the property line for comparison with the DOH standards.

4.2.4.1.1 C-E/Amfac Facility. The calculated 75, 70, and 65 dB(A) contours for the C-E/Amfac facility are shown in Figure IV-2. The 70 dB(A) DOH level would barely be met at the parcel boundary using the site plan shown. However, the adjoining properties are used for heavy industrial activities (oil refinery, steel fabrication yard, etc.) that are not sensitive to noise levels in the range projected.

4.2.4.1.2 Wheelabrator-Frye Facility. Figure IV-3 depicts the calculated 75, 70, and 65 dB(A) noise levels associated with the facility proposed by Wheelabrator-Frye. In the absence of proposal-specific noise data, the same source noise levels employed in estimating noise from the C-E/Amfac facility were employed. Hence, the differences in noise contours that are apparent are a function of varying plant equipment location and the absence of a cooling tower in the ocean-water-cooled Wheelabrator-Frye plant. The DOH noise standard of 70 dB(A) at the property line would be met.

4.2.4.1.3 Air Cooling. As noted elsewhere in this report, both of the offerors prefer to use water to cool the facility's condensers. However, because of uncertainties which exist over permits which must be obtained in order to use ocean water (or well water as proposed by

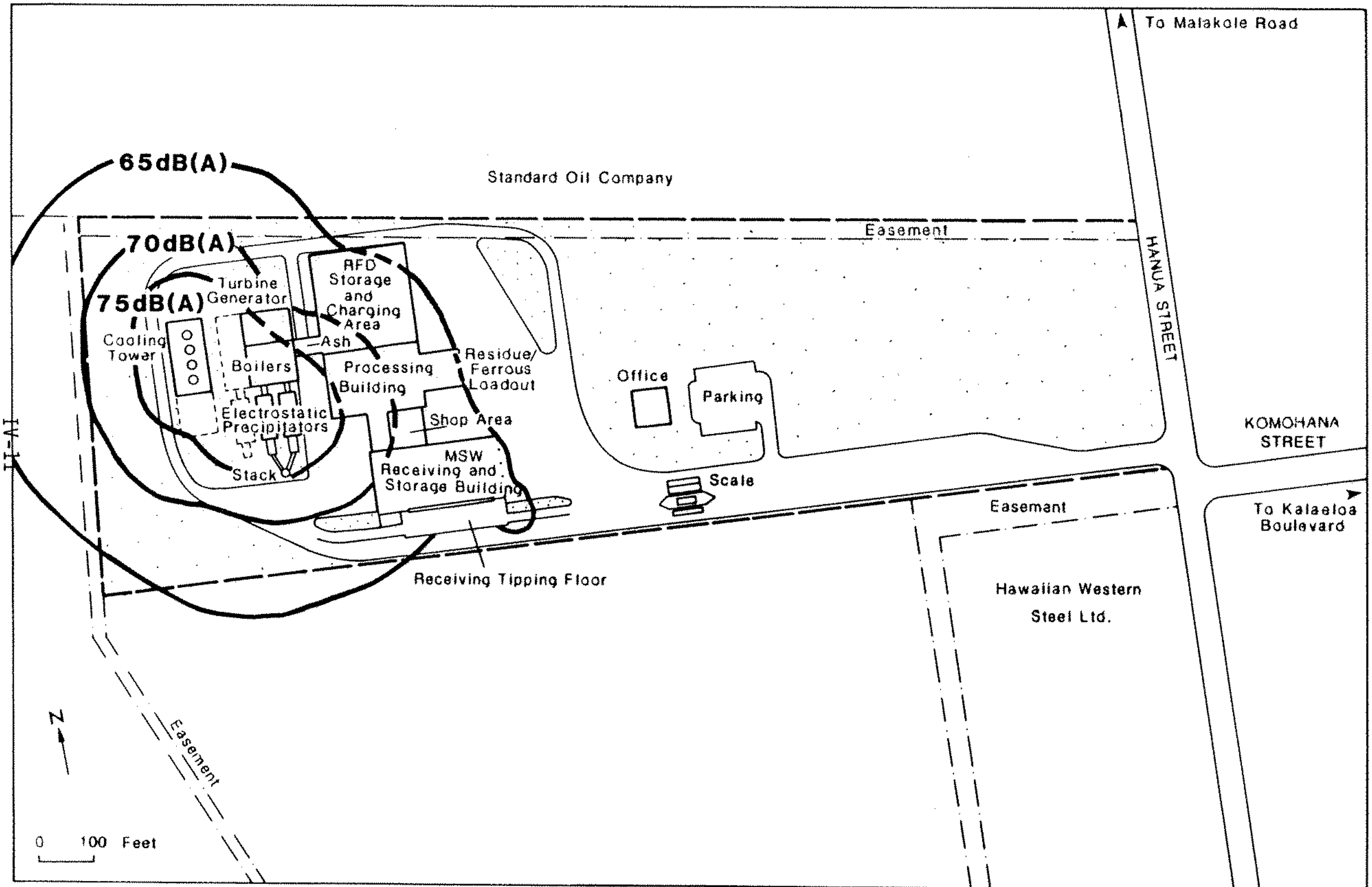


Figure IV-2. Calculated Noise Contours: Combustion-Engineering/Amfac Facility.

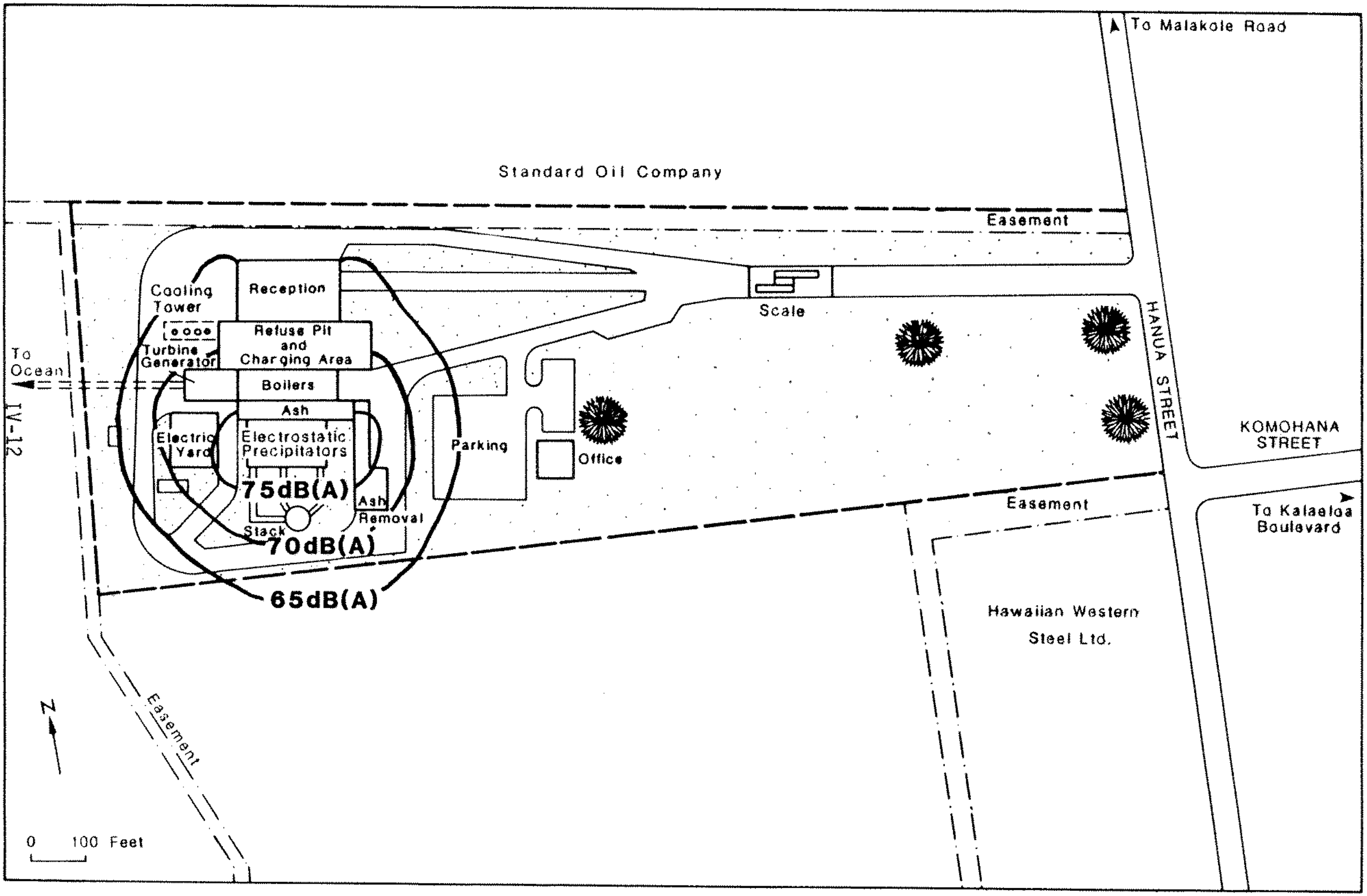


Figure IV-3. Calculated Noise Contours: Wheelabrator-Frye, Inc.

C-E/Amfac), both have indicated a willingness to utilize air-cooled steam condensers as well. While no detailed sound level information has been provided for such units, the offerors have indicated that they would still be able to meet the 70 dB(A) DOH noise limit.

4.2.4.2 Noise Resulting From On-Site Vehicle Movement

Refuse vehicles produce noise levels of approximately 78 dB(A) at a distance of 50 feet. For Industrial Districts, the State DOH noise regulations require that 70 dB(A) not be exceeded at the property line more than 10 percent of the time in any 20-minute period. Noise measurements made during this study at the City and County's Ke'ehi Transfer Station indicate that 70 dB(A) can be exceeded at a distance of 50 feet for three to nine seconds per refuse vehicle pass-by. Assuming "worst-case" conditions of 50 truck passes per hour and seven seconds of noise above 70 dB(A) per pass, the State DOH standard can be met so long as the roadway is set back at least 50 feet from the property line. Both offerors have indicated that they will do this.

4.2.5 SUMMARY OF NOISE IMPACTS AND ANTICIPATED MITIGATION MEASURES

4.2.5.1 Summary of Anticipated Noise Impacts

Either of the facilities under consideration would raise background ambient noise levels at the property line by at least 10 dB(A). This is a noticeable change, but, given the industrial nature of the area, it would be of little practical consequence.

Noise impacts from facility-related traffic are not expected to be severe. Project-related traffic noise is projected to be approximately 6 Ldn units below the 1987 non-project traffic noise level and to produce an increase of only 0.7 Ldn units in total traffic noise along Kalaeloa Boulevard, the most heavily impacted route.

A detailed investigation of traffic noise level increases on minor roads within Campbell Industrial Park was not performed due to uncertainties over the exact route that vehicles would take, the absence of accurate projections of non-project traffic, and the fact that the increase in traffic on them would be less than that experienced on Kalaeloa Boulevard. However, since project-related traffic would produce noise levels of 59 Ldn or less even during the peak traffic hour and would affect only industrial uses, it is certain that project-related vehicular traffic would have no noticeable effect on noise levels.

4.2.5.2 Recommended Noise Mitigation Measures

Each proposed facility would probably require either a use of minimum setback distance and/or noise attenuation measures to comply with State and County noise regulations. Various methods of achieving these goals are available; and ultimately, the choice of which methods to use would depend upon their impact on equipment performance, maintenance, and costs, and on overall plant efficiency. General methods of implementing noise control include:

- Procurement of lowest noise emission equipment.

- Arrangement and orientation of plant equipment and structures to take advantage of shielding effects or of distances to the property lines.

- Minimization of water, steam, and air velocities and pressures at critical noise emission or generation locations.

- Utilization of high density material and/or composite wall and roof systems in the construction of enclosures.

- Utilization of sound-absorbing materials within the interior of high noise areas to minimize noise build-up and reduce the level of noise propagating outdoors.

- Utilization of sound-rated construction systems, silencers, enclosures, and barriers.

During the facility construction phase, which is anticipated to extend over two years, noise impacts resulting from construction activities can be minimized by adherence to State DOH conditional use permit procedures for construction activities. Construction at the Campbell Park site is not anticipated to generate adverse noise impacts on surrounding activities. The use of quiet or properly-muffled equipment, location of stationary reciprocating engine-powered equipment away from noise-sensitive activities, and proper scheduling of noisy construction and blow-down operations are means of minimizing noise impacts.

4.3 HYDROLOGIC IMPACTS

4.3.1 HYDROLOGIC SETTING

The 28-acre resource recovery facility (RRF) site in Campbell Industrial Park is situated on a relatively flat, emerged coral reef. Ground elevations are typically between six and ten feet but there are numerous small (solution) sink holes, some of which extend below the water table. The site is about 1800 feet from the shoreline. The intervening land is leased to CONOCO-Dillingham and is currently open and unused.

Subsurface conditions are revealed in a nearby test boring and by inference from other drill holes in the area. The test boring was done in 1972 for a proposed CONOCO-Dillingham oil refinery. It was located about 500 feet from the southwest corner of the RRF site lot. Its drilling log can be simplified as follows:

Depth (feet)	Strata	Permeability
0 to 140	Hard white to yellow coral	Very high
140 to 190	Coralline algae and calcareous mud	Poor
190 to 235	White to pink coral	Very high
235 to 265	Limey mud	Impermeable
265 to 300	White coral	Very high

(Source: Dames & Moore, 1972:10 and Plate 5)

Groundwater in the drill hole demonstrated that a basal lens exists in the coral formation. The chloride concentration was 1900 milligrams per liter (mg/l) at the top of the groundwater body, 17,155 mg/l at 50-foot depth, and 19,300 mg/l at 150 feet. The latter concentration is essentially equivalent to seawater.

Monitoring of tidal fluctuations in the bore hole and results of a pump test both demonstrated that the coralline limestone is very permeable. A permeability coefficient in the range of 10^5 to 10^6 gal/day/foot was computed (Dames & Moore, 1972:16-17).

4.3.2 DRAINAGE

Neither of the SWPRRF proposals being considered offer specific designs or concepts for site drainage. It is presumed that runoff from any exposed loading and/or processing area would be captured and disposed of in the process water drain system. Its treatment and disposal will be described subsequently. Other stormwater runoff from the site will, in all probability, be directed toward Campbell Industrial Park's existing storm drain system. Catch basins and pipe conduits located in Hanua Road are designed to carry this runoff. Discharge to the ocean occurs via an open channel at the southwest corner of CONOCO-Dillingham's 98-acre parcel.

4.3.3 COMBUSTION-ENGINEERING/AMFAC PROPOSAL

4.3.3.1 Proposed Water Use

As a result of comments on the draft EIS and ongoing refinement of its proposal, C-E/Amfac has substantially changed its water use scheme from that described in the draft EIS. Previously, water from Oahu Sugar Company's irrigation system was to be the cooling water source. An average of 1,310,000 gallons per day (GPD) would have been supplied and 455,000 GPD would have been returned as condenser blowdown. In addition to the 855,000 GPD consumptive use, return water would have been two to three times saltier. C-E/Amfac's current proposal is to use groundwater from the limestone aquifer beneath the facility for cooling. This scheme is explained below. The irrigation water scheme described in the draft EIS has been deleted.

C-E/Amfac's water use and circulation are shown on Figure IV-4. The Board of Water Supply system would provide potable water; cooling water would come from on-site wells. A breakdown of potable water use and its ultimate disposition is given in Table IV-3. Of the approximately 35,700 GPD average usage, almost 27,000 GPD would be reused for ash quench or in the cooling system. The balance of about 8,800 GPD would either be consumed in process sprays and landscape irrigation or used for domestic purposes.

The cooling water system will circulate water at the rate of 76.7 million gallons per day (MGD). It will utilize a cooling tower so its sources of supply must provide make-up water for losses at the cooling tower and blowdown to maintain water salinity at an acceptable level. The balance of make-up and losses would be as follows:

Make-Up Sources	GPD	Losses	GPD
On-Site Wells	1,676,020	Evaporation at Tower	1,113,120
Boiler Blowdown	7,340	Drift from Tower	15,840
Demineralizer Blowdown	2,880	Blowdown	557,280
TOTAL	1,686,240	TOTAL	1,686,240

The primary make-up source would be on-site wells. Most probably, two would be installed; each would be capable of the entire make-up requirement so there would be 100 percent standby capacity. Disposal of the cooling water blowdown would be in other, on-site wells. Three or four may be required, depending on the amount of back-up capacity that is desired. Since both source and disposal wells will be on-site, and since a groundwater flow path from injection to pumping wells is to be avoided, the wells are likely to be at opposite ends of the site and open to different strata of the limestone. A desirable situation would be to have a separation of these strata by a relatively impermeable layer. The 1972 bore hole for Conoco-Dillingham suggests that this can be achieved: very permeable layers (0 to 140, 190 to 235, and below 265 feet) are separated

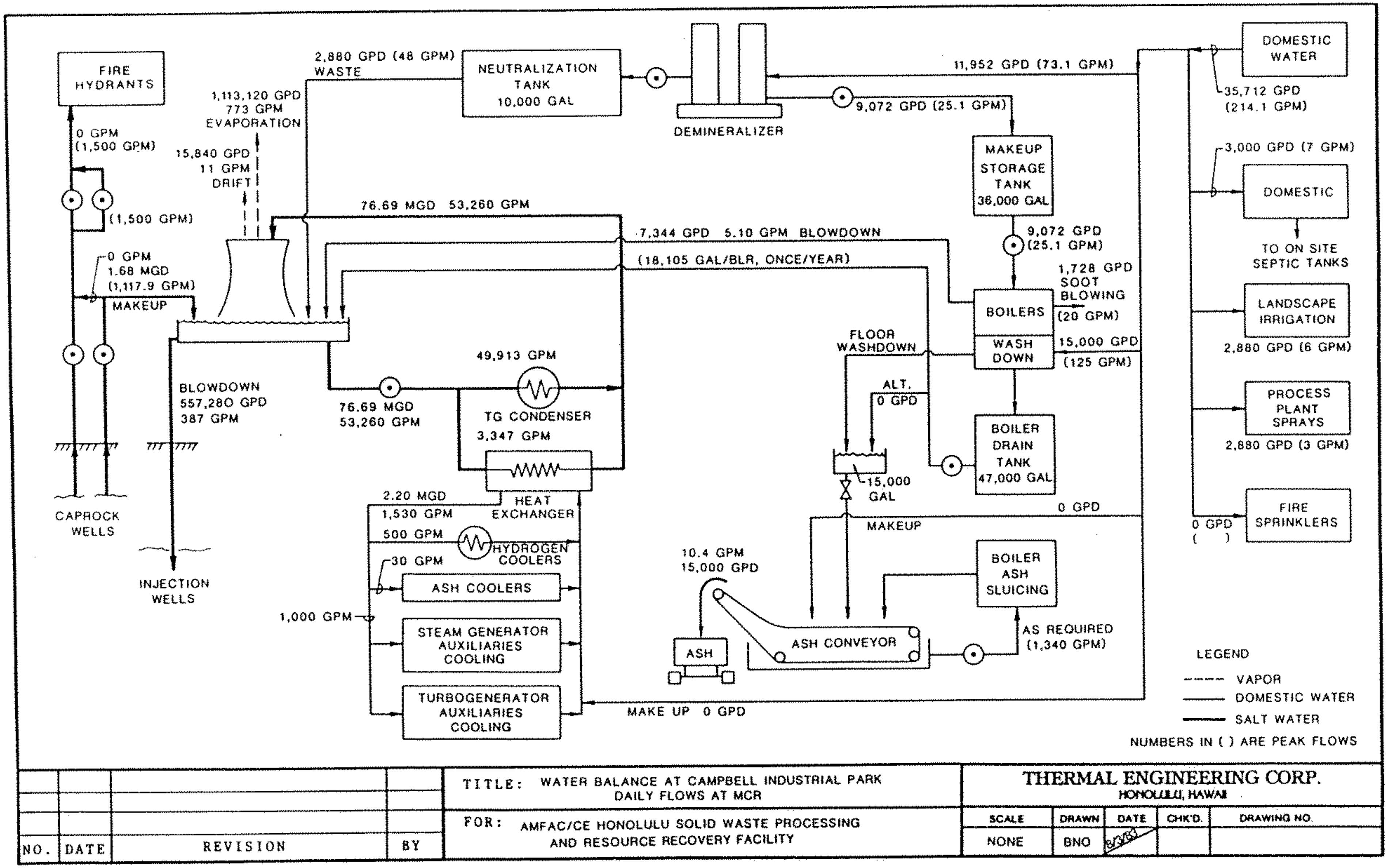


Figure IV-4. Combustion Engineering/Amfac Water Use and Circulation

Source: Thermal Engineering Corp.
Honolulu, Hawaii

Table IV-3. Use and Disposition of Potable Water Required for the C-E/Amfac Facility.

Water Use	Average Use Rate (GPD)	Ultimate Disposition
Domestic Consumption	3,000	Treated in a septic tank and disposed of in a leaching field
Landscape Irrigation	2,880	Consumptive use
Process Plant Sprays	2,880	Consumptive use
Demineralizer	11,952	2,880 GPD direct blowdown to cooling system; 7,344 GPD boiler blowdown to cooling system; 1,728 GPD consumed in soot blowing
Boiler Washdown	15,000	Used for ash quench and carried out with ash
TOTAL WATER USE	35,712	

Source: Derived from Thermal Engineering Corp. (August 3, 1983) Water Balance Figure prepared for C-E/Amfac.

by poorly permeable calcareous mud. Further drilling would reveal how extensive the separations are.

4.3.3.2 Proposed Water Treatment and Disposal

Most water in the C-E/Amfac facility would either be reused or lost to evaporation. The only waters requiring disposal are the cooling water blowdown noted previously and the 3,000 GPD used for domestic purposes. The 0.56 MGD cooling water blowdown would be directly injected into the limestone aquifer via on-site wells. The small quantity of domestic wastewater will be treated in a septic tank and disposed of in a leaching field.

4.3.3.3 Impacts of Proposed Water Use, Treatment, and Disposal

Potential impacts requiring consideration are the use of 35,700 GPD of potable water and the pumpage and injection of water from the limestone aquifer beneath the site. Modest changes of surface runoff from the site and disposal of 3,000 GPD of domestic wastewater are not considered to be significant.

Proposed average water use of 35,700 GPD is minor in comparison to use by adjacent development and would not infringe on water allocations reserved for future tenants of Campbell Industrial Park. It presents no problem to the hydraulic capacity of existing water mains and can be supplied from the Barbers Point reservoirs located above H-1 Freeway. The significance of this use arises because restrictions have been enacted for the "Pearl Harbor Ground Water Control Area" by the State Board of Land and Natural Resources. All domestic supply in Campbell Industrial Park comes from Board of Water Supply wells in the Waipahu area. State-certified pumpage from these wells has been set at the rate of withdrawal in 1979. Under the State's control rules, new water uses such as for the SWPRRF facility can be met in either of the following ways:

- If the Board of Water Supply decreases exportation of Pearl Harbor water to Waianae and Honolulu, more water will be available for in-area use.

- Under State rules, the Board of Water Supply (as a municipal corporation) can increase its rate of ground water withdrawal up to five percent of its rate immediately prior to designation of the ground water control area.

The Board of Water Supply has developed a plan to decrease exports of ground water from the Pearl Harbor area (Honolulu Board of Water Supply, October 1981). One of its conservation measures is to reduce exports to Waianae from the current approximately 5.0 MGD average rate currently to zero by 1989. New wells in Waianae have been drilled and tested as a first step to implement this. Since the yield of these wells is far greater than anticipated use by the resource recovery facility, and since this yield can proportionately benefit water supply to the 'Ewa area, it is concluded that potable supply for the proposed facility can be met.

The limestone formation from which make-up cooling water would be drawn and into which the more saline, cooling water would be injected is well suited for this purpose. First, it has highly permeable layers which make the pumping and injection physically possible. Second, it contains brackish to saline water which is subject to pollution from sources within Campbell Industrial Park and from sugarcane sprays and fertilizers on the periphery of the industrial area. In other words, the limestone water in this area is not a potential domestic or agricultural resource that C-E/Amfac's proposed use would preempt. Third, the limestone aquifer is hydraulically separated from the Waianae basalt aquifer which lies below it, and the project site is far removed from the Ko'olau (Pearl Harbor) basalt aquifer. Pumpage and injection in the limestone formation can be done without affecting the better quality water in these basalt aquifers.

The limestone aquifer does fall within the Pearl Harbor Groundwater Control Area so its use would be subject to controls established by the State Board of Land and Natural Resources. Limits of pumpage, in contrast to the Pearl Harbor and Waianae basalt aquifers, have not been established for this aquifer. It is recognized that the limestone aquifer in this area is not a potential water resource. It is expected that C-E/Amfac's proposed use would be approved.

4.3.4 WHEELABRATOR-FRYE PROPOSAL

4.3.4.1 Proposed Water Use

Wheelabrator-Frye proposes to utilize the Board of Water Supply system for domestic and process water. It plans to meet its cooling water requirement with a single pass of seawater through its condensers. Expected use of Board of Water Supply water is listed on Table IV-4. It would average 95,000 GPD and peak daily use would be almost 120,000 gallons. A connection to the existing 12-inch pipeline in Hanua Street would provide this supply.

Wheelabrator-Frye's water use rate for single pass seawater cooling is 28,000 gallons per ton of refuse processed. For an average of 1800 tons daily, this would require 50 MGD. For a peak processing rate of 2250 tons/day, cooling would require 63 MGD. No alignment for intake and discharge pipelines is given in the contractor's proposal but a velocity cap on the intake pipe is proposed. The cap ensures horizontal (rather than vertical) flow at the intake. Its purpose is to minimize entrainment of marine life. For the cooling flowrate and its required pipe size, the cap would necessitate a water depth of 20 feet or more. A 400-foot (minimum) spacing between intake and discharge is also proposed.

4.3.4.2 Proposed Wastewater Treatment and Disposal

Wheelabrator-Frye proposes to treat the 1600 GPD of domestic (sanitary) wastewater for irrigation re-use on-site. Non-sanitary wastewater will be used as make-up supply to the fly ash and bottom ash quench systems.

Table IV-4. Wheelabrator-Frye's Proposed Domestic Water Use.

Use Within the Facility	Use Rate: Lbs. per Ton of Refuse	Use Rate: Gals. per Ton of Refuse	Range of Expected Water Use*: Average Gal/Day	Range of Expected Water Use*: Peak Gal/Day	Disposal
Demineralizer and condensate backwash	48	5.76	10,360	12,950	Collected for reuse as make-up to ash disposal systems
Washdown	37	4.44	7,990	9,985	
Fly ash quench	21	2.52	4,535	5,665	
Bottom ash quench	93	11.15	20,075	25,095	
Deaerator vent	2	0.24	430	540	
Sootblowing	234	28.06	50,515	63,145	
Domestic	--	--	1600		Treated for irrigation reuse
TOTAL WATER USE			95,505	118,980	

* Average use is based on 1800 tons of refuse processed per day; peak use is based on 2250 tons per day.
Source: Compiled by Belt, Collins & Associates based on data supplied by Wheelabrator-Frye.

4.3.4.3 Impacts of Proposed Water Use, Treatment, and Disposal

Potential impact of use of water from the Board of Water Supply system would be as previously described for the Combustion-Engineering/Amfac proposal. Capacities of existing pipelines, reservoirs, and pumps are sufficient to supply anticipated usage. Because of the State's Pearl Harbor Ground Water Control Area restrictions, supply from wells must be obtained by decreasing water exports from the Pearl Harbor area or by relying on the Board of Water Supply's option to increase its pumpage up to five percent over its State-certified rates. Development of wells by the Board of Water Supply in Makaha will allow exports to Waianae to be cut back. The decrease in exports will be far greater than the amount of water the SWPRRF facility would use.

If 20 feet is the minimum depth of the velocity-capped seawater intake for cooling water, the required pipelines would be a minimum of 3300 feet long if the alignment directly crosses the intervening (open) parcel to the shoreline and at least 6100 feet if the route is within Hanua Street and Kaomi Loop to the shoreline. In either case, it is assumed that the discharge pipeline would extend 400 feet further offshore than the intake. For the more direct route, pipe diameters of six feet are likely; seven-foot diameter pipes can be anticipated for the longer alignment. Impact on marine biota will have to be considered in the final intake and outfall location. Conceivably, this could add up to 1500 feet to each pipeline in order to extend the pipes to the sharp drop-off of the limestone shelf offshore. It is located at the 30- to 35-foot depth.

Intake and outfall construction would require a National Pollutant Discharge Elimination System (NPDES) permit from the State Department of Health, a Conservation District Use permit from the State Board of Land and Natural Resources, a permit for work in the shore waters of the State of Hawaii from the State Department of Transportation, a Special Management Area permit from the City & County Department of Land Utilization, and a U.S. Army Corps of Engineers permit. In conjunction with the last, it would also require a Coastal Zone Management Program certification from the State Department of Planning and Economic Development. The design of the pipeline and related structures will have to account for the dynamic forces of the large waves which can occur during northwest swells or southwest (Kona) storms.

An advantage of onshore/offshore pipelines in this location is the existence of a consolidated rock shoreline and the virtual absence of sand or other unconsolidated littoral material in the nearshore. The shoreline rock is comprised of cemented sand grains ("beachrock"); its surface is darkened by weathering and pitted by solution. The absence of sand offshore is the result of normally high wave energy. The only loose sand can be found in the berm which is located inland of the rock shoreline and above the normal reach of waves. This shoreline configuration can provide good anchorage for pipes offshore. It also ensures that the pipeline crossing at the shoreline will not interfere with littoral transport nor alter the shoreline beyond the limits of construction.

4.3.5 OTHER OPPORTUNITIES FOR SINGLE-PASS SEAWATER COOLING

When site-specific engineering is undertaken, it will be apparent that the RRF site's distance from the shoreline will involve a substantial investment in intake and discharge pipelines. Permeability of the site's underlying limestone, the existence of a basal aquifer in the limestone which can be utilized without adverse impact to the basalt aquifer at depth, and the stability of the rock shoreline provide opportunities to minimize the cost of seawater cooling facilities. It is probable that a supply of up to 63 MGD could be obtained from on-site wells. For example, nine drilled wells with nominal pumping rates of 5000 GPM each would suffice. Such yields have been obtained from OSCO wells on the 'Ewa plain and from Kahuku Seafood Plantation wells in a similar formation on the Kahuku plain. Alternatively, the cooling supply could be obtained from one or more horizontal galleries such as OSCO has constructed at several locations in 'Ewa using bulldozers. Depending on depth of wells, the water obtained would have seawater salinity initially or would achieve it after a time at the high rate of pumpage. Cost of the wells would be far less than an offshore pipeline. Energy cost of pumping would be comparable. Permits from the State under Pearl Harbor Ground Water Control Area rules would be required but can be expected to be obtained.

An ocean outfall would be required regardless of whether shallow, salt-water wells or an ocean intake is used as the source. Cooling water intake and/or discharge could, from an engineering perspective, be feasibly located at the shoreline. The rocky coastline is stable and interference by sand such as occurs at Hawaiian Electric's Kahe Power Plant intake would not be a factor. Shoreline locations for intake or discharge would save the substantial cost of offshore construction.

4.4 BIOLOGICAL IMPACTS

4.4.1 IMPACTS ON VEGETATION

Construction of the project would involve clearance of essentially all existing vegetation on the 28-acre parcel. The available evidence indicates that factors associated with the operation of the facility (e.g., air emissions, traffic, etc.) do not have the potential to adversely affect off-site vegetation. Hence, with the exception of a review of the status of Achyranthes splendens var. rotundata, a candidate endangered species present in adjoining areas, the analysis is limited to the area that would be directly affected by site grading.

4.4.1.1 General Characteristics of Existing Vegetation

Three vegetation surveys have been conducted of the site. The first was carried out by Industrial Bio-Test Laboratories, Inc. in December 1971 and May 1972 as part of planning for the then proposed CONOCO-Dillingham Oil Company refinery. The second (Elliott & Hall, 1980) was conducted during the preparation of the environmental impact statement for the HPOWER project. Both surveys covered areas in excess of the 28 acres now under consideration for the resource recovery facility. Both studies post-dated grading that disturbed at least some of the vegetation originally found in the area. An additional survey was conducted by Winona Char and N. Balakrishnan as part of the Ewa Plains botanical survey sponsored by the U.S. Fish and Wildlife Service in 1979.

The proposed resource recovery facility site is situated entirely within the zone designated as "Xeric Vegetation - Low Shrub/Herb and Grass" in the Bio-Test Laboratories survey. Species characteristic of this vegetation grouping are listed in Table IV-5. The Bio-Test Laboratories report concluded that at the time of their survey, there was very little damage to vegetation in the area as the result of plant diseases or insects. The investigators also noted that vegetation along unpaved roads in the area was frequently covered with dust without apparent adverse effect. However, they concluded that the observed absence of vegetation to the southwest of the cement plant was probably due to the presence of deep deposits of dust believed to result from the operation of that industrial facility.

The survey conducted for the HPOWER project (Honolulu, City and County of, Department of Public Works, October 1980: IV-65 to IV-72) described the vegetation on the site as open kiawe woodland with grassy clearings (see Appendix A). Speaking of an area which extended from Hanua Street nearly to the ocean, it characterized the area as consisting of open kiawe woodland with grassy clearings which grade into a scrub grassland cover towards the coast. More specifically, it stated:

> Kiawe (Prosopis pallida) trees and shrubs predominate, with feathery pennisetum (Pennisetum setosum), swollen fingergrass (Chloris inflata), golden crown-beard (Verbesina encelioides), and Chinese violet (Asystasia gangetica) common in the understory and in grassy clearings. Scrub grassland areas are characterized by koa haole (Leucaena leucocephala), pluchea (Pluchea spp.),

Table IV-5. Xeric Vegetation - Low Shrub/Herb and Grass.

Scientific Name	Common Name	Type	Observed Frequency[a]	Seasonal Distribution[b]
Acacia farnesiana	Klu	shrub	common	W and S
Achyranthes indica	Achyranthes	herb	common	W and S
Asystasia gangetica	Asystasia	herb	rare	W and S
Atriplex muelleri	Atriplex	herb	common	S
Atriplex semibaccata	Australian saltbush	herb	abundant	W and S
Batis maritima	'Akulikuli kai	herb	abundant	W and S
Cenchrus echinatus	Sandbur	grass	rare	S
Chenopodium murale	Goosefoot	herb	common	S
Chloris barbata	Swollen fingergrass	grass	abundant	W and S
Desmanthus virgatus	Desmanthus	shrub	common	W and S
Distichlis spicata	Salt grass	grass	rare	W and S
Heliotropium anomalum var. *argenteum*	Hinahina	herb	rare	S
Heliotropium curassavicum	Wild Heliotrope	herb	rare (locally common)	S
Ipomoea cairica	Five-fingered morning glory	herb	rare (locally abundant)	W and S
Ipomoea obscura	Morning glory	herb	rare	W and S
Jacquemontia sandwicensis	Pau-o-hi'iaka	herb	rare	W and S
Leucaena leucocephala	Koa haole	shrub	common	W and S
Lycium sandwicense	'Ohelo-kai	herb	rare	W and S
Myoporum sandwicense	Naio	shrub/tree	rare	W and S
Nicotiana glauca	Wild tobacco	shrub	rare	W and S
Passiflora foetida	Passion flower	herb	common	W and S
Pennisetum clandestinum	Kikuyu grass	grass	rare	S
Phaseolus lathroides	Wild bean	herb	rare	S
Pluchea indica	Indian fleabane	herb	common	W and S
Rhynchelytrum repens	Natal redtop	grass	rare (locally common)	S
Ricinus communis	Castor bean	herb/shrub	rare	W and S
Sesuvium portulacastrum	Sea purslane	herb	common	W and S
Setaria verticillata	Bristly foxtail	grass	common	W and S
Sida cordifolia	Lei'ilima	shrub	rare	W
Sida fallax	'Ilima	herb/shrub	abundant	S
Sonchus oleraceus	Sowthistle	herb	common	W and S
Stachytarpheta jamaicensis	Jamaica vervain	shrub	rare	W
Trichachne insularis	Sour grass	grass	rare	W and S
Verbesina enceloides	Yellow crownbeard	herb	abundant	W and S
Stachytarpheta jamaicensis	Australian saltbush	herb/shrub	(locally abundant)	Distribution

[a]Visual index on frequency of occurrence (abundant, common and rare).

[b]Seasonal distribution; W = winger, S = spring.

Source: Conoco-Dillingham Oil Company (May 1972:II-73).

false sandalwood (Myoporum sandwicense var. stellatum), golden crown-beard and feathery pennisetum. More coastal species are found in this site, particularly towards the western edge. These include the native seaside heliotrope (Heliotropium curassivicum) and sea purslane (Sesuvium portulacastrum) as well as exotic coastal species such as pickleweed (Batis maritima) and Australian salt bush (Atriplex semibaccata).

4.4.1.2 Endangered Species

The most significant characteristics of the large area studied by Elliott and Hall (1980) was the presence of two rare and important native Hawaiian species. The first, Naio (Myoporum sandwicense var. stellatum), is a rare native false sandalwood whose habitat is restricted to the coralline substrate of the 'Ewa plain. At the time the HPOWER EIS was written, it was under consideration for inclusion on the Federal list of endangered and threatened species. Many individuals of this species, most of them shrubs or saplings averaging six feet in height, were found in the western (i.e., makai) portions of the area studied.

The second important plant located during the HPOWER survey was Achyranthes splendens var. rotundata, a species endemic to O'ahu. It, too, was found only in the makai portions of the study area. The EIS noted that:

> Achyranthes is on the proposed list of endangered species, it is highly sensitive to human disturbance, and has disappeared in other known habitats -- even within the Campbell Industrial Park -- when the soil nearby has been disturbed. There are at present only three or four known colonies /believed to be two or three now/ of Achyranthes on Oahu. More than 300 healthy individuals of this species are located . . . near Kaomi Loop, about 500 feet from the Brewer Chemical Company entrance. This colony represents the largest single colony of Achyranthes splendens var. rotundata remaining in the United States.

The continuing presence of Achyranthes and Naio was confirmed by Winona Char (April 7, 1983) of the University of Hawaii Department of Botany and by the U.S. Fish and Wildlife Service during the consultation phase of this EIS. In conformance to the 1978 amendments to the Endangered Species Act, Achyranthes has been withdrawn from the list of proposed endangered species. According to the U.S. Department of the Interior, Fish and Wildlife Service (July 19, 1983), it is now a "candidate endangered species".

4.4.1.3 Probable Impacts and Mitigation Measures

As noted above, research conducted by Elliott and Hall (1980) indicated that most of the plant species present in the vicinity of the proposed resource recovery facility site are common in coastal areas of the island. The loss of these plants as a result of site clearance and grading is not significant. However, investigations conducted for that project did reveal the presence of two rare (one candidate endangered) plant species towards the western (makai) end of the area bounded by Kaomi Loop, Hanua

Street, and the Chevron refinery. Because of this, the EIS Preparation Notice (Honolulu, City and County of, Department of Public Works, March 1983) for the resource recovery project specified that the makai boundary of the facility would be set back at least 1,000 feet from the shoreline. This setback was judged adequate to prevent disturbance to the endangered plants.

A comment letter on the EISPN indicated that the *Achyranthes* and Naio colonies extended slightly farther inland than had previously been thought, and it recommended that the 1,000-foot setback be measured from the coastal road rather than from the shoreline. At its closest point, the makai edge of the parcel now designated by the City for the resource recovery facility is 1,000 feet inland from Kaomi Loop and 1,800 feet mauka of the shoreline (see Figure II-4). Because the parcel boundary is not parallel to the shoreline, the *average* setback is significantly greater than this. If ocean water cooling is used, a pipeline would be needed between the project site and the shoreline. The pipeline would be constructed either within existing roadways or along an alternative route removed from the *Achyranthes* colonies, and Naio specimens.

The U.S. Department of the Interior, Fish and Wildlife Service (July 19, 1983) has made a formal determination that "... the 1,000 foot setback from the /coastal/ roadway will provide adequate protection for the *Achyranthes* and the *Myoporum* species." The Service recommends that if the seawater cooling pipeline is to be built, it should be routed so as to avoid these plants. An alignment along the C. Brewer and Standard Oil Company parcels was suggested as unlikely to affect the plants in any way.

4.4.2 IMPACTS ON TERRESTRIAL MAMMALS

4.4.2.1 General Characteristics of Terrestrial Fauna

Field studies of the project site and environs (see, for example, CONOCO-Dillingham Oil Company, 1972: II-46 to 52; Eddinger, November 1979) indicate that the mammalian species present are typical of those found throughout lowland areas of O'ahu. Animal counts from the most extensive of these surveys are summarized in Table IV-6.

In terms of the size of individual animals, feral dogs (*Canis familiaris*), feral cats (*Felis catus*), and mongoose (*Herpestes auropunctatus*) are the largest. Of these three, mongoose is by far the most common, typically near the edges of brush-wooded areas or in rocky spots.

In terms of relative abundance, results of the trapping program conducted for the CONOCO-Dillingham refinery project indicate that mice and rats are the most abundant mammalian species present. Overall, the house mouse (*Mus musculus*) and Hawaiian rat (*Rattus exulans*) were captured in the greatest numbers. On the proposed resource recovery site itself, however, only mice were caught. Researchers have speculated that the absence of rats on the resource recovery site may be due largely to the shallow soils being unsuited to burrowing (CONOCO-Dillingham Oil Company, 1972: II-49).

While the evidence is limited, it appears as though the population of both species is sensitive to vegetation density. Since this varies

Table IV-6. Relative Density of Mammals in and Around the Resource Recovery Facility Site.[1]

Species	Number of Animals Observed by Location					Number of Observer- or Trap-Days					Average Number Per Observer- or Trap-Day				
	On-Site	Cane-field	Lowland Scrub	Wooded Upland	Total	On-Site	Cane-field	Lowland Scrub	Wooded Upland	Total	On-Site	Cane-field	Lowland Scrub	Wooded Upland	Total
House Mouse (*Mus musculus*)	51	32	82	2	161	514	444	459	190	1,607	.10	.07	.18	.01	.10
Black Rat (*Rattus rattus*)	0	2	7	0	9	514	444	459	190	1,607	.00	.00	.02	.00	.01
Brown Rat (*Rattus norvegicus*)	0	2	5	0	7	514	444	459	190	1,607	.00	.00	.01	.00	.00
Hawaiian Rat (*Rattus exulans*)	0	6	26	0	32	514	444	459	190	1,607	.00	.01	.06	.00	.02

[1] In addition to the rodents listed in the table, 3 feral dogs (*Canis familiaris*), 5 feral cats (*Felis catus*) and 17 mongoose (*Herpestes auropunctatus*) were observed but no data was given on the specific location or number of observer days.

Source: CONOCO-Dillingham Oil Company (1972).

significantly with rainfall, it is believed that the population of the smaller animals may also vary seasonally. The density of rats and mice on-site appears to be less than that observed about a mile to the north along the old railroad right-of-way in an area adjacent to sugarcane fields; there, the presence of an abundant source of food, dense ground cover, and soils more suitable for burrowing probably account for the larger population.

4.4.2.2 Probable Impacts

Construction of the resource recovery facility would radically alter the site as a habitat for existing terrestrial wildlife. It is to be expected that the feral dogs and cats which have been seen there would be effectively excluded by the perimeter fence and other security precautions. Mongoose might find some suitable nesting areas and homes in the onsite landscaping, but the opportunities would be limited. In view of the wide distribution of these small mammals, this change cannot be considered significant.

The change in habitat would also affect the natural rat and mice populations. However, the facility itself, with its abundant food supply and potential harborage, constitutes a potentially fertile breeding ground for these animals. This potential, together with the steps that would be taken to see that it is not realized, are discussed in Section 4.4.4 below.

4.4.3 IMPACTS ON AVIFAUNA

4.4.3.1 Existing Avifauna

There have been three ornithological surveys conducted on the site. Two of them, December 1971 and April 1972, were commissioned by the CONOCO-Dillingham Oil Company (1972) as part of their environmental studies of the proposed refinery site. The third was conducted for the City and County of Honolulu (Bruner, 1980) as part of planning for the HPOWER project. Results of these surveys are summarized in Table IV-7. Except for the black-crowned night heron (Nycticorax nycticorax), all of the resident birds sighted are introduced. The dramatic, man-induced changes in vegetation and land use that have occurred in the area have virtually eliminated endemic species.

Two species of migrating shorebirds, the golden plover (Pluvialis dominica) and wandering tattler (Heteroscelus incanum) use the area as a wintering ground. Golden plovers were most frequently observed along the shoreline and in open fields or field roads. Doves were particularly abundant at the edge of wooded and open areas, where they feed on small weeds and grass seeds. Many were frequently seen feeding and loafing on the site. The cardinals were sighted most frequently around brushy and wooded areas. House sparrows and mynahs were most widespread near buildings.

The maximum number of each species observed during one morning in April and December during the 1971-1972 surveys is summarized in Table IV-8. These are not maximum population estimates, but serve as an index to the relative size of the various populations.

Table IV-7. Species List of Birds Observed on the Resource Recovery Facility Site and Its Environs.

Common Name	Scientific Name	When Observed 1971-72[1]	1980[2]
Lace-Neck Dove	Streptopelia chinensis chinensis		*
Barred Dove	Geopelia striata striata	*	*
Spotted Dove	Streptopelia chinensis	*	
Ring-Necked Pheasant	Phasianus colchicus	*	
Mockingbird	Mimus polyglettos	*	
Indian Myna	Acridotheres tristis tristis	*	*
Japanese White-Eye	Zosterops japonica japonica	*	*
Rice Bird	Lonchura punctulata	*	*
House Sparrow	Passer domesticus	*	*
American (or Kentucky) Cardinal	Richmondena cardinalis	*	*
Northern Cardinal	Cardinalis cardinalis		*
Brazilian Cardinal	Paroaria cristata	*	*
Red-Crested Cardinal	Paroaria coronata		*
House Finch	Carpodacus mexicanus frontalis	*	*
Golden Plover	Pluvialis dominica	*	*
Wandering Tattler	Heteroscelus incanum	*	
Black-Crowned Night Heron	Nycticorax nycticorax	*	*
Black-Headed Mannikin (or Munia)	Lonchura malacca	*	*
Cattle Egret	Bubulcus ibis	*	*
Red-Billed Leiothrix	Leiothrix lutea	*	
Barn Owl	Tyto alba pratincola		*
Red-Vested Bulbul	Pycnonotus cafer		*
Common Pigeon	Columba livia		*
Ruddy Turnstone	Arenaria interpres		*

[1]CONOCO-Dillingham Oil Company, 1972:II-54.

[2]Bruner, June 1980.

Source: Compiled by Belt, Collins & Associates from sources noted above.

Table IV-8. Maximum Number of Each Bird Species Observed on the Two Survey Routes During Any One Morning.

Species	Maximum Number Observed			
	December		April	
	Site	Offsite[1]	Site	Offsite[1]
Barred Dove	96	104	26	131
Spotted Dove	18	11	9	12
Japanese White-Eye	31	4	15	34
Brazilian Cardinal	27	14	9	22
American Cardinal	17	5	5	14
Golden Plover	16	28	7	22
Rice Bird	12	20	3	19
House Sparrow	9	2	22	8
House Finch	8	2	8	6
Indian Myna	2	1	-	3
Black-Headed Mannikin	2	2	-	-
Wandering Tattler	2	-	-	-
Mockingbird	2	-	2	1
Cattle Egret	-	1	-	23
Black-Crowned Night Heron	-	1	-	-
Red-Billed Leiothrix	-	-	-	7

[1]The offsite survey area was located four miles east of the site.

Source: CONOCO-Dillingham (1972).

4.4.3.2 Probable Impacts

Construction of the proposed project would alter the habitat on which the birds now depend. However, surrounding areas with substantially the same characteristics would remain available. Hence, the effect would probably be felt as a decline in overall population numbers rather than the total elimination of particular species. The area has already been so altered by human activities that only species which do well in urban or semi-urban setting survive. So long as the facility is properly maintained, there would be no significant increase in scavenging species feeding on spilled refuse. Some care may need to be taken in the design of structures to prevent nesting from becoming a nuisance.

4.4.4 VECTORS

4.4.4.1 Introduction

One of the most commonly expressed concerns regarding the biological impacts of the proposed resource recovery facility is that it might increase the number of rodents, birds, and insects in the vicinity. The presence of these organisms is viewed as a potential threat to public health because of the diseases which they can carry; their presence is also considered a general nuisance. This aspect of the project is significantly different from other biological concerns which focus more on the protection of valuable biological resources. Because of this, a separate section has been created for the discussion of vectors.

At this point, it is useful to define two terms that are used repeatedly in the discussion:

> A **"vector"** is any living organism that directly or indirectly transmits pathogens. The majority of higher animals are potential vectors for pathogens that affect humans. Three of these -- rodents, insects, and birds -- can be associated with resource recovery facilities. In addition to being potential disease carriers, some of these animals can create public nuisances as well. Rodents are probably the most significant nuisance animals because of the damage they do to buildings and electrical wiring. However, the presence of large numbers of birds or insects is also undesirable, even if they do not carry pathogens.
>
> The **"carrying capacity"** of an environment is the number of organisms of a particular kind that it can support over an indefinite time period. In general, it is determined by the amount of food and suitable living space that is available to the population and the kind of competition that is present from other organisms.

A significant proportion of the solid waste that would arrive at the resource recovery facility each day would consist of putrescible material that is a potentially rich source of food for a variety of animal vectors. Improperly designed, the facility could provide a suitable physical habitat (or access to a suitable habitat) for resting and breeding as well. If this were to occur, the biological carrying capacity of the area in which it is built could be increased significantly above its current level. At the very least, the resulting increase in the vector population could create a public nuisance; at its worst, it could threaten public health. The purpose of this analysis is to identify potential impacts and to determine the extent to which the designs of the proposed facilities would prevent this potential from being realized.

4.4.4.2 Applicable Regulations

Both Chapter 58 of the State Public Health Regulations and standards established by the U.S. Environmental Protection Agency have sections relating to the control of vectors at solid waste disposal facilities. Major stipulations contained in each of these summarized below.

4.4.4.2.1 State Public Health Regulations. These regulations establish minimum standards governing the design, construction, installation, operation and maintenance of solid waste disposal systems. More specifically, they are intended to "prevent the spread of disease and the creation of nuisances and to protect the public health and safety" (Section 11-58-1).

Section 11-58-3 establishes a solid waste management permit system, and indicates that such a permit would be required for the proposed resource recovery facility. In Section 11-58-4, the following general operating standards relevant to vector control are stated:

> (B) Provide effective measures to control insects, birds, rodents, other disease vectors, and nuisance conditions at the facility.
>
> (E) Provide for the adequate storage of all solid waste so as to prevent the attraction, harborage, or breeding of insects or rodents and to eliminate conditions harmful to public health or which create safety hazards, odors, unsightliness, and other public nuisance.

Additional control requirements can be found under "Standards for Reclamation Facilities" /Section 11-58-4 (c)/:

> (1) By-products removed during processing shall be handled in a sanitary and nuisance-free manner and shall be recycled or disposed of in a manner approved by the department.

and under "Standards for Incineration" /Section 11-58-4 (d)/:

> (1) Incinerator fly ash and residue generated from incineration of solid waste shall be treated and disposed of in a manner to prevent odor and dust nuisance and to control insects, birds, rodents, and other disease vectors.

The intent of the above standards are clear and provide a strong indication that the Department of Health would disapprove any facility which it believed did not provide for adequate control of potential vectors.

4.4.4.2.2 EPA Guidelines. The qualitative nature of present standards regarding vectors is also reflected in U.S. Environmental Protection Agency (EPA) guidelines on the subject. These do not specify exactly how many organisms per unit area or volume are acceptable. The issue of the Federal Register in which the standards were promulgated indicated that the agency felt that specific numerical standards ". . . could not be measured with any accuracy." Section 257.3-6(a) establishes the following standard for disease vectors:

> The facility or practice shall not exist or occur unless the on-site population of disease vectors is minimized through the periodic application of cover material or other techniques as appropriate so as to protect public health.

To summarize, the primary objectives of the existing standards are:

- to protect the public from vector-associated nuisances and disease;
- to insure that the processing and storage of solid waste is done in such a way as not to harbor or attract vectors; and
- to see that effective methods are employed to control/minimize vector populations associated with solid waste facilities.

The acceptability of the resource recovery proposals with respect to potential vector-related impacts was judged on the basis of their compliance with the aforementioned standards.

4.4.4.3 Potential Project-Related Vectors

The species associated with solid waste which are most likely to serve as disease vectors (see Tables IV-9 and IV-10) are either already present in the area or will be brought there in the refuse; moreover, they have great reproductive power. Hence, their ultimate population is independent of their current numbers on the site. Rather, it will be determined by the facility's effect on the carrying capacity of the environment.

The diseases which can be carried with each of the vector types are discussed generally below. Appendix B contains more complete lists of the diseases which have reportedly been associated with vectors and indicates the extent to which each is considered a public health concern in Hawaii.

4.4.4.3.1 Rodents. The rodent species most likely to be found in the vicinity of the proposed site (either because they are already present or would be brought there in refuse trucks) are listed in Table IV-9. The species' high average reproductive rate for breeding females means a potential for a fast increase in the rodent population -- if suitable food and habitat are available, i.e., if the presence of the facility resulted in a greater carrying capacity of the environment.

Rats have been connected with about 20 diseases that can be transmitted to man. The majority of these are actually transmitted by ectoparasites (fleas, mites, lice) which live on the rats. Rats and mongooses have

Table IV-9. Checklist of Potential Mammalian Vectors.

Scientific Name	Common Name
Rattus rattus	Roof Rat
Rattus norvegicus	Norway Rat
Rattus exulans hawaiiensis	Hawaiian Rat
Mus musculus domesticus	House Mouse
Herpestes auropunctatus	Mongoose

Source: Lawrence H. Pierce.

Table IV-10. Potential Insect Vectors.

Scientific Name	Common Name
Musca domestica	House Fly
Chrysomia megacephala	Oriental Blow Fly
Chrysomia rufifacics	Hairy Maggot Blow Fly
Culex quinquefasciatus	Southern House Mosquito
Diploptera dysticoides	Pacific Beetle Roach
Blatella germanica	German Cockroach
Periplaneta americana	American Cockroach
Periplaneta australasiae	Australian Cockroach
Supella longipalpis	Brown-Banded Cockroach
Chironomus sp.	Midges
Drosophilia sp.	Fruit Flies

Source: Mr. James Ikeda, Staff Entomologist for the Vector Control Branch, State of Hawaii Department of Health. Personal communication to Lawrence Pierce (October 1979).

been shown to be carriers of both plague and leptospirosis in Hawaii (Higa, 1972).

Rats are not tolerated by the average citizen, not only because of the diseases they carry, but also because of the property damage they can cause and the fact they are considered frightening and/or physically abhorent. The types of property damage associated with rodent pests range from the consumption and contamination of food and feed to the actual destruction of buildings as the result of gnawing. The murine rodents' need to gnaw has also resulted in fires caused by insulation being stripped from electrical wiring in infested structures. One author has estimated that 5 to 20 percent of fires of unknown origin are stated by rodents (Bjornson, 1968).

4.4.4.3.2 Insects. The anthropod (insect) vector species which have the greatest potential for increase in the vicinity of resource recovery facility are listed in Table IV-10. The cockroaches, fruit flies, and midges are not likely to be true vectors in the sense of disease carriers, but they are definite nuisances. Most insect populations have a phenomenal potential growth rate, a potential many local residents become fully aware of only when there is an interruption in normal refuse collection. As an example, up to 20,000 fly larvae per week have been observed to develop (under ideal experimental conditions) from a single garbage can (James, 1969).

There has been relatively little research into fly/solid waste/disease relationships. The public health hazard presented by flies is primarily a function of their affinity for human and animal fecal material and their ability to transfer pathogens present in this material to humans, either directly or by contaminating food and water supplies. Flies are a nuisance both because they can contaminate food and feed, and because they are among the most numerous, mobile, and visible of the insect vectors.

While mosquitos are vectors of many diseases, only encephalitis and malaria have been significant health concerns in the continental United States (Hunter, 1960). In Hawaii, the last significant mosquito-borne disease outbreak was a few dengue fever cases in 1943-1944 (Ikeda, 1979). Mosquito bites are a source of irritation and possible secondary infection. They can make both recreation and cattle-grazing areas unusable.

Cockroaches are not generally associated with human disease outbreaks, although they have the ability to act as mechanical vectors of pathogenic organisms. They are a nuisance and possible health hazard primarily because of their contamination of food. They can do some damage to property by feeding on such things as stamps, book covers, wall paper, and draperies. There is generally just a strong aversion to the sight of them.

Fruit flies and midges may develop in any fermenting material, including the organic components of municipal solid waste (MSW). With each female fruit fly being capable of laying up to 500 eggs, they rank among the most prolific of the nuisance vectors. They are obviously bothersome in large numbers and they can contaminate food.

4.4.4.3.3 Birds. The bird species observed in the areas of the proposed HPOWER sites are listed in Table IV-7. Although all are potential vectors, it is doubtful that more than a few of the species present in the area would be associated with the facility.

Birds are associated with several diseases which affect humans. Birds also harbor numerous ectoparasites, including: lice, mites, fleas, bed bugs, louse flies, and ticks. These may invade structures where birds nest and roost and, if in close proximity, can attack humans. In small numbers, birds are relatively inocuous. They tend to be a nuisance or cause property damage only when they nest or roost in large flocks in or around a facility. Damages or nuisances associated with birds include droppings causing premature corrosion on metal surfaces, nests clogging drain spouts, or excessive noise and excrement.

4.4.4.4 Vectors in the Vicinity of Existing Solid Waste Disposal Facilities

The State Department of Health Vector Control Branch conducts a rodent trapping program that provides some comparative information regarding the magnitude of rodent populations in and around existing solid waste disposal facilities vis-a-vis those in other locations. These data indicate that the density of rats in the vicinity of the Waipahu Incinerator (a facility similar in many respects to a mass-burning resource recovery facility or the receiving portion of an RDF facility) is no higher than that in the Waipahu Mill Camp area. Trapping inside the City's Keehi Transfer Station (comparable to the receiving areas of resource recovery facilities) indicated about the same density of rats (all of them Rattus rattus, or roof rats) there as at the Waipahu Incinerator. Traps established outside the Keehi Transfer Station did not capture any rats, indicating that the animals that do use the facility as a habitat are likely to stay relatively close to home, at least when foraging for food.

The Department of Health also conducted a laboratory study designed to determine if rodents are able to breed and survive on refuse derived fuel such as would be produced by the RDF facility proposed by C-E/Amfac. The rodents used for the study were obtained from traps at the Keehi Transfer Station; hence, it is believed that they were already accustomed to the use of refuse as a food source. Control animals were fed laboratory animal chow and remained healthy throughout the course of the study. The remaining rats were fed prepared RDF and water. None of them accepted the RDF as food, and all of the animals died within a week of the beginning of the experiment. This suggests that stored RDF is unlikely to support a rodent population.

To determine the impact that the proposed facility might have on fly populations in and around the proposed facility, five poison bait traps each were placed adjacent to buildings at the Waipahu Incinerator and at the Keehi Transfer Station. A fifth trap was placed approximately 200 yards away from the buildings at each site to measure the background density of flies.

The data collected (see Table IV-11) shows the average fly population in the vicinity of two of the City's existing solid waste facilities to be significantly higher than the average populations in the communities sampled. Bait stations closest to fresh refuse captured the highest number

Table IV-11. Results of Fly Trapping Studies at the Keehi Transfer Station and the Waipahu Incinerator.

Location	No. of Traps	Flies Captured at Each Station					Mean No. of Flies Per Trap
		1	2	3	4	5	
Keehi Transfer Station	5	908	649	1,388	536	28	700
Waipahu Incinerator	5	420	708	388	3,064	904	1,097
Controls:							
Waianae, Makaha, Nanakuli	70						210
Kailua Town	12						56

Note: Data for solid waste facilities collected 12/7/81 to 12/14/81. Poison bait traps were used. Trap Nos. 1-4 were placed adjacent to facilities; trap No. 5 was placed approximately 200 yards from the buildings. The control studies were done previously.

Source: Hawaii, state of, Department of Health (March 30, 1983).

of flies. The low fly count at trap No. 5 at Keehi suggests that flies tend to be concentrated immediately around that facility. The 904 flies captured at trap No. 5 near the Waipahu Incinerator indicates either that the flies there are more far ranging or that other factors, such as the presence of nearby sugarcane fields, contribute to a higher natural background level.

It should be noted that it is only the raw (i.e., unprocessed) refuse that appears to attract flies. In a test using standard fly traps, a trap baited with the normal attractant caught 29 flies during the same period one baited with dry RDF caught only one.

4.4.4.5 Probable Impacts and Mitigation Measures

From the preceding, it is clear that organisms associated with solid waste can be disease vectors and that, by virtue of the food and harborage which they provide, a resource recovery facility has the potential to increase the carrying capacity for some species. However, this demonstrates only that problems could occur. The fact that resource recovery facilities have operated for years in Europe and Japan, and more recently on the mainland U.S., without undue problems from rodents, insects, and birds demonstrates that the problem is a manageable one. In short, so long as suitable care is taken in the design, maintenance, and operation of the resource recovery facility, vectors associated with it will not adversely affect public health.

Both of the offerors are committed to implementing whatever control or mitigation measures are necessary to assure that rodent, insect, or bird vectors are not a nuisance or a public health hazard, on or around the site. All of the facilities would be designed to minimize problem-creating situations, such as nesting and roosting areas. Other design elements which could be incorporated to control vectors include sealing around pipes coming out of the walls, installing metal rat guards on wires and pipes running up walls, and installing metal mesh on windows and other openings. Doors could be self-closing and with less than a half-inch clearance at the bottom.

In addition to design and operation controls, mechanical and chemical measures would be instituted as necessary to control pests as problems arise. The types of control methods that could be utilized for specific vectors are discussed below.

4.4.4.5.1 Rodents. Besides a good sanitation and housekeeping program, and design and maintenance of the structures and grounds to eliminate potential harborages, traps and poisons would probably be used to keep rodent populations as low as possible. Permanent bait stations and repeating mouse traps set at intervals around the borders of the site and at strategic locations such as entrances to the facility would serve to intercept rodents which might be attracted to the facility. The choice of attractants and poisons should be determined by the area of placement (very toxic agents should not be in areas accessible to birds or domestic animals), and the extent of rodent activity in the area. Water baits might be used at Campbell Industrial Park because these are effective against rats in areas where water is scarce and food is not. Baits incorporated into paraffin are resistant to mold, insects, and spillage, and have the additional advantage of showing gnaw marks as an indicator of activity in the area. Break-back type rat traps could be used as a further step in situations where rats cannot be eliminated by baiting.

4.4.4.5.2 Insects. Elimination of moisture is critical for control of many insect vectors, especially mosquitos. In addition to good drainage, openings to potential breeding areas should be screened wherever possible with a 12- to 18-mesh barrier. An air stream at large openings would minimize the ingress and egress of insects. Insect electrocutors could also be installed. These devices generally rely on the phototactic response of most flying insects to draw them into an electrically-charged grid. Chemical control can be through surface or space sprays. Since the use of chlorinated hydrocarbons has been limited by legal restrictions and insects' increasing resistance to them, organo-phosphates and carbamates are effective for surfaces, and pyrethrins for contact or space sprays. Light hydrocarbons, such as kerosene and No. 2 fuel oil, have been used on standing water to kill mosquito larvae. Thermal fog generators and Ultra-Low-Dosage (ULD) equipment (a highly-concentrated insecticide which is sprayed as a micron size mist) are effective against adult mosquitos. For cockroach control, contact and residual sprays, baits, dusts, and fogging materials can be used. Residual control is desirable in cracks, crevices, baseboard edges, and wall-floor intersections. Dusts (toxicants, dessicants, or abrasives) can be used in dry areas such as wall voids and under equipment.

4.4.4.5.3 Birds. Site noise and activity is a reasonably effective deterrent to excessive bird populations near industrial facilities. Design and operation procedures should be effective enough to limit or eliminate the need for further control measures such as repellents, toxicants, shooting, or trapping.

4.4.5 IMPACTS ON MARINE BIOTA

The proposed resource recovery facility site is more than a thousand feet from the shoreline; delivery of solid waste would be via land routes; and the proposed designs provide for the containment and treatment/disposal of water which might contain undesirable pollutants. Hence, the only means by which the project could significantly affect the marine environment is via the discharge of warm ocean water that would result from one condenser cooling option under consideration. A brief description of the ocean water cooling system which has been proposed is contained in Section 4.3. This section discusses the effect that such a condenser water cooling system would have on marine biota.

The discussion draws heavily from a reconnaissance survey conducted by a marine biologist (Dollar, 28 February 1983) and a preliminary review of ocean water intake and discharge options commissioned by the City and County Department of Public Works (Belt, Collins & Associates, March 1983). Both of these studies were based on limited information provided by offerors regarding the nature of the intake/discharge system that would be used. The purpose of the biological reconnaissance and subsequent analysis was to provide a qualitative assessment of the existing marine ecosystem and its sensitivity to damage as a result of pipeline construction and/or discharge of heated cooling water. The assessment was intended as the basis for preliminary judgements regarding the viability of an ocean water cooling scheme. As such, the biological reconnaissance was not intended as a comprehensive inventory of the organisms that inhabit the pipeline corridors and possible discharge points. Such work must await a more precise definition of the route that is to be followed and the thermodynamic characteristics of the discharge; it would only be undertaken after final acceptance of technical proposals.

The remainder of Section 4.4.5 consists of three main parts. The first provides an overview of the physical setting and of the kind of structures that would be required if ocean intake/discharge were employed. The second describes the methodology and results of the biological reconnaissance survey. The third, and final, section discusses the impacts that the use of ocean intake/discharge structures would have on marine biota.

4.4.5.1 Background

4.4.5.1.1 Physical Setting. The proposed site is underlain by coral limestone to a depth of several hundred feet (see Section 4.1). The shoreline is composed of relatively stable beachrock (cemented sand grains). Where the beachrock is exposed to weathering, its surface is jagged and pitted by rainwater solution. At the water's edge, there is a wave-cut scarp two to three feet high; it is generally vertical, but undercutting is apparent in places. On the backshore above the normal reach of waves are substantial deposits of calcareous sand, the only sand which is found along the shore and in nearshore waters. Judging by its appearance, there has been substantial recent erosion, probably as a result of waves from Hurricane Iwa.

The limestone reef offshore slopes gradually down at about one percent until an abrupt, vertical drop is encountered about 3,000 feet offshore. At this point, the depth changes from about 30-35 feet to 55-60 feet. On the inner half of the gently sloping reef, holes and coralline structures protruding several feet are common. The only sand consists of small amounts of very coarse calcareous particles; this is found in scattered pockets which apparently provide shielding from wave energy. The outer half of the reef ledge has less topographic variation, and is also devoid of sand. When field work was undertaken in early 1983, the several hundred feet immediately in front of the abrupt drop-off had recently been stripped of most coral and algae growth, leaving an exceptionally smooth surface. Waves of Hurricane Iwa were judged the probable cause of this.

4.4.5.1.2 Intake/Discharge Structures. A single-pass cooling water system for the proposed 1,800-ton per day capacity facilities would require a cooling water flow of from 50 to 65 million gallons per day. To put this in perspective, it amounts to seven percent of the present ocean thermal discharge from the Kahe power plant, Hawaiian Electric's largest facility. It is possible that this water would be obtained from on-site brackish water wells. If this is not done, an ocean intake would be required. Water could be obtained using a shoreline intake (as is the case at Kahe) or through an intake pipe extending farther offshore. Good engineering practice dictates that an offshore intake be located in water at least 22 to 24 feet deep; this depth is reached some 1,800 to 2,000 feet from the shoreline. This depth would provide sufficient water cover over a vertical inlet structure to prevent momentary exposure by passing wave troughs.

Discharge of heated water would occur either close to the shoreline (if brackish water wells are used as the source) or a minimum of 400 feet makai of the intake (to prevent reingestion of heated water) if an offshore intake is used. Based on the observed wave break, as well as damage sustained by ocean (oil) pipelines at Barbers Point during Hurricane Iwa, the pipelines should be buried (partially or wholly) in the reef.

4.4.5.2 Existing Biota

4.4.5.2.1 Survey Methodology. A survey of the nearshore environment makai of the proposed resource recovery facility site was conducted in February 1983. All surveys were conducted by divers using scuba equipment operating from a 20-foot boat. The diver was towed in a zig-zag pattern along possible intake/discharge pipeline routes from the most shoreward depths that were accessible to the seaward limit of the reef formation. Following this reconnaissance, three stations were selected for quantitative transect surveys. One station is located in the shallowest accessible reef zone (about 4 meters depth), which is the zone most likely to be impacted if the intake or diffuser is located close to shore. A second station is located at a depth of 8 meters in the zone of highest coral cover, and a third is situated at the seaward edge of the reef in water 12 meters deep.

At each of the stations biological data was collected using a replicating photo-transect technique with ten 0.6 square meter quadrats. Photographs of the quadrats were then used to accurately estimate the proportion of cover of each benthic species. In addition, a diver with knowledge of resident species visually estimated the occurrence of all organisms and the areal coverage of organisms larger than 2 centimeters.

4.4.5.2.2 Description of Existing Biota. The biological communities that inhabit the Barbers Point reef are typical of those found in high wave energy nearshore environments in Hawaii. In general, the shallow areas of the reef (water depth of 5 meters or less) which are subject to the highest levels of wave-induced turbulence are dominated by marine macroalgae. Detailed species inventories contained in the environmental report for the CONOCO-Dillingham oil refinery (CONOCO-Dillingham Oil Company, 1972) identified 60 species of algae occurring in the nearshore zone:

Type of Algae	No. of Species
Red algae (*Hodophyta*)	27
Green algae (*Chlorophyta*)	17
Brown algae (*Phaeophyta*)	14
Blue-green algae (*Cyanophyta*)	2

During the present study, the following genera were most prevalent: *Sargassum*, *Padina*, *Ulva*, *Acanthophora*, *Dictyosphaeria*, *Lyngbya*, *Liagora*, and *Hypnea*. Corals occurred very sporadically in the nearshore surf zone. Colonies that did occur were all small encrusting patches of Porites lobata and Montipora spp. Transect photographs from a depth of four meters indicated that less than two percent of the substrate was coral covered (see Table IV-12).

Table IV-12. Number of Coral Species and Percent of Cover Along Bottom Transects.

Depth	No. Species	% Coral Cover
4 meters	3	2
8 meters	6	45
12 meters	12	1

Source: Dollar, February 28, 1983

The structure of the benthic community changes several hundred meters offshore in water about 7 meters deep. There, wave action is less pronounced than in the shallows, and the reduced turbulence, scour, and concussive shock allow corals, rather than fleshy algae, to become the dominant bottom cover. Broad, flat encrustations of Porites lobata and Montipora spp. cover the flat bottom. Branched, hemispherical colonies of Pocillopora meandrina are also common. Photo transects indicate a mean coral cover of approximately 45 percent, by far the highest coral cover zone in the Barbers Point area.

Moving farther seaward toward the reef shelf drop-off, the solid bottom becomes increasingly barren and devoid of corals. Normally, in Hawaiian reefs this area is the richest in terms of coral cover. At Barbers Point, however, a short algal turf covers the flat reef bench. At the upper edge of the reef drop-off, a two-meter wide zone of large coral heads occurs. Most of these corals are pinnacle-shaped Porites lobata colonies. At the base of the drop-off, as well as in depressions in the reef, large coral rubble chunks are common.

It is possible to speculate that the cause of this rather anomalous community structure is due to the recent extremely high surf generated by Hurricane Iwa in November 1982. Apparently, large storm swells from the storm directly impacted Barbers Point, and the concussive shock they generated was sufficient to strip most of the seaward part of the reef of all living corals. Quantitative surveys (see, for example, Dollar, 1982) show that such severe, but infrequent, events serve to bring zones of high cover but low species diversity back to early pioneering stages of community succession. Based on this interpretation, it is estimated that the recovery time for the wave-decimated outer reef zone at Barbers Point will be on the order of 20 to 40 years.

4.4.5.3 Expected Impacts

A review of the literature regarding the environmental effects of underwater pipeline construction and thermal discharges indicates that the following are the most important areas to consider with respect to the proposed intake/discharge structures:

- o thermal stress resulting from the discharge of heated water;
- o impingement or entrapment of fish and invertebrates on the intake screens; and
- o silt and sediment damage to invertebrates resulting from dredging and blasting.

The remainder of this section discusses the significance of each of these potential effects with respect to possible ocean intake/discharge structures for the proposed resource recovery facility.

4.4.5.3.1 Thermal Stress. Wheelabrator-Frye has indicated that water discharged from the cooling condensers at the proposed facility would have a temperature of approximately 10 to 12 degrees centigrade above that of the surrounding ocean. (C-E/Amfac's basic design would not involve ocean discharge.) Studies of cooling water discharges in Hawaii (Jokiel, P.L. and S.L. Coles, 1974) have indicated that:

- o temperature increases of 4 to 5 degrees centigrade above ambient result in total coral mortality;
- o increases of from 2 to 4 degrees centigrade cause corals to lose their zooanthellar pigment and suffer high, but not complete, mortality; and
- o rises of less than 2 degrees centigrade apparently cause little or no physiological effect, unless ambient temperature is already close to the upper lethal limit of 32 degrees centigrade.

The State Department of Health has adopted water quality standards based on this and other scientific evidence. The standards stipulate that discharges of water whose temperature is more than one degree centigrade above ambient may only be made into special zones of mixing established by the Department. Since the heated water effluent from the water cooled condensers at the proposed resource recovery facility would be significantly above this threshold level, the potential for adverse effects does exist, and it will be necessary to obtain a National Pollution Discharge Elimination System (NPDES) permit from the State Department of Health.

Since 1973, the Hawaiian Electric Company (HECO) has conducted an ongoing investigation of the effect of heated water on the coral reef environment adjacent to the discharges of its Kahe power plant. The Kahe facility is located just a few miles from the proposed resource recovery facility site, and the ocean environments at the two locations have many similarities. Because of this, results of the Kahe studies are useful in assessing the potential impact of thermal discharges from the proposed project, and the following discussion draws heavily from them.

The Kahe power plant discharges approximately 800 million gallons per day of heated water through an ocean outfall. The temperature of this water is about 5^{o} to 6^{o} centigrade higher than the surrounding ocean. The official zone of mixing for this discharge (i.e., the area within which the temperature may be raised more than one degree centigrade above ambient) encompasses 1,125 acres. In contrast, monitoring during 1981 showed that the composite envelope of water heated by more than one degree centigrade included only 83 acres during that year.

Biological surveys of the area in the vicinity of the Kahe power plant outfall have shown an overall decline in the percentage of coral cover during the 1973 to 1980 period. However, two facts suggest quite strongly that the decline is not due to thermal stress as a result of heated water discharge. First, the decline between mid-1979 and mid-1980 was about five times greater than the rate for the remaining years. This drastic decrease in coral cover coincides with a severe Kona storm which impacted the coastline in January 1980; it indicates that the detrimental effects of a single natural event were far more devastating than any chronic thermal stress. Secondly, and perhaps most importantly, regression analyses of coral cover change against distance from the outfall and against outfall-related physical variables has indicated that coral cover decline is greater with increasing distance from the outfall. Mean coral cover observed at a nearby sampling station used as a control which lies outside the zone of mixing of the Kahe power plant has declined from three to ten times as much as has the coral cover at any of the stations within the zone of mixing.

Comparison of these patterns of coral growth and survival with the physical data that is available suggest that sediment resuspension, which was greatest at the control station, is the dominant detrimental factor. The moderate temperature elevations that may be attributed to the outfall appear to have favored coral growth and survival. This corroborates with observations in coral recruitment and growth which were found to increase with proximity to the Kahe outfall.

Cooling water discharge from the proposed resource recovery facility would be on the order of 50 to 65 million gallons per day, and its temperature would be about 10^{o} to 12^{o} centigrade above ambient. The amount of heat released into the ocean would be about one-tenth that contained in the Kahe discharge, and the size of the zone of mixing would decrease accordingly. If the decrease were directly proportional to the volume and current and wind conditions were comparable to those experienced in 1981 during the study by Coles, then the area which would experience a temperature rise of more than one degree centrigrade would be well under ten acres. Within this area, varying degrees of effects would be noticeable, increasing with proximity to the outfall.

If the outfall discharged near the shoreline or in water 12 meters or more in depth, the paucity of coral cover in those location means that there would be little effect on the existing coral community. If the discharge were in the 8-meter depth zone, where coral cover approximates 50 percent, the effects would probably be more noticeable. However, even in this zone the adverse effects would be limited in geographic dimensions and would not affect a particularly rare or diverse coral community.

Another benthic assemblage that may conceivably be affected by thermal discharge is the algal community. Surveys at Kahe showed an increase in the number of algal species and a net decrease in algal abundance from 1980 to 1981. This may reflect a trend of algal succession to a more stable community following the reef damage generated by the January 1980 storm referred to previously. While statistical analyses indicated that depth and proximity to the offshore outfall influenced the redistribution and abundance of reef algal communities, it also suggested that the Kahe outfall's influence on abundance and distribution was related to the resuspension of sediment and subsequent sand deposition on adjacent reefs which it caused, not to changes in water temperature.

Because of the high wave energy present, there is very little sand or other sediment in the vicinity of potential outfall locations off the Campbell Industrial Park site. Hence, this type of effect on algal populations is not to be expected there.

4.4.5.3.2 Entrapment. Another aspect of the ocean intakes that can have an adverse effect on marine biota is the impingement or entrapment of fish or invertebrates on intake pipe screens. Information supplied by HECO for its Kahe power plant indicates that this is not a problem there. Use of capped vertical intakes combined with the much smaller intake volume of the proposed resource recovery facility indicates that entrapment would be inconsequential there, especially since no unique or overly abundant nektonic populations were noted there.

4.4.5.3.3 Construction Effects. Outfall construction involves dredging and/or blasting of pipe channels. If the outfall extends into the middle zone (8-meter depth) off Barbers Point, the pipeline will have to cross a relatively healthy reef segment, and some destruction will inevitably result. However, due to the rapid flushing of fine sediment from the reef bench produced by the area's normal wave regime, such damage, if it did occur, would likely be of a very temporary nature. Moreover, because the moderate to high wave stress to which benthic communities at Barbers Point are regularly exposed maintains the reef at a relatively diverse but early successional stage, recolonization and regrowth of the disturbed portions of the reef would be rapid (probably completed within several years).

No ocean intake/outfall designs have been decided upon as yet. Hence, the nature and extent of the underwater work that would be required cannot be determined at this time. Should underwater blasting be required, some fish and other marine biota would be adversely affected. It is possible to minimize potential adverse effects by utilizing relatively small charges and measures designed to keep mobile marine organisms (especially marine mammals) at a distance. The danger grows with increasing water depth; the relatively shallow water in which outfall construction would occur means that adequate protective measures could be taken. Should the winning bid utilize an ocean intake or outfall, such issues will be addressed in much greater detail in the necessary permit applications.

4.4.5.3.4 Beneficial Effects. If they are not buried, man-made structures such as would be used for an ocean outfall system can also have a positive effect on marine community abundance and diversity. Solid concrete or basaltic structures (such as pipe or armor rock) often add surfaces that are preferred over natural substrate by settling larvae. Also, vertical surfaces, rare in the natural environment, provide settlement sites that do not accumulate sediment. The complex of interstitial spaces created by armor rock often creates habitat space that is quickly colonized by motile species for shelter as well as by sessile benthos. Fish and invertebrate populations on existing outfall structures in Hawaii are vastly greater than those of the surrounding flat bottom.

4.5 TRAFFIC IMPACTS

The proposed resource recovery facility would be the origin and destination of trips made by many different types of vehicles. These include public and private refuse collection vehicles, transfer trailers, commercial vehicles, employee automobiles, visitor vehicles, and trucks carrying ash, process residue, and recovered materials. While the total number of trips that would be made each day is modest compared to existing traffic volumes on affected roadways, most of them would be made by medium and heavy trucks. Because of this, a detailed traffic impact analysis was conducted.

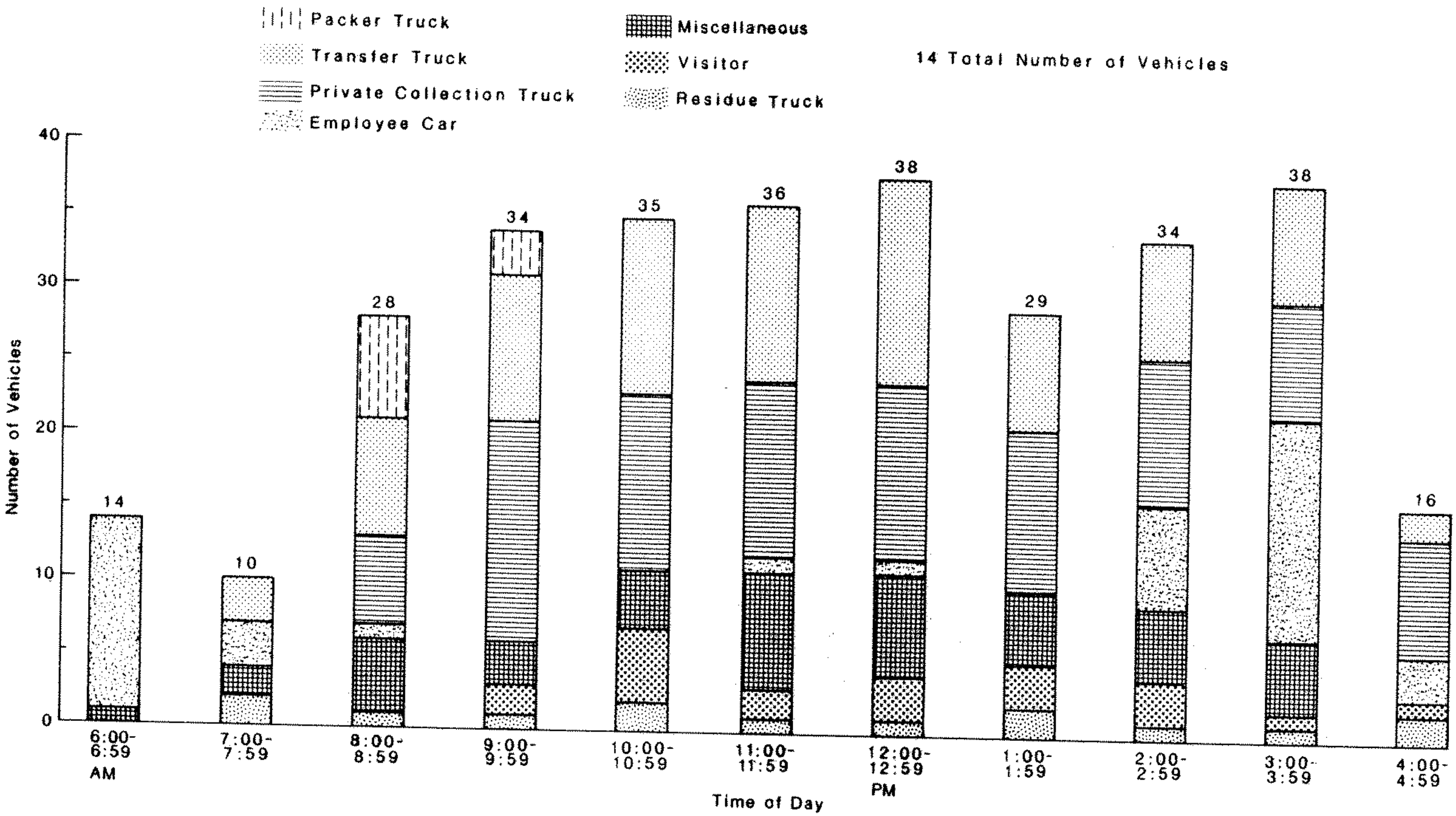
The analysis was designed to answer the following questions:

- How much traffic would be generated?
- What types of vehicles would be involved, and what routes would be affected?
- What are the existing traffic volumes on the roads that would be affected?
- Are there any already-approved (but uncompleted) projects that can be expected to raise traffic volumes on those roadways significantly above its existing level?
- What would be the total traffic on affected roadways following implementation of each of the alternatives under consideration?
- Do the existing roadways (together with planned improvements) have sufficient capacity to accommodate projected traffic volumes?
- What provisions have or could be incorporated into the project in order to avoid or mitigate undesirable traffic impacts?

4.5.1 TRIP GENERATION

The traffic to and from resource recovery facilities depends in large part upon the type of colection and disposal network employed, and these vary significantly from place to place. Hence, traffic generation for Honolulu's proposed resource recovery project could not be estimated on the basis of comparable projects elsewhere. Instead, vehicular traffic to and from the facility was broken down into its constituent parts, and data from the City's existing solid waste facilities and from offerors' technical proposals were used to construct the traffic profile for the facility shown in Figure IV-5. The bases for the trip-generation estimates are described in the following subsections.

In general, the mass-burning and RDF facilities are quite similar with respect to the number of vehicle-trips they would generate. Perhaps the most significant difference is that C-E/Amfac's RDF system produces about one truck load of residue per hour from the processing operation which must be transported to landfill, whereas Wheelabrator-Frye's mass-burning system



Source: Refuse Division, Department of Public Works;
Belt Collins and Associates

Figure IV-5. Number of Round Trips Generated by the Proposed Resource Recovery Facility by Hour: 6:00am to 5:00pm.

does not. At the same time, the ash output of the mass-burning system is greater. The differences in vehicle-trips are so minor that they can be ignored without affecting the accuracy of the analysis. Because of this and the belief that the elimination of unnecessary detail permits greater clarity, a single traffic generation profile was used to characterize both proposals.

4.5.1.1 City Packer Trucks

"Packer trucks" are the familiar City-operated collection vehicles (the "Ka'a Opala") that pick up refuse from individual residences and small businesses throughout the island. They have a capacity of 20 cubic yards, or about 5 tons.

If a resource recovery facility is constructed in Campbell Industrial Park, the only packer trucks delivering directly to it would be those serving 'Ewa-Makakilo and Waianae. This would amount to about 10 truck loads per day, or a total of 20 one-way vehicle-trips. Routing patterns for other packer trucks would not be affected. Most would still deliver their loads to a City-operated transfer station. The refuse would then be transported to Campbell Industrial Park in large transfer trailers.

4.5.1.2 Private Collection Vehicles

The City estimates that its own collection system would account for approximately 860 of the 1,800 tons per day handled by the facility. The remaining 940 tpd would originate with private collectors. About half of the private vehicles would deliver their loads to the Keehi Transfer Station (see section 4.5.4.3) rather than directly to the resource recovery facility in CIP. Thus, it is estimated that only 470 tpd would arrive at CIP in private collection trucks.

Average daily vehicle counts at the Kapa'a Landfill, where most of the private haulers now deliver, showed the following breakdown by vehicle size:

Veh.Gross Wt.	# Veh.	Tons of Refuse	Avg.Wt. (tons)/Veh.	% of Total # Veh.
0-20,000 lbs	76	114	1.5	44
20-20,000 lbs	35	192	5.5	20
20-40,000 lbs	62	588	9.5	36
	173	894	5.15	100

Based on this data, it is estimated that private collection trucks would account for an average of 91 vehicle-loads, or 182 one-way vehicle-trips per day. It is assumed that the time distribution of these trips would be roughly the same as that observed at Kapa'a.

4.5.1.3 Transfer Trailers

Large, municipally owned tractor-trailers would deliver raw solid waste to the resource recovery facility from transfer stations at Keehi, Kapa'a and the North Shore. The City's estimate is that this would account for approximately 1,275 tons per day. In addition, large trailers would also be used to carry residue and ash to a landfill in the Leeward area.

It is estimated that approximately 11 percent (by weight) of the municipal solid waste entering the RDF facility proposed by C-E/Amfac would be rejected as residue. At a throughput of 1,800 tpd, this amounts to approximately 200 tons per day. The density of the residue is estimated at approximately one-third ton per cubic yard. Since the capacity of the trailers that would be used is approximately 20 tons, residue disposal would involve 10 round-trips per day. In addition, other vehicles would carry away the approximately 100 tons per day of ferrous scrap that would be recovered. Rounding, we have assumed approximately ten trips per day for this traffic component. These trips would be confined to the 10 hours per day during which the processing plant would normally be in operation.

The mass-burning system proposed by Wheelabrator-Frye does not involve front-end processing and does not, therefore, generate processing residue. However, much of the residue that is removed by front-end processing in the RDF alternative is non-combustible; hence, the reduction in process residue associated with this proposal is largely offset by an increase in ash volume produced by a mass-burning system.

Approximately 8 tons of ash would be discharged from the ash quench pits of the C-E/Amfac facility each hour the energy units are in operation. At an estimated density of about 2.5 cubic yards per ton, this is equivalent to 20 cubic yards per hour. At this rate, ash disposal would require one round-trip every three hours. We have rounded this off to an average of 1 one-way trip per hour, 24-hours per day. Residue disposal from the Wheelabrator-Frye facility would require approximately twice that number of vehicle-trips. These trips would be between the resource recovery facility and the Leeward landfill.

4.5.1.4 Employee Trips

It is estimated that a combined processing and combustion/power generation facility would employ from 50 to 70 persons. Information contained in technical proposals regarding hours of operation together with data concerning the number of persons required to staff various subsystems of the facility was used to estimate the approximate time distribution of employee trips. To insure that the number of trips was not underestimated, it was assumed that all employees would work every day, i.e., we did not try to account for persons on the payroll who are not at work on any given day because of sickness, vacation, or regular time off. Finally, it was assumed that all work trips would be by private automobile and that nobody would car-pool, i.e., that there would be one round-trip per employee per day. All of these assumptions tend to exaggerate the calculated number of vehicle-trips. Hence, it is expected that the actual employee traffic would be significantly less than that shown.

4.5.1.5 Visitors

The City intends to open the resource recovery facility to the public on a limited basis. No precise estimate of the number of persons who would take advantage of this opportunity is possible. However, experience elsewhere suggests that the number would be small. The vehicle-trip estimates for this component of traffic shown in Figure IV-5 take into account the fact that only ten visitor parking stalls would be provided and that a substantial proportion of the visitors would arrive by bus on group tours.

4.5.1.6 Miscellaneous Trips

The "miscellaneous trips" category covers all trips not otherwise accounted for. It includes trips by outside maintenance contractors, administrative personnel, and the like. This component was estimated by the Refuse Division based on its operating experience at other facilities.

4.5.2 ROUTES

Once the number of vehicle-trips generated at the entrance to the facility had been estimated, they were assigned to the highway network to arrive at projections of SWPRRF-related traffic volumes at key locations. This was done for each individual traffic component (e.g., transfer vehicles, private collectors, employees, etc.) to account for differences in the routes that each would follow. The bases for the assignments are outlined below.

Nearly all of the vehicles moving to and from the proposed Campbell Industrial Park site would utilize the Palailai Interchange of the H-1 Freeway (see Figure IV-6); for the purposes of this study, the very few cars and trucks that might use Farrington Highway to reach local destinations and the very few that would begin/end elsewhere in Campbell Industrial Park were neglected.

All vehicles would use Kalaeloa Boulevard between the H-1 Freeway and Malakole Road. Makai of that intersection, drivers can select one of several alternatives; their choice would depend upon the type of vehicle they are driving, prevailing traffic conditions (busy/not busy), and the extent to which drivers vary their routes from day to day. For the purposes of this analysis, it is assumed that, because it is more direct, from 60 to 70 percent of the drivers would choose a Kalaeloa Boulevard/Malakole Road/Hanua Street route. However, this assumption is not critical to the conclusions which are reached.

4.5.3 DIRECT IMPACT OF THE RESOURCE RECOVERY FACILITY ON TRAFFIC

Evaluating the impact of project-related traffic involved the following steps:

- Determination of existing traffic volumes;
- Calculation of the capacities of impacted roadways;

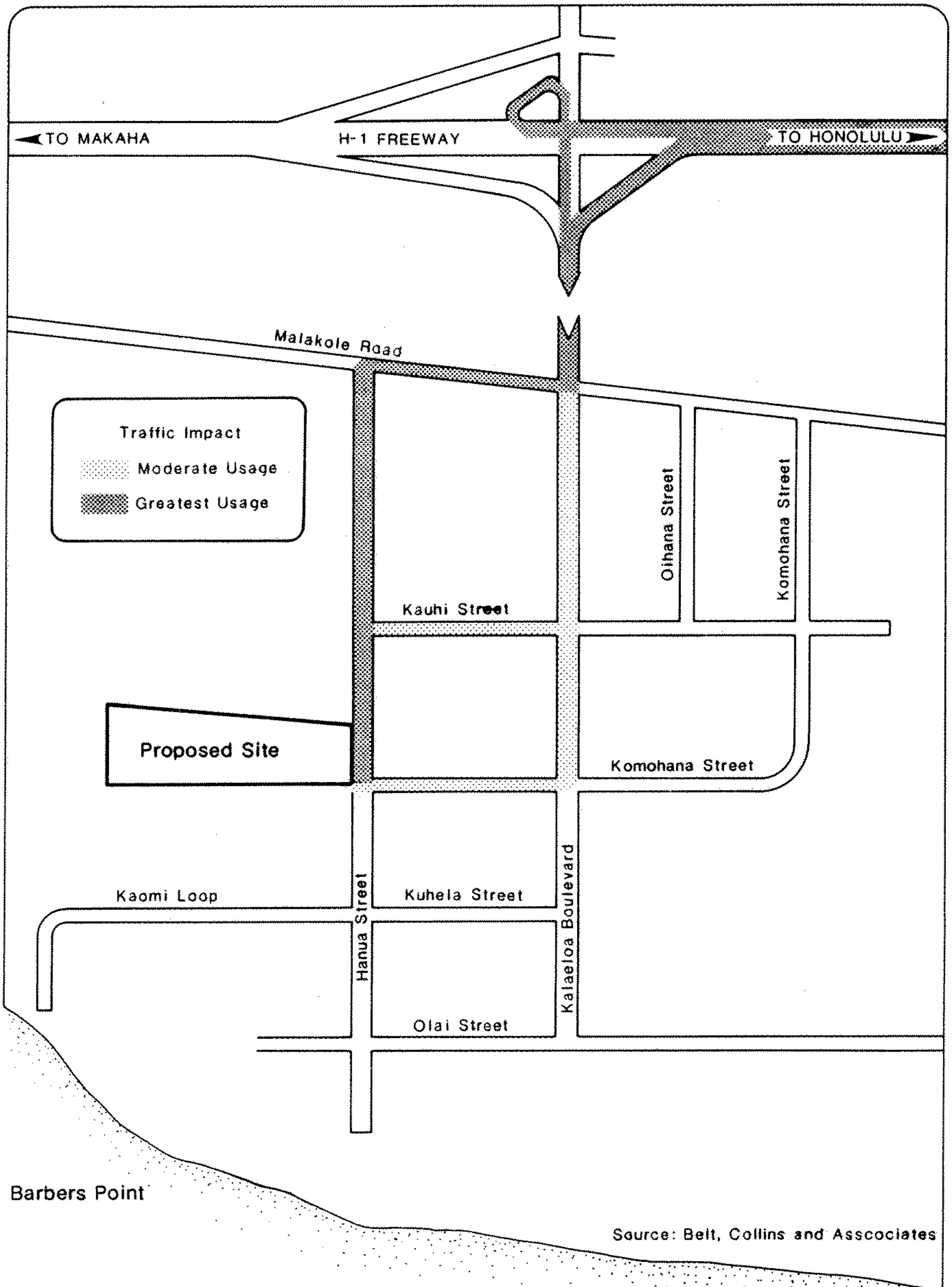


Figure IV-6. Roads Directly Affected by Project-Related Traffic.

- o Forecasting future increases in traffic unrelated to the proposed project; and
- o Comparison of the sum of all traffic (including project traffic) with roadway capacities.

Results of the evaluation are presented below.

4.5.3.1 Existing Traffic Volumes

As noted previously, essentially all of the vehicles moving to and from the proposed resource recovery facility would use the Palailai Interchange on H-1 and Kalaeloa Boulevard between the interchange and Malakole Road. Traffic counts are available from the State Department of Transportation for the interchange (Station TS82-2) and for Kalaeloa Boulevard just north of Malakole Road (Station 10-H). Results of the counts taken at the two stations in 1982 are presented in Tables IV-13 and IV-14. The counts at the Palailai Interchange do not measure all approaches, making a direct comparison with the counts for Kalaeloa Boulevard impossible. However, the 1982 data suggests that the great majority of the vehicles entering Campbell Industrial Park arrive via the H-1 Freeway.

Accurate data on traffic elsewhere in Campbell Industrial Park is not currently available. However, the distribution of existing development within Campbell Industrial Park as well as spot checks conducted during the course of this study makes it clear that most vehicles approaching the Malakole Road on Kalaeloa continue straight through the intersection. In general, only those headed for businesses on Hanua Street or for the Chevron Refinery, the barge harbor, or other minor destinations north of the Chevron refinery have a reason to use Malakole Road. It is our estimate that these amount to no more than 20 percent of the total inbound traffic. Outbound, it is likely that the proportion is even smaller.

4.5.3.2 Roadway Capacity

Kalaeloa Boulevard is a private roadway owned and maintained by the Campbell Estate. The right-of-way is 108-feet wide. The roadway itself is divided, with two 12-foot lanes in each direction. At present the absence of curbs and gutters and other required design features means that the portion of Kalaeloa Boulevard between the H-1 Freeway and Malakole Road does not meet City and County standards; hence, upgrading will be required before dedication will be possible. Other roads within the industrial park have been improved to City and County standards. All have generous right-of-way and pavement widths and wide landscaped setbacks.

Open stretches of Kalaeloa Boulevard have capacities of about 3,000 vehicles per hour in each direction. Long-range plans call for increasing the number of lanes from four to six. This would increase the capacity by approximately 45% to about 4,200 vehicles per hour. The Honolulu-bound on-ramp to the H-Freeway is designed to accommodate approximately 2,000 vehicles per hour. The pavement width on other interchange ramps is similar, but the movement of vehicles on them is controlled by stop signs,

Table IV-13 Existing Traffic in the Vicinity of Campbell Industrial Park.

Time Period	Farrington Highway Waianae-Bound	Off H-1 From Hono. Direction To Kalaeloa	Off H-1 From Waian. Direction To Kalaeloa	Off H-1 to Farr. Highway	Off H-1 Honolulu-Bound From Kalaeloa	Kalaeloa to H-1 Freeway	Kalaeloa from H-1 Freeway
	Number of Vehicles Per Hour						
12:00- 1:00am	26	0	2	9	2	14	5
1:00- 2:00am	14	4	0	7	2	7	3
2:00- 3:00am	7	1	2	5	2	4	2
3:00- 4:00am	6	12	2	11	3	4	12
4:00- 5:00am	11	25	7	27	5	8	16
5:00- 6:00am	12	98	18	73	14	21	71
6:00- 7:00am	110	567	169	275	42	90	564
7:00- 8:00am	117	266	112	222	117	169	669
8:00- 9:00am	112	215	30	121	180	158	258
9:00-10:00am	119	202	27	130	145	214	256
10:00-11:00am	142	197	22	115	147	229	231
11:00-12:00pm	168	171	28	126	144	242	256
12:00- 1:00pm	164	159	25	129	149	237	246
1:00- 2:00pm	149	183	18	116	143	262	252
2:00- 3:00pm	205	99	19	129	154	270	235
3:00- 4:00pm	327	94	31	149	414	736	218
4:00- 5:00pm	392	51	7	103	309	525	111
5:00- 6:00pm	220	30	11	126	116	218	88
6:00- 7:00pm	137	41	12	110	49	116	75
7:00- 8:00pm	102	14	7	83	41	45	30
8:00- 9:00pm	92	15	5	54	26	28	17
9:00-10:00pm	102	3	8	58	47	85	13
10:00-11:00pm	75	22	10	57	25	33	28
11:00-12:00am	53	9	6	42	17	39	32
24-HOUR TOTAL	2862	2478	578	2277	2293	3754	3688
AM Peak-Hour	168	608	176	326	189	886	816
PM Peak-Hour	455	183	31	191	476	242	271

Notes:

(1) Data from the Palailai Interchange is from State Department of Transportation Traffic Station TS82-2. It was recorded on May 14 and 15, 1982 (Wed. & Thurs.).

(2) Data for Kalaeloa Boulevard just north of Malakole Road is from a State Department of Transportation count at station 10-H taken May 20 & 21, 1982.

Source: Complied by Belt, Collins & Associates from State Department of Transportation data as noted.

Table IV-14 Projected Traffic With and Without the Proposed Resoure Recovery Facility: Kalaeloa Boulevard Near the Palailai Interchange of H-1.

	1982 Traffic Count		1987 Traf.w/o Proj.		Proj.-Related Traf.		1987 Traf.w/Project		% Inc. due to Proj.	
TIME PERIOD	Kalaeloa to H-1 Freeway	Kalaeloa from H-1 Freeway	Kalaeloa to H-1 Freeway	Kalaeloa from H-1 Freeway	Kalaeloa to H-1 Freeway	Kalaeloa from H-1 Freeway	Kalaeloa to H-1 Freeway	Kalaeloa from H-1 Freeway	Kalaeloa to H-1 Freeway	Kalaeloa from H-1 Freeway
12:00- 1:00am	14	5	16	6	2	2	18	8	12	34
1:00- 2:00am	7	3	8	4	1	1	9	5	12	28
2:00- 3:00am	4	2	5	2	1	1	6	3	21	43
3:00- 4:00am	4	12	5	14	2	2	7	16	43	14
4:00- 5:00am	8	16	9	19	1	1	10	20	11	5
5:00- 6:00am	21	71	25	83	2	2	27	85	8	2
6:00- 7:00am	90	564	106	663	14	14	120	677	13	2
7:00- 8:00am	169	669	199	786	10	10	209	796	5	1
8:00- 9:00am	158	258	186	303	28	28	214	331	15	9
9:00-10:00am	214	256	251	301	34	34	285	335	14	11
10:00-11:00am	229	231	269	271	35	35	304	306	13	13
11:00-12:00pm	242	256	284	301	36	36	320	337	13	12
12:00- 1:00pm	237	246	278	289	38	38	316	327	14	13
1:00- 2:00pm	262	252	308	296	29	29	337	325	9	10
2:00- 3:00pm	270	235	317	276	34	34	351	310	11	12
3:00- 4:00pm	736	218	865	256	38	38	903	294	4	15
4:00- 5:00pm	525	111	617	130	16	16	633	146	3	12
5:00- 6:00pm	218	88	256	103	3	3	259	106	1	3
6:00- 7:00pm	116	75	136	88	2	2	138	90	1	2
7:00- 8:00pm	45	30	53	35	1	1	54	36	2	3
8:00- 9:00pm	28	17	33	20	2	2	35	22	6	10
9:00-10:00pm	85	13	100	15	1	1	101	16	1	7
10:00-11:00pm	33	28	39	33	1	1	40	34	3	3
11:00-12:00am	39	32	46	38	2	2	48	40	4	5
24-HOUR TOTAL	3754	3688	4411	4333	333	333	4744	4666	7.5	7.7
AM Peak-60 min.	242	669	284	786	36	36	320	882	7.8	1.3
PM Peak-60 min.	736	252	865	296	38	38	903	334	4.4	9.8

Source: Belt, Collins & Associates

making their effective capacity less. None of the interchange legs or intersections on Kalaeloa Boulevard are congested at the present time.

4.5.3.3 Forecast Traffic Volumes Without the Project

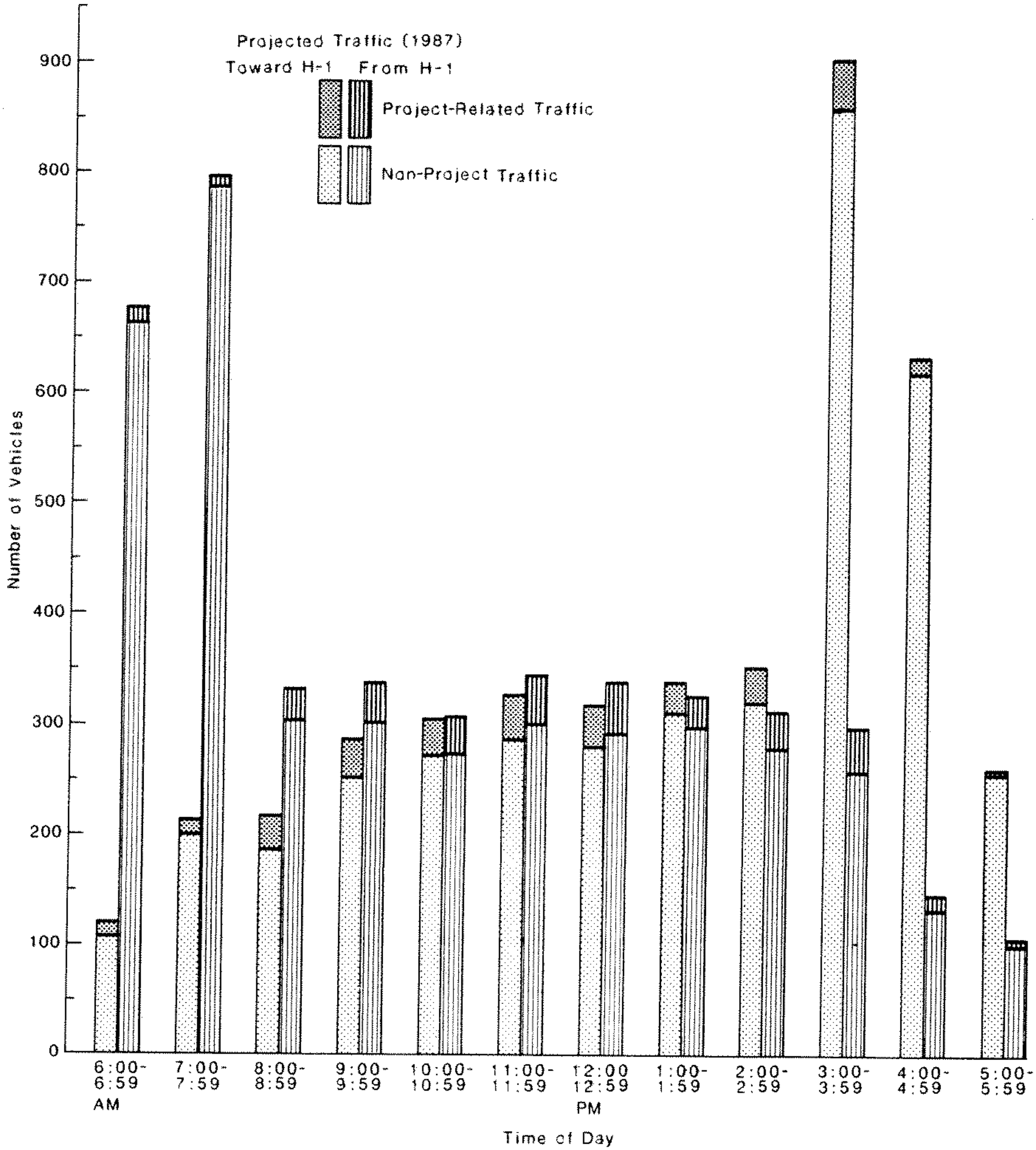
Over the past five years, traffic on Kalaeloa Boulevard has grown from 6,300 vehicles per day to about 7,400 vehicles per day, an increase of 1,100, or about 3 percent per year, compounded. Assuming this growth continues between now and the time the resource recovery project is operational early in 1987, average daily traffic at that time will be about 8,700 vehicles per day. An hourly forecast for that year without the resource recovery facility based on the time distribution observed in 1982 is presented in Table IV-14 and Figure IV-7.

It is expected that further development of Campbell Industrial Park will continue after 1987 as the deep draft harbor is completed and becomes operational and as the proposed Campbell Industrial Park expansion plans are implemented. The State Department of Transportation (June 1978: III-29) has prepared peak-hour traffic projections assuming complete development of Campbell Industrial Park. They indicate an afternoon peak hour outbound volume of 1,900 to 2,000. Twenty-four hour traffic under this scenario is estimated at 20,000 vehicles per day. The total could not be reached for many years and would require a very substantial increment of additional industrial zoning.

4.5.3.4 Probable Impacts

To determine whether or not the proposed resource recovery facility would have a significant effect on traffic flow in and around Campbell Industrial Park, project-related traffic as estimated in Figure IV-8 was added to the "without project" volumes forecast in Table IV-14. As can be seen from Figure IV-7, traffic moving to and from the resource recovery facility would have only a marginal effect on expected traffic. In 1987, the year it is scheduled to begin operation, it would increase morning peak-hour volume by less than 15 vehicles, or about two percent. It would raise the afternoon outbound peak-hour volume by about 40 trips, or four percent. All roadways would operate well below their capacity.

Results of the foregoing analysis indicate that the resource recovery facility could be constructed on the Hanua Street site without causing significant traffic congestion. However, if all of the development shown on the Campbell Estate's long-range master plan for the industrial park is approved and implemented, some improvements to Kalaeloa Boulevard and the Palailai Interchange may be necessary after 1995. The need for these improvements would not be triggered or substantially accelerated by the proposed project.



Source: Compiled by Belt, Collins and Associates

Figure IV-7. Projected Traffic on Kalaeloa Boulevard in 1987 With and Without the Project.

4.5.4 INDIRECT IMPACTS: KE'EHI TRANSFER STATION

If the proposed resource recovery facility is constructed in Campbell Industrial Park, it will affect operational patterns at the Ke'ehi Transfer Station. Instead of being able to take their loads directly to the Kapa'a or Palailai landfills, private collectors will be required to deliver either directly to the resource recovery facility or to the Ke'ehi Transfer Station. Because it is situated closer to many of their large customers, these operators may find it more economical to deliver a substantially greater portion of their collection to Ke'ehi than is presently the case. This subsection describes existing and projected refuse truck volumes and routing in the vicinity of Ke'ehi and evaluates its potential impact on traffic flow.

4.5.4.1 Truck Routes

Currently, City packer trucks deliver approximately 90 loads to the transfer station on Mondays, Tuesdays, and Wednesdays; Thursday through Saturday, when the collection trucks have lighter loads, the number of trips drops to 70. Essentially all vehicles arrive via the Airport/Middle Street Freeway exit with loads from areas on the Diamond Head side of Middle Street. Approximately twelve packer truck trips on Monday and six on Thursday arrive from the opposite direction; they carry refuse collected from the area between Middle Street and Halawa. /Most of the City packer trucks collecting from areas 'Ewa of Halawa discharge their loads at the Waipahu Incinerator./

Figure IV-8 shows the routes taken by packer trucks and by transfer trailers in the vicinity of the Ke'ehi transfer Station. Westbound packer trucks exit the freeway with airport-bound traffic, then merge with King Street 'Ewa-bound traffic. In the two blocks following the merging point, trucks must move two lanes to the left in order to turn left at the Middle Street traffic light. They then proceed makai on Middle Street to the entrance road located a short distance mauka of Dillingham Boulevard.

Leaving the transfer station, trucks may turn either right or left onto Middle Street. If they are finished for the day and are returning to the City base yard in Kaka'ako, they usually turn right onto Middle Street and then left onto Dillingham Boulevard. If they are headed for a second collection run, their routes vary.

Transfer trailers carry compacted refuse from the transfer station to the Waipahu Incinerator and Palailai Landfill. Leaving the transfer station the tractor trailers turn makai on Middle Street and right again onto the ramp which takes them up onto the elevated H-1 Freeway westbound. They return to the transfer station via the Moanalua Freeway and Middle Street makai-bound.

4.5.4.2 Existing Traffic

Traffic at key points near the Ke'ehi Transfer Station was observed to determine if there are existing points of congestion that might be further aggravated by increased refuse truck traffic. Because the vast majority of traffic into and out of the transfer station occurs before nooon, only the

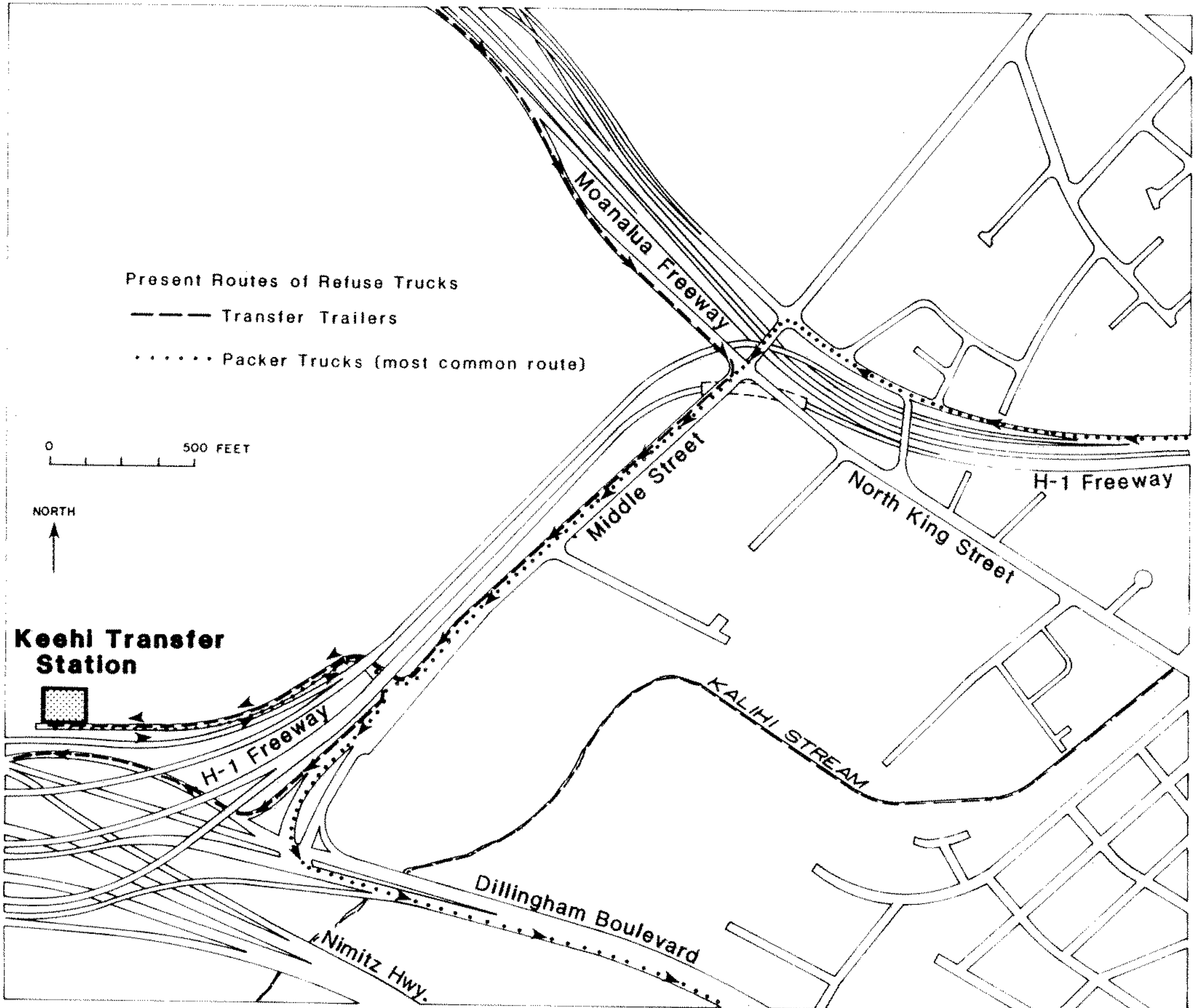


Figure IV-8. Roads Indirectly Affected by the Proposed Project.

morning hours were studied. Results of these investigations show the following:

- o The H-1 Middle Street exit 'Ewa-bound off-ramp to the merge with King Street carries very few vehicles. Since traffic 'Ewa-bound on King Street was also light, vehicles crossing over to make the left turn down Middle Street encountered no difficulties.

- o Traffic volume on Middle Street was also moderate, with long periods of totally clear road. These gaps in traffic made it easy for trucks exiting the transfer station access road to turn mauka-bound onto the roadway, or to turn right and move over two lanes for a left-hand turn onto Dillingham Boulevard.

- o Between 7:30 and 8:00, eastbound traffic on the Moanalua Freeway (the return route from Ewa) was heavy, and the King Street off-ramp was somewhat congested. However, vehicles were able to clear the signalized intersection at Middle Street within two signal cycles.

- o A point of infrequent congestion is the Middle Street Freeway overpass. Its short length, together with the fact that the signals are synchronized for through (rather than turning) traffic, limits the number of left turn vehicles that can be accommodated. The existing light traffic volumes keep this from being a problem at present.

4.5.4.3 Changes in Operations

Integration of the resource recovery facility into the City's solid waste disposal system would cause tonnage handled at the Ke'ehi Transfer Station to increase from its present 500 tons per day to 1,000 tons per day. No physical expansion or other changes to the facility would be required, but an increase in truck traffic and an extension of the facility's operational hours would occur.

Essentially all of the increase in tonnage at the transfer station would be carried by private collection vehicles. No change in the number or routing of City packer trucks delivering there is planned. Based on the vehicle-size/refuse tonnage breakdown from the Kapa'a Landfill (where most of the private trucks serving central Honolulu now take their loads), it is estimated that approximately 95 additional vehicles would operate out of Ke'ehi on a peak day. The time distribution of these trips is estimated as follows:

Hour (a.m.)	# of Additional Refuse Vehicles	Hour (p.m.)	# of Additional Refuse Vehicles
7:00- 7:59	11	12:00-12:59	11
8:00- 8:59	12	1:00- 1:59	11
9:00- 9:59	12	2:00- 2:59	9
10:00-10:59	12	3:00- 3:59	6
11:00-11:59	11		
		TOTAL	95

A point to note in this distribution is its evenness as compared to the packer truck schedule. Whereas the City trucks all arrive within the span of a few hours, the private collection vehicles operate over a much longer period of time. Hence, although the total number of trips made by the two groups is quite similar, the private haulers create a relatively smaller "peak", and their potential impact on traffic flow is less.

On a peak day, the changes in delivery volume noted above would result in an additional 35 round-trips by transfer trailers hauling compacted refuse to the resource recovery facility. However, essentially all of the required increase in transfer tonnage will be achieved by extending the transfer operation into the afternoon (at present, it is normally completed by noon). Hence, the maximum number of transfer trips made in any one hour will remain at its current level of twelve.

4.5.4.4 Impact on Traffic Flow

Present traffic volume on Middle Street is far below its capacity. The addition of a maximum of 12 refuse-vehicle round-trips during the peak hour would not create any traffic problems there. Traffic through the Middle Street/Dillingham Boulevard intersection would also continue to flow normally.

The two points of greatest concern because of existing peak-hour congestion are at the King Street/Middle Street intersection. One of these is the Diamond Head-bound off-ramp to Middle Street, and traffic on it would not be increased by projected changes at Ke'ehi. The second potential problem area is for 'Ewa-bound vehicles on King Street wishing to turn left (makai) onto Middle Street. Because of the timing of the signal lights at either end of the Middle Street bridge over the H-1 Freeway, vehicles turning left (makai-bound) must queue in the limited area between these signals. An average of one additional refuse truck would pass this way per signal cycle during the peak hour (12 over the course of the entire 60 minutes). While any increase in peak-hour traffic is undesirable, the effect of this very slight increase is not expected to be significant. There is also the possibility that it could be totally offset by a slight adjustment in the timing of the signal lights.

4.6 ENERGY IMPACTS

The impact that the proposed resource recovery facility would have on energy would be beneficial in two respects. First, it would recover waste energy. In this regard, the U.S. Department of Energy has stated that a resource recovery facility for Honolulu ". . . would offer some degree of energy self-sufficiency and would be supportive of the National Energy Plan" (Crawford, May 1979). As indicated in Chapter III, it would also be consistent with the O'ahu General Plan's objectives regarding energy and the State Energy Plan. In addition to reducing the island's use of, and dependence on, imported fossil fuels, the recovery of ferrous metal from the waste stream would also result in a substantial energy savings for the mainland metals industry. The remainder of this section presents estimates of the amount of energy that the project would deliver to the utility network, reviews the implications that this has for fossil fuel consumption on the island, and discusses the effect that ferrous metal recovery would have on energy use on the mainland.

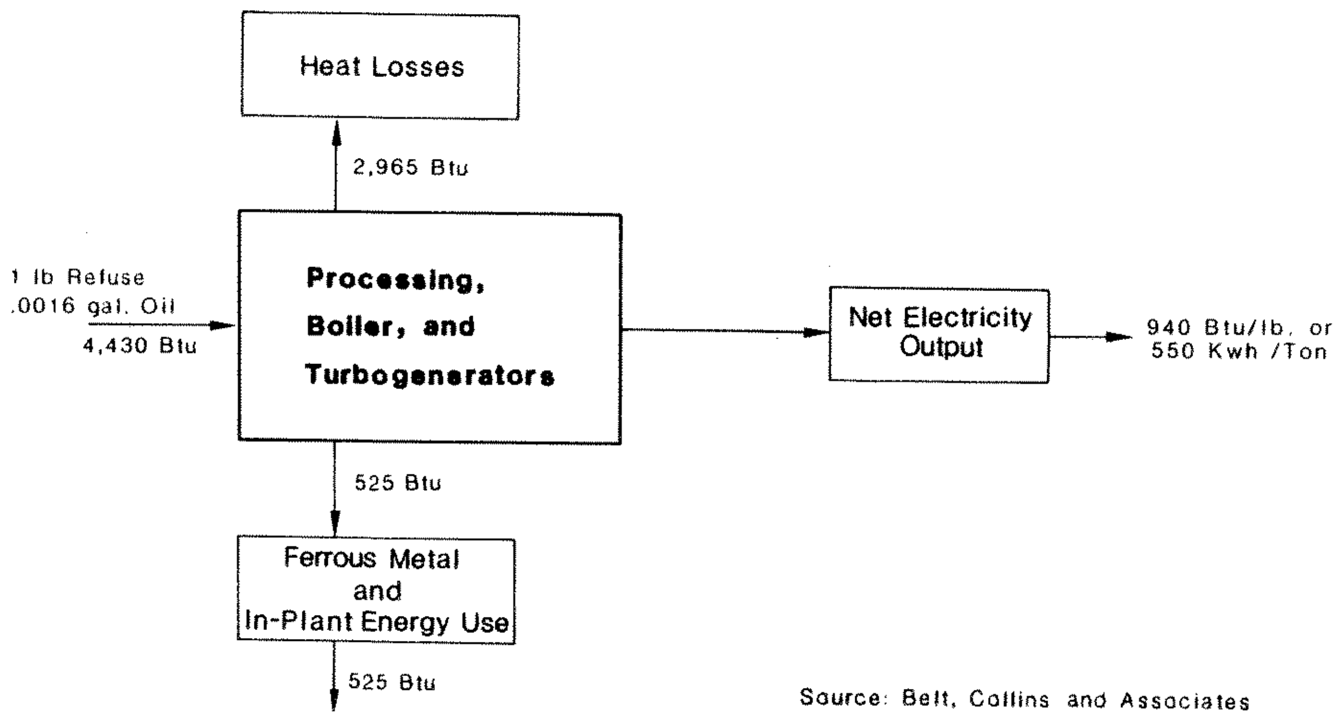
4.6.1 ENERGY BALANCE

4.6.1.1 Electrical Power

An 1,800-ton per day facility is expected to handle approximately 540,000 tons of refuse per year (1,800 tons per day, six days per week minus two weeks per year of scheduled and unscheduled downtime). With an estimated heat value of 4,400 British thermal units (Btu) per pound, this amounts to 4.75×10^{12} Btu's per year.

Figure IV-9 presents a generalized energy flow diagram for the proposed resource recovery facility. As it indicates, the net output of the facility (i.e., the amount of electricity available for sale to the Hawaiian Electric Company) after thermal inefficiencies, in-plant use, and other factors are taken into account is estimated at about 550 kilowatt hours per ton of refuse. This is substantially higher than the minimum requirement of 420 kwh per ton established in the City's Request for Proposals. /Note: there are significant differences between the mass-burning and refuse-derived fuel systems with respect to internal energy cycling which are not shown here. However, the net output of the two alternatives is similar, and it was not possible to present more detailed figures without revealing proprietary information./

At 550 kilowatt hours per ton, the facility would generate roughly 300 million kilowatt hours of electricity per year. In comparison, the Hawaiian Electric Company's sales of electricity in 1981 were approximately 5,275 million kilowatt hours (Hawai'i, State of, Department of Planning and Economic Development, November 1982:398). At this rate, the proposed facility would generate over five percent of the island's electrical power needs. Since nearly all of HECO's electricity is currently produced by petroleum-burning power plants, petroleum imports for that purpose may be expected to decrease by a similar percentage.



Source: Belt, Collins and Associates

Figure IV-9. Generalized Energy Flow Diagram.

4.6.1.2 Material Recovery Benefits

As indicated in Chapter II of this report, it is expected that the proposed facility would recover approximately 110 pounds of ferrous metal from each ton of refuse delivered to the facility. Assuming the processing of 540,000 tons of refuse per year, this would result in the recovery of 29,700 tons of ferrous metal annually.

The manufacture of new steel from virgin products requires approximately 29.5 million Btu (MBtu) per ton. In contrast, only 3.5 MBtu is required if the same steel is produced from recovered ferrous (3.2 MBtu/ton for a modern electric furnace and an additional 0.3 MBtu/ton for detinning). The saving, then, is 26 MBtu per ton of ferrous recovered (C-E/Amfac, December 1982:III-5-43).

One kilowatt-hour of electricity is equivalent to approximately 3,415 Btu. Hence, the energy saved as a result of reusing one ton of ferrous scrap rather than manufacturing steel from virgin materials is equivalent to over 7,600 kilowatt hours. Multiplying this times the 29,700 tons per year of ferrous that would be recovered gives a total energy saving from this source of approximately 225 million kilowatt-hours per year. This is only 25 percent less than the direct electrical energy output expected from the facility. Because new steel is produced on the mainland rather than in Hawai'i, the reduction in energy use from this component would be largely felt there rather than locally, but the overall impact would be similar.

4.7 VISUAL IMPACTS

The resource recovery facilities that have been proposed consist of large, concrete and steel structures whose form is dictated more by function than by aesthetics. At its highest point (the roof of the structure over the boilers), the mass-burning facility that has been proposed by Wheelabrator-Frye stands about 150 feet above ground level; the C-E/Amfac RDF facility is lower, but its roof still reaches a 105 feet height. The stacks used for either facility would probably be between 250 and 290 feet. Because of their size and mass, such structures have the potential to create significant visual impacts. Whether or not this potential is actually realized in any given situation depends largely on the location of the facility relative to potential viewers and the extent to which adequate measures are taken to visually integrate it with the existing environment. The visual impacts of the 138-kv electrical power transmission line, which is to run from the resource recovery facility to the Campbell Industrial Park substation, are also discussed in the section.

4.7.1 EXISTING VISUAL ENVIRONMENT

Campbell Industrial Park (CIP) is an existing heavy industrial area. In addition to numerous warehouses, it contains many small and medium-sized industrial shops and several large industrial facilities such as the Standard and HIRI oil refineries and the Cyprus Hawaiian cement plant. The streets in the industrial area are wide, have generous roadside setbacks, and are well landscaped; all towers, conveyors, stacks, and outside equipment are subject to design review and approval by the Campbell Estate. The design guidelines for the area (Campbell Estate n.d.: 1) state that, "Excellence in site planning, building design, landscaping, and the design of other site improvements are of paramount concern . . . /in/ providing an attractive and pleasant working environment for industry and employees." Specific design criteria expressed in the guidelines require the following:

- o reduction of overbearing masses;
- o minimization of flat expanses of uninterrupted surfaces;
- o architectural harmony between principal and subsidiary buildings;
- o imaginative use of color and texture; and
- o abundant, well-maintained landscaping (for which there are very specific requirements).

The design guidelines were not in force during the early days of the Industrial Park, and there are a few reminders of the uncontrolled era still visible. However, recent construction has been tastefully executed and is well maintained.

Access to the proposed resource recovery facility site is from Hanua Street. Barring an extension of Komohana Street (something that has been mentioned, but not seriously pursued by the Campbell Estate), it would front only on that roadway. On other sides, the site abuts the Standard Oil Refinery, the Hawaiian Western Steel Company's yard, and the currently vacant areas leased by the CONOCO-Dillingham Oil Company (See Figure II-5). All of these parcels are now in, or zoned for, heavy industrial use, and the structures proposed for the resource recovery facility are visually compatible with these existing land uses and building types. The proposed electrical power transmission line between the resource recovery facility and Hawaiian Electric Company's Campbell Industrial Park Substation would run along Hanua Street to Malakole Road and then along existing dirt roads to the north. These roads pass through scrub vegetation and along the periphery of sugarcane fields. Easements will have to be acquired from Campbell Estate.

The sugarcane fields south of the railroad right-of-way are currently being phased out of production by the Oahu Sugar Company, and the Campbell Estate has plans to expand the industrial park into this entire area. Preliminary plans for this expansion call for the streets (and therefore, the power lines) to be aligned slightly differently than the existing dirt roads. If the streets are constructed prior to the time the power line must be in service, the electrical transmission facilities would follow the new road alignment. If they are not, the power lines will parallel the existing transmission line route shown in Figure IV-10.

4.7.2 VISUAL IMPACTS AND MITIGATION MEASURES

The overall appearance of facilities contained in each of the two proposals is depicted in the artists' renderings presented in Chapter II (see Figures II-6 and II-9). Persons in vehicles on Hanua Street and at the western end of Komohana Street would be able to see the main structures, but the nearest one would be set back at least 500 feet from the roadway. As a result, the visual impact would be greatly attenuated. In fact, through proper landscaping in the areas on either side of the on-site access road, the structures could be made virtually invisible from the portion of Hanua Street fronting the site except for the tall shack. The latter would probably be visible at some distance, but its relatively narrow cross section and a light-colored paint should make it unobtrusive.

Shielding the facility from view from a possible extension of Komohana Street would be much more difficult. Landscaping along a fence at the property line could screen ground level structures and activities from view and provide a visual environment comparable to that found adjacent to other heavy industry at CIP, but the tops of the largest structures would still be clearly visible. The establishment of a treeline along the northern side of a Komohana Street extension would greatly ameliorate the impact, and this mitigation measure could be implemented quickly if large specimens were used. Use of smaller stock would eventually have the same results and provide an effective screen after a number of years.

The poles holding the electrical power transmission line would be approximately 60 feet high. The most probable design would involve four wires (three conductors and one static) and two twelve-foot cross bars. If another circuit is added later, a third cross bar could be added. The poles along Hanua Street would run along the Diamond Head side of the Street as there are already poles and lines on the opposite side. The

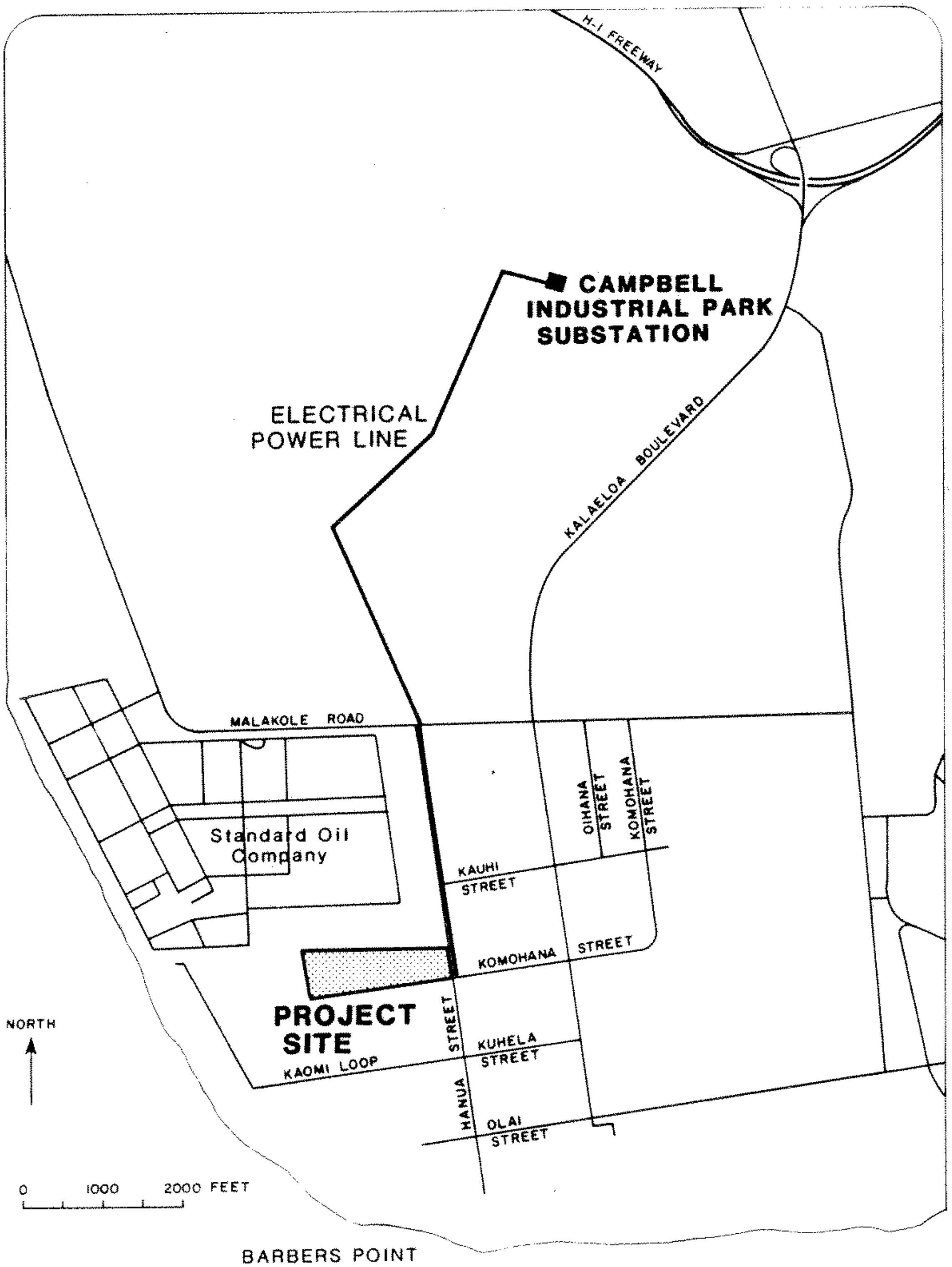


Figure IV-10. Route of 138-kv Electrical Power Line.

existing poles on Hanua Street are at least as tall and have six cross bars. There are also existing poles and electric lines along the dirt roads north of CIP. Some of the poles have only one cross bar but approaching the substation, the number of cross bars increases. The poles would be creosoted timber, not high-tension steel towers.

The increased number of wires and poles would be an obvious change in the visual environment. However, there are no homes near the route followed by the proposed transmission line, and it would not obstruct views. Since it parallels other transmission lines for its entire length, any views affected by it are already impacted by the existing lines. The design of the proposed line is consistent with other transmission facilties alrady in place at Campbell Industrial Park. For these reasons, the change is not believed to be significant.

4.8 IMPACTS ON HISTORICAL, ARCHAEOLOGICAL AND PALAEONTOLOGICAL RESOURCES

4.8.1 INTRODUCTION

The construction of the proposed resource recovery facility would result in the disturbance or destruction of any historical, archaeological and palaeontological resources that are present on the site. If such resources are significant primarily for the information they can provide in history, prehistory and paleoecology, data recovery efforts undertaken prior to project construction can preclude adverse effects which would otherwise result. If such resources are significant for other reasons, such as their interpretive value, other mitigative measures may be necessary. This section discusses (1) the known archaeological, historical and palaeontological resources within and near the project area; (2) the effects construction of the facility might have on such resources; and (3) steps that could be taken to prevent, lessen or mitigate those impacts.

4.8.2 EXISTING CONDITIONS

4.8.2.1 Results of Previous Surveys

The Barbers Point area and the 'Ewa Plain in general have been the subject of relatively intensive archaeological interest and study during the last ten years. Though the relatively arid emerged coralline reef forming this plain appears at present to be an inhospitable environment, recent archaeological and palaeontological research conducted in association with the construction of the Barbers Point Deep Draft Harbor has demonstrated that the area was the site of extensive Hawaiian settlement (Barrera 1975, 1979; Davis 1980; Hammatt and Folk 1981; Lewis 1970; Sinoto 1976, 1978, 1979).

A search of the literature revealed little information specific to the project parcel. There were no previously reported archaeological sites on it, and the property is not included in the nearby Barbers Point Harbor Archaeological Complex. Campbell Estate (the property owner) records show the area was used by the Army for maneuvers during World War II, but no permanent facilities were installed there (O.K. Stender, personal communication). From the late 1940s through 1958, the land was used for grazing. In 1962, the entire parcel was bulldozed in anticipation of industrial development.

Surveys and excavations conducted elsewhere at Barbers Point have provided valuable information about exploitation of the drier regions of O'ahu. The ground surface of the area consists of very shallow soil overlying bedrock (in this case the emerged reef) containing numerous solution sinkholes of various diameters and depths. The seaward portion of the 'Ewa plain has not been subject to any great extent to alluviation from the nearby Waianae mountains (McCoy et al., 1983). As a result, archaeological resources are much more readily detected than would be the case in many other coastal areas in Hawai'i. Previous research has shown that the sinkholes have been used by precontact human populations as refuse pits and that these may contain significant archaeological, as well as paleontological, data.

The most significant information to come from recent research in the area has been in the area of paleoecology (Kirch and Christensen, 1981; Olsen and James, 1981). Non-marine molluscan and avian faunal remains in association with prehistoric human cultural material suggest that human exploitation of this arid environment may have played a role in the extinction of certain species and widespread change in the environment. These findings have come from surface habitation sites as well as sinkholes.

4.8.2.2 Results of Archaeological Reconnaissance Survey

An archaeological reconnaissance survey of the 28-acre project site and a literature search of material relevant to that site was conducted in June 1983 by Science Management, Inc. (Ahlo and Hommon, June 1983). The survey was intended to identify and locate surface archaeological material as well as sinkholes large enough to examine for archaeological and palaeontological material.

The archaeological reconnaissance survey confirmed that the entire parcel has been significantly disturbed by bulldozing, dumping of recent trash, as well as probable logging of kiawe wood for charcoal manufacturing. Though the physical environment is similar to that of nearby areas where rich archaeological and palaeontological remains were located, it is distinguished from them by the degree to which the ground surface has been disturbed and the number and size of the sinkholes which are present. Only ten sinkholes large enough to examine were located on the 28-acre site, and all of them have been either partially or completely filled with coral rubble, probably as a result of the bulldozing mentioned above. It is likely that many sinkholes in the area have been completely filled by the bulldozing and are no longer visible. Given the relatively low number of sinkholes, it is likely that surface evidence of any archaeological or palaeontological material that may once have existed would be much less noticeable than in some nearby areas that have been investigated.

In addition to the sinkholes noted above, a disturbed midden deposit and three anomolous pits were also noted. The significance of the sinkholes, pits, and possible midden deposit is unclear at this point.

The possible midden deposit was noted in one of the few areas on the parcel with any significant soil deposit. The soil in this area was dark brown to black and contained flecks of charcoal. Though this may indicate either intentional or unintentional burning in recent times, it was impossible to confirm this without excavation. Other areas on the parcel however, lack such charcoal inclusions and coloration, suggesting that any fire that produced this deposit was not widespread.

The three pits located by the archaeologists are enigmatic. They are all approximately the same size and shape (rectangular, 2.5 meters x 3.5 meters by 0.6 meter deep), the material excavated from them is still intact in clearly defined piles on one side of each pit, and they all contain charcoal flecks and/or pieces. One of the pits contained flakes of basalt, a material not natural to the area. The pits are all probably recent; it is unlikely that three such features would have survived the 1962 bulldozing intact.

4.8.3 POTENTIAL IMPACTS AND MITIGATION MEASURES

The archaeological reconnaissance survey conducted for this study identified several minor sites and a number of sinkholes similar to those found elsewhere at Barbers Point. At present, the three pits and the charcoal deposit are believed to be of recent origin, but excavation and testing will be undertaken to confirm this. In addition, three sinkholes will be excavated prior to construction and significant archaeological/palaeontological material will be salvaged. Based on these initial excavations, a determination regarding the need to investigate the remaining sinkholes will be made.

The sinkholes on the site resemble those found elsewhere at Barbers Point that have contained information valuable to scientist trying to determine precontact habitation and subsistence patterns and the nature of the indigenous flora and fauna prior to human settlement.

In summary, the site appears to contain limited archaeological or palaeontological material of any value or significance. There is no known material requiring preservation <u>in situ</u>. Because of this, the proposed project's impacts on these resources is judged minor.

4.9 ECONOMIC IMPACTS

This section examines (1) the many factors that must be considered in financing solid waste disposal and the proposed resource recovery facility, and (2) the impacts that construction and operation of the proposed facility would have on the O'ahu economy.

4.9.1 OVERVIEW OF FINANCIAL CONSIDERATIONS

One of the objectives expressed in the Request for Proposals (RFP) for the proposed resource recovery facility is to provide economical solid waste disposal for the citizens and industry of O'ahu. Sale of energy and recovered materials would provide revenues which would partially or wholly offset capital and operating costs of the project. The resulting savings to the City and County government would be passed along to taxpayers.

The RFP for the proposed project stipulates three financial objectives:

(1) A first year (1987) net tipping fee of not more than $17 per ton;

(2) A net tipping fee equal to or less than the projected cost of landfill before the fifth year of the facility's operation; and

(3) A total disposal cost less than the projected cost of landfill over a 20-year period.

Except for first year net tipping fee, the City's financial objectives are expressed in terms of the cost of waste disposal via a resource recovery facility compared to landfill disposal, the most practical and least expensive alternative (see Chapter V). In the following sections, the bases for comparing disposal costs are discussed; this is followed by a projection of disposal costs without resource recovery. Next, two hypothetical cases are examined which indicate the range of possible waste disposal costs with resource recovery. In the final section, the impact of the method of financing on project costs and City credit standing is addressed.

4.9.2 BASES FOR COMPARING DISPOSAL COSTS

To properly evaluate waste disposal costs, it is necessary to examine all elements of the system including collection, transfer, and disposal options. For the purposes of this analysis, the following elements were considered the same for all waste disposal systems, with or without resource recovery:

- Collection/Transfer Elements - The City Refuse Division has estimated the twenty-year cost of collection/transfer for the Hanua Street site at Campbell Industrial Park at approximately $374 million. Without resource recovery, projected twenty-year costs for collection/transfer were estimated at $368 million. In view of the negligible difference in these projected costs with and without resource recovery, these need not be taken into account in evaluating the cost of resource recovery relative to landfill.

- o Incineration - The Waipahu incinerator will continue to operate at 120,000 tons per year.

- o Landfill - A resource recovery facility would generate ash residue; moreover not all municipal solid waste can be handled by such a facility. Hence, landfilling will continue, although at a greatly reduced rate. In evaluating potential cost savings of resource recovery, landfill disposal costs with the facility must be added to facility waste processing costs to arrive at total disposal costs with resource recovery. The basis of comparison then, is landfill disposal costs without resource recovery versus the sum of net resource recovery facility costs and landfill disposal costs for residue and solid wastes not accommodated by it.

4.9.3 DISPOSAL COSTS WITHOUT RESOURCE RECOVERY

The City operates three sanitary landfills they are located at Kapa'a, Kawailoa, and Waianae. Kapa'a is by far the largest of the City operated SLFs, handling 361,000 tons of waste in 1980, compared with less than 26,000 tons handled by each of the other two landfills. Besides the City SLFs, there is a privately owned SLF (Palailai), which handled 196,000 tons of waste in 1980. The military currently operates one small landfill at the Kaneohe Marine Corps Air Station for disposal of industrial wastes originating on base. (For a complete discussion of current and projected landfill operations refer to Chapter V on Alternatives.)

As noted above, in fiscal 1981-82, capital and operating costs of the City's sanitary landfills amounted to $9.71 per ton of solid waste. For purposes of projecting future costs it is assumed that disposal cost per ton for the privately owned and military SLFs is the same as the City's cost. Although all of the existing landfills are expected to be filled within the next three years, the City plans to open one new site each in Windward and Leeward O'ahu (Honolulu, City and County of, Department of Public Works, March 1983).

Projected landfill costs without resource recovery are a product of the tonnage of solid waste to be disposed and the disposal cost per ton. In Table IV-15 projected annual tonnage to be landfilled, together with disposal cost per ton figures are presented. Based on these projected figures, annual landfill disposal costs are given in column 3 of the table.

The tonnage of solid waste requiring disposal was projected to increase at a rate of 1.5 percent per year. Given Oahu's projected *de facto* population growth of about 1.0 percent per annum (Hawaii, State of, Department of Planning and Economic Development, 1982:35), this implies a small rate of increase (0.5%) in the per capita rate of waste generation. Since 1976, growth in annual solid waste tonnage has been uneven, first increasing rapidly and more recently increasing very little. The recent slowdown in growth of solid waste tonnage is believed to reflect the impact of economic recession. Even with little recent growth, tonnage increased from 547,000 tons in 1976 (Mitre's high estimate, Mitre, 1977:55) to about 700,000 tons in 1983 (City Refuse Division's estimate), an average annual growth rate of 3.6 percent per annum.

Table IV-15. Projected City and County of Honolulu Landfill Disposal Costs Without Resource Recovery: 1987-2006

Year	Tonnage Landfilled (in 1,000s)	Cost per Ton ($)	Annual Disposal Costs ($ millions)
1983	585.0[1]	10.39[1]	6.08[1]
1987	620.9	13.62	8.46
88	630.2	14.57	9.18
89	639.6	15.59	9.97
1990	649.3	16.68	10.83
91	658.9	17.67	11.64
92	668.9	18.91	12.65
93	678.9	20.24	13.74
94	689.2	21.65	14.92
1995	699.5	23.17	16.20
96	709.8	24.79	17.60
97	720.4	26.25	18.91
98	731.3	28.10	20.55
99	742.2	30.06	22.31
2000	753.5	32.16	24.24
01	764.7	34.42	26.32
02	776.3	36.82	28.58
03	787.8	38.99	30.72
04	799.7	41.73	33.37
05	811.8	44.65	36.25
2006	824.0	47.77	39.36

Cummulative 20-year Cost, 1987-2006 . . . . . 405.80

[1]estimate

Source: Robert Lucas (June 1983).

The cost per ton used in Table IV-15 is based on an assumed increase of 7 percent per year, reflecting the City's long-term expectation in regard to rising landfill unit costs (RFP, p.II-9). The unit cost (per ton cost) of $9.71 for 1981-82 largely reflects the Kapa'a SLF operation which accounts for the largest proportion of waste disposed in municipal landfills. In making the unit cost projection, allowance has been made for increased economies of scale (lower cost per ton) in handling larger tonnage at landfill sites. A scale adjustment based on tons per day handled is applied for tonnages ranging above 1,000 TPD. For example, if the tonnage at a particular site is 1,500 TPD, a scale factor of .95 is applied to the unit cost figure projected for the given future year. The projected cost per ton figure in Table IV-15, then, is a weighted average of the unit cost and tonnage figures for the landfill sites comprising the total tonnage in each projected year. Likewise, in computing landfill costs <u>with</u> resource recovery, scale adjustments are made for lower volumes with the scale factor rising above 1.00 (the factor for 1,000 TPD).

From Table IV-15, without resource recovery the City's projected twenty-year landfill disposal costs are estimated at about $406 million. In the next two sections, hypothetical examples of possible waste disposal costs <u>with</u> resource recovery are discussed and compared with the costs shown in Table IV-15

4.9.4 DISPOSAL COSTS WITH RESOURCE RECOVERY

<u>4.9.4.1 Constant Net Disposal Costs (Case I)</u>

This sub-section and the one following present two hypothetical cases which indicate the range of possible solid waste disposal costs with resource recovery. Case I assumes that the City's financial objectives for resource recovery are met. This means a net tipping fee (disposal cost per ton) to the City of $17.00 or less in the first year of facility operation, and a fee equal to or less than the projected cost of landfill before the fifth year of facility operation (i.e., $16.68 or less, as indicated for 1990 in Table IV-15). Also, twenty-year disposal costs are to be less with resource recovery than the costs projected in Table IV-15. In this scenario, it was assumed that the City would realize a net tipping fee of $16.50 for the first year, and that this fee would remain constant over the twenty-year life of the project.

With a constant $16.50 net disposal cost per ton, twenty-year resource recovery facility costs would amount to $185 million (560,000 tons/year facility capacity X $16.50/ton X 20 years). However, since resource recovery facility capacity would not accommodate all City solid waste, landfill disposal costs would be incurred for that portion of the projected annual tonnage in excess of 560,000. (Note: Although ash residue and non combustibles would still have to be landfilled, the cost of this would be borne by the facility contractor and is already accounted for in the tipping fee.) Taking the annual tonnages in column one of Table IV-15 and subtracting 560,000 and multiplying each year's difference by the corresponding disposal cost per ton (column 2), gives the projected landfill disposal costs with resource recovery. These costs over the twenty-year project period amount to $98.1 million.

Total Case I costs for the project life are the sum of the facility solid waste processing costs ($185.3 million) and the landfill disposal costs with resource recovery ($98.1 million), or $283.4 milion. Comparing Case I costs with disposal costs without resource recovery (i.e., landfilling only), it is apparent that Case I would result in twenty-year waste disposal savings of over $120 million; thus all of the City's financial objectives for the project would be met in this hypothetical example.

4.9.4.2 Declining Net Disposal Costs (Case II)

To illustrate the importance of key variables and relative trends in determining net waste disposal costs, the Case II example illustrates the computation of net cost per ton given a different set of assumptions than was used for Case I. The assumptions and resulting net disposal costs are first explained, and then the implications of changing assumptions are examined. It must be emphasized that this example is intended for illustrative purposes only; a definitive cost comparison between disposal alternatives cannot be conducted until offerors have submitted their price bids.

Table IV-16 presents cost and revenue data based on a particular set of assumptions. Annual capital costs are based on facility construction costs estimated to be $125 million (1983 dollars). Taking into account three-year construction price escalation, payment of interest on borrowed funds, testing, and other costs, a $204 million bond issue may be expected. For Case II it is assumed that the contractor makes an equity contribution of 25 percent to the project, funding $51 million of the total capital cost. The balance of $153 million is raised by the City issuing Special Purpose Revenue Bonds (more fully discussed later), assuming an interest rate of 10.0 percent on twenty-year bonds.

Facility construction costs of $125 million are based on an average of the construction prices submitted by the two bidders in 1980, increased by 20 percent (and rounded to the nearest five million) to take into account price increases since 1980 (Mitre, 1980:A3 and F3). Likewise, the operation and maintenance (O & M) costs shown are based on an average of the two 1980 HPOWER bidder's first year (1984) projected costs, increased by 20 percent to give the 1987 O & M cost figure of $9.0 million in Table IV-16. While annual capital costs ($17.33 million) on bonded debt remain level over the 20 year project life, O & M costs are assumed to escalate at 7 percent per annum over time.

Total annual facility operating and capital costs are indicated in line 3 of Table IV-16 they are $26.33 million in 1987, $29.13 million in 1991, and $49.88 million in 2006. Revenues from the sale of recovered energy and materials partially offset facility costs. From the perspective of the private contractor, facility revenues include City and private waste haulers' tipping fees as well as revenues from the sale of energy and materials. The contractor anticipates a return on its equity investment and for the risks involved in carrying out the full service contract (including repayment of debt service on bond issue). For illustrative purposes, it is assumed that the contractor's return comes from his share of project revenues (not shown in Table IV-16), and that the project share

Table IV-16. Case II Example of Resource Recovery Facility Capital and Operating Costs, Revenues, and Net Disposal Fee Per Ton: 1987-2006 (in $1,000s)

Item	Year 1987	Year 1991	Year 2006
(1) Annual Capital Costs	17,330	17,330	17,330
(2) O & M Costs	9,000	11,800	32,550
(3) Total Costs	26,330	29,130	49,880
(4) Electricity Revenues (Project Share)	14,990	19,650	54,230
(5) Material Revenues (Project Share)	610	800	2,200
(6) Total Revenues	15,600	20,450	56,430
(7) Net Annual Costs	10,730	8,680	(6,550)
(8) Net Disposal Cost per Ton	$19.11	$15.46	($11.66)

Source: Robert Lucas (June 1983).

(lines 4 and 5) offsets facility capital and operating costs. The project share is assumed to be 70 percent of total energy revenues and 50 percent of materials revenues.

For the Case II example, revenues come from the sale of electricity to the Hawaiian Electric Company (HECO), and from the sale of recovered metals. As indicated in Table IV-16, electricity sales are the dominant source of revenue. First year (1987) electricity revenues are the product of total kilowatt hours (kwh) committed to HECO times the projected rate per kwh. The annual amount of electricity committed to HECO is conservatively estimated to be about 250 million kwh's. The rate per kwh payable by HECO is HECO's avoided cost rate per kwh as of July 1982 (7.6 cents for firm on-peak energy, with committed generating capacity of 20-40 MW (Hawaii, State of, Public Utilities Commission, May 1983), and escalating this rate by 2 percent per annum to 1987 and 7 percent per year thereafter to 2006. The relatively low 2 percent short-term escalation factor was used to reflect short-term conditions (excess supplies relative to demand) in the international oil market. Also included in electricity revenues is an estimated credit ($0.6 million per year) payable by HECO for the firm commitment of electrical generating capacity; this component does not escalate over time. Materials revenues were escalated at 3 percent per annum.

Net annual cost in Table IV-16 is the difference between total costs and total revenues. In turn, net annual costs divided by annual tonnage delivered to the facility (561,600), determines net disposal cost per ton (tipping fee) shown in the bottom line of Table IV-16. In this scenario, first year disposal cost is $19.11 per ton, declining to $15.46 per ton in the fifth year, and to a negative ($11.66) per ton in 2006.

In Table IV-17, Case II net disposal costs per ton are compared with the landfill disposal costs per ton without resource recovery (from Table IV-15). Case II costs decline steadily over the twenty-year project term because of the growing revenue stream from sale of electricity and recovered metals, whereas landfilling produces no revenue to offset rising O & M costs. Cummulative 20-year Case II costs amount to only $174 million, representing cost savings of over $230 million relative to landfill disposal without resource recovery.

In terms of the City's three financial objectives for the project, the first objective (first-year net tipping fee equal to or less than $17/ton) would not be met, but the second (net tipping fee equal to or less than projected landfill cost before fifth year) and third (20-year disposal costs less than costs of landfilling only) objectives would be achieved by the Case II example.

4.9.4.3 Impact of Change in Assumptions

Although Case II is based on what is believed to be a set of plausible assumptions, actual facility capital costs and first-year O & M costs could differ. Likewise, costs experienced over the project life can be expected to be heavily influenced by actual long-term trends in inflation and energy prices. By the same token, landfill disposal costs could also differ, thereby affecting costs relative to landfilling.

Table IV-17. Case II Net Disposal Costs Versus Projected Landfill Disposal Costs Without Resource Recovery

Year	Case II Disposal Costs per Ton	Projected Landfill Disposal Costs per Ton Without Resource Recovery
1983	NA	$10.39[1]
1987	$ 19.11	13.62
88	18.28	14.57
89	17.40	15.59
1990	16.46	16.68
91	15.46	17.67
92	14.37	18.91
93	13.22	20.24
94	11.98	21.65
1995	10.66	23.17
96	9.25	24.79
97	7.74	26.25
98	6.12	28.10
99	4.39	30.06
2000	2.53	32.16
01	0.55	34.42
02	(1.57)	36.82
03	(3.84)	38.99
04	(6.27)	41.73
05	(8.87)	44.65
2006	(11.66)	47.77

Cummulative 20-year Cost,[2] 1987-2006:

Case II . . . . $174.10 million
Landfilling without resource recovery . . . 405.80 million

NA - Not applicable

[1]estimate

[2]Case II costs based on annual tonnages in Table IV-15 and Table IV-17 rates per ton; cost of landfilling waste in excess of facility capacity is included. Costs of landfilling without resource recovery are from Table IV-15.

Source: Robert Lucas (June 1983).

Using the Case II example as the basis for changing values, a 1.0 percentage point increase, from 10.0 to 11.0 percent, in the interest rate on revenue bonds issued to fund the non-equity portion (75%) of project capital requirements would result in a 20-year cumulative increase of $33.9 million in the Case II costs. Increasing first-year O & M costs by $1.0 million, from 9.0 to $10.0 million, would result in a cumulative 20-year cost increase of $41.0 million. Reducing the escalation factor for electricity revenues by 1.0 percentage point from 7.0 to 6.0 percent, would increase the cumulative 20-year Case II costs by $63.1 million.

In Table IV-17a, the above impacts on resource recovery costs are summarized, and the cumulative effect of the changes are added to the basic Case II costs. For comparative purposes, landfill disposal costs (from Table IV-15) also are indicated.

Although any of the changes in variables would increase resource recovery costs in the first years of the project such that neither of the City's first two financial objectives would be met, the third objective of lower 20-year costs relative to landfilling would still be met. Even if all the adverse changes in variables occurred simultaneously, there would be a 20-year cost advantage of $93.7 million in resource recovery compared with landfill disposal without resource recovery.

With respect to the change in escalation rate of electricity revenues from 7 percent (same as escalation rate for O & M costs) to 6 percent, this is almost certainly an overly pessimistic assumption in light of expected long-term real increases in energy prices. /The American Gas Association projects a 2.4 percent average annual rate of increase in U.S. powerplant residual oil fuel prices in real terms for the period 1982-2000 (Bureau of National Affairs, Inc., September 16, 1982:957)/. If energy prices increase in real terms (i.e., at an average annual rate above that of inflation) during the 1987-2006 period, the comparative advantage of resource recovery versus landfilling would be greater.

4.9.5 COMPARISON OF RESOURCE RECOVERY DISPOSAL COSTS WITH PROBABLE LANDFILL DISPOSAL COSTS

For the hypothetical case examples, potential 20-year cost savings with resource recovery range from a low of $93.7 million to a high of $231.7 million, compared with landfill disposal only. The Case II example with cost and revenue figures shown in Table IV-16, points up relations among the variables which indicate that the actual net disposal cost per ton is likely to decline over the project life. This is because capital costs remain constant over the 20-year period while revenues from energy and materials sales are expected to rise along with O & M costs. The presence of a large fixed component (capital cost) in total costs is likely to result in revenues rising more rapidly than total costs, bringing about the decline in net disposal cost.

Table IV-17a. Summary of Case II Disposal Costs With Changes in Variables and Comparison With Landfill Disposal Costs (millions $)

Value of Changed Variable	Case II Costs With Change 20-year Costs	Landfill Disposal Costs 20-year Costs
Basic Case II	174.1	405.8
11% interest rate	208.0	405.8
$10.0 million O & M costs	215.1	405.8
6% electricity escalation rate	237.2	405.8
Cummulative impact of all variable changes	312.1	405.8

Source: Robert Lucas, June 1983.

Case	With Resource Recovery	Without Resource Recovery	Cost Savings[1]
	Twenty Year Disposal Costs (in millions of $)		
Landfill Disposal	NA	$405.8	—
Case I	$283.4	$405.8	$122.4
Case II, basic assumptions	$174.1	$405.8	$231.7
Case II, adverse assumptions[2]	$312.1	$405.8	$ 93.7

NA = Not Applicable

[1]$405.8 minus first column

[2]Basic Case II, but with 11% interest rate, $10.0 million O & M costs, and 6% escalation rate for energy revenues (see Table IV-17a).

The Case II scenario, like that for Case I, is hypothetical. The actual bids will be based on bidders responses to a complex set of variables, and cannot be accurately predicted at the present time. They could, in other words, be less advantageous to the City. However, Case II represents one possible outcome with relatively adverse conditions and illustrates the effect that changes in assumptions regarding key variables can have on costs.

4.9.6 FINANCING ALTERNATIVES AND CONSIDERATIONS

Capital requirements for constructing and equipping a resource recovery facility are very substantial, as indicated in the previous section. The method of financing affects project costs as well as the allocation of risks between the City and the private operator of the facility. Risks are associated with payment of debt service on bond borrowing and the impact of such borrowing on the City's credit and future capacity to fund capital improvements.

Alternative methods of financing a solid waste processing and resource recovery facility include:

(1) Sale of General Obligation Bonds.

(2) Sale of Special Purpose Revenue Bonds.

(3) Private financing via sale of corporate bonds, equity funding, or other private debt instruments.

(4) Some combination of the above methods.

The RFP for resource recovery notes the City's preference for having the project financed with private capital provided by the offeror. If private financing is not forthcoming, the City is committed to the issuance of special purpose revenue bonds. The sale of General Obligation (GO) Bonds is not being considered.

4.9.6.1 Private Financing

It is theoretically possible to use private financing only, to fund facility capital requirements. Whether corporate bonds, other forms of debt, or equity capital were used, the cost could be expected to be prohibitively high because such forms of financing would lack tax exempt status. Although the private financing of total capital requirements is not considered economically practical, partial equity funding in conjunction with sale of tax exempt revenue bonds is an alternative which appears to be most attractive to the offerors and is discussed below.

4.9.6.2 Special Purpose Revenue Bond Financing

Chapter 48E (HRS), "Political Subdivision, Pollution Control Special Purpose Revenue Bonds" provides for the use of Special Purpose Revenue Bond financing for the proposed project. The primary advantage of using tax exempt revenue bonds (hereafter simply "revenue bonds") is that the liability (and hence risk) for payment of debt service would be that of the resource recovery facility project party. Security for debt service payments would be provided by project tipping fees, and energy and materials revenues. While the City would issue the revenue bonds, the project party would be the guarantor for debt service payment. The main disadvantage of revenue bonds would be the potentially higher interest rate (and hence borrowing costs) payable relative to GO Bonds.

4.9.6.3 Combination of Financing Methods

In a number of states, solid waste processing and resource recovery facilities have been financed using combined revenue bond financing with partial private equity contributions. States' enabling legislation authorizing revenue bond financing typically facilitates the structuring of project agreements which enable the private sector participants to obtain tax benefits of ownership, while at the same time permitting the issuance of tax exempt revenue bonds to fund a significant percentage of the capital requirements (Lamb, 1980).

The advantage of this type of combined financing is that the project party bears the liability for payment of debt service, but the costs of financing are substantially reduced to the extent that tax exempt bond funding is used. Equity contributions (often 20-30 percent of total capital requirements) also adds financial strength to the project, thus making the revenue bond issue more marketable.

4.9.7 EFFECTS OF FINANCING DECISIONS

At the end of April 1983, the interest rate on the Bond Buyers 20 Municipal Bond average was 8.82 percent; during the same time the Bond Buyer's 25 Revenue Bond average rate was 9.26 percent (Daily Bond Buyer, Inc., May 2, 1983), or about one-half percentage point higher. Because resource recovery facilities are relatively new compared to most kinds of projects financed by tax-exempt revenue bonds, the market may demand a somewhat higher than average rate. With an equity contribution, the bond may be more marketable (i.e., require lower interest than revenue bonds for projects without equity contributions) as the tax benefits available to the private equity participants may further reduce the borrowing cost. The magnitude of the benefits available, the capacity of the participants to utilize the tax benefits, and the differential in rates at the time the bonds are marketed are variables which will influence the actual cost of financing.

4.9.8 IMPACT ON THE O'AHU ECONOMY

The construction and operation of a solid waste resource recovery facility could be expected to result in positive economic benefits for the O'ahu economy. Less tangible but nevertheless real benefits could be expected in terms of lessening O'ahu's dependence on imported oil and in the reduction in acreage needed for landfill disposal into the twenty-first century.

4.9.8.1 Impact of Project Construction

Plant construction, and manufacture and installation of equipment for a resource recovery facility, costing an estimated $125 million is a major undertaking. The construction impact on the O'ahu economy can be approximated by utilizing the interindustry (input-output model) framework developed by the State Department of Planning and Economic Development (DPED), and its construction industry model (Hawaii, State of, DPED, The Hawaii Input-Output Study: 1977, forthcoming; and Hawaii Constuction Model Further Developments, 1982). Based on interindustry linkages, output and employment multipliers provide a rough estimate of the impact of a one million dollar increase in final demand in a given sector of the economy, such as construction.

To utilize the multipliers in approximating the impact of constructing the proposed project, it is first necessary to make an adjustment to the estimated $125 million plant and equipment expenditure to take into account the higher import content of the resource recovery facility compared with the typical construction job upon which the multipliers are based. It is estimated that roughly 70 percent of the materials and equipment for the proposed project would be imported, compared with only about one-eighth (12.5 percent) for the typical construction project in Hawai'i. After adjusting for this sizable difference in import content, the equivalent (to $125 million) construction amount in terms of impact on the local economy, would be about $43 million.

Each million dollar increase in final demand for construction generates roughly an additional million dollars in output in the economy, as the initial construction spending leads to successive rounds of spending in the household sector (based on the receipt of construction wages and salaries), and in the material and service sectors supporting construction. Given the construction output multiplier of 2.0 (approximately), the impact of the proposed project would amount to an $86 million dollar increase in total output. This impact would be spread over several years; this is because facility construction is expected to take about two years, and the multiplier effects of successive rounds of spending take time to work through the economy.

In terms of jobs, each million dollar increase in annual construction spending supports from 11 to 12 jobs in the construction industry. In addition, from 12 to 14 non-construction jobs are created. Hence, the total employment impact of $1 million dollars in construction expenditures is approximately 25 jobs. Based on a two-year facility construction period, the solid waste processing and resource recovery facility would generate about 260 construction jobs (500 person-years). Nonconstruction employment would be increased by approximately 280 workers as a result of these expenditures, for a total of 540 jobs. The Hawaii Construction Model is believed to provide the most accurate estimate of construction employment impacts possible with the data now readily available. However, the employment multipliers contained in it are based on industry-wide averages. Because of the specialized nature of the resource recovery facility, actual direct and indirect construction employment could differ substantially from the levels estimated using the model.

4.9.8.2 Impact of Facility Operation

Operation of the proposed resource recovery facility would be expected to have a positive long-term effect on O'ahu's employment and personal income. In addition, the resource recovery facility would contribute to the diversification of O'ahu's energy base which currently depends almost exclusively on imported oil as its primary energy source, and would sharply reduce future acreage requirements for the disposal of solid waste via sanitary landfill.

4.9.8.2.1 Employment and Income Impacts. Depending on the technology of the selected facility contractor, plant employment would be expected to number between 60 and 70 employees. Assuming an employment figure of 65 for purposes of this analysis, the net impact on the number of direct jobs on O'ahu would be somewhat less. The reason for this is that City Refuse Division employment in sanitary landfill would be reduced as a consequence of waste disposal via the resource recovery facility; in contrast, transfer station employment would increase.

Assuming that electricity is the primary resource output of the facility, would job losses be expected to occur in terms of existing electrical generating capacity? Probably not. An 1800-TPD facility is expected to have an electrical generating capacity of approximately 50 MW. Based on a firm commitment of this capacity to the Hawaiian Electric Company (HECO), part of HECO generating capacity could be replaced. As of the begining of 1982, HECO generating capacity on O'ahu was 1,211 MW; thus, facility capacity would represent about 5 percent of HECO's total generating capacity (Hawaii, State of, DPED, 1982:401). Given the relatively small proportion of HECO's capacity that the facility would represent, and the fact that electrical transmission, distribution and customer service costs for all electrical energy (generated and purchased) must still be borne by HECO, it is unlkely that the proposed project would result in a net loss of jobs at the utility.

The positive, but modest, long-term gain of about 65 new jobs would be augmented by the indirect job generating effects of the facility's payroll expenditures (that portion attributable to the net gain in jobs), and for expenditures on facility supplies, materials, and contracted services required to operate and maintain the plant. In the previous section regarding impact on City finances, facility O & M costs were assumed to amount to about $9.0 million in the first year of operation. These costs, in part, can be thought of as the import substitution effect of displacing imported oil with solid waste for generating electricity. The long-term impact of oil import substitution would be indirect gains in employment, as well as output and personal income, as dollars that would have been spent out of state by HECO on oil, instead circulate in the local economy. These multiplier effects in terms of indirect employment and income gains would be positive and permanent, but cannot be quantified given the information available. Another method of approximating the import substitution effect is to take the half million barrels of oil (explained in following sub-section) displaced by resource recovery, and multiply by the per barrel cost of imported oil. For example, at $25 per barrel, the value of displaced oil would amount to about $12.5 million.

<u>4.9.8.2.2 Energy Impact</u>. A resource recovery facility is expected to provide about 300 million kwh's of electrical energy, net of in-plant requirements. In 1981 HECO sold 5.28 billion kwh's of electricity to O'ahu customers. Relative to 1981 consumption, electrical energy available from a resource recovery facility would represent an amount equal to about 5 percent of HECO electrical sales. While not large in relative terms, the contribution to O'ahu's energy base would be significant. By way of comparison, in 1981, bagasse accounted for less than 2 percent of total primary energy for O'ahu's electrical power production. Imported petroleum accounted for the balance of O'ahu's primary energy for electrical power generation (Hawaii, State of, DPED 1982:III-17). Taken in this context the proposed project would triple O'ahu's indigenous supply of primary energy for electrical power generation.

In 1982, HECO used about 8.8 million barrels of oil in its O'ahu generating plants, with a total fuel oil cost of just over $380 million (PUC, personal communication, May 1983). The crude oil equivalent of one million kwh's of electrical power (generated on O'ahu) is about 1,840 barrels of oil (Rau and Wooten, 1980:5-14). Based on the estimated annual electrical output available for sale by the proposed resource recovery facility, solid waste would provide the net energy equivalent of over one-half million barrels of oil per annum. In other words, an amount equivalent to about 5 percent of HECO's 1982 fuel oil consumption could be replaced by solid waste as an energy source if the proposed project were to be implemented.

4.10 SOCIAL IMPACTS

The site of the proposed project is in the midst of a large, heavy-industrial area. It is several miles from the nearest residential community, and is currently vacant. Hence, its construction would not have any direct social impacts such as the displacement of existing residents or uses.

Many authorities on social impact assessment (c.f., Wolf, 1974; Burdge & Johnson, 1977) believe that some of the greatest psychological impacts from major projects occur during the planning stage, when residents may be deeply affected by anxieties and concerns over a proposal. Regardless of whether or not they are well-founded, community perceptions, concerns, and opinions can (1) represent a type of psychological impact in and of themselves, and (2) become important with respect to project approval.

In order to insure that community concerns were adequately addressed for the present resource recovery project, the City scheduled numerous meetings and presentations to inform the public and listen to their concerns. Beginning in January 1983, the City targeted and contacted business groups, community organizations, and neighborhood boards whose members would be particularly affected if a resource recovery facility were located in their areas. City representatives informed these organizations of their desire to meet with them, and in the following weeks made presentations to the organizations listed in Table II-3.

An additional series of "regional" meetings was scheduled by the City to inform the public as a whole about the resource recovery program. These meetings were held at various locations around Oahu, as listed in Table II-3. All neighborhood boards on O'ahu -- plus a wide range of business, professional, and public interest organizations -- were asked to inform their memberships about these meetings. The City also made efforts through the mass media to inform the public of the meetings and encourage attendance. At each of the regional meetings (and at all of the meetings with organizations as well), the City presented a slide show on its resource recovery program and responded to questions from those attending. Also, at the first three of the regional meetings listed in Table II-3 each of the three offerors described its proposal.

Members of the team preparing the environmental impact statement attended most of the meetings in order to familiarize themselves with community concerns and ensure that these would be adequately discussed in the EIS. They also familiarized themselves with information and discussions from meetings at which they were not in attendance. While a number of "social" issues emerged with respect to the Sand Island and Waiau sites that were initially considered, no such issues were raised concerning Campbell Industrial Park.

Persons in attendance at the various meetings held in 'Ewa did express concerns regarding the effect that some of the physical impacts (particularly air and water emissions) might have on other existing or proposed uses in or near Campbell Industrial Park, and these issues have been discussed in the appropriate physical impact sections of this report. Thus, the effect that emissions from the facility would have on the ability of other industries in the region to increase their emissions under the Federal and State air quality regulations is discussed in Section 4.11 -Air Quality Impacts, and the implications of water use are covered in Section 4.3 - Hydrologic Impacts.

Finally, it should be noted that, with very few exceptions, persons in attendance at all meetings favored the general concept of resource recovery. In fact, most of those who opposed the idea of locating a facility in their areas stressed that their objections were to the site, not to concept itself.

Public support for the general concept of resource recovery also emerged in a telephone survey commissioned by one of the potential bidders, the Hawaiian Electric Company. HECO's survey (Hawaiian Electric Company, 1983) of 376 adult residents in the Pearl City-Waiau-Waipahu area included this question: "In general, would you be in favor of, or against, building a facility on Oahu to make electricity from processed refuse?" (The nature of this facility had been more fully described in a previous question.) A substantial majority of 64 percent said they favored building such a facility, while only four percent opposed it; 25 percent said "it depends"; and seven percent had no opinion.

The HECO survey also included a question on siting preference. Results of the survey indicated that respondents felt Campbell Industrial Park was an appropriate location for refuse processing facilities.

4.11 AIR QUALITY IMPACTS

4.11.1 INTRODUCTION

The resource recovery facility (RRF) involves the combustion of over a half-million tons of refuse per year. This fact alone made it clear from the outset that control of air pollutant emissions would be a major environmental concern. Because of this, an in-depth analysis was conducted of the impacts that each of the two alternative plant designs would have on air quality. The studies focused on emissions and ambient air quality impacts of the major regulated pollutants emitted by the proposed facilties. The initial concern was to determine whether or not Federal and State emission limitations and air quality standards would be exceeded as a result of the proposed action. This was accompanied by an assessment of the potential impacts of other, unregulated pollutants likely to be emitted by a resource recovery facility.

This discussion is divided into five major parts. The first describes relevant ground and atmospheric conditions in the vicinity of Campbell Industrial Park. The second discusses Federal and State regulations with which the proposed facility must comply. Next, emissions from the project are identified and their relationship to emission standards indicated. Sub-section four covers the impact that the facility would have on ambient air quality and focuses on areas where there may be some difficulty in meeting existing standards. The section concludes with a summary of the major impacts and a brief discussion of the kinds of measures that could be taken to lessen or avoid the impacts that have been identified.

4.11.2 RELEVANT SITE CONDITIONS

4.11.2.1 Climate and Meteorology

Weather conditions at Campbell Industrial Park are typical of sites located on the leeward coast of O'ahu. Long-term climatic data collected at Barbers Point Naval Air Station indicate mean daily maximum and minimum temperatures of 81 and 69 degrees Fahrenheit, respectively; mean annual rainfall of 20.3 inches; and prevailing winds from the northeast at 9 knots (U.S. Air Force, undated). Annual rainfall is of interest because of its role in particulate matter removal for the atmosphere, while wind speed and direction are determinants of pollutant concentration and potential receptors, respectively.

Atmospheric stability is another important factor in determining the potential for air pollution problems. It is largely a function of insolation and wind speed, and an objective methodology for determining it has been developed by Turner (U.S. Environmental Protection Agency, 1973). Historical meteorological data from Barbers Point Naval Air Station was processed by the Turner method in order to produce joint frequency tables of wind speed and direction by stability category. These had been previously obtained from the National Weather Service, and were reviewed for this study (National Climatic Center, 1960-64). The frequency tables, displayed in Table IV-18, provide a number of pertinent facts. First of all, they reiterate the previously noted predominance of northeasterly winds.

Table IV-18. Joint Frequency Table of Wind Speed, Direction and Stability Category, Barbers Point NAS

WIND SPEED GROUPS (miles per hour)

STABILITY A (extremely unstable)

	1.5	5.4	9.8	15.3	21.1	27.5	ALL
N	.0000	.0000	.0000	.0000	.0000	.0000	.0000
NNE	.0002	.0001	.0000	.0000	.0000	.0000	.0003
NE	.0002	.0004	.0000	.0000	.0000	.0000	.0006
ENE	.0003	.0004	.0000	.0000	.0000	.0000	.0007
E	.0004	.0007	.0000	.0000	.0000	.0000	.0011
ESE	.0002	.0004	.0000	.0000	.0000	.0000	.0006
SE	.0001	.0000	.0000	.0000	.0000	.0000	.0001
SSE	.0001	.0001	.0000	.0000	.0000	.0000	.0002
S	.0001	.0003	.0000	.0000	.0000	.0000	.0004
SSW	.0000	.0001	.0000	.0000	.0000	.0000	.0001
SW	.0000	.0000	.0000	.0000	.0000	.0000	.0000
WSW	.0000	.0000	.0000	.0000	.0000	.0000	.0000
W	.0000	.0000	.0000	.0000	.0000	.0000	.0000
WNW	.0000	.0000	.0000	.0000	.0000	.0000	.0000
NW	.0000	.0000	.0000	.0000	.0000	.0000	.0000
NNW	.0000	.0000	.0000	.0000	.0000	.0000	.0000
ALL	.0016	.0025	.0000	.0000	.0000	.0000	.0041

STABILITY B (moderately unstable)

	1.5	5.4	9.8	15.3	21.1	27.5	ALL
N	.0004	.0002	.0002	.0000	.0000	.0000	.0008
NNE	.0008	.0010	.0007	.0000	.0000	.0000	.0025
NE	.0023	.0024	.0027	.0000	.0000	.0000	.0074
ENE	.0029	.0053	.0068	.0000	.0000	.0000	.0150
E	.0015	.0043	.0058	.0000	.0000	.0000	.0116
ESE	.0006	.0020	.0023	.0000	.0000	.0000	.0049
SE	.0004	.0017	.0021	.0000	.0000	.0000	.0042
SSE	.0006	.0026	.0021	.0000	.0000	.0000	.0053
S	.0009	.0036	.0023	.0000	.0000	.0000	.0068
SSW	.0004	.0023	.0015	.0000	.0000	.0000	.0042
SW	.0001	.0006	.0008	.0000	.0000	.0000	.0015
WSW	.0002	.0008	.0006	.0000	.0000	.0000	.0016
W	.0002	.0004	.0003	.0000	.0000	.0000	.0009
WNW	.0001	.0003	.0001	.0000	.0000	.0000	.0005
NW	.0001	.0001	.0001	.0000	.0000	.0000	.0003
NNW	.0000	.0001	.0000	.0000	.0000	.0000	.0001
ALL	.0115	.0277	.0284	.0000	.0000	.0000	.0676

STABILITY C (slightly unstable)

	1.5	5.4	9.8	15.3	21.1	27.5	ALL
N	.0001	.0003	.0007	.0000	.0000	.0000	.0011
NNE	.0009	.0029	.0054	.0008	.0000	.0000	.0100
NE	.0024	.0064	.0180	.0052	.0001	.0000	.0321
ENE	.0029	.0077	.0305	.0090	.0001	.0000	.0502
E	.0009	.0045	.0188	.0035	.0000	.0000	.0277
ESE	.0002	.0010	.0067	.0029	.0000	.0000	.0108
SE	.0002	.0005	.0070	.0039	.0000	.0000	.0116
SSE	.0004	.0009	.0063	.0014	.0000	.0000	.0090
S	.0004	.0015	.0040	.0003	.0000	.0000	.0062
SSW	.0001	.0011	.0027	.0001	.0000	.0000	.0040
SW	.0000	.0007	.0020	.0002	.0000	.0000	.0029
WSW	.0002	.0005	.0023	.0002	.0000	.0000	.0032
W	.0002	.0004	.0018	.0002	.0000	.0000	.0026
WNW	.0000	.0003	.0010	.0001	.0000	.0000	.0014
NW	.0001	.0003	.0008	.0000	.0000	.0000	.0012
NNW	.0001	.0001	.0003	.0000	.0000	.0000	.0005
ALL	.0091	.0291	.1083	.0278	.0002	.0000	.1745

WIND SPEED GROUPS (miles per hour)

STABILITY D (neutral)

	1.5	5.4	9.8	15.3	21.1	27.5	ALL
N	.0005	.0012	.0028	.0022	.0003	.0000	.0070
NNE	.0010	.0043	.0147	.0090	.0005	.0000	.0295
NE	.0024	.0086	.0279	.0194	.0008	.0001	.0592
ENE	.0033	.0098	.0355	.0283	.0010	.0000	.0779
E	.0013	.0049	.0186	.0185	.0010	.0000	.0443
ESE	.0004	.0013	.0036	.0030	.0000	.0000	.0083
SE	.0001	.0011	.0033	.0046	.0001	.0000	.0092
SSE	.0001	.0011	.0034	.0033	.0001	.0001	.0081
S	.0003	.0020	.0048	.0033	.0009	.0006	.0119
SSW	.0001	.0013	.0028	.0027	.0010	.0002	.0081
SW	.0001	.0008	.0025	.0020	.0010	.0002	.0066
WSW	.0002	.0009	.0024	.0022	.0005	.0001	.0063
W	.0004	.0007	.0031	.0035	.0006	.0002	.0085
WNW	.0001	.0008	.0018	.0025	.0007	.0001	.0060
NW	.0002	.0004	.0009	.0009	.0001	.0000	.0025
NNW	.0002	.0002	.0004	.0004	.0000	.0000	.0012
ALL	.0107	.0394	.1285	.1058	.0086	.0016	.2946

STABILITY E (Slightly stable)

	1.5	5.4	9.8	15.3	21.1	27.5	ALL
N	.0000	.0022	.0021	.0000	.0000	.0000	.0043
NNE	.0000	.0106	.0120	.0000	.0000	.0000	.0226
NE	.0000	.0255	.0151	.0000	.0000	.0000	.0406
ENE	.0000	.0335	.0218	.0000	.0000	.0000	.0553
E	.0000	.0107	.0079	.0000	.0000	.0000	.0186
ESE	.0000	.0006	.0003	.0000	.0000	.0000	.0009
SE	.0000	.0004	.0003	.0000	.0000	.0000	.0007
SSE	.0000	.0005	.0006	.0000	.0000	.0000	.0011
S	.0000	.0012	.0004	.0000	.0000	.0000	.0016
SSW	.0000	.0009	.0004	.0000	.0000	.0000	.0013
SW	.0000	.0006	.0004	.0000	.0000	.0000	.0010
WSW	.0000	.0005	.0006	.0000	.0000	.0000	.0011
W	.0000	.0015	.0011	.0000	.0000	.0000	.0026
WNW	.0000	.0006	.0007	.0000	.0000	.0000	.0013
NW	.0000	.0004	.0004	.0000	.0000	.0000	.0008
NNW	.0000	.0003	.0002	.0000	.0000	.0000	.0005
ALL	.0000	.0900	.0643	.0000	.0000	.0000	.1543

STABILITY F (moderately stable)

	1.5	5.4	9.8	15.3	21.1	27.5	ALL
N	.0031	.0031	.0000	.0000	.0000	.0000	.0062
NNE	.0158	.0183	.0000	.0000	.0000	.0000	.0341
NE	.0491	.0513	.0000	.0000	.0000	.0000	.1004
ENE	.0575	.0657	.0000	.0000	.0000	.0000	.1232
E	.0125	.0143	.0000	.0000	.0000	.0000	.0268
ESE	.0009	.0002	.0000	.0000	.0000	.0000	.0011
SE	.0004	.0002	.0000	.0000	.0000	.0000	.0006
SSE	.0004	.0003	.0000	.0000	.0000	.0000	.0007
S	.0012	.0007	.0000	.0000	.0000	.0000	.0019
SSW	.0011	.0006	.0000	.0000	.0000	.0000	.0017
SW	.0005	.0005	.0000	.0000	.0000	.0000	.0010
WSW	.0003	.0003	.0000	.0000	.0000	.0000	.0006
W	.0010	.0010	.0000	.0000	.0000	.0000	.0020
WNW	.0004	.0005	.0000	.0000	.0000	.0000	.0009
NW	.0006	.0005	.0000	.0000	.0000	.0000	.0011
NNW	.0007	.0003	.0000	.0000	.0000	.0000	.0010
ALL	.1455	.1578	.0000	.0000	.0000	.0000	.3033

Source: National Climatic Center, 1960-64

Secondly, they indicate that almost 25% of the time slightly to moderately unstable conditions exist. Such conditions are conducive to bringing smoke plumes from elevated sources, e.g., smoke stacks, down to the ground within a relatively short distance downwind. Somewhat surprisingly, the data also show a very significant percentage (45%) of stable air conditions which tend to carry plumes largely intact for great distances. Such conditions can result in high pollutant concentrations if the plume reaches hills which are at approximately the same height as the stack.

Somewhat more recent hourly meteorological data from Barbers Point Naval Air Station (National Climatic Center, 1967-71) were obtained for the modeling studies conducted as part of this current analysis. These data were pre-processed through EPA's meteorological preprocessor (U.S. Environmental Protection Agency, 1977) in order to produce a data file which included stability category, wind speed, wind direction, temperature, and mixing depth. The 1967-71 data differ from the 1960-64 data set in that they were obtained and used on an individual year basis with the models rather than as a 5-year composite average case as was done with the earlier data.

4.11.2.2 Terrain

The terrain in the Campbell Industrial Park area is generally flat and at an elevation of ten feet above mean sea level. Vegetation in the area is generally limited to grasses, some trees within the industrial park itself, and sugar cane outside it. Going north, the elevation gradually increases to about 80 feet over a distance of some four kilometers and then rises more sharply to over 1,000 feet about seven kilometers away. Immediately south of the park is the ocean; thus, the area is subjected to a land/sea-breeze regime during periods when the prevailing northeasterly trade winds are weakened or absent. Wind shear can be quite noticeable in the area as near-surface onshore winds carry plumes from low level sources landward while higher reaching plumes are moving in the opposite direction with the synoptic flow.

4.11.2.3 Existing Air Quality

The State Department of Health (DOH) has maintained monitoring stations at Campbell Industrial Park since February, 1971. Total suspended particulates (TSP), sulfur dioxide (SO2), and nitrogen dioxide (NO2) were all monitored on a 24-hour average basis. Initially the site was at the Barbers Point Lighthouse, but the proximity to the ocean resulted in very high TSP levels due to sea spray. The station was therefore moved to the Chevron Refinery site about 1.7 kilometers north of the lighthouse on March 17, 1972. On August 7, 1979, the monitoring station was moved to a rooftop location at the same Chevron site. The total suspended particulates, sulfur dioxide, and nitrogen dioxide monitoring data collected since 1971 are summarized in Table IV-19.

The data indicate that the National Ambient Air Quality Standards (NAAQS) are being met and that only the State's more stringent 24-hour particulate standard is being exceeded about once or twice a year (see Table IV-20 and discussion of standards in Section 4.11.3). Note that nitrogen dioxide monitoring ceased statewide in 1976.

Table IV-19. Air Monitoring Data, Campbell Industrial Park, 1971-83

	TSP			SO2			NO2		
YEAR	RANGE	MEAN	>AQS	RANGE	MEAN	>AQS	RANGE	MEAN	>AQS
1971	18-471	125	54	<5-16	<5	0	<20-49	29	0
1972	24-155	55	4	<5- 7	<5	0	<20-49	21	0
1973	14-129	50	1	<5- 5	<5	0	<20-33	<20	0
1974	23-132	47	1	<5-10	<5	0	<20-40	25	0
1975	13-137	52	1	<5-11	<5	0	<5-25	11	0
1976	12-101	40	1	<5- 7	<5	0	<5-29	14	0
1977	25-134	54	1	<5-18	<5	0	———	—	-
1978	22-127	48	1	<5-40	<5	0	———	—	-
1979	23-223	76	10	<5-27	<5	0	———	—	-
1980	29-158	53	2	<5-10	<5	0	———	—	-
1981	26-188	51	2	<5-40	<5	0	———	—	-
1982	15- 63	41	0	<5-12	<5	0	———	—	-
1983	30-109	55	1	<5-28	<5	0	———	—	-

NOTES:
1. TSP = total suspended particulates
2. SO2 = sulfur dioxide
3. NO2 = nitrogen dioxide
4. >AQS = Number of violations of State air quality standard.
5. All concentrations are in micrograms per cubic meter of air.
6. 1983 data are for January thru April.
7. Sampling station was moved from Barbers Point Lighthouse to the Chevron Refinery site due to salt spray from the ocean on 17 March 1972.
8. The sampler were elevated to a rooftop on 7 August 1979.

Source: State of Hawaii
Department of Health

Table IV-20. Summary of State of Hawaii and Federal Ambient Air Quality Standards

<table>
<tr><th></th><th>POLLUTANT</th><th>SAMPLING PERIOD</th><th>FEDERAL STANDARDS PRIMARY</th><th>FEDERAL STANDARDS SECONDARY</th><th>STATE STANDARDS</th></tr>
<tr><td>1.</td><td>Total Suspended Particulate Matter (TSP)</td><td>Annual Geometric Mean</td><td>75</td><td>60</td><td>—</td></tr>
<tr><td></td><td></td><td>Annual Arithmetic Mean</td><td>—</td><td>—</td><td>55</td></tr>
<tr><td></td><td></td><td>24-hours</td><td>260</td><td>150</td><td>100</td></tr>
<tr><td>2.</td><td>Sulfur Dioxide (SO2)</td><td>Annual Arithmetic Mean</td><td>80</td><td>—</td><td>20</td></tr>
<tr><td></td><td></td><td>24-hours</td><td>365</td><td>—</td><td>80</td></tr>
<tr><td></td><td></td><td>3-hours</td><td colspan="2">1300</td><td>400</td></tr>
<tr><td>3.</td><td>Carbon Monoxide (CO)</td><td>8-hours</td><td colspan="2">10</td><td>5</td></tr>
<tr><td></td><td></td><td>1-hour</td><td colspan="2">40</td><td>10</td></tr>
<tr><td>4.</td><td>Ozone (O3)</td><td>1-hour</td><td colspan="2">240</td><td>100</td></tr>
<tr><td>5.</td><td>Nitrogen Dioxide (NO2)</td><td>Annual Arithmetic Mean</td><td colspan="2">100</td><td>70</td></tr>
<tr><td>6.</td><td>Lead (Pb)</td><td>Calendar Quarter</td><td colspan="2">1.5</td><td>1.5</td></tr>
</table>

NOTES: 1. Short-term standards (1, 3, 8, 24-hour standards) may be exceeded once per year. Annual and calendar quarter standards are not to be exceeded at all.

2. All concentrations listed are in micrograms/cubic meter except carbon monoxide which is milligrams/cubic meter.

3. Federal primary standards are intended to prevent adverse effects on public health. Secondary standards are intended to prevent adverse effects on comfort, visibility, vegetation, animals, aesthetic values, and soiling and deterioration of materials.

Sources: Title 40, Code of Federal Regulations, Part 50 (Federal)
Title 11, Administrative Rules, Chapter 59 (State)

Because the monitoring station is situated relatively close to the elevated sources (i.e, the stacks) located at Campbell Industrial Park, the data collected might not be representative of the highest ambient pollutants levels resulting from the various industrial sources at the park. Of particular concern is sulfur dioxide because of the presence of two refineries at the park and a 658 megawatt oil-fired power plant some 5 kilometers northwest of the park. The area around that power plant had been designated a non-attainment area for sulfur dioxide in 1979. At the present, however, it appears to be in compliance with both federal and state ambient sulfur dioxide standards due to the installation of taller smoke stacks and the use of low sulfur fuel oil. The U.S. Environmental Protection Agency, however, has not officially reclassified the area as attainment.

4.11.3 APPLICABLE REGULATIONS AND STANDARDS

4.11.3.1 New Stationary Source Performance Standards (NSSPS)

The U.S. Environmental Protection Agency has promulgated standards of performance for new stationary sources of air pollution which include maximum allowable emission rates for specific pollutants. These are found in Title 40, Code of Federal Regulations, Part 60 (40 CFR 60), and are established for specific types of facilities. Since the proposed resource recovery facility is primarily a municipal waste incinerator it is subject to Subpart E of 40 CFR 60. This subpart sets a particulate matter (PM) emission limitation for incinerators capable of burning more than 50 tons per day of municipal refuse. The allowable emission rate for PM under this regulation is 0.08 grains per dry standard cubic foot of exhaust air, corrected to 12 percent carbon dioxide.

4.11.3.2 Prevention of Significant Deterioration (PSD)

The U.S. Environmental Protection Agency has also promulgated regulations intended to prevent significant deterioration in the quality of air in areas where the National Ambient Air Quality Standards (NAAQS) are presently being met. With the exception of two discrete and quite limited sites which have not officially been redesignated attainment areas, the State of Hawai'i does meet all the NAAQS and is thus subject to PSD requirements. Under these regulations (40 CFR Part 52.21), increments of maximum allowable air quality degradation have been specified for Class I, II, and III areas. Class I areas have the most stringent increments and are intended to remain almost pristine. The federal Clean Air Act made all national parks Class I; thus, Haleakala on Maui and Volcanoes National Park on Hawai'i are subject to Class I restrictions. Class II areas are permitted significantly more degradation, and the rest of the state is presently designated Class II. Class III areas are allowed even greater air quality deterioration and would be appropriate for heavily industrialized regions. The Class II increments applicable to the proposed resource recovery facility are presented in Table IV-21.

These increments are essentially the additional pollution which will be allowed over and above existing baseline pollutant levels. In the case of Campbell Industrial Park, part of the allowable increment for sulfur dioxide has been used up, primarily because of the approval of PSD

Table IV-21. Prevention of Significant Deterioration, Class II Increments

POLLUTANT	AVERAGING PERIOD	MAXIMUM ALLOWABLE INCREASE (micrograms/cubic meter)
Particulate Matter	Annual Geometric Mean	19
	24-Hour Maximum	37
Sulfur Dioxide	Annual Arithmetic Mean	20
	24-Hour Maximum	91
	3-Hour Maximum	512

Source: Title 40, Code of Federal Regulations, Part 52.21

construction permits for expansion of the existing Hawaiian Independent Refinery. What remains of the increment can be "consumed" on a "first come, first served" basis by new or existing industries. Once the increment is used up, however, any new or expanded air pollution sources would have to arrange for "offsets", that is, for every additional ton of pollutants they wanted to emit, they would have to get an existing source to cut back its emissions by the same amount. Another option is for the State to go through the process of reclassifying the area to Class III to allow larger increments. It should be made clear, however, that increment consumption is determined on a point-by-point basis. Therefore, while one source may consume the entire increment at a given location, another proposed source may not contribute at that location and could still be permitted.

4.11.3.3 Non-attainment Area

In 1979, the U.S. Environmental Protection Agency designated a two-kilometer-radius circle around the Hawaiian Electric Company power plant at Kahe Point as a non-attainment area for sulfur dioxide (44 Federal Register 53084, September 12, 1979). Since that time the company has replaced four short (150') smoke stacks with a single taller one (304') in an effort to offset the downwash effects of the mountain behind the plant and has also switched to a cleaner burning low sulfur fuel oil. A year's worth of continuous monitoring recently completed around the plant indicates that it is presently in compliance with both federal and state standards for sulfur dioxide (Hawaiian Electric Company, 1983). Thus, while the plant is legally still within a non-attainment area, it is only a matter of time before the EPA officially redesignates the area as an attainment area. In order to be in compliance with EPA regulations for non-attainment areas, it must be demonstrated that new source pollutants will not significantly impact such areas.

4.11.3.4 National Ambient Air Quality Standards (NAAQS)

Pursuant to the federal Clean Air Act, the U.S. Environmental Protection Agency has promulgated air quality standards for the so-called "criteria" pollutants (40 CFR Part 50). These are the pollutants for which "criteria" documents have been published containing all the technical information necessary to justify establishment of the ambient standards. The standards are summarized in Table IV-20.

There are two types of federal ambient standards, i.e., primary and secondary. The primary standards are intended to protect the public's health with an adequate margin of safety. The secondary standards are intended to protect public welfare through the prevention of adverse effects on comfort, visibility, vegetation, animals, aesthetic values, and soiling and deterioration of material.

These standards essentially address cumulative impact; thus, the emissions of the proposed resource recovery facility when combined with the emissions of existing and approved air pollution sources and natural background pollutant levels must not result in violations of the NAAQS.

4.11.3.5 State of Hawai'i Regulations and Standards

4.11.3.5.1 Incinerator Emission Standard. The State of Hawai'i Department of Health (DOH) has promulgated a particulate emission standard of 0.20 pound per 100 pounds of refuse charged (Title 11, Administrative Rules, Chapter 60, Air Pollution Control, 1983). This standard applies to the stack emissions from the proposed resource recovery facility.

4.11.3.5.2. Process Industries Standard. The DOH has also promulgated an emission standard for process industries which is graduated according to the weight of material that is processed per hour. For the Combustion Engineering/Amfac proposal which involves front-end processing of raw refuse to produce refuse-derived fuel (RDF), a maximum allowable particulate emission rate of 40 pounds per hour is applicable (Title 11, Administrative Rules, Chapter 60, Air Pollution Control, 1983).

4.11.3.5.3. Hawai'i Ambient Air Quality Standards. The State of Hawaii Ambient Air Quality Standards (HAAQS) are found in Title 11, Adminstrative Rules, Chapter 59 (1983). They are presented in Table IV-20. It is evident that the HAAQS are substantially more stringent than their federal counterparts. They may be viewed as providing an inherent non-deterioration policy since they are numerically quite close to the ambient levels that existed in the early 1970s when the standards were first promulgated. They may also be viewed as providing a greater margin of safety for public health than the federal standards, or they may be viewed as overly conservative and restrictive, particularly for industrially zoned areas.

4.11.3.5.4 Opacity Standard. The resource recovery facility must also comply with the visible emission restriction of 20 percent opacity (Title 11, Administrative Rules, Chapter 60, Air Pollution Control, Section 11-60-24, 1983).

4.11.4 EMISSIONS

4.11.4.1 Qualitative Analysis

Because of the heterogeneous nature of municipal refuse, there is a large variety of substances emitted from refuse-handling facilities, and the emissions display significant day-to-day variability. Table IV-22 presents in a very general fashion the type of emissions emanating from such facilities. Sanitary landfills have been included for comparison. Table IV-23 lists trace elements commonly found in municipal refuse and which can be expected to become part of incinerator emissions. Among the organic compounds associated with incinerator emissions, dibenzodioxins are perhaps of greatest concern, although the data collected to date from incinerators indicates that they are either present at extremely low concentrations or not detectable at all. These will be discussed in more detail in a later section.

4.11.4.2. Quantitative Analysis

4.11.4.2.1 Regulated Pollutants. Projected emission rates for all pollutants covered by federal or state emission and/or ambient air quality standards were provided in bidders' technical proposals. These emission

Table IV-22. Major Pollutants Associated with Disposal of Municipal Solid Waste

POLLUTANT	INCINERATION WITH ENERGY RECOVERY	RDF ENERGY RECOVERY	RDF FRONT-END PROCESSING	MATERIALS RECOVERY	LANDFILL
Particulates	X	X			
Sulfur Oxides	X	X			
Nitrogen Oxides	X	X			
Hydrocarbons	X	X			
Volatile Metals	X	X			
Volatile Organic Compounds	X	X	X		
Carbon Dioxide	X	X			X
Methane					X
Hydrogen Sulfide					X
Bacteria and Viruses	X	X	X		X
Dust			X	X	X

Source: After U.S. Environmental Protection Agency, 1979

Table IV-23. Trace Elements in Urban Refuse

Major Elements Average Content (1,000 - 100,000 ppm)	Minor Elements Average Content (1 - 999 ppm)	
Aluminum	Antimony	Manganese
Calcium	Arsenic	Mercury
Chlorine	Barium	Molybdenum
Iron	Beryllium	Nickel
Magnesium	Bismuth	Niobium
Phosphorous	Boron	Platinum
Potassium	Cadmium	Rabidium
Silicon	Cesium	Selenium
Sodium	Chromium	Silver
Sulfur	Cobalt	Strontium
Titanium	Copper	Tantalum
Zinc	Germanium	Tin
	Gold	Tungsten
	Lead	Vanadium
	Lithium	Zirconium

Sources: U.S. Environmental Protection Agency, August, 1977
Freeman, H. M., November, 1978

rates were generally based on each bidder's experience at other similar facilities. With respect to emissions from the proposed Honolulu resource recovery facility, only particulate matter is covered by existing emission standards, and both proposals show particulate emission rates which are less than half of the specified federal and state standards. The facility should have no difficulty complying with the 20 percent opacity restriction mentioned above, since the principal emitting point source will be equipped with high-efficiency electrostatic precipitators or baghouses.

Worst-case annual emissions based on the facility operating at 100% capacity for 365 days per year were estimated and are summarized in Table IV-24. Some of the disparity between the two proposals is attributable to their different processes while some of it is simply due to the bidder's selection of very conservative (high) estimated emission rates. In order to put this into better perspective and to localize it more, a comparison of emission rates for the two bidders and a recently completed stack gas analysis at the existing Waipahu Incinerator is presented in Table IV-25. The conservatism of the bidder's emission rates seems quite evident from this comparison. Most of their emission rates are about the same or greater than at the incinerator burning Honolulu refuse. In the case of particulates, the bidder's emission rates are lower because they have proposed higher efficiency electrostatic precipitators for control. In the case of sulfuric acid mist, the current proposals do not include a water spray chamber such as the existing incinerator has, and thus they expect drier conditions not as conducive to sulfuric acid mist formation. Hydrogen chloride is included in both tables because, although it is not currently regulated, it is commonly emitted in significant quantities from refuse-fired facilities due to the presence of plastics. The comparison in Table IV-25 suggests that Honolulu's refuse may contain somewhat less plastics since the emission rate for the incinerator was about half of those for the two proposed resource recovery facilities which were based on mainland experience.

It should also be noted that such facilities do not normally operate at 100% capacity throughout the year. On an annual average basis, operations would be more on the order of 80%, and thus emissions would also be proportionately reduced. For comparison purposes and to provide a basis for judging the significance of the impact, the latest Department of Health emissions inventory for the State of Hawai'i is presented in Table IV-26.

<u>**4.11.4.2.2 Trace Elements.**</u> While earlier investigations of municipal incinerator stack emissions have been conducted (Carrotti, 1974; 1969), the world-wide depletion of fossil fuels and the increase in the number of refuse-fired power plants have sparked increased interest in characterizing these emissions. Much of the work has focused on the particulates and their potentially toxic constituents, both viable and nonviable (Jackbo, October 1977; Greenberg, May 1978; Gelembiewski, June 1978; Rinaldi, 1979; California Air Resources Board, 1980; A.D. Little, Inc., 1981).

Table IV-27 displays the range of concentrations of trace metals in the particulate matter emitted from resource recovery facilities. There is quite a wide variability in these reported concentrations from facility to facility around the country. The constituents of the emitted particulates are obviously determined by the make-up of the refuse being burned. Some

Table IV-24. Estimated Controlled Emissions of Regulated Pollutants from the Proposed Resource Recovery Facility

	ESTIMATED ANNUAL EMISSIONS (TPY)	
POLLUTANT	CE/AMFAC	WHEELABRATOR-FRYE
Sulfur Dioxide (SO2)	1,326	821
Nitrogen Oxides (NOx)	1,336	1,232
Carbon Monoxide (CO)	723	254
Particulate Matter (PM)	298	429
Volatile Organic Compounds (VOC)	123	13
Fluorides (F)	9.7	41
Mercury (Hg)	5.9	3.9
Lead (Pb)	1.0	13
Beryllium (Be)	0.0035	0.0044
Sulfuric Acid (H2SO4)	trace	10.2
Hydrogen Sulfide (H2S)	trace	trace
Total Reduced Sulfur Compounds	trace	trace
Vinyl Chloride (VC)	Not detectable	Not detectable
Asbestos	trace	0.12
*Hydrogen Chloride (HCl)	2,842	3,828

* Not regulated under the federal Clean Air Act.

Table IV-25. Comparative Controlled Emission Rates for Three Refuse-Fired Facilities

POLLUTANT	EMISSION RATE (lb/T of MSW) CE/AMFAC	WHEELABRATOR-FRYE	WAIPAHU INCINERATOR
Nitrogen Oxides	3.96	3.0	N.D.
Sulfur Dioxide	3.92	2.0	1.36
Carbon Monoxide	2.14	0.619	N.D.
Particulate Matter	0.87	1.04	3.20
Volatile Organic Compounds	0.36	0.1	0.49
Lead	0.0030	0.031	0.007
Fluorides	0.029	0.1	0.011
Sulfuric Acid	trace	0.0247	0.21
Asbestos	trace	0.000297	<0.0000000044
Beryllium	0.00001	0.000006	0.00000023
Mercury	0.017	0.0096	0.01
Hydrogen Chloride (HCl)	8.40	9.32	5.15

NOTES: 1. CE/AMFAC and Wheelabrator-Frye values are estimates based on their respective experiences in operating other facilities. CE/AMFAC would burn refuse derived fuel (RDF) while WF would burn unprocessed municipal refuse.

2. The Waipahu Incinerator values are based on stack gas sampling conducted in February, 1983.

3. MSW = municipal solid waste
N.D.= not determined

Table IV-26. Emissions Inventory, State of Hawaii, 1980

SOURCE CATEGORY	EMISSIONS (tons per year) TSP	SOx	NOx	CO	HC
Steam Electric Power Plants	2,530	43,262	15,776	1,711	289
Gas Utilities	27	0	213	0	0
Fuel Combustion in Agricultural Industry	6,819	1,998	2,079	0	48
Refinery Industry	550	7,077	2,185	428	2,597
Petroleum Storage	0	0	0	0	1,780
Metallurgical Industry	27	114	53	0	0
Mineral Products Industry	8,194	1,941	693	0	0
Municipal Incineration	27	171	2,025	0	192
Motor Vehicles	2,035	1,427	24,250	335,750	32,081
Construction, Farm, and Industrial Vehicles	27	285	3,411	6,416	577
Aircraft	385	171	2,025	9,410	1,876
Vessels	82	628	586	428	192
Agricultural Field Burning	6,544	0	0	73,566	8,417
TOTAL (Tons per year):	27,497	57,074	53,297	427,708	48,097

NOTES: TSP = total suspended particulates
SOx = sulfur oxides
NOx = nitrogen oxides
CO = carbon monoxide
HC = hydrocarbons

Source: State of Hawaii
Department of Health

Table IV-27. Concentrations of Trace Elements in Particulate Emissions from Solid Waste Resource Recovery Systems

ELEMENT	CONCENTRATION RANGE (ppmw)
Antimony	403 - 3,583
Arsenic	50 - 4,478
Barium	270 - 540
Bromine	350 - 1,200
Cadmium	670 - 20,600
Chromium	130 - 9,852
Cobalt	5 - 50
Copper	620 - 10,748
Iron	2,000 - 2,130
Magnesium	20,600
Manganese	140 - 17,913
Nickel	179 - 9,852
Selenium	<30 - 2,687
Silver	50 - 269
Tin	42 - 16,122
Zinc	52,843 - 394,087

Sources: Rinaldi, May 1979
Combustion Engineering, 1982

of these trace elements end up in the bottom ash of the incinerator, most in the collected fly ash in the electrostatic precipitator, and the remainder are emitted. The previously cited Rinaldi (1979 report) noted that the chemical makeup of the collected particulates differed in many cases from that of the emitted particulates. Certain chemical species tended to be concentrated in one or another of these due to differences in particle size, shape, mass, and resistivity.

Applying the concentrations from Table IV-27 to the projected boiler emissions from the facilities that have been proposed by Combustion Engineering/Amfac and Wheelabrator-Frye yields the estimated annual emissions displayed in Table IV-28. These, of course, reflect the same variability of the concentrations on which they are based. The actual emissions from the proposed facility will depend on the nature of the refuse received and the other factors previously discussed. While a knowledge of annual emissions of pollutants is of general interest and perhaps useful for comparing air pollution sources, what is most important in terms of public health and welfare protection are the ambient concentrations. These are determined by emission levels, plant design, local meteorology, and terrain factors. They are discussed in a subsequent section.

4.11.4.2.3 Organic Compounds. Incinerators have been suspected as possible sources of some polynuclear aromatic hydrocarbons (PAH) such as pyrene and benzo(a)-pyrene that have been of concern because of their potential carcinogenicity. Data on emissions of PAH are limited, but what is available indicates that concentrations are very low, in fact at the limit or below the range of reliable quantitative analysis. Total PAH emissions from the proposed facility are estimated at less than half a ton per year.

Another group of organics which have attracted much attention in recent years, are the polychlorinated dibenzo dioxins (PCDD) and their structural relatives the polychlorinated dibenzo-furans (PCDF). The most notable of the PCDD's is 2,3,7,8 tetrachloro-dibenzo-para-dioxin (TCDD). This is an extremely toxic substance which received notoriety due to its presence in Agent Orange (the herbicide widely used in Viet Nam), public exposure in Seveso, Italy after an industrial plant explosion, and, most recently, public exposure in Times Beach, Missouri when it was discovered that waste oil contaminated with TCDD had been used for years to oil roads in the area. The body of research and literature concerning dioxins and furans has continued to grow in recent years because of this interest (Crummett et al., 1979; Lustenhouwer et al., 1980, Bumb et al., 1980; Duckett, 1981; Barnes, 1983).

Dioxins and furans are of interest in resource recovery projects because they have been found in the fly ash resulting from the burning of refuse. While they have been found at extremely low levels, they are a subject of great interest primarily because of the high toxicity of TCDD. There are many other isomers most of which have only very recently been identified, and there are only limited data available on their toxic effects. What is known indicates a rather wide range of toxicities, none of which are known to be as toxic as 2,3,7,8 TCDD. Most studies to date have focused on 2,3,7,8 TCDD almost exclusively with little attention to the other structural isomers. The 2,3,7,8 TCDD seems to occur as about 5-15% of the total tetrachloro isomers and as an even smaller percentage of

Table IV-28. Estimated Range of Trace Element Emissions from the Proposed Resource Recovery Facility

ELEMENT	RANGE OF ANNUAL EMISSIONS (tons)
Antimony	0.12 - 1.1
Arsenic	0.02 - 1.3
Barium	0.12 - 0.23
Bromium	0.15 - 0.51
Cadmium	0.29 - 6.2
Chromium	0.06 - 3.0
Cobalt	<0.01 - 0.02
Copper	0.27 - 3.2
Iron	0.86 - 0.91
Magnesium	6.2
Manganese	0.60 - 5.4
Nickel	0.05 - 3.0
Selenium	<0.01 - 0.81
Silver	0.02 - 0.08
Tin	0.01 - 4.9
Zinc	16.0 - 119

Note: Based on estimated throughput of refuse provided in bidders' proposals and trace element concentrations given in Table IV-26.

the total PCDD's and PCDF's present (Josephson, March 1983; Kemp, April 1983).

Some of the properties of dioxins and furans include very low water solubility, low vapor pressures, and high resistance to heat. TCDD, for example, is little affected by exposure to air at 600 degrees Centigrade, but burns completely and fairly rapidly to carbon dioxide, water, hydrogen chloride, and chlorine at 800 degrees. This is an important characteristic since it suggests that by maintaining high enough furnace temperatures, emissions of these chemicals could be sharply reduced.

While some uncertainty remains about the exact mechanism of formation of dioxins and furans, it appears reasonably certain that these chemicals are produced in almost any inefficient combustion process involving organic fuels. Chlorinated dioxins have been found associated with chemical tar burners, coal-fired power plants, cigarette smoke, motor vehicle mufflers, fireplaces chimneys, and portions of charcoal-broiled steaks (Bumb et al., October 1980). It is the recent development of extremely sensitive analytical techniques which has permitted detection of these chemicals at the part per trillion level which has been largely responsible for their discovery in various environmental settings.

The dioxins and furans also appear to have a very strong tendency to attach to fly ash and once attached they seem to remain so despite high temperature and the presence of an oxidizing atmosphere. This too is important since it suggests that high efficiency particulate removal can effectively reduce emissions of dioxins and furans. It should also be noted that like lead and some other metals, the PCDD's and PCDF's also seem to be more concentrated on the particulates that do escape control than those that are captured by the control device, i.e., electrostatic precipitator (Kemp, April 1983). This may be explained by the fact that it is the smallest sub-micron size particles which generally escape and these would have, per unit mass, more surface area available for sorption of dioxins and furans than larger diameter particles. Thus, while the bulk of the dioxins and furans would be captured in a high-efficiency collector, that two percent or less of particles that are emitted would have a somewhat higher concentration of the two species.

Using the median values for PCDD and PCDF emissions from data collected at 35 solid waste combustion plants (Lustenhouwer, 1980; Kemp, 1983), total annual PCDD and PCDF emissions from the proposed resource recovery facility were estimated at 10.7 and 15.4 pounds for the Combustion Engineering/Amfac and Wheelabrator-Frye proposals, respectively. Again, we would remind the reader that while annual emissions are of interest for comparative purposes, it is ambient concentrations to which the public is exposed and thus of greater import in terms of assessing public health risks. This will be discussed further in a subsequent section.

4.11.4.3 Bacterial Emissions

The Midwest Research Institute has conducted a series of investigations into the bacterial emissions from different types of waste treatment facilities (U.S. Environmental Protection Agency, August 1979b). High-volume and Anderson samplers were set up on the upwind and downwind sides, as well as inside municipal refuse incinerators, refuse processing plants, and other waste treatment facilities. Relevant conclusions reached in the study were that:

- o Airborne bacterial levels, both in-plant and at the property line, were generally higher for the RDF plant than for the other types of waste facilities that were tested.

- o A fabric filter system (baghouse) applied to the primary source of dust emissions (air classifier) at the RDF plant can significantly reduce particulate and bacterial concentrations.

- o There is insufficient information, data, or relevant standards to determine the levels of microbiological contaminants that might be considered "hazardous."

4.11.5 AMBIENT AIR QUALITY IMPACTS

4.11.5.1 Methodology

The ambient air quality impact analysis basically consists of modeling the proposed sources using U.S. Environmental Protection Agency approved computer models in order to determine whether violations of any existing ambient standards will occur. The analysis is further divided into two parts. The first simply involves assessing the impact of each proposed source by itself in order to determine if:

- o the source, without adding in the effect of existing sources, is capable of violating federal or state ambient standards.

- o the source's impact will exceed the allowable PSD increments for particulate matter or sulfur dioxide (see Table IV-21).

- o the source's impact will exceed any of the "de minimus" levels from the PSD regulations (40 CFR 52.21) which would then trigger a requirement for preconstruction monitoring (see Table IV-29).

- o the source's impact due to non-criteria and non-regulated pollutants would create any adverse public health or environmental effects.

The second step involves assessing the cumulative impact of the proposed source plus existing sources, under-construction and other approved sources, in addition to the natural background pollutant levels. This can be accomplished through a combination of modeling and use of existing monitoring data. In the case of criteria pollutants, the results of this analysis are then compared to federal and state standards. For non-criteria pollutants with no ambient standards, the results must be evaluated in light of what is published about the toxicology of each pollutant.

In this case, the modeling was accomplished using two EPA dispersion models, i.e., Industrial Source Complex - Short Term (ISCST) and COMPLEX-1. ISCST is recommended for use in terrain below source stack height, while COMPLEX-1 is the preferred model for use in terrain higher than stack height. An array of receptors was established around the proposed plant

Table IV-29. Federal Prevention of Significant Deterioration Monitoring Exemption "De Minimus" Concentrations

POLLUTANT	24-HOUR CONCENTRATION (micrograms/cubic meter)
Total Suspended Particulates	10
Sulfur Dioxide	13
Nitrogen Dioxide	14
Carbon Monoxide	575
Lead	0.1
Fluorides	0.25
Mercury	0.25
Beryllium	0.0005

Source: Title 40, Code of Federal Regulations, Part 52 site along 10 degree radial lines at distances of 0.5, 1.0, 1.5, 2.0, and 3.0 kilometers. This results in five concentric circles around the source at those distances with a total of 180 receptor locations at which the model calculates pollutant concentrations. In the high terrain, 24 receptor locations were placed at elevations approximately equal to the effective plume height under stable conditions. At least one receptor was placed in each 10 degree sector. Receptors were placed at present and future populated areas such as Makakilo City, Honokai Hale, West Beach, and Barbers Point Naval Air Station. The monitoring sites used by the Hawaiian Electric Company in its recent study of sulfur dioxide concentrations were also input as receptor locations. See Figure IV-11 for a graphical presentation of the receptor array.

The source parameters for the modeling were as follows:

	C-E/AMFAC	WHEELABRATOR-FRYE
Main Stack		
Stack Height (m):	59.4	76.2
Stack Diameter (m):	2.8	2.0
Exit Gas Temperature (K):	445	505
Exit Gas Velocity (m/sec):	27.7	26.1
Building height (m):	32	46.3
length (m):	31.7	57.9
width (m):	25.6	19.8
Baghouse Stacks (4 ea)		
Stack Height (m):	19.8	n/a
Stack Diameter (m):	0.6 and 0.9	n/a
Exit Gas Velocity (m/sec):	25.4	n/a
Exit Gas Temperature (K):	298	n/a
Building height (m):	17.4	n/a
length (m):	54.9	n/a
width (m):	36.6	n/a

/Note: Baghouses were not applicable (n/a) to the Wheelabrator-Frye proposal because it does not involve preparation of refuse-derived fuel./

Emission rates for the modeling were based on the assumption of plants operating at 100% design capacity. The downwash option was used in the ISCST model. As mentioned in Section 4.11.2.1, 1967-1971 meteorological data from Barbers Point NAS were used with the models in order to determine the highest possible pollutant concentrations at each of the receptor sites. Each year of data was run separately with each model in order to identify the worst-case hours and days during that five-year period.

4.11.5.2 Results

4.11.5.2.1 Individual Impacts. The results of the individual impacts analysis are summarized in Tables IV-30 through 36. In short, neither proposed facility would by itself threaten either federal or the more

Figure IV-11. Receptor Locations for Modeling Air Quality Impact of the Proposed Resource Recovery Facility

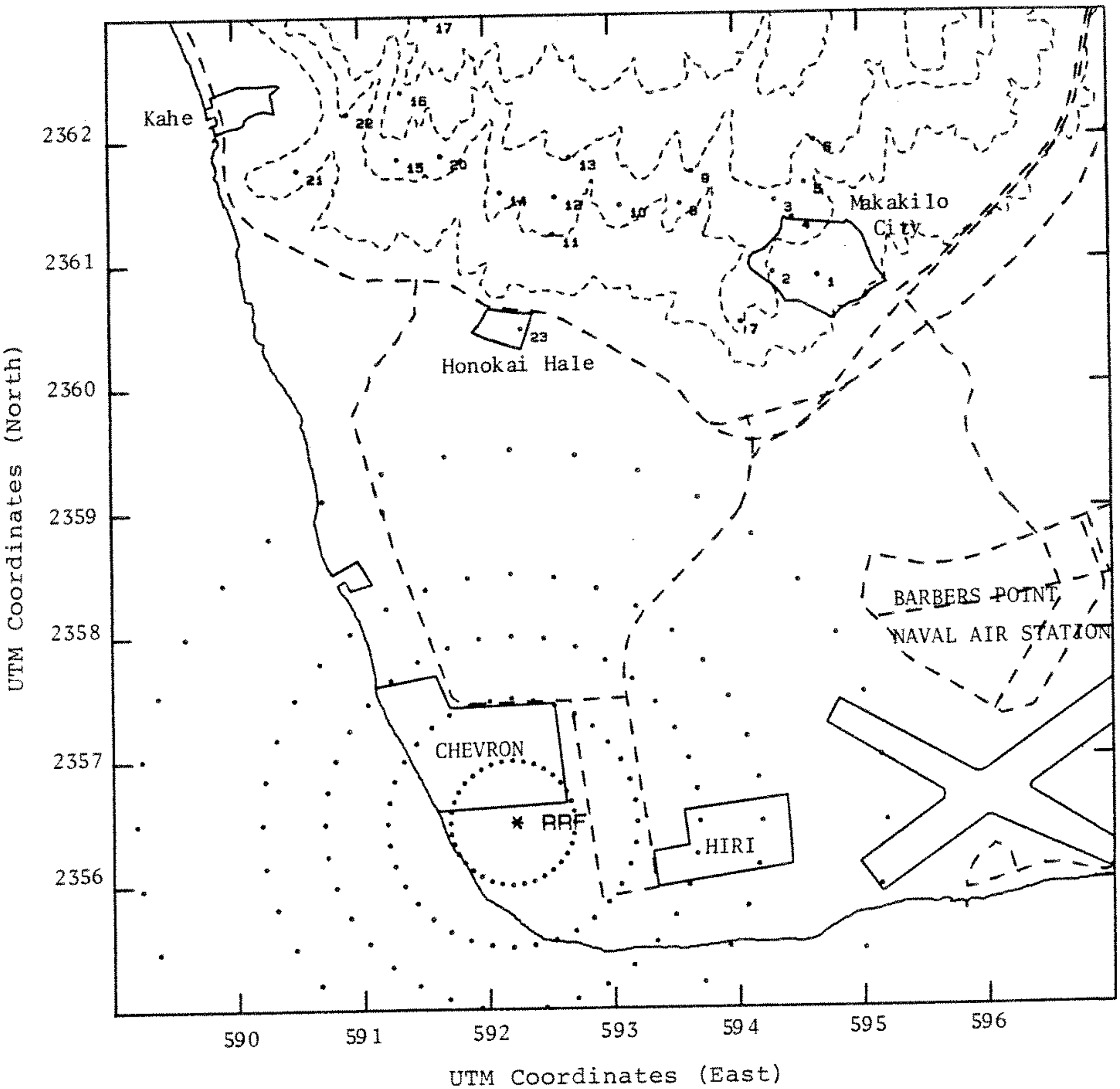


Table IV-30. Estimated Maximum Air Quality Impacts of the Proposed Resource Recovery Facility at Terrain Elevations Less Than 65 Feet

	MAXIMUM CONCENTRATIONS (micrograms/cubic meter)			
	WHEELABRATOR-FRYE		CE/AMFAC	
POLLUTANT	24-HOUR	ANNUAL	24-HOUR	ANNUAL
Carbon Monoxide	<0.01	<0.01	<0.01	<0.01
Sulfur Dioxide	9.1	1.0	12.4	1.68
Nitrogen Dioxide	13.6	1.6	12.6	1.38
Total Suspended Particulates	4.7	0.55	2.91	0.55
Lead	0.14	0.016	0.01	0.001
Fluorides	0.45	0.052	0.09	0.011
Mercury	0.042	0.0049	0.06	0.006
Beryllium	0.000048	0.0000056	0.000033	0.0000036
Hydrogen Chloride	42.1	4.9	26.8	3.29
Arsenic	0.00044	0.000051	0.013	0.0024
Cadmium	0.0054	0.00063	0.060	0.011
Chromium	0.0012	0.00014	0.029	0.0056
Nickel	no data	no data	0.029	0.0056
Selenium	<0.00011	<0.000013	0.0079	0.0015
Total Dioxins and Furans	—	0.0000098	—	0.0000055
2,3,7,8 TCDD	—	0.000000027	—	0.000000015

NOTES:

1. CO concentrations are in milligrams/cubic meter (mg/m3). 1-hour and 8-hour CO levels were <0.05 mg/m3.

2. The maximum 3-hour SO2 concentrations for WF and CE were 18.9 and 34.5, respectively.

3. The location of the maximum 24-hour concentrations for Wheelabrator-Frye was 500 meters directly north of the project site. The point of maximum 3-hour and annual impact was 500 meters west-southwest of the site.

4. The location of maximum 24-hour impact for CE/AMFAC was 3,000 meters directly north of the project site. The point of maximum 3-hour impact was 1,500 meters northwest while the point of maximum annual impact was 2,000 meters west-southwest of the site.

Table IV-31. Maximum Air Quality Impacts of the Proposed Resource Recovery Facility at Terrain Elevations Over 65 Feet

	MAXIMUM CONCENTRATIONS (micrograms/cubic meter)			
	WHEELABRATOR-FRYE		CE/AMFAC	
POLLUTANT	24-HOUR	ANNUAL	24-HOUR	ANNUAL
Carbon Monoxide	<0.01	<0.01	<0.05	<0.01
Sulfur Dioxide	19.1	0.24	31.9	0.93
Nitrogen Dioxide	28.7	0.35	32.3	0.77
Total Suspended Particulates	10.0	0.12	7.5	0.18
Lead	0.30	0.0038	0.03	0.0060
Fluorides	0.96	0.011	0.23	0.0063
Mercury	0.089	0.0011	0.14	0.0034
Beryllium	0.00010	0.0000013	0.000084	0.000002
Hydrogen Chloride	89	1.10	68.8	1.83
Arsenic	0.00093	0.000011	0.033	0.00078
Cadmium	0.011	0.00014	0.16	0.0037
Chromium	0.0026	0.000031	0.076	0.0018
Nickel	no data	no data	0.076	0.0018
Selenium	<0.00023	<0.0000028	0.020	0.00049
Total Dioxins and Furans	—	0.0000022	—	0.0000030
2,3,7,8 TCDD	—	0.0000000061	—	0.0000000084

NOTES:

1. CO concentrations are in milligrams/cubic meter (mg/m3). 1-hour and 8-hour CO levels were <0.1 mg/m3.
2. The maximum 3-hour SO2 concentrations for WF and CE were 85.5 and 175, respectively.
3. The location of the maximum concentrations for both WF and CE was Puu Palailai at an elevation of 480 feet.

Table IV-32. Estimated Maximum Air Quality Impacts of the Proposed Resource Recovery Facility at the Department of Health Monitoring Site, Campbell Industrial Park

POLLUTANT	MAXIMUM CONCENTRATIONS (micrograms/cubic meter) WHEELABRATOR-FRYE 24-HOUR	WHEELABRATOR-FRYE ANNUAL	CE/AMFAC 24-HOUR	CE/AMFAC ANNUAL
Carbon Monoxide	<0.01	<0.01	<0.01	<0.01
Sulfur Dioxide	4.0	0.10	3.7	0.020
Nitrogen Dioxide	5.9	0.15	3.7	0.016
Total Suspended Particulates	2.1	0.052	1.2	0.052
Lead	0.062	0.0016	0.0029	0.00001
Fluorides	0.20	0.0050	0.027	0.00013
Mercury	0.018	0.00046	0.017	0.00007
Beryllium	0.000021	0.0000005	0.00001	0.00000004
Hydrogen Chloride	18.4	0.46	8.0	0.039
Arsenic	0.00020	0.0000048	0.0052	0.00023
Cadmium	0.0024	0.000059	0.025	0.0011
Chromium	0.00054	0.000013	0.012	0.00053
Nickel	no data	no data	0.012	0.00053
Selenium	<0.000049	<0.0000012	0.0033	0.00014
Total Dioxins and Furans	—	0.00000094	—	0.00000066
2,3,7,8 TCDD	—	0.0000000026	—	0.0000000018

NOTES: CO concentrations are in milligrams/cubic meter (mg/m3).
1-hour and 8-hour CO levels were <0.05 mg/m3.

Table IV-33. Estimated Maximum Air Quality Impact of the Proposed Resource Recovery Facility in the West Beach Area

POLLUTANT	MAXIMUM CONCENTRATIONS (micrograms/cubic meter) WHEELABRATOR-FRYE 24-HOUR	WHEELABRATOR-FRYE ANNUAL	CE/AMFAC 24-HOUR	CE/AMFAC ANNUAL
Carbon Monoxide	<0.01	<0.01	<0.01	<0.01
Sulfur Dioxide	2.6	0.25	5.5	0.41
Nitrogen Dioxide	3.9	0.38	5.5	0.34
Total Suspended Particulates	1.3	0.13	1.4	0.080
Lead	0.040	0.0040	0.0043	0.00027
Fluorides	0.13	0.013	0.040	0.0028
Mercury	0.012	0.0012	0.024	0.0015
Beryllium	0.000014	0.0000014	0.000014	0.0000009
Hydrogen Chloride	12.0	1.2	11.8	0.81
Arsenic	0.00012	0.000012	0.0061	0.00035
Cadmium	0.0015	0.00015	0.029	0.0017
Chromium	0.00033	0.000033	0.014	0.0008
Nickel	no data	no data	0.014	0.0008
Selenium	<0.000030	<0.0000030	0.0038	0.00022
Total Dioxins and Furans	—	0.0000024	—	0.0000014
2,3,7,8 TCDD	—	0.0000000066	—	0.0000000037

NOTES: CO concentrations are in milligrams/cubic meter (mg/m3). 1-hour and 8-hour CO levels were <0.05 mg/m3.

Table IV-34. Estimated Maximum Air Quality Impacts of the Proposed Resource Recovery Facility at Barbers Point Naval Air Station

POLLUTANT	MAXIMUM CONCENTRATIONS (micrograms/cubic meter) WHEELABRATOR-FRYE 24-HOUR	WHEELABRATOR-FRYE ANNUAL	CE/AMFAC 24-HOUR	CE/AMFAC ANNUAL
Carbon Monoxide	<0.01	<0.01	<0.01	<0.01
Sulfur Dioxide	3.4	0.10	5.3	0.16
Nitrogen Dioxide	5.0	0.15	5.4	0.13
Total Suspended Particulates	1.8	0.053	1.4	0.033
Lead	0.052	0.0016	0.0042	0.0001
Fluorides	0.17	0.0051	0.039	0.0012
Mercury	0.016	0.00048	0.024	0.00057
Beryllium	0.000018	0.0000005	0.000014	0.0000003
Hydrogen Chloride	15.6	0.48	11.5	0.31
Arsenic	0.00017	0.0000049	0.0061	0.00014
Cadmium	0.0021	0.000060	0.029	0.00069
Chromium	0.00046	0.000014	0.014	0.00033
Nickel	no data	no data	0.014	0.00033
Selenium	<0.000042	<0.0000012	0.0038	0.000090
Total Dioxins and Furans	—	0.00000096	—	0.00000052
2,3,7,8 TCDD	—	0.0000000026	—	0.0000000014

NOTES: 1. CO concentrations are in milligrams/cubic meter (mg/m3). 1-hour and 8-hour CO levels were <0.05 mg/m3.

2. The location of maximum concentrations was 3000 meters northeast of the project site. This is in the vicinity of the northwest corner of Barbers Point NAS.

Table IV-35. Estimated Maximum Air Quality Impacts of the Proposed Resource Recovery Facility at Honokai Hale Subdivision

	MAXIMUM CONCENTRATIONS (micrograms/cubic meter)			
	WHEELABRATOR-FRYE		CE/AMFAC	
POLLUTANT	24-HOUR	ANNUAL	24-HOUR	ANNUAL
Carbon Monoxide	<0.01	<0.01	<0.01	<0.01
Sulfur Dioxide	2.1	<0.01	5.7	0.47
Nitrogen Dioxide	3.2	<0.01	5.8	0.38
Total Suspended Particulates	1.1	<0.01	1.6	0.09
Lead	0.033	<0.01	0.0045	0.0003
Fluorides	0.11	<0.01	0.041	0.0032
Mercury	0.010	<0.001	0.026	0.0017
Beryllium	0.000011	<0.0000001	0.000015	0.000001
Hydrogen Chloride	9.9	<0.01	12.3	0.91
Arsenic	0.00010	<0.00000093	0.0070	0.00039
Cadmium	0.0013	<0.000011	0.033	0.0019
Chromium	0.00028	<0.0000026	0.016	0.00091
Nickel	no data	no data	0.016	0.00091
Selenium	<0.000026	<0.00000023	0.0044	0.00024
Total Dioxins and Furans	—	<0.0000020	—	0.0000015
2,3,7,8 TCDD	—	<0.0000000060	—	0.0000000042

NOTES: CO concentrations are in milligrams/cubic meter (mg/m3).
1-hour and 8-hour CO levels were <0.05 mg/m3.

Table IV-36. Estimated Maximum Sulfur Dioxide Impacts of the Proposed Resource Recovery Facility at Kahe Monitoring Sites

	24-HOUR CONCENTRATION (micrograms/cubic meter)	
KAHE MONITORING SITE NO.	WHEELABRATOR-FRYE	CE/AMFAC
123	5.2	3.5
124	9.1	15.6
125	5.4	12.2
126	4.3	6.9
127	3.5	5.7
129	14.4	24.7

stringent state ambient air quality standards (Table IV-20). Similarly, neither plant by itself appears capable of consuming all of the allowable PSD increments (Table IV-21) for total suspended particulates or sulfur dioxide. Both proposed plants, however, appeared to exceed the "de minimus" level for sulfur dioxide and nitrogen dioxide in the high terrain north of the site; under the PSD regulations, this triggers a requirement for up to one year of pre-construction monitoring for those two pollutants. In addition, Wheelabrator-Frye's plant showed exceedances of the "de minimus" levels for lead and fluorides (see Table (IV-29) in both high and low terrain.

Because of the efforts of the Hawaiian Electric Company to switch to a higher sulfur fuel oil at its Kahe Power Plant, there has been some concern as to the possible joint impact of that plant and any proposed new facilities at Campbell Industrial Park. In conjunction with those efforts, HECO recently conducted one year of monitoring in the Kahe area with monitoring instruments located at several sites generally north of the industrial park. The data collected indicated that a switch to 2% sulfur fuel would result in very high concentrations in the vicinity of monitoring sites No. 125 and 126. Whether or not federal sulfur dioxide standards would be exceeded is a point of contention and currently being resolved by EPA and HECO. Those and other Kahe monitoring sites were included in the modeling to determine whether or not the proposed resource recovery facility was capable of impacting "significantly" at those sites. The results in Table IV-36 show that both alternatives are capable of exceeding the 5 microgram/cubic meter "significant" level established by the U.S. Environmental Protection Agency (44 Federal Register 3283, 16 January 1979) at the two critical sites. The only issue remaining is whether it is possible for the Kahe plant and a facility in the Campbell Park area to impact those sites significantly during the same 24-hour period. If it is possible, and the higher sulfur fuel were permitted at Kahe, then the proposed resource recovery facility might have to lower its sulfur dioxide emissions or not be permitted at Campbell Park. Analysis of all the pertinent meteorological, monitoring, and modeling data is currently being conducted by the U.S. Environmental Protection Agency in an effort to resolve this question.

In the case of those pollutants for which there are no ambient standards, a common rule of thumb is to compare the concentrations to 1/100th of the occupational standards, i.e., the so-called threshold limit values (TLV) State of Hawaii, 1982). Direct comparison with the TLV is inappropriate because they are designed to protect healthy young men working 40-hour work weeks. They are not intended to protect the general public with its mix of susceptible individuals who may be exposed for longer than 8 hours and possibly continuously. By dividing the TLV by 100, an additional margin of safety is added in order to account for the more susceptible members of the general public. The 0.01 TLV values for the chemicals of concern are listed in Table IV-37 (State of Hawaii, 1982).

A comparison of the results with the values in Table IV-37 indicates that with the exception of the 24-hour hydrogen chloride (Wheelabrator-Frye) and mercury (C-E/Amfac) in high terrain, all the other concentrations estimates are below the 0.01 TLVs. In the case of hydrogen chloride (HCl), the bidder may be overestimating emissions by basing them on mainland

Table IV-37. Threshold Limit Values (TLV) for Non-Criteria Pollutants

POLLUTANT	TLV (micrograms per cubic meter)	0.01 TLV (micrograms per cubic meter)
Fluorides	2,500	25
Mercury	10 - 50	0.1 - 0.5
Beryllium	2	0.02
Hydrogen Chloride	7,000	70
Arsenic	500	5
Cadmium	50	0.5
Chromium	50	0.5
Nickel	7 - 1,000	0.07 - 10
Selenium	200	2

Source: State of Hawaii, Department of Labor and Industrial Relations, 1982 experience. The Waipahu Incinerator testing showed HCl emissions about half of what the two bidders were estimating (see Table IV2-5).

In the case of mercury, the 0.14 microgram/cubic meter concentration falls within the range of 0.01 TLVs presented in Table IV-37. There is a range because of the varying toxicities of compounds of mercury, the most toxic being alkyl compounds such as methyl mercury. Previous tests have shown that the bulk of mercury emissions are in the elemental vapor form with much less attached to particles (Freeman, 1979) and similar results were observed in the Waipahu Incinerator testing. There are a number of possible mechanisms for removal of elemental mercury from the atmosphere and some may result in the formation of more toxic alkyl compounds. The EPA at one time suggested an acceptable ambient level of mercury as 1 microgram per cubic meter as a 30-day average (U.S. Environmental Protection Agency, 1974).

The dioxins and furans present a much more difficult situation to assess simply because of the lack of information on the toxic effects of the many isomeric forms of each, and the uncertainty as to the rate of emission, if any, of each isomer from refuse incinerators. The levels of exposure to these substances are far below those causing immediate or acute effects. The health concerns have focused on the chronic effects which may result from long-term, low-level exposures which explains why this report and others utilized annual average concentrations rather than shorter averaging periods.

The concentration estimates of 2,3,7,8 TCDD presented in Tables IV-30 to 35 were all well below the "worst-case" annual concentration estimated by EPA in its interim evaluation of dioxin hazards (U.S. Environmental Protection Agency, November 1981). In this evalution, the EPA concluded that:

> "These estimates suggest that the present emissions levels of TCDDs from the five municipal waste combustors described in this report do not present a public health hazard for residents living in the immediate vicinity. In addition, the health risk estimates presented in the assessment indicate that as long as emission levels of TCDDs do not greatly exceed the emissions measured at the five U.S. sites evaluated in this interim assessment, there should be no reason for concern. This conclusion is valid for all toxicological effects (including reproductive and cancer) for which the available animal and human data have been analyzed."

Using the same approach as Wei (1982), we have attempted to quantify the risk associated with the concentration estimates in Table IV-30 to 35. Wei took the estimated annual concentration of 2,3,7,8 TCDD and assumed continuous exposure of a 70 pound human breathing 15 cubic meters of air per day. He further assumed that all the TCDD that was present in the air would be absorbed and retained in the body, which is a conservative assumption since a certain fraction would be detoxified or removed from the body.

Using Wei's procedure, the estimates of maximum annual average concentrations of both total dioxins and furans as well as 2,3,7,8 TCDD were converted into human exposure levels in terms of picograms (1 trillionth of a gram) of toxin per kilogram of body weight per day (pg/kg/day). These figures were then compared with the "no effect" level observed in laboratory animals (rats) as reported by Wei (1982). By dividing the no effect level by the estimated human exposure figures safety margins were calculated.

For 2,3,7,8 TCDD, these safety margins ranged from about 170,000 to 3.3 million to one, which simply means that the likelihood of having an effect ranged from one in 170,000 to one in 3.3 million. The adequacy of a given safety margin depends on the nature of the toxic substance and its effect. For many toxic materials used in the workplace, a factor of 10:1 is acceptable. For food contaminants, 100:1 is more common. In the specific case of 2,3,7,8 TCDD, the EPA accepts 100,000:1 while the State of New York uses 1,000,000:1 (Wei, 1982).

Our estimated safety margins for 2,3,7,8 TCDD fall within the limits specified by the EPA and the New York State Health Department. There are no criteria for total dioxins and furans; thus, it is not possible at this time to compute safety margins for all of them. At this point in time there is simply insufficient information on the amounts of each isomer present and their toxicities to permit a quantitative assessment of risk or determination of safety factors. What is known is that they have been found at very low levels in particulate matter; that the fraction of each isomer is quite variable; and that the relative toxicities of those isomers that are known range from about one-tenth to one-millionth of 2,3,7,8 TCDD.

4.11.5.2.2 Cumulative Impacts. The results of the cumulative impact analysis are summarized in Tables IV-38 through IV-43. Of the four major regulated pollutants shown, only sulfur dioxide appears to reach relatively high concentrations. The modeling program which determined these results was based on "allowable" not "actual" emissions, thus the data presented is preliminary and conservative. "Allowable" emissions were modeled because specific data on "actual" emissions are in the process of being obtained by the State Department of Health. These data are being verified and were not available at the time this analysis was being conducted. The modeling also included sources which have federal PSD permits, but which are not built yet. The intent was to model the "worst case" and include all existing and permitted sources with the assumption that they would operate at maximum ("allowable") capacity.

The results of this modeling indicate that the State sulfur dioxide standards are exceeded. The federal 3-hour sulfur dioxide standard was also exceeded in high terrain (Table IV-39). Note that the two proposed resource recovery facilities contribute 6 - 9.7% of that high concentration. The highest levels in low terrain occur out over the ocean west of the Chevron Refinery. The standards all appear to be met in the vicinity of the three populated or potentially populated areas with the exception of the State's 24-hour sulfur dioxide standard near West Beach. These results are about what would be expected in light of our local climate and meteorology. Annual averages tend to be higher southwest of the industrial park due to the prevailing northeast tradewinds while short-term concentra-

Table IV-38. Preliminary Estimates of Cumulative Impact of the Proposed Resource Recovery Facility at Terrain Elevations Less than 25 Feet

	CUMULATIVE CONCENTRATIONS (micrograms/cubic meter)			
	WHEELABRATOR-FRYE		CE/AMFAC	
POLLUTANT	24-HOUR	ANNUAL	24-HOUR	ANNUAL
Carbon Monoxide	1 - 3	1	1 - 3	1
Sulfur Dioxide	239	67	239	67
Nitrogen Dioxide	81	26	80	25
Total Suspended Particulates	83	41	81	41

NOTES: 1. CO concentrations are in milligrams/cubic meter (mg/m3). With no on-site monitoring available, CO concentrations were estimated from data collected at the Department of Health monitoring stations within urban Honolulu.

2. The second highest 24-hour and annual concentrations occurred at locations about 1 - 1.25 kilometers west of the Chevron Refinery over the ocean.

3. TSP estimates were obtained by adding the computer-generated maximum concentrations from the proposed RRF to the second highest concentration recorded in the latest available data (Jan-Mar 83) for the Department of Health monitoring station at Campbell Industrial Park.

4. 3-hour sulfur dioxide levels were 737 ug/m3 and 742 ug/m3 for WF and CE, respectively. The location of the second highest concentrations was just northwest of the Chevron Refinery on the Camp Malakole Military Reservation site.

Table IV-39. Preliminary Estimates of Cumulative Impact of the Proposed Resource Recovery Facility at Terrain Elevations Over 25 Feet

	CUMULATIVE CONCENTRATIONS (micrograms/cubic meter)			
	WHEELABRATOR-FRYE		CE/AMFAC	
POLLUTANT	24-HOUR	ANNUAL	24-HOUR	ANNUAL
Carbon Monoxide	1 - 3	1	1 - 3	1
Sulfur Dioxide	310	6.5	322	6.6
Nitrogen Dioxide	123	2.4	126	2.4
Total Suspended Particulates	88	41	86	41

NOTES: 1. CO concentrations are in milligrams/cubic meter (mg/m3). With no on-site monitoring available, CO concentrations were estimated from data collected at the Department of Health monitoring stations within urban Honolulu.

2. The second highest 3-hour, 24-hour, and annual concentrations all occurred at a location about one kilometer west of Makakilo City. The 3-hour levels were 1,412 ug/m3 for Wheelabrator-Frye and 1,469 ug/m3 for Combustion Engineering. The contributions of WF and CE to those concentrations were 6% and 9.7%, respectively.

3. TSP estimates were obtained by adding the computer-generated maximum concentrations from the proposed RRF to the second highest concentration recorded in the latest available data (Jan-Mar 83) for the Department of Health monitoring station at Campbell Industrial Park.

Table IV-40. Preliminary Estimates of Cumulative Impact of the Proposed Resource Recovery Facility at the Department of Health Monitoring Site, Campbell Industrial Park

	CUMULATIVE CONCENTRATIONS (micrograms/cubic meter)			
	WHEELABRATOR-FRYE		CE/AMFAC	
POLLUTANT	24-HOUR	ANNUAL	24-HOUR	ANNUAL
Carbon Monoxide	1 - 3	1	1 - 3	1
Sulfur Dioxide	64	5.6	63	5.6
Nitrogen Dioxide	26	2.0	23	1.9
Total Suspended Particulates	80	41	79	41
Lead	0.61	0.26	0.55	0.26

NOTES:

1. CO concentrations are in milligrams/cubic meter (mg/m3). With no on-site monitoring available, CO concentrations were estimated from data collected at the Department of Health monitoring stations within urban Honolulu.

2. TSP estimates were obtained by adding the computer-generated maximum concentrations from the proposed RRF to the second highest concentration recorded in the latest available data (Jan-Mar 83) for the monitoring site.

3. 24-hour lead concentrations were estimated based on lead levels measured at Campbell Industrial Park in 1972 as part of an environmental impact study (Conoco-Dillingham Oil Company, 1972). The contribution of the proposed resource recovery facility was added to the highest level measured in 1972. Annual lead concentrations were estimated by adding the RRF contribution to the annual average lead concentration for 1980 based on Department of Health monitoring data.

Table IV-41. Preliminary Estimates of Cumulative Impact of the Proposed Resource Recovery Facility in the West Beach Area

	CUMULATIVE CONCENTRATIONS (micrograms/cubic meter)			
	WHEELABRATOR-FRYE		CE/AMFAC	
POLLUTANT	24-HOUR	ANNUAL	24-HOUR	ANNUAL
Carbon Monoxide	1 - 3	1	1 - 3	1
Sulfur Dioxide	113	9.8	113	9.9
Nitrogen Dioxide	39	3.5	39	3.5
Total Suspended Particulates	79	41	79	41

NOTES: 1. CO concentrations are in milligrams/cubic meter (mg/m3). With no on-site monitoring available, CO concentrations were estimated from data collected at the Department of Health monitoring stations within urban Honolulu.

2. TSP estimates were obtained by adding the computer-generated maximum concentrations from the proposed RRF to the second highest concentration recorded in the latest available data (Jan-Mar 83) for the Department of Health monitoring station at Campbell Industrial Park.

Table IV-42. Preliminary Estimates of Cumulative Impact of the Proposed Resource Recovery Facility in the Vicinity of Barbers Point Naval Air Station

	CUMULATIVE CONCENTRATIONS (micrograms/cubic meter)			
	WHEELABRATOR-FRYE		CE/AMFAC	
POLLUTANT	24-HOUR	ANNUAL	24-HOUR	ANNUAL
Carbon Monoxide	1 - 3	1	1 - 3	1
Sulfur Dioxide	46	3.4	47	3.4
Nitrogen Dioxide	17	1.2	17	1.2
Total Suspended Particulates	80	41	79	41

NOTES: 1. CO concentrations are in milligrams/cubic meter (mg/m3). With no on-site monitoring available, CO concentrations were estimated from data collected at the Department of Health monitoring stations within urban Honolulu.

2. TSP estimates were obtained by adding the computer-generated maximum concentrations from the proposed RRF to the second highest concentration recorded in the latest available data (Jan-Mar 83) for the Department of Health monitoring station at Campbell Industrial Park.

Table IV-43. Preliminary Estimates of Cumulative Impact of the Proposed Resource Recovery Facility at Honokai Hale

	CUMULATIVE CONCENTRATIONS (micrograms/cubic meter)			
	WHEELABRATOR-FRYE		CE/AMFAC	
POLLUTANT	24-HOUR	ANNUAL	24-HOUR	ANNUAL
Carbon Monoxide	1 - 3	1	1 - 3	1
Sulfur Dioxide	70	4.2	71	4.2
Nitrogen Dioxide	25	1.4	25	1.4
Total Suspended Particulates	80	41	80	41

NOTES: 1. CO concentrations are in milligrams/cubic meter (mg/m3). With no on-site monitoring available, CO concentrations were estimated from data collected at the Department of Health monitoring stations within urban Honolulu.

2. TSP estimates were obtained by adding the computer-generated maximum concentrations from the proposed RRF to the second highest concentration recorded in the latest available data (Jan-Mar 83) for the Department of Health monitoring station at Campbell Industrial Park.

tions tend to be higher on the land side where smoke plumes can impact on the higher terrain. Also concentrations tend to be higher on the West Beach side then Honokai Hale or the Naval Air Station because there is a somewhat greater frequency of southeasterly winds then south or southwesterly.

Modeling of only the industrial point sources can seriously underestimate particulate concentrations because of the lack of an adequate source inventory. A significant percentage of particulates arises from fugitive dust sources, i.e., roads, agricultural activities, sea spray, quarrying, construction, etc. Thus, it was decided to simply add the modeled contribution from the resource recovery facility to the measured particulate concentrations at the Department of Health monitoring site. The results indicate that both state and federal standards would be met.

The individual impact analysis showed that trace element concentrations generated by the RRF would be very low. Their addition to existing concentrations should not result in a significant increase in ambient levels. Since there is no statutory requirement for routine monitoring of trace elements, and no long-term research studies have been conducted, the available data on these elements is very limited. Table IV-44 presents the results of an analysis of total suspended particulates collected during four days of sampling at Campbell Industrial Park in 1972 (Conoco-Dillingham Oil Company, 1972).

Lead data were presented for the DOH monitoring site (Table IV-40) because in addition to the four days of data collected in 1972, there were also several years of data collected by the Department of Health in urban Honolulu which did provide some indication of annual lead concentration. Airborne lead in Hawai'i is largely due to motor vehicles burning leaded gasoline. As leaded gasoline use has been reduced due to new vehicle designs, airborne lead concentrations have come down (see Table IV-45). Lead concentrations are well below the 1.5 microgram/cubic meter standard and the contribution of the resource recovery facility is generally quite small.

In the case of mercury, there has been no continuous monitoring conducted, but a significant number of samples have been collected by Dr. S.M. Siegel of the University of Hawai'i during the 1969-79 period (S.M. Siegel, June 1980). These data indicate aiborne mercury levels around O'ahu ranging from 0.04 microgrms per cubic meter at a station in central Honolulu to 1.36 micrograms/cubic meter at a station close to the Kahe power plant. As noted previously, there is no ambient Standard for mercury although the EPA has suggested a 1 microgram/cubic meter 30-day average as a basis for setting emissions limits. While the Siegel data suggest that ambient levels already exceed that numerical value, there remains some uncertainty as to whether that occurs as a 30-day average. In any event, it seems important that the mercury contribution of the proposed resource recovery facility is relatively small with the maximum estimated short-term (24-hour) impact being 0.14 micrograms/cubic meter and the long-term (annual) impact being 0.0060 micrograms/cubic meter. And if the proposed facility emissions are similar to the existing Waipahu Incinerator, then mercury emissions, and therefore ambient levels, may be even lower (see Table IV-25).

Table IV-44. Trace Metal Analysis of Total Suspended Particulates Collected at Campbell Industrial Park, February-April 1972

	24-HOUR CONCENTRATION (micrograms/cubic meter)										
DATE	Fe	Cu	Cr	Ni	Be	As	V	Hg	B	Pb	Se
2/09/72	0.480	0.020	<0.001	0.016	0.002	<0.16	0.016	0.0030	N.D.	0.278	N.D.
2/11/72	0.822	0.034	<0.001	0.018	0.006	<0.16	0.018	0.0001	N.D.	0.396	N.D.
4/24/72	1.420	0.047	<0.001	0.029	<0.001	<0.02	<0.001	0.0001	<0.001	0.552	0.001
4/28/72	0.757	0.046	<0.001	0.026	<0.001	<0.02	<0.001	0.0001	<0.001	0.167	0.001
MEAN:	0.870	0.033	<0.001	0.022	0.002	<0.16	0.009	0.0001	<0.001	0.348	0.001

Total particulate concentration: 2/09/72 - 31 ug/m3
2/11/72 - 45 "
4/24/72 - 25 "
4/28/72 - 36 "

Notes:
1. N.D. = not determined
2. Samples were collected on high volume filters.
3. Fe = iron, Cu = copper, Cr = chromium, Ni = nickel, Be = beryllium, As = arsenic, V = vanadium, Hg = mercury, B = boron, Pb = lead, Se = selenium

Source: Conoco-Dillingham Oil Company, 1972

Table IV-45. Lead Monitoring Data, Honolulu, 1970-81

YEAR	AVERAGE CONCENTRATION (micrograms/cubic meter) 1st QUARTER	2nd QUARTER	3rd QUARTER	4th QUARTER	ANNUAL MEAN
1970	0.78	0.81	0.65	0.92	0.79
1971	1.65	0.63	0.65	1.05	1.00
1972	—	0.75	0.65	0.48	—
1973	0.52	0.52	0.72	0.55	0.58
1974	0.84	0.61	0.70	0.92	0.77
1975	0.65	0.81	0.59	1.05	0.78
1976	0.91	0.65	0.99	1.00	0.89
1977	0.89	0.59	0.48	0.80	0.71
1978	—	—	—	0.72	0.72
1979	0.39	0.25	0.26	0.42	0.33
1980	0.41	0.23	0.21	0.20	0.26
1981	0.25	—	—	—	0.25

Source: State of Hawaii
Department of Health

4.11.5.2.3 PSD Increment Consumption. Since the proposed resource recovery facility is subject to the federal Prevention of Significant Deterioration (PSD) regulations, an analysis was performed in order to determine whether or not the Class II increments for sulfur dioxide and total suspended particulates would be exceeded. It was necessary to model previously permitted PSD sources including those that have been approved but are not yet constructed. The major sources are primarily related to the Hawaiian Independent Refinery (HIRI), but also include the Cyprus Hawaiian Cement facility at Campbell Park as well as the Hawaiian Electric Company's Kahe Unit 6. It should also be noted that some of HIRI's existing sources also contribute to increment consumption because they were granted a variance by the State Health Department in 1980 which allowed them to increase the sulfur content of their fuel from 0.5% to 1.5%.

The results, presented in Table IV-46, indicate that in high terrain all the increments for both pollutants can be met. In low terrain, however, only the particulate increments and the 3-hour sulfur dioxide increment appear to be met. The 24-hour and annual sulfur dioxide increments are significantly exceeded. Analysis of the meteorological conditions during the 24-period when this second-highest concentration occurred revealed that the wind direction was persistent from the east-northeast and the only source contributing was the Hawaiian Independent Refinery. Since this analysis was based on "allowable" emissions, the use of "actual" emissions would result in lower estimates. In this situation, however, the important fact is that the proposed resource recovery facility does not contribute to the exceedance of the increment.

4.11.5.3 Fugitive Dust

In general, the proposed resource recovery facility will not generate significant amounts of fugitive dust. The vast majority of the site will be covered with buildings, roadways, and other man-made surfaces. The remainder will contain irrigated landscaping. Trucks carrying material to and from the site will be covered. The receiving and processing areas will be enclosed and under negative pressure which means air will be drawn into the building rather than emitted. Air collected in this manner will be used as combustion air for the furnaces thereby burning most of the fugitive dust and collecting the rest in the electrostatic precipitator. In the case of front-end processing, all processing and transfer equipment will be designed with dust collection devices, and again, the dirty air will be ducted either into the boiler or into a baghouse filter with a removal efficiency in excess of 99%.

Only during the site preparation and construction phases will there be an increased potential for entrainment of particulates. Due to the relatively dry climate on leeward O'ahu, it will be important for the construction contractor to make sure that adequate dust control measures are employed in order to avoid creating a nuisance for the existing businesses in the area. The State does have fugitive dust standards in Title 11, Chapter 60 of the Department of Health regulations which must be met at all times.

Table IV-46. Preliminary Estimates of PSD Increment Consumption in the Campbell Industrial Park Area

	AVERAGING PERIOD	CONCENTRATION (micrograms/cubic meter) WHEELABRATOR-FRYE SO2	TSP	CE/AMFAC SO2	TSP
High Terrain					
	3-Hour	234	—	234	—
	24-hour	41	13	42	11
	Annual	1.7	0.22	1.8	0.29
Low Terrain					
	3-Hour	278	—	278	—
	24-hour	115*	16	115*	14
	Annual	25.3*	2.4	25.3*	2.4

NOTES: 1. SO_2 = sulfur dioxide
TSP = total suspended particulate

2. Sources which were modeled on the basis of allowable emissions include:

a. Hawaiian Independent Refinery (HIRI) existing sources which are allowed to burn up to 1.5% sulfur fuel oil under a State variance.

b. HIRI sources with current PSD permits some of which are on-line and some of which are not constructed yet.

d. Kahe Unit 6.

e. The proposed resource recovery facility alternatives.

3. Concentrations with asterisks (*) exceed the allowable PSD Class II increments (see Table IV-21). The locations of the high values were west-southwest of the HIRI refinery and included no contribution from the proposed resource recovery facility.

4.11.5.4 Odors

In refuse handling and processing, there are always some odors associated with the waste material. The amount of odor is usually a function of the amount of putrescible material, the moisture content, the ambient temperature and humidity, and the duration of storage. Of those factors, the resource recovery facility can control duration of storage and to some extent alter moisture content and the concentration of putrescible materials. In both proposed systems, the raw refuse will be processed rapidly and not stored for extended periods. The simple process of mixing and compacting refuse helps to disperse and therefore dilute the effect of that refuse fraction which is odorous. In the front-end processing system, most of the moist, odorous food waste is separated out and transported to a sanitary landfill. What remains is a drier, less odorous, combustible refuse derived fuel (RDF). In addition, the same negative air pressure that draws dust-laden air into the boilers also carries in odors and thus prevents their escape into the atmosphere around the facility.

4.11.5.5 Traffic Impacts on Air Quality

The proposed resource recovery facility in addition to being a direct source of air pollution due to its combustion process, is also an indirect source in that it attracts motor vehicle traffic. The transfer trucks, packer trucks, and miscellaneous automobiles described in Section 4.5 will increase the number of vehicle miles traveled (VMT) on O'ahu due to the distance to Campbell Industrial Park and will therefore increase motor vehicle emissions. The primary pollutants associated with motor vehicles are carbon monoxide, nitrogen oxides, and hydrocarbons. They are also minor sources of particulates although diesel-powered vehicles are notable for their irritating particulate and odor emissions.

The traffic projections for the resource recovery facility indicate that the greatest contribution to traffic during any given hour will be 38 trips. This is simply not a large enough hourly volume to have a significant impact on air quality. The only circumstances under which it might be considered significant would be if a given highway were already at or over capacity and experiencing high pollutant levels along its corridor. Then any additional traffic might be considered significant. However, this is not the case at Campbell Park in the immediate future.

4.11.6 DISCUSSION AND CONCLUSIONS

Based on the foregoing analyses, the following conclusions may be drawn:

- o The proposed resource recovery facility is primarily a particulate emitter although due to the high efficiency control of particulates, oxides of sulfur and nitrogen will be emitted to the atmosphere in greater quantities. Annual particulate emissions will range from 298 to 429 tons depending on which design is selected. This amounts to 1.1 to 1.6% of the latest (1980) statewide emissions inventory. Oxide of sulfur would range 1.4 to 2.3% and oxides of nitrogen, 2.3 to 2.5%.

- With the exception of hydrogen chloride (HCl), estimated emissions of organic and inorganic non-criteria pollutants are very low. Most are less than one ton per year.

- On an individual basis, the proposed facility will not cause violations of federal or state ambient air quality standards, nor will it exceed the allowable Class II PSD increments for particulates or sulfur dioxide.

- Estimated ambient levels of the non-criteria pollutants were generally well below one hundredth (1/100) of the occupational threshold limit value (TLV). Only the Wheelabrator-Frye proposal appeared to exceed the 0.01 TLV for HCl in the high terrain. The bidder's choice of an HCl emission factor based on mainland experience may be too conservative since recent testing on the Waipahu Incinerator found HCl emissions about one half of that used by Wheelabrator-Frye. The C-E/Amfac proposal was also slightly over the 0.01 TLV for mercury, but again the bidder's choice of an emission factor was about twice as high as that found at the Waipahu Incinerator. It should also be noted that the estimated maximum concentrations for mercury were below the one microgram/cubic meter (30-day average) suggested by EPA.

- No adverse health effects are expected from 2,3,7,8 TCDD since estimates of ambient levels were well below the "no effect" level. The range or margin of safety values was 170,000 - 3.3 million to one. In the case of total polychlorinated dibenzo dioxins and furans no conclusions can be drawn because of the lack of information on the many different isomers.

- Estimates of individual ambient impact indicated that Wheelabrator-Frye would exceed the PSD "de minimus" levels for lead and fluorides in both high and low terrain. Both proposals appear to exceed the "de minimus" levels for sulfur dioxide and nitrogen dioxide in high terrain. If emissions are not reduced by the time a PSD application is submitted, then the EPA will require up to one year of preconstruction monitoring for those pollutants.

- The impact of the proposed facility at the critical Kahe monitoring sites was significant, but no conclusions can be drawn about the combined sulfur dioxide impact until EPA finishes its analyses.

- The cumulative impact analysis indicated that the existing and approved-but-not-built sources would exceed the State's 3-hour and 24-hour standards in both high and low terrain, and the annual standard in low terrain. The addition of the resource recovery facility would add to these violations. Re-analysis with actual emissions data will lower these estimates, but it is not likely that they will go below the State standards. The City & County government may have to seek a variance from the State in order to construct the proposed facility.

- The Federal 3-hour sulfur dioxide standard also appeared to be exceeded in high terrain, but in this case the likelihood of meeting the standard when re-analyzed with actual emissions is much greater because the "worse-case" estimate is only about 13% above the standard.

- The Federal PSD increments for particulate and 3-hour sulfur dioxide were met; however the 24-hour and annual sulfur dioxide increments appear to be exceeded by existing PSD-permitted sources. Because of the location of the proposed resource recovery facility in relation to those existing sources and the meteorology on the day of the violation, the proposed RRF did not contribute to the exceedance. It is therefore still possible for the proposed facility to receive a PSD permit. Additionally, re-analysis with actual emissions may eliminate one or both of the apparent exceedances.

- The impacts of expanding the facility to 2,400 TPD have been evaluated by proportionately increasing all of the air quality impacts described in this section. This evaluation showed no additional violations of standards, but did indicate aggravation of those violations already identified. Expansion may also result in additional requirements for pre-construction monitoring. The PSD permit application will have to include a detailed air quality impact analysis based on the expanded facility capacity, and at this time it appears the 2,400 TPD facility would be able to obtain a PSD permit.

4.12 IMPACTS ON AIR NAVIGATION

The proposed resource recovery facility is located approximately a mile and a half west of the ends of runways 4L and 11 of the Barbers Point Naval Air Station. At the time the EIS Preparation notice (EISPN) for the proposed project was published, it was expected that stack heights between 170 and 200 feet would be used. The then-proposed stacks were not high enough to require notification of the Federal Aviation Administration (FAA). /Note: Section 77.13 of the FAA Regulations states that persons or organizations "proposing to erect or alter an object that may affect navigable airspace" must submit a notice to the Administrator of the FAA./ Hence, possible adverse effects on air navigation were not among the impacts listed in the EISPN.

Subsequently, preliminary air quality modeling has shown that a higher stack would reduce pollutant concentrations in surrounding areas. no definite height has been established; however, current indications are that a structure in the range of 250 to 290 feet may be needed. These heights exceed the threshold level for notification specified in Section 77.13 of the FAA Regulations. Because of this, the City and County of Honolulu Department of Public Works filed a "Notice of Proposed Construction" with the FAA on April 26, 1983. The notice specifies a height of 290 feet above mean sea level, the highest considered possible. The FAA is currently conducting an aeronautical study to determine the highest stack that could be constructed without creating a hazard to air navigation.

It its review of the Draft EIS, the U.S. Navy objected to any stack with a height in excess of 203 feet (approximately 213 feet above mean sea level) on the grounds that it would:

- increase all standard instrument approach minimums for Barbers Point Naval Air Station by the proposed stacks' additional height over existing obstructions (i.e., by 87 feet in the case of a 290-foot high stack) and/or
- pose a hazard to the normal left traffic pattern for helicopters and small fixed-wing aircraft using runway 4L and the right hand pattern for 11, since their pattern altitudes are 500 and 800 feet, respectively.

The FAA's aeronautical study will take into account all of the pertinent facts, and the City will require offerors to comply with limits specified in their determination. Thus, even if the stack height is higher than that requested by the navy, no significant adverse effects on air navigation are expected.

CHAPTER V

ALTERNATIVES

5.1 INTRODUCTION

Presently most of O'ahu's solid waste is disposed of in sanitary landfills, but those currently in use are very nearly filled. With the island's resident and visitor population continuing to grow, ever-greater pressure will be placed on land and water resources, and new landfill sites will become increasingly difficult to obtain.

This chapter describes and assesses alternative methods of solid waste disposal. Since dumping municipal solid wastes in the sea is prohibited for environmental reasons, all methods of waste disposal involve at least some land disposal. Available waste disposal technologies reduce the volume of solid waste through processing into a more compact form, gases, or usable products (or some combination thereof), but residue must be landfilled. Therefore, the consideration of alternatives focuses on two main topics: (i) the extent to which they would reduce landfilling requirements, and (ii) the financial and environmental costs that are involved.

The proposed resource recovery facility would generate a stream of revenues from the sale of energy and recovered products, thus helping to offset the costs incurred. For this reason, significant savings relative to landfilling are possible (refer to Section 4.9 for a complete discussion of the impact on City finances). The proposed project also would substantially reduce the amount of solid waste that would still need to be landfilled, thereby minimizing future landfill acreage requirements.

In the remainder of this chapter, the alternative methods of waste disposal are evaluated in relation to the proposed project. In addition, the "No-Action" or delayed-action alternative is considered.

5.2 CONTINUED LANDFILLING

The principal means of disposing of O'ahu's solid waste at the present time is through the operation of sanitary landfills. Civilian sanitary landfills currently handle an average volume of about 1,875 tons per day (6-days per week, 312 days per year). Another 390 tons per day are disposed through incineration at the City's Waipahu Incinerator (see Table V-1), with residue from the incinerator being landfilled in an adjacent ash disposal area.

The Kapa'a, Kawailoa, and Waianae sanitary landfills are operated by the City, while the Palailai sanitary landfill is privately owned. Kapa'a currently accounts for more than half of the solid waste landfilled on O'ahu. Not indicated in Table V-1 is the small amount (about 10,000 tons per year) of industrial/commercial wastes disposed at the Kaneohe MCAS landfill. The Kaneohe MCAS landfill handles wastes originating on base, but it is expected to close within the next two years.

Table V-1. Present O'ahu Solid Waste Volumes at Civilian Disposal Facilities.

Facility Name	Present Volume[1] (Tons/Day)	Approximate Remaining[3] Life in Years (as of 7/1/83)
Kapa'a Sanitary Landfill	1,150	1.5
Kawailoa Sanitary Landfill	50	1
Waianae Sanitary Landfill	45	1
Palailai Sanitary Landfill	630	3
SUBTOTAL	1,875	
Waipahu Incinerator Landfill	80[2]	5
TOTAL AMOUNT LANDFILLED	1,955	
Waipahu Incinerator	390	

[1] Refuse Division estimates of volumes for fiscal 1983 based on six days per week.

[2] Volume equivalent of landfilled solid waste. Incineration of solid waste reduces volume about 80 percent.

[3] Remaining life estimates based on projections in Kalaheo Sanitary Landfill EIS (Environmental Impact Study Corporation, March, 1983, p. 1-5), adjusted to account for the lower projected growth rate of O'ahu solid waste tonnage used in the present EIS.

Source: Compiled by Belt, Collins & Associates from sources indicated above.

Space in all of the existing sanitary landfills is expected to be exhausted by the end of 1984, except Palailai which has a remaining life of about three years (Table V-1). However, if the City is unable to open new landfills to replace those that are closed, Palailai is likely to reach capacity sooner as it will have to accommodate virtually all of O'ahu's solid waste.

Section 4.9 contains estimates of the amount of solid waste which must be disposed together with the projected disposal costs. Over twenty years (1987-2006), the cumulative amount to be landfilled amounts to 14.3 million tons; total cost is estimated at $405 million. If residue from the Waipahu Incinerator is also included, nearly 15 million tons of solid waste will need to be landfilled if no other means of disposal is available.

On the average it takes about 2.0 cubic yards to landfill each ton of O'ahu's solid waste. This must be increased by about 20 percent to account for the daily earth cover that is required. Over the projected twenty-year project term, the 14.3 million tons of waste would require approximately 34 million cubic yards of landfill capacity. Since existing landfill capacity will be just about exhausted by the end of 1984, the City would have to obtain and develop new landfill sites having combined capacities of 34 million cubic yards to meet its needs over the 1987-2006 period.

Continued landfilling will be necessary regardless of whether resource recovery, incineration, or other methods of solid waste disposal are utilized. The reason for this is that certain types of waste are not processable by any method except through landfilling. Construction demolition material, bulky items, and rock are examples of solid waste which cannot be processed by resource recovery or other disposal methods. Sanitary landfills also must be available to accept the residue of resource recovery or incinerator facilities and to take solid wastes during periods of scheduled or unscheduled downtimes of the processing facilities.

The City and County Department of Public Work's planning goals include keeping at least one sanitary landfill open in Windward O'ahu and another open in Leeward O'ahu (Kalaheo Sanitary Landfill EIS, 1983:1-1). With population growth and consequent greater pressure placed on O'ahu's land and water resources, the acquisition of acceptable sanitary landfill sites has become extremely difficult. Since the mid-seventies, site selection efforts have intensified, and some 37 potential sites have been identified; however, only a few remain as viable candidates. Most of the 37 potential sites have been eliminated from consideration for one or more of the following reasons: (1) located within groundwater supply area, (2) situated within close proximity to residential areas, or (3) used by the State or Federal government. /For a more complete discussion of potential sanitary landfill sites, refer to Shimabukuro & Associates (1977, and 1979 Supplement)./

As of this writing, the number of sites still under consideration by the City has been reduced to four: Kalaheo and Bellows Field on Windward O'ahu, and Waimanalo Gulch and 'Ohikilolo in the Leeward area. Information on these sites is presented in Table V-2. Total capacity of all four sites would accommodate O'ahu's solid waste for about 15 years, based on the annual volume of waste projected for 1997, the mid-year of the proposed

Table V-2. Potential Landfill Sites Currently Under Consideration by the City and County.

Name	Location and TMK No.	Approximate Area (Acres)	Capacity (Cu. Yards)	Present Use	Estimated[1] Life (Years)	Comments
Kalaheo	Near existing Kapa'a SLF 4-2-15:portions of 1 and 6	100	5,585,000	open space	3.3	Site access is a problem. Visible from H-3.
Bellows Field	Situated at north end of Bellows Air Force Station TMK 4-1-15:1	173	7,510,000	used as training area by Marines	4.4	Marine Corps has stated that site is unavailable use as SLF.
Waimanalo Gulch	Near Kahe Point 9-2-03:13,40, and portion of 2	260	3,700,000	open space	2.2	High development cost relative to capacity. Opposition from nearby residents expected.
'Ohikilolo	North of Makaha Valley 8-3-01:13	706	9,500,000	agriculture, open space, & recreation	5.6	Will increase highway traffic. High transportation costs for hauling refuse from urban areas.

[1] Based on an estimated landfill use rate of 1.7 million cubic yards per year for all of O'ahu, the landfill volume projected for 1997, the mid-year of the proposed project (exclusive of Waipahu Incinerator residue).

Source: Compiled by Belt, Collins & Associates.

project. However, the Marine Corps has informed the City that the Bellows Field site is used for training and therefore is unavailable.

With a resource recovery facility, O'ahu's landfilling requirements would be substantially reduced. This is because processing reduces its volume by up to 90 percent. Considering the requirement for landfilling facility residue, the need to landfill raw refuse during scheduled and unscheduled downtime (two weeks per year), and the continuing need to landfill solid waste that is unsuitable for processing or which exceeds the plant capacity, the proposed resource recovery facility would reduce O'ahu's twenty-year landfill requirement from 34 million cubic yards (14 million tons of waste) to 11 million cubic yards (5 million tons of waste). This amounts to a 68 percent reduction in landfill capacity requirements. Stated another way, this would extend given landfill capacity almost threefold.

In view of the opposition that can be expected toward developing new landfill sites, in all likelihood the City will have great difficulty in meeting its long-term goals of maintaining at least one sanitary landfill in each of the Windward and Leeward areas. With the 68 percent reduction in landfill capacity provided by the proposed resource recovery facility, the odds become much better that at least one sanitary landfill can be maintained in each area.

In regard to landfill costs, the analysis in Chapter IV, Section 4.9, indicated that landfill disposal cost per ton is expected to increase from $9.71 (1981-82) to almost $50 in 2006. Since landfills generate little or no revenue which can be used to offset costs and involve minimal fixed capital charges, landfill disposal costs are projected to increase at about the same rate as inflation. By comparison, the proposed resource recovery facility would generate increasing revenues from the sale of energy and recovered materials, thereby lowering solid waste net disposal costs. While it is impossible to project probable net disposal costs before price bids are received, long-term savings resulting from resource recovery are expected to be significant (refer to Section 4.9).

5.3 OTHER METHODS OF WASTE DISPOSAL

5.3.1 BALING/LANDFILLING

This is not a real "alternative" to landfilling as a means of solid waste disposal; however, baling can extend the life of landfills by compressing waste, thereby reducing the space needed for disposal. High-pressure compaction baling presses can reduce the volume of solid waste by as much as 30 percent, therefore extending landfill life (Diaz, 1982:157). Transforming raw solid wastes into higher density bales for landfilling produces some environmental benefits, such as greater stability of wastes, elimination of flying paper and pests, and reduced requirements for earth cover.

The advantages of baling involve a cost tradeoff between extending landfill life, versus the operating and capital costs involved in implementing a baling system. Besides the cost of baling, which would probably be in the $10-$20 per ton range, costs of hauling waste to the compaction point (transfer station) must be considered (U.S. Environmental Protection Agency, 1976:76-77). Presently, less than 20 percent of O'ahu's solid waste is hauled to a transfer station; the balance is hauled directly to sanitary landfills. To haul the bulk of O'ahu's solid waste to transfer stations for baling would involve the addition of very substantial transport charges to the cost of the baling operation. While definitive studies utilizing current data are not available, it seems likely that in O'ahu's circumstances (minimal need for transfer stations) baling would be uneconomical.

5.3.2 SHREDDING/LANDFILLING

Shredding, like baling, is a means of reducing solid waste volume. The reduction achieved through shredding is about the same as that for baling. Like baling, shredding is not an alternative to landfilling; rather it is a means of processing solid waste before ultimate disposal -- usually via landfilling. Shredding is sometimes used in conjunction with incineration and in some types of resource recovery processes.

As with baling, utilization of shredding as part of the solid waste disposal system should be determined in light of the tradeoff between savings in terms of extended landfill life versus the operating and capital costs of shredding. The City considered the inclusion of shredding equipment at the Keehi Transfer Station during the design phase of that project, but results of a feasibility analysis indicated shredding would add more to capital and operating costs than it would save by extending landfill life. A current analysis might indicate the possibility of modest long-term savings through shredding, and this in conjunction with the environmental advantages of preventing problems from odors, littering, and vectors, may warrant reconsideration of a shredding operation. However, just as with baling, shredding is inferior to the resource recovery alternative.

5.3.3 INCINERATION/LANDFILLING

Incineration is the controlled burning of solid, liquid, or gaseous wastes. The Waipahu Incinerator is presently the only incinerator in operation on O'ahu, two other incinerators having been closed by the City. Although the capacity of the Waipahu Incinerator is 600 tons per day, it currently processes only about 390 tons per day, the level of operation expected to be maintained over the long-term.

Incineration reduces the volume of solid waste about 80 percent -- almost the volume reduction (90 percent) required of the proposed resource recovery facility (RFP, 8/24/82:IV-15). Like a resource recovery facility, an incinerator cannot process certain kinds of solid waste such as large appliances, tree stumps, construction debris, and other items of the same nature.

Constructed in 1968, the Waipahu Incinerator is a conventional refractory-lined incinerator of the type built before air pollution control regulations became more stringent. To insure complete combustion and to help cool the incinerator, the amount of air fed to the firebox of a conventional refractory incinerator (as opposed to waterwall incinerators, which are cooled by water, and which recover energy in the form of stream)

CHAPTER VI

SUMMARY OF ADVERSE IMPACTS AND UNRESOLVED ISSUES

6.1 SUMMARY OF ADVERSE IMPACTS

6.1.1 SOIL, GEOLOGY AND PHYSIOGRAPHY

Development of the resource facility on the proposed site would have no significant adverse impacts. The area does not have potentially productive agricultural soils, would require relatively little site grading, and is geologically stable. There are no minerals present which are not abundantly available from other nearby locations. From 25,000 to 35,000 cubic yards of fill material might have to be imported in order to construct the ramp up to the receiving area, and this could have some effect on some as yet unspecified borrow area. However, the volume is limited and the activity controlled by provisions of the County Grading Ordinance. Together, these insure that there would be no significant adverse effects.

6.1.2 NOISE

Precise calculations of noise levels resulting from fixed on-site equipment was not possible at this time due to the absence of detailed design drawings for the facilities. However, a preliminary determination made using generic noise source data indicates that both C-E/Amfac and Wheelabrator-Frye will be capable of meeting State and City and County noise standards if equipment is properly sited and adequate care is taken in the selection and installation of major pieces of equipment. However, because of the narrowness of the site, the margin for error is slight if the State Department of Health's 70 db(A) property-line limit is to be met.

Despite their compliance with existing standards, the facilities would still result in an increase in noise levels on neighboring parcels. It is anticipated that the maximum increase associated with the C-E/Amfac facility would be about 20 db(A); the increase that would be produced by the Wheelabrator-Frye proposal would be slightly less.

In addition to the impact on lots immediately adjacent to the resource recovery facility site, implementation of the project would also lead to slightly greater ambient sound levels on properties adjacent to Malakole Road and Kalaeloa Boulevard due to vehicular traffic. However, the increase is expected to be only 0.7 Ldn unit, too small to be noticeable to the human ear.

6.1.3 HYDROLOGIC IMPACTS

The Wheelabrator-Frye facility would require an average of 95,000 gallons per day of potable water from the Honolulu Board of Water Supply's system. This is about half the 200,000 gallons per day that the Board of Water Supply has indicated it can make available for the project, but, all other things being equal, it does imply an increase in total pumpage. For condenser cooling, Wheelabrator-Frye proposes to use either an ocean water cooling system or air cooling. A third cooling option, shallow wells drawing saline groundwater (ocean water) together with an ocean outfall for heated discharge, is also being investigated. None of these involves the use of potable water.

The plan proposed by C-E/Amfac involves the use of approximately 42,000 gallons per day of potable water from the Board of Water Supply's system. The company's approach to cooling differs from that proposed by its competitor in that evaporative cooling towers would be used, with an estimated 0.8 million gallons per day (net) supplied from the Oahu Sugar Company's irrigation system. Since this water would be taken from wells in the Pearl Harbor Groundwater Control Area and increased pumpage for cooling water use is unlikely to be approved by the Department of Land and Natural Resources, a reduction in irrigation use will probably be necessary. Given the sugar company's intentions to reduce acreage across the plantation and the existence of pipeline interconnections made during conversion to drip irrigation, it is believed that these changes can be made without significant adverse effect.

6.1.4 BIOLOGICAL

Construction of the proposed facility would involve clearance of essentially all existing vegetation on the site. While one plant species (Achyranthes splendens var. rotundata) proposed for endangered species status is known to exist in an area makai of the proposed resource recovery facility site, the colony of Achyranthes stops well short of the plant boundary, and no adverse impacts on it are anticipated. Other vegetation consists of common exotic species, and its loss would not be significant. No important terrestrial wildlife or birds are known to depend on the area, and the effect that the change in habitat would have on them would be minimal.

Because of the increase in food supply which they provide, resource recovery facilities have the potential to produce increases in the number of rodents, insects, and other nuisance and disease-carrying animals. However, both technologies under consideration incorporate design and operational provisions which are judged effective in preventing such problems.

Alternatives involving underwater construction and/or the discharge of heated cooling water into the ocean have the potential to adversely affect marine biota, particularly immobile organisms such as corals. Depending upon the intake/outfall configuration that is used, discharge of heated water could affect organisms in the immediate vicinity of the outfall. Preliminary calculations indicate that the required zone of mixing would be less than ten acres in size, and the area within which the temperature change would exceed two degrees centrigrade (the minimum needed to produce significant adverse effects on corals) would be even smaller than this. Some destruction of corals would occur as a result of outfall construction. However, because it is a high wave-energy environment with rapid flushing, the effect of sediment deposition on adjacent areas is expected to be minor. The high wave energy also maintains the coral communities in a state of early succession; as a result, areas disturbed by pipeline construction would be recolonized within a few years.

6.1.5 TRAFFIC

The proposed facility would generate about 660 vehicle-trips per day (about 7.5 percent of the forecast non-project total) on Kalaeloa Boulevard. The heaviest volumes would occur in the middle part of the day when they would range from 34 to 38 trips per hour in each direction. The existing morning peak hours are earlier (7:00-8:00 am) than this, but the afternoon peak of the facility coincides with the existing 3:00-4:00 pm peak-hour. The increase would amount to only four percent of the "without-project" volume, however, and would be well below the capacity of the roadway.

6.1.6 VISUAL

By virtue of its size, the proposed facilities have the potential to create a strong visual impact. However, because of the 1,000 foot setback from Hanua Street, the industrial nature of surrounding land uses, and the ability to screen the structures from Hanua Street with appropriate landscaping, the effect on drivers on that street would be minimal. If Komohana Street were to be extended makai of Hanua Street, vehicles would pass much closer to the main structures of the resource recovery facility than if they are confined to Hanua Street. Landscaping could provide effective screening of ground level activities, but the narrowness of the site makes it impossible to provide sufficient setback/landscaping to completely hide the combustion units and stacks (250-300 feet high).

6.1.7 ARCHAEOLOGICAL, HISTORICAL, AND PALAEONTOLOGICAL RESOURCES

The site of the proposed resource recovery facility contains sinkholes similar to those found elsewhere on the 'Ewa plain. However, their number and size appear to be significantly lower than in nearby areas where rich archaeological and palaeontological remains have been found. Moreover, most have been filled with earth as a result of grading conducted during the 1960s. An archaeological reconnaissance survey conducted for this study identified ten sinkholes, a disturbed midden (probably of historical origin), and three unusual pits believed to have been dug since the site was graded in 1962. In view of the findings elsewhere on the 'Ewa plain, it is possible that the sinkholes may contain information valuable to scientists trying to determine: (i) precontact habitation and subsistence patterns, and (ii) the nature of the indigenous flora and fauna prior to human settlement. None of the material found needs to be preserved <u>in situ</u>, however, and a properly designed archaeological salvage program would avoid this adverse effect.

6.1.8 ECONOMIC IMPACTS

The capital cost of the project is unknown at this time. However, based on bids received for the HPOWER project, construction is expected to cost at least $125 million. At this time, it appears likely that the contractors will make a substantial equity contribution to the project, possibly amounting to 25 percent of the total. Nevertheless, it will probably be necessary for the City to issue special purpose revenue bonds in the name of the contractor for at least $150 million.

Over the 20-year life of the contract, solid waste disposal using a resource recovery facility is expected to be significantly less expensive than if sanitary landfills, the most viable alternative, are employed. The exact amount of the saving cannot be determined at this time. Despite the overall cost savings, it is probable that the cost of resource recovery will be higher than the landfill alternative during the early years of the project's operation. However, by 1995 or earlier, annual expenditures for a resource recovery should be lower than if landfills are used, and the savings would increase in subsequent years.

6.1.9 AIR QUALITY IMPACTS

The primary pollutant created by the combustion of municipal solid waste is particulates. However, due to the high efficiency (greater than 99 percent removal) of the electrostatic precipitators included in the design, nitrogen oxides and sulfur oxides (which would not be controlled) would actually be emitted to the atmosphere in greater quantities. Annual emissions of particulates, oxides of sulfur, and oxides of nitrogen would amount to 1.1 to 1.6%, 1.4 to 2.3%, and 2.3 to 2.5% of the 1980 statewide total, respectively. With the exception of hydrogen chloride (HCl), estimated emissions of organic and inorganic noncriteria pollutants (i.e., pollutants for which there is no established ambient air quality standard) are very low.

On an individual basis, the proposed resource recovery facility would not cause violations of State or Federal ambient air quality standards, nor would it exceed the allowable Class II PSD increments for particulates or sulfur dioxide allowed by the U.S. Environmental Protection Agency. However, results of air quality modeling indicate that emissions from existing and approved-but-not-yet-built sources will cause the very stringent State 3-hour and 24-hour sulfur dioxide standard to be exceeded in both high and low terrain, and the annual standard to be exceeded in low terrain. The operation of the resource recovery plant would, of course, further increase the concentrations of this pollutant, albeit by a modest amount. Thus, it may be necessary for the City and County to seek a variance from the State Department of Health in order to construct and operate the proposed facility. Any other organization desiring to construct a sulfur oxide emitting facility in the area would also require such a variance.

It is possible that the Federal 3-hour standard for sulfur dioxide is also exceeded in high terrain. However, this may not prove to be the case when final estimates are made using updated information now being prepared by the State Department of Health. Finally, it appears that the Federal PSD increment for the area is already exceeded as a result of emissions from existing and approved but uncompleted sources. However, because of the relationship of the proposed site to existing and approved emitters and the prevailing wind direction on days when violations are most likely to occur, the resource recovery facility would not add to those violations. Hence, it is still eligible for a PSD permit.

6.2 UNRESOLVED ISSUES

There are a number of specific questions which have not been answered at this time. These regard such things as the final grading and drainage plans, electrical power transmission line alignment, water system approvals, cooling water intake/outfall arrangements, and technical specifications of the air quality control devices used. These topics are discussed at a conceptual level in Chapter IV of this report, but the analyses have not been finalized, and necessary permit approvals (see Chapter IX) will not be sought until after a contract has been awarded. In view of this, these items can be viewed as "unresolved," but they are not truly "issues" at this point since there is little or no contention over them. One possible exception to this concerns the air quality impacts of the proposed project and the adequacy of the mitigation measures that are proposed.

As indicated in the air quality impact section of this report (Section 4.11), the proposed facility would meet all air pollutant emission standards and would not, in and of itself, produce ambient air pollutant concentrations in excess of State or Federal standards. However, preliminary computer modeling suggests that existing sources may already result in ambient concentrations of sulfur dioxide that are above the stringent State standards. If final computer runs incorporating more recent data substantiate this, it will be necessary for the City to seek a variance from the State Department of Health.

To minimize the proposed facility's effects on air quality, the City has proposed the use of extensive air pollution control equipment and a stack height of up to 290 feet. A review of the proposal by the Navy led to objections on the grounds that it might create a hazard to aircraft operating out of the nearby Barbers Point Naval Air Station. At the request of the City, the Federal Aviation Administration is conducting an aeronautical study of the situation aimed at determining a safe maximum height for the stack. The FAA's decision is expected shortly, and the City will adhere to their findings.

The air quality modeling, as noted in Section 4.11.5.1, was based on stack heights of 195 and 250 feet for the C-E/Amfac and Wheelabrator-Frye facilities, respectively. The requested higher stack height may be a desirable means of reducing ambient pollutant concentrations. Submissions for the required U.S. Environmental Protection Agency and State Department of Health permits will be based on a stack height not exceeding the limit set by the Federal Aviation Administration. The facility will meet all Federal and State requirements.

The facility would also release small quantities of "unregulated" pollutants (i.e., substances not covered by State or Federal ambient air quality standards). The available scientific evidence indicates that the quantities released by the resource recovery facility would not constitute a significant health hazard. However, under the terms of the PSD regulations, the U.S. Environmental Protection Agency must review plans for the facility to determine that the best available control technology (BACT) has been used and that the forecast concentrations will not result in significant adverse effects to the public health and welfare. That agency, together with the State Department of Health, will be the ultimate arbitors of these issues.

This EIS is based on data submitted by each of the offerors in response to the City's Request for Proposals (RFP). The RFP stipulates an initial minimum plant capacity of 561,600 tons per year, or 1,800 tons per day, six days per week. However, it also allows the offerors to include the processing of additional waste so long as its availability and net energy output per ton is guaranteed by the offeror. Hence, as the City moves through the competitive bid process outlined in Section 2.1.4, it can be expected that contractors may attempt to increase the number of tons processed at the facility as a means of enhancing the economics of the project. Because of this, the guaranteed plant capacity will not be known for certain until the contractors' pricing proposals are received.

The impact of any such increase (should one occur) is expected to be limited, and would not substantially affect the findings and conclusions of this EIS. The area that would be most affected by an increase in plant throughput is air emissions, and these, together with ambient concentrations, must meet EPA regulations as part of the PSD permitting process. Based on the results of analyses conducted for this EIS, it is expected that the proposed resource recovery facility would meet EPA regulations and qualify for the necessary permits, at least up to the 2,400 tons per day throughput volume specified in the RFP as the required expansion capacity of the facility.

It is the City's belief that all of these items can be resolved satisfactorily during the procurement process. The Environmental Protection Agency, State Department of Health, and other responsible agencies retain sufficient power to insure that no proposal with unacceptable adverse impacts could be implemented. It should also be noted that the failure of a contractor to obtain the needed permits would place it in default of the contract stipulations and free the City from monetary obligations thereunder.

greatly exceeds the amount theoretically required for combustion. The turbulence created by the high volumes of air that are used entrains large amounts of particulate matter in the exhaust gas stream. Stringent Federal and State ambient air quality and emission standards require pollution control devices which have become prohibitively expensive for conventional incinerators because of their high volume of gaseous discharge.

The high cost of renovation to meet air quality standards resulted in the decision to close the City's old Kapalama and Kewalo incinerators. In 1978, the Waipahu Incinerator underwent extensive renovation to enable it to meet air pollution emission standards. Although now in compliance with environmental regulations, the Waipahu facility is expensive to operate. In 1982-83, the cost of waste disposal at the incinerator amounted to about $24.00 per ton, exclusive of any charge for capital costs incurred in previous years.

Environmental impacts associated with conventional incineration are roughly similar to those of the proposed resource recovery facility discussed in previous chapters of this report. However, in contrast to resource recovery, incineration does not generate revenues from the sale of energy and other recovered materials. The City has completed a feasibility study of the possibility of retrofitting the Waipahu Incinerator as a resource recovery facility. The study concluded that such a retrofit is technically feasible, but that its relative cost-effectiveness should be evaluated after the price bids for the Campbell Industrial Park project have been received and analyzed.

The high cost of incineration, with no revenue stream to offset operating costs, makes this method of solid waste disposal an impractical alternative to resource recovery. The City will evaluate the possibility of diverting more refuse from the Waipahu Incinerator to the resource recovery facility, once it is in operation.

5.3.4 COMPOSTING/LANDFILLING

Composting is a process in which organic solid wastes are biochemically decomposed in open windows or within confined tanks. The process results in a humus-like substance that is used to condition the soil (Institute for Solid Wastes, 1970:293). Before municipal solid waste can be composted, the inorganic component (about 15 percent of the total) must be removed and disposed of at a landfill. The end product is "disposed of" in agricultural fields and nurseries where it can greatly improve the ability of the soil to support growth.

Since composting offers the large-scale recycling of solid waste back into the soil, it has attracted a large amount of interest as a means of disposing of municipal solid waste. Unfortunately, lack of large-scale market demand for compost, together with relatively high capital and operating costs for composting solid wastes has rendered this method of solid waste disposal uneconomical in the continental U.S. (Diaz, 1981:117). Even in Europe, where composting is more prevalent, it accounts for less than three percent of total solid waste disposal, and its share has been declining in recent years. Outside of Holland, composting is not used by any major European city in their solid waste management program. (Golueke;

1977: 222). The countries such as Holland where the method is often used have unique applications in high-value agriculture.

In Hawai'i, where the potential uses are even fewer than on the mainland or in Europe, the likelihood of any significant market demand seems practically nil. Without the prospect of a revenue stream from sales, composting cannot be considered a practical alternative to resource recovery.

5.3.5 PYROLYSIS/LANDFILLING

Pyrolysis has been defined as:

> The physical and chemical decompositon of organic matter at high temperatures in the absence of oxygen. Unlike combustion in an excess of air, which produces heat and carbon dioxide, the pyrolysis reaction absorbs heat and results in the production of synthetic oil-like liquids and a solid carbon char (oil pyrolysis), or, at higher temperatures, a low Btu gas and a slag material (gas pyrolysis). /Mitre Corporation, April 1977:160/

The products of the pyrolysis process, low Btu gas and liquid fuel, can be used as supplemental fuels to fire boilers which produce steam as an end product, or to produce electrical power via steam generation. The pyrolysis technology was in the developmental stage in the mid-seventies, and received demonstration grant support from the Environmental Protection Agency for facilities in several cities (U.S. Environmental Protection Agency, 1976:90). The pyrolysis process is not commercially proven and was, therefore, not acceptable to the City.

5.4 NO ACTION/DELAYED ACTION

As emphasized in this chapter and noted throughout the report, landfilling will always be a necessary means of solid waste disposal. Growth in population attended by increased urbanization will further aggravate the already severe problem of obtaining new landfill sites. Given the short life expectancies of the existing landfills and the anticipated problems in obtaining the relatively few remaining potential sites, no action or a further delay in action would lead to serious public safety and health hazards.

Since there will always be a need for landfilling, the rational course of action would entail selecting disposal method(s) which minimize the volume of solid waste that must be landfilled, protect the environment, and control disposal costs. The alternatives discussed in this chapter would either have relatively little impact in reducing landfill requirements given the costs involved or would result in substantial reduction in landfill requirements only at a cost significantly higher than that expected of resource recovery.

While judged not to be the most prudent course of action, in the absence of resource recovery continued landfilling is probably the most practical alternative during the next 10 to 20 years -- provided sufficient landfill capacity can be obtained.

CHAPTER VII

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES AND THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

A decision to proceed with the proposed resource recovery project would involve the commitment of approximately 28 acres of land for a period of at least 25 years. The Campbell Industrial Park site is already designated by the County for industrial use. Hence, construction of the project would simply preclude its usage for some other industrial activity. A substantial amount of other industrially-zoned land is available within Campbell Industrial Park, including 100 acres immediately adjacent to the project site. Hence, with the possible exception of its effect on the available PSD increment, implementation of the resource recovery project appears unlikely to foreclose significant development options or to narrow the range of beneficial uses that are possible. As discussed in Section 4.11 of this report, emissions from the facility would consume a portion of the pollution increment permitted by the U.S. Environmental Protection Agency's PSD regulations. This could mean that subsequent applicants for PSD permits may have to utilize more efficient pollution control equipment or to obtain offsets from existing sources.

Both of the proposals still under consideration provide for recovery of economically valuable minerals. (At this time there are specific proposals only for ferrous recovery, but space is provided for additional equipment if the market for other items develops.) However, in recovering heat from the refuse, the organic matter which it contains would be destroyed. Two of the alternatives discussed in Chapter V, composting and landfilling, preserve the organic matter, but only the former allows it to be put to a beneficial (but uneconomical) use.

Unlike some alternative disposal methods, the technologies that have been proposed involve few long-term risks. All air, noise, water quality, and other standards would be met. If serious problems should arise, the facility could be closed immediately (albeit at substantial cost), thereby eliminating the source of the problem. In return for its commitments, the City would obtain a solid waste disposal system that recycles an important metal and effects a significant reduction in the use of imported fossil fuel.

CHAPTER VIII

INTERESTS AND CONSIDERATIONS OF GOVERNMENTAL POLICIES BELIEVED TO OFFSET THE ADVERSE ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

As indicated in Chapter III of this report, the proposed resource recovery project is consistent with Federal, State, and City and County policies calling for a reduction in the consumption of fossil fuel and increased dependence on renewable forms of energy. Similarly, policies also exist with respect to the preservation of other mineral resources through the increased recycling it would provide. It is the Department's belief that the project is the most significant single step that could be taken toward implementing those policies on O'ahu.

As noted repeatedly throughout this report, the City and County must find a means of handling the solid waste generated on this island. "No action" is not a viable course of action; hence, the only realistic means of judging the proposed resource recovery facility's impacts is by comparing them with the impacts that would result from the other alternatives that are available. Based on the analyses presented in Chapters IV, and V, it appears that none of the available alternatives would have fewer adverse impacts (most have more) and that there are no proven alternatives that offer equivalent benefits in terms of energy savings or that can provide superior materials recovery possibilities.

CHAPTER IX

LIST OF NECESSARY APPROVALS

The winning bidder and/or the City will need to obtain the following approvals before the resource recovery project can be fully implemented:

Approval Needed	Approving Agency or Body
Federal	
Prevention of Significant Deterioration (PSD) Permit	U.S. Environmental Protection Agency
Air Navigation Clearance	Federal Aviation Administration
Permit for Activities in Waterways (For Ocean Cooling Water Intake/ Outfall)	U.S. Army Corps of Engineers
State	
Conditional Use Permit for Construction Activities, Chapter 44B (Noise Control) of the Public Health Regulations	Department of Health
Certificate of Compliance and Solid Waste Management Permit, Chapter 58 of the Public Health Regulations	Department of Health
Authority to Construct and Permit to Operate as required by Chapter 43 of the Public Health Regulations	Department of Health
Permit to Operate a Sewage Treatment Facility as required by Chapter 38 of the Public Health Regulations	Department of Health
Conservation District Use Permit (For Ocean Cooling Water Intake/ Outfall	Dept. of Land & Natural Resources
Designated Groundwater Control Area Use Permit (For well sources of cooling water)	Dept. of Land & Natural Resources
Coastal Zone Management Program Consistency Review and Certification (in conjunction with U.S. Army Corps of Engineers permit for Ocean Cooling Water Intake/Outfall)	Department of Planning and Economic Develoment

Approval Needed	Approving Agency or Body
State (continued)	
Permit for Work in the Shore Waters of the State of Hawaii (For Ocean Cooling Water Intake/Outfall)	Department of Transportation
National Pollution Discharge Elimination System (NPDES) Permit (for discharge of cooling water)	Department of Health
Permit for Work in Airport Hazard Areas (Airport Zoning Regulations)	Department of Transportation
City and County of Honolulu	
Subdivision Approval	Department of Land Utilization
Water Connection Permit	Board of Water Supply
Grading Permit	Department of Public Works
Drainage Plan Approval	Department of Public Works
Building Permit	Building Department
Well Permit (Needed if new wells are used as source of cooling water)	Board of Water Supply
Construction Dewatering Permit	Department of Public Works

CHAPTER X

LIST OF CONSULTED PARTIES & INDIVIDUALS AND ORGANIZATIONS WHO PREPARED THE EIS

10.1 CONSULTED PARTIES

A great deal of agency consultation at the Federal, State, and County levels of government has taken place since discussion of a solid waste resource recovery program for O'ahu first began in the mid-1970s. Much of this took place in 1979 and 1980 during the processing of the EIS for the now-abandoned HPOWER project and, more recently, during the on-again series of public meetings held this year to discuss the current resource recovery proposal.

An EIS Preparation Notice (EISPN) for the project was published in the Environmental Quality Commission Bulletin dated March 8, 1983. The agencies, organizations, and individuals listed below were sent copies of the EISPN and asked to comment on the proposal (see cover letter following Section 10.1.11). The list includes everyone who was believed to have an interest in the project or who requested consulted-party status. Letters from those who chose to submit comments and responses to them are reproduced in Chapter XI.

10.1.1 FEDERAL AGENCIES

U.S. Air Force
U.S. Army Corps of Engineers, Pacific Ocean Division
U.S. Department of Agriculture, Soil Conservation Service
U.S. Department of Commerce, National Marine Fisheries Service - Honolulu
U.S. Department of Health, Education, and Welfare
U.S. Department of Housing and Urban Development
U.S. Department of the Interior:
- Fish and Wildlife Service
- Geological Survey, Water Resources Division

U.S. Department of Labor, Occupational Safety & Health Administration
U.S. Department of Transportation:
- Federal Highway Administration
- Federal Aviation Administration
- U.S. Coast Guard

U.S. Environmental Protection Agency, Region IX - San Francisco
U.S. Department of Energy
Federal Communications Commission
U.S. Navy, Headquarters, Naval Base Pearl Harbor
U.S. Navy, Barbers Point Naval Air Station

10.1.2 STATE AGENCIES

Office of the Governor, Office of Environmental Quality Control
Department of Agriculture
Department of Accounting and General Service
Department of Budget and Finance
Department of Defense

Department of Education
Department of Health
Department of Labor and Industrial Relations
Department of Land and Natural Resources
Department of Planning and Economic Development
Department of Social Services and Housing
Department of Transportation
Department of Taxation

10.1.3 UNIVERSITY OF HAWAII

Environmental Center
Water Resources Research Center
Hawai'i Natural Energy Institute

10.1.4 CITY AND COUNTY OF HONOLULU

Board of Water Supply
Department of Budget
Building Department
O'ahu Civil Defense Agency
Fire Department
Department of General Planning
Department of Health
Department of Housing and Community Development
Department of Land Utilization
Department of Parks and Recreation
Police Department
Department of Transportation Services

10.1.5 CONGRESSIONAL REPRESENTATIVES

The Honorable Daniel K. Inouye
The Honorable Spark M. Matsunaga
The Honorable Daniel K. Akaka
The Honorable Cecil Heftel

10.1.6 STATE LEGISLATORS

Senator Milton Holt - 13th Sen. District
Senator Joseph T. Kuroda - 17th Sen. District
Senator Patsy K. Young - 18th Sen. District
Senator Anthony K.U. Chang - 12th Sen. District
Representative Mike Crozier - 37th Rep. District
Representative Clarice Hashimoto - 32nd Rep. District
Representative Terrance W.H. Tom - 34th Rep. District
Representative Tom Okamura - 31st Rep. District
Representative Gene Albano - 26th Rep. District
Representative Arnold Morgado - 23rd Rep. District

10.1.7 CITY COUNCIL MEMBERS

Patsy T. Mink
George Akahane
Rudolph Pacarro
Leigh-Wai Doo
David Kahanu
Marilyn Bornhorst
Welcome S. Fawcett
Toraki Matsumoto
Tony Narvaes

10.1.8 COMMUNITY ASSOCIATIONS

Kalihi Businessmen's Association
Kalihi-Palama Community Council
Makakilo Community Association
Neighborhood Boards Nos. 15, 21, and 23
Pearl City Community Association
Sand Island Businessmen's Association
Waiau Community Association
Waipahu Community Association

10.1.9 PUBLIC INTEREST GROUPS

League of Women Voters
American Lung Association
O'ahu Development Conference
O'ahu Metropolitan Planning Organization
Life of the Land
Outdoor Circle

10.1.10 PUBLIC UTILITIES

Hawaiian Electric Company
Hawaiian Telephone Company
Honolulu Gas Company

10.1.11 OTHER

Campbell Estate
United Refuse Collectors of Hawaii

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

~~WILLIAM A. BONNET~~
~~DEPUTY DIRECTOR~~

R 83-164

March 8, 1983

Environmental Impact Statement Preparation Notice for a
Solid Waste Processing and Resource Recovery Facility

We are in the consultation phase of preparing an EIS for the subject project. We request your assistance in the preparation of the EIS by providing comments on the proposed project as it relates to your jurisdiction and responsibility, special expertise, knowledge or special interest with respect to any environmental impact, study or survey involved with the subject project.

The enclosed EIS Preparation Notice will provide information on the general description of the project's technical, economic, social and environmental characteristics as well as a summary of the major impacts, and alternatives considered. As provided in Section 1:41b of the Environmental Quality Commission's EIS Regulation, consulted agencies, groups or individuals shall have a period of thirty (30) days in which to make written comments on the environmental effects of the proposed project. The period may be extended upon good cause for a period not to exceed thirty (30) days by written request to the Department of Land Utilization, City and County of Honolulu, the accepting authority authorized by the Mayor.

Written comments received shall be responded to in writing prior to the filing of the EIS. If further information is required, you may call Mr. Melvin Lee of the Division of Refuse Collection and Disposal at 523-4774.

Very truly yours,

Michael J Chun

MICHAEL J. CHUN
Director and Chief Engineer

10.2 ORGANIZATIONS AND INDIVIDUALS WHO PARTICIPATED IN THE PREPARATION OF THE EIS

This environmental impact statement was prepared for the Refuse Division, Department of Public Works, City and County of Honolulu by Belt, Collins & Associates. Mr. James Morrow prepared the air quality impact section (4.11) under a separate contract with the City. Listed below are the individuals and subcontractors who were most directly involved. Many others contributed in small, but important ways, and we extend them our thanks.

10.2.1 Department of Public Works

Frank Doyle - Chief, Refuse Division
Roy Takara - Planning Engineer, Refuse Division
Mel Lee - Project Coordinator

10.2.2 Belt, Collins & Associates

Paul M. Hirota - Chief Engineer
Perry J. White - Project Manager and Principal Author
Thomas F. Nance - Contributor (Hydrology)
Ann K. Yoklavich, Nancy E. Brown, and Philip I. Estermann - Contributors and Editing
Karen M. Fassler, Clyde Kanehiro - Graphics and Cover Design
Linda Tajiri, Lynn S. Fukuhara, Doug Cowan - Typing

10.2.3 Sub-Consultants/Sub-Contractors to Belt, Collins & Associates

Erin Hall (Earthwatch) - Vegetation
Yoichi Ebisu (Darby-Ebisu & Associates) - Noise
Hamilton M. Ahlo (Science Management, Inc.) - Archaeology and History
Robert L. Lucas - Economics
Steven J. Dollar - Marine Biology
Philip I. Estermann/John Knox (SMS Research, Inc.) - Social Impacts
Cellar Mead, Inc. - Cover and Divider Printing
The Copy Center - Text Printing

10.2.4 Offerors

Combustion Engineering/Amfac - Henry Tease, George St. John, and Edith Ellis
Wheelabrator-Frye, Inc. - Alfred Scaramelli and William Siderewicz

CHAPTER XI

COMMENTS AND RESPONSES DURING THE CONSULTATION PROCESS

United States Department of Agriculture
Soil Conservation Service
P. O. Box 50006
Honolulu, HI 96850

83-01287

Refuse

March 9, 1983

R 83-164

DEPT OF PUBLIC WORKS
MAR 11 3 17 PM '83

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Dr. Chun:

Subject: Environmental Impact Statement Preparation Notice for a Solid Waste Processing and Resource Recovery Facility

Thank you for the opportunity to review the subject notice.

We have no comments.

Sincerely,

Stratford L. Whiting

STRATFORD L. WHITING
District Conservationist

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Stratford L. Whiting
District Conservationist
Soil Conservation Service
U.S. Department of Agriculture
P. O. Box 50006
Honolulu, Hawaii 96850

Dear Mr. Whiting:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 9, 1983 (your reference R 83-164) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA MOANA BOULEVARD
P O BOX 50167
HONOLULU HAWAII 96850

IN REPLY REFER TO:
ES
Room 6307

MAR 25 1983

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

The Service has reviewed the Environmental Impact Statement Preparation Notice for a Solid Waste Processing and Resource Recovery Facility (SWPRR) which was forwarded to us with your letter of March 8, 1983. In general, we support the intent of this proposed project and recommend giving strong consideration to location of a facility at the Campbell Industrial Park.

We recommend that discussions of the following subjects be expanded in the EIS. Pearl Harbor and Honolulu Harbor support significant "Nehu" baitfish resources which are important for the Hawaiian skipjack tuna fishery. Discussion of potential direct impacts of a SWPRR facility at Waiau or Sand Island and a review of its secondary and cumulative effects upon the commercial fishery would enhance the EIS. The proposed facility at Sand Island would be adjacent to a State park used for recreational purposes including sport fishing and crabbing. We recommend the EIS further discuss potential impacts to these and other recreational activities in this area.

We also encourage expanded discussion to assess biological impacts related to saltwater cooling systems. Impacts would include entrainment of organisms in cooling water intake, impingement and entrapment of larger motile organisms, and thermal stress associated with heated effluent. The future EIS should note the consumptive volume of saltwater used by this system and should indicate proposed sites of effluent discharge for both the seawater and well-water cooling systems.

The Service encourages use of evaporative cooling towers or use of treated wastewater for cooling to aid in the conservation of Oahu's limited freshwater resource. If heated effluent is discharged, we suggest consideration of prior dilution by seawater or wastewater to lower effluent temperature and recommend the outfall be placed to avoid zones of mixing in near shore waters. The Service suggests investigating the use of wastewater from the Honouliuli Wastewater Treatment Plant if an alternative site can be located nearby. We appreciate this opportunity to comment.

Sincerely,

Ernest Kosaka

Ernest Kosaka
Project Leader
Office of Environmental Services

cc: NMFS-WPPO
EPA, San Francisco
HDAR

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Ernest Kosaka, Project Leader
Office of Environmental Services
Fish and Wildlife Service
U.S. Department of the Interior
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Kosaka:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 25, 1983 (your reference ES/Room 6307) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We appreciate your support of our resource recovery project. We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

U.S. Department of Labor

Honolulu Area Office
300 Ala Moana Blvd., Room 5122
Honolulu, Hawaii 96850

March 24, 1983

Mr. Michael J. Chun
Director & Chief Engineer
Department of Public Works
City & County of Honolulu
Honolulu, Hawaii 96813

Dear Mr. Chun:

We have had an opportunity to review your transmittal of material relating to the new Waste Processing and Recovery Facility. The Occupational Safety and Health Administration has as its uppermost interest, the safety and health of employees during construction and operation of the plant finally selected for building.

The release of harmful gases, dusts and vapors in work atmospheres arising from the various jobs performed in the operation of the plant would be of concern to OSHA. The rupturing of containers holding solvents or other chemicals, the receipt and processing of dust laden waste matter, the heavy operation of various internal combustion engine equipment in building areas are some of the ways these releases may occur. The escape of these materials outside of the plant site would have environmental interest though perhaps in low concentrations and minimal effect on the environment.

As you are undoubtedly aware the State Division of Occupational Safety and Health under Federal/State agreement has jurisdiction over a large part of the safety and health effort in Hawaii. You may wish to solicit their views as well as ours. A small portion of safety and health still under federal administration are activities on the waterfront. For this reason, should the decision be made to barge fuel from Sand Island to Hawaiian Electric facility at Waiau, this operation would come within the purview of the Federal OSHA office.

Hoping these comments are of some help in your upcoming job, I am,

Sincerely,

KENNETH C. HOLLAND
Area Director

'83 JUL 5 P

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Kenneth C. Holland, Area Director
Occupational Safety and
Health Administration
U.S. Department of Labor
300 Ala Moana Boulevard, Room 5122
Honolulu, Hawaii 96850

Dear Mr. Holland:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 24, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We have also solicited comments from the Department of Labor and Industrial Relations, State of Hawaii, as it relates to their jurisdiction of safety and health of employees in Hawaii.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

COMMANDER (dpl)
Fourteenth Coast Guard District
Prince Kalanianaole Federal Bldg
300 Ala Moana Blvd
Honolulu, Hawaii 96850
(808) 546-2861

11000
Serial 534
1 April 1983

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

The Fourteenth Coast Guard District has reviewed the Environmental Impact Statement Preparation Notice for a solid waste processing and resource recovery facility and has no objection or constructive comments to offer at the present time.

Sincerely,

J. E. SCHWARTZ
Commander, U. S. Coast Guard
District Planning Officer
By direction of
Commander, Fourteenth Coast Guard District

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN PH D
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Commander J.E. Schwartz
Fourteenth Coast Guard District
U.S. Coast Guard
Department of Transportation
Prince Kalanianaole Federal Building
300 Ala Moana Boulevard
Honolulu, Hawaii 96850

Dear Commander Schwartz:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 1, 1983 (your reference 11000/serial 534) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 15TH AIR BASE WING (PACAF)
HICKAM AIR FORCE BASE, HAWAII 96853

REPLY TO ATTN OF: DEEV (Mr Hanaoka, 449-1831)

16 MAR 1983

SUBJECT: Environmental Impact Statement Preparation Notice for a Solid Waste Processing and Resource Recovery Facility (Your Ltr, 8 Mar 1983)

TO: Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

This headquarters does not have any comments relative to your proposed project. We appreciate your efforts in keeping the Air Force apprised of your efforts in processing solid wastes generated on the island of Oahu.

Kenneth W. Cowan

KENNETH W. COWAN, Colonel, USAF
Director of Civil Engineering

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Colonel Kenneth W. Cowan, USAF
Director of Civil Engineering
U.S. Department of the Air Force
Headquarters 15th Air Base Wing (PACAF)
Hickam Air Force Base, Hawaii 96853

Dear Colonel Cowan:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 16, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT SHAFTER, HAWAII 96858

83-01841

April 6, 1983

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

DEPT OF P... 2 22 PM '83

Dear Dr. Chun:

Thank you for the opportunity to review the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility, Oahu, Hawaii. Based on our review, we provide the following comments:

a. A Department of the Army (DA) permit will not be required for the proposed project.

b. Two of the proposed resource recovery sites, which the City has identified as being well-suited for such a project, were evaluated for flood hazard potential based on the Flood Insurance Study for Oahu prepared by the Federal Insurance Administration (FIA):

(1) The proposed Sand Island site, adjacent to the City's existing wastewater treatment plant, is designated Zone C or area of minimal flooding. Zone C areas are not considered special flood hazard or regulatory flood plain areas under the National Flood Insurance Program (see enclosure 1).

(2) The proposed Campbell Industrial Park site is designated Zone D or area of undetermined but possible flood hazards under the FIA flood study (see enclosure 2).

Under the National Flood Insurance Program requirements which have been incorporated into the County's flood hazard ordinances, there are no mandatory flood proofing measures for proposed developments in Zone C or Zone D areas.

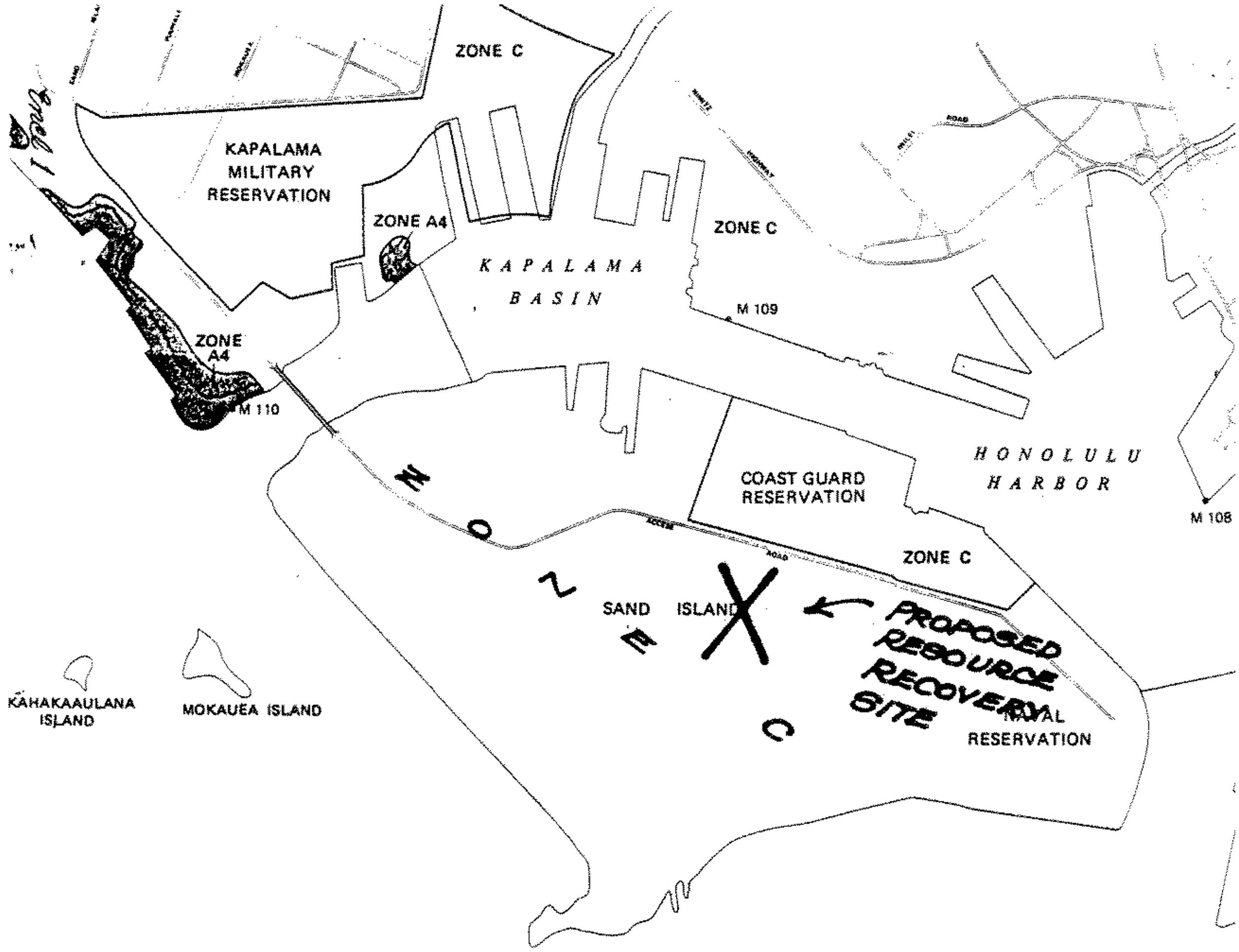
Sincerely,

Kisuk Cheung
Chief, Engineering Division

Enclosures

EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30*	Areas of 100-year flood, base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30*	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.
*	The numerals indicate the magnitude of difference between the 100-year and 10-year flood elevations. For numerals between 1-20, the difference is one half of the value; for values greater than 20, the difference is 10 less than the numerals shown. This information is used in establishing insurance rates.
—18—	100-year tsunami or riverine elevation line, with elevation in feet above mean sea level.
———	Zone boundary line


Encl 1
ZONE C
KAPALAMA
MILITARY
RESERVATION
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M 109
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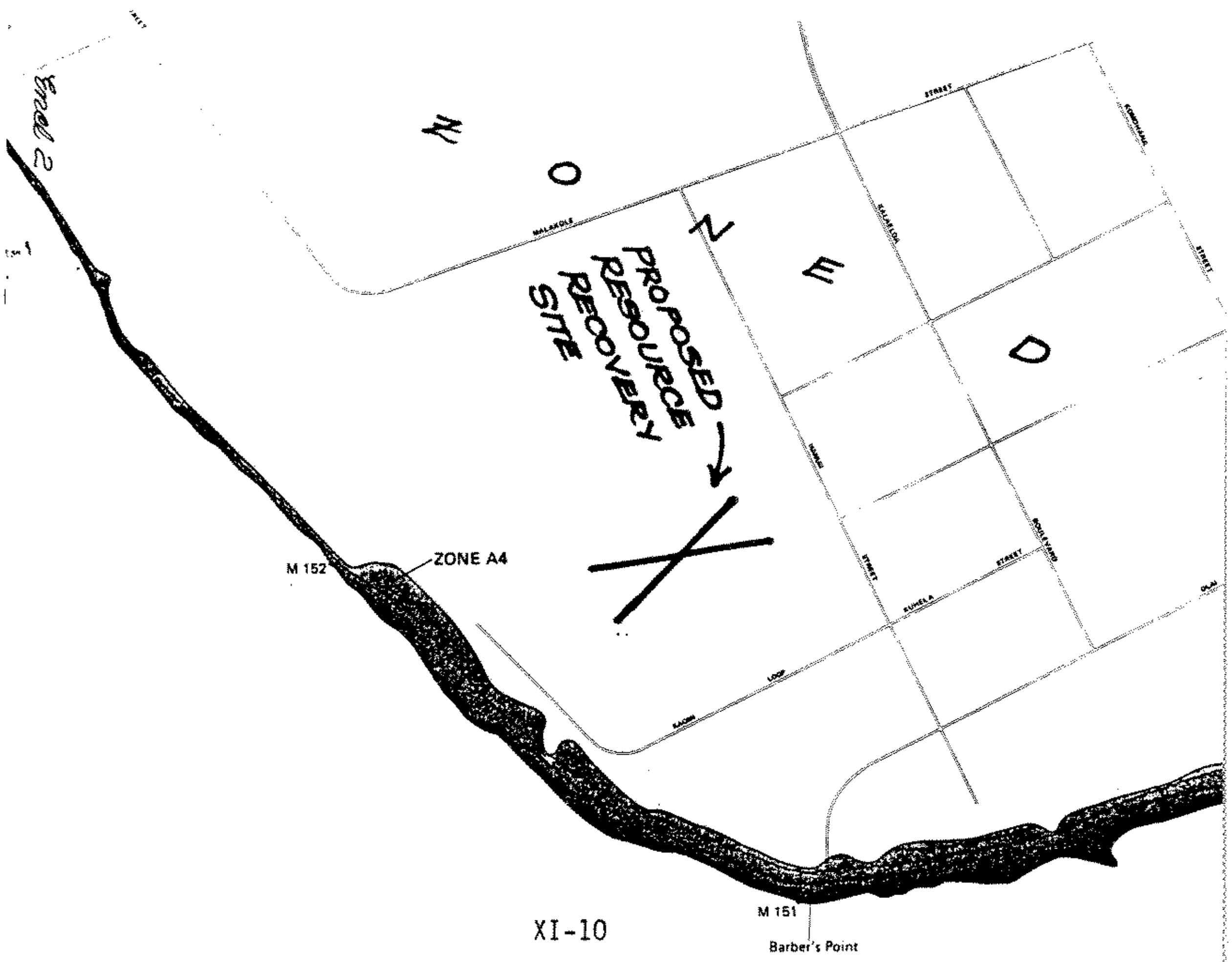
M 110
ZONE C
COAST GUARD
RESERVATION
HONOLULU
HARBOR
M 108
ZONE C
SAND ISLAND
PROPOSED
RESOURCE
RECOVERY
SITE
NAVAL
RESERVATION
KAHAKAAULANA
ISLAND
MOKAUEA ISLAND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RESOURCE
RECOVERY
SITE
ZONE A4
M 152
M 151
Barber's Point

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983 R 83-437

Mr. Kisuk Cheung, Chief
Engineering Division
Pacific Ocean Division
Corps of Engineers
U.S. Department of the Army
Fort Shafter, Hawaii 96858

Dear Mr. Cheung:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 6, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

DEPARTMENT OF THE NAVY
NAVAL AIR STATION
BARBERS POINT HAWAII 96862

301:RBA:gm
9593
Ser 710

24 MAR 1983

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

Environmental Impact Statement Preparation Notice for a
Solid Waste Processing and Resource Recovery Facility

In response to your letter R 83-164 of March 8, 1983, the proposal for a Resource Recovery Facility at Campbell Industrial Park is compatible with the mission of Naval Air Station, Barbers Point and poses no adverse environmental impact. We request, though, that in accordance with the provisions of the U.S. Dept. of Transportation, Federal Aviation Administration, Advisory Circular AC 70/7460-1F, standards for lighting obstructions to air navigation be incorporated into any proposal for the Campbell Industrial Park site.

If further information is required, you may call or write LCDR Bruce Arnold, Air Operations Department, NAS Barbers Point, HI 96862, telephone 684-8261/2.

Sincerely,

R. O'CONNOR

DEPT OF ... APR 13 9 39 AM '83
TO ____

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Lt. Commander Bruce Arnold
Air Operations Department
NAS Barbers Point, Hawaii 96862

Dear Lt. Commander Arnold:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your department's letter of 24 March 1983 (your reference 301:RBA:gm/9593/Ser. 710) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We will incorporate any requirements of the Federal Aviation Administration into the design and have filed a "Notice of Proposed Construction or Alteration" with the FAA.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

HEADQUARTERS
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR HAWAII 96860

IN REPLY REFER TO
002B:WKL:jam
Ser 629
7 APR 1983

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Environmental Impact Statement Preparation Notice
for a Solid Waste Processing and Resource Recovery Facility

We have reviewed the subject EIS Preparation Notice provided by your letter R 83-164 of 8 March 1983 and do not anticipate any significant impact from the project in any areas of direct concern to the Navy. Those areas of impact such as waterborne delivery to the Waiau site and dredging a channel to that site are of concern but can only be fully evaluated after more detail regarding that operation is specified in the Final EIS.

Please send us a copy of the Final Environmental Impact Statement.

Thank you for this opportunity to comment.

Sincerely,

M. M. DALLAM
CAPTAIN, CEC, U. S. NAVY
FACILITIES ENGINEER
BY DIRECTION OF THE COMMANDER

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Captain M.M. Dallam
CEC, U.S. Navy
Facilities Engineer
Headquarters
Naval Base Pearl Harbor
Box 110
Pearl Harbor, Hawaii 96860

Dear Captain Dallam:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 7, 1983 (your reference 002B:WKL: jam/Ser 629) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119 HONOLULU, HAWAII 96810

LETTER NO. (P)1316.3

MAR 30

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
Honolulu, Hawaii

Dear Dr. Chun:

Subject: Solid Waste Processing and Resource Recovery Facility EIS Preparation Notice

We have reviewed the subject EIS preparation notice and have no comments to offer.

Thank you for the opportunity to review the subject preparation notice.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HI:jm

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Rikio Nishioka
State Public Works Engineer
Division of Public Works
Department of Accounting and General Services
State of Hawaii
P. O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Nishioka:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 30, 1983 (your reference (P) 1316.3) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Michael J. Chun
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR

JACK K. SUWA
CHAIRMAN, BOARD OF AGRICULTURE

SUZANNE D. PETERSON
DEPUTY TO THE CHAIRMAN

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
Honolulu, Hawaii 96814

Mailing Address
P. O. Box 22159
Honolulu, Hawaii 96822

April 4, 1983

MEMORANDUM

To: Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu

Subject: Environmental Impact Statement Preparation Notice for a Solid Waste Processing and Resource Recovery Facility

The Department of Agriculture has reviewed the subject notice and suggests that the potential for the utilization of biomass by the facility, particularly sugarcane or cane byproducts, should also be addressed in the Environmental Impact Statement. If cooling water is to be taken from Oahu Sugar Company's irrigation system or from shallow groundwater wells, the impact on agriculture in the Pearl Harbor groundwater Control Area should be assessed.

Thank you for the opportunity to comment.

Jack K. Suwa
JACK K. SUWA
Chairman, Board of Agriculture

"Support Hawaiian Agricultural Products"

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Jack K. Suwa, Chairman
Board of Agriculture
Department of Agriculture
State of Hawaii
1428 South King Street
Honolulu, Hawaii 96814

Dear Mr. Suwa:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 4, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Michael J. Chun
Director and Chief Engineer

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
STATE CAPITOL
P. O. BOX 150
HONOLULU, HAWAII 96810

HAWAII PUBLIC EMPLOYEES HEALTH FUND
EMPLOYEES' RETIREMENT SYSTEM
PUBLIC UTILITIES COMMISSION
OFFICE OF THE PUBLIC DEFENDER

DIVISIONS
BUDGET, PLANNING AND MANAGEMENT
HAWAII INSTITUTE FOR MANAGEMENT AND ANALYSIS IN GOVERNMENT
ELECTRONIC DATA PROCESSING
FINANCE

March 31, 1983

Mr. Michael J. Chun, Director
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

ENVIRONMENT IMPACT STATEMENT PREPARATION NOTICE FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your letter of March 8, 1983 and for the opportunity to review and comment on the preparation notice for a Solid Waste Processing and Resource Recovery Facility. I have had my departmental programs such as the Finance Division and Public Utilities Commission review your proposal. They have indicated to me that they have no concerns nor find anything objectionable.

Therefore, please be advised that the Department of Budget and Finance has no comments or recommendations to make on your preparation notice for an environmental impact statement.

Sincerely,

FOR JENSEN S. L. HEE
Director of Finance

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Jensen S.L. Hee
Director of Finance
Department of Budget and Finance
State of Hawaii
P. O. Box 150
Honolulu, Hawaii 96810

Dear Mr. Hee:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 31, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD, HONOLULU, HAWAII 96816

DANIEL K. C. AU
COLONEL
DEPUTY ADJUTANT GENERAL

15 MAR 1983

HIENG

Mr. Michael J. Chun
Director and Chief Engineer
Dept of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

Environmental Impact Statement Preparation Notice for a Solid Waste Processing and Resource Recovery Facility

Thank you for providing us the opportunity to review the proposed project for the above subject.

We have completed our review and have no comments to offer at this time.

Yours truly,

JERRY M. MATSUDA
Captain, HANG
Contr & Engr Officer

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Captain Jerry M. Matsuda, HANG
Contr. & Engr. Officer
Office of the Adjutant General
Department of Defense
State of Hawaii
3949 Diamond Head Road
Honolulu, Hawaii 96816

Dear Captain Matsuda:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 15, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR

DR. DONNIS H. THOMPSON
SUPERINTENDENT

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

March 16, 1983

2 28 PM '83

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

SUBJECT: EIS Preparation Notice for a Solid Waste Processing and Resource Recovery Facility

The Department of Education has reviewed the subject matter and supports the County's efforts in seeking a viable solution to the solid waste disposal problem. However, we do not have any comments to offer at this time.

Thank you for the opportunity to review the proposal.

Sincerely,

Donnis H. Thompson
Superintendent of Education

DHT:HL:jl

cc: Mr. James Edington
Honolulu District
Leeward District

AN EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Dr. Donnis H. Thompson
Superintendent of Education
Department of Education
State of Hawaii
P. O. Box 2360
Honolulu, Hawaii 96804

Dear Dr. Thompson:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 16, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801

CHARLES G. CLARK
~~GEORGE A. L. YUEN~~
DIRECTOR OF HEALTH

JOHN F. CHALMERS, M.D.
DEPUTY DIRECTOR OF HEALTH

HENRY N. THOMPSON, M.A.
DEPUTY DIRECTOR OF HEALTH

MELVIN K. KOIZUMI
DEPUTY DIRECTOR OF HEALTH

ABELINA MADRID SHAW, M.A., J.D.
DEPUTY DIRECTOR OF HEALTH

In reply, please refer to:
File: EPHS-SS

April 15, 1983

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City & County of Honolulu
650 S. King St.
Honolulu, Hawaii 96813

Dear Mr. Chun:

Subject: Request for Comments on Proposed Environmental Impact Statement (EIS) for a Solid Waste Processing and Resource Recovery Facility

Thank you for allowing us to review and comment on the subject proposed EIS.

We submit the following comments for your information and consideration:

<u>Vector Control</u>

The plant must be designed for effective control of odors and pests (e.g., flies, rats, or cockroaches).

<u>NPDES</u>

The EPA does not have any specific effluent guidelines for wastewaters generated from Resource Recovery Systems. Effluent limitations for wastewaters from such facilities would have to be evaluated with respect to the State's Water Quality Standards and Water Quality Criteria guidelines.

According to Section 11-54-03, waste discharges into inland waters would be prohibited and no new industrial or sewage discharges would be permitted within estuaries or embayments. The Basic Water Criteria (Section 11-54-04) would limit the discharge of floatable, settleable and toxic material into all waters.

Potential wastewater generation from the Resource Recovery System include:

1. Runoff from the collection/storage sites.
2. Cooling water discharge from the steam electric generating facility.
3. Ash quenching system in the incineration process.

If the City and County proposes to use steam electric generating facility for the energy conversion process, the cooling water discharges would be required to meet the effluent limitations guidelines established for that point source

category (the same requirements as the electric companies). The ash quenching system would probably not require an NPDES permit if it utilizes the recycling system similar to the Waipahu Incinerator.

<u>Noise</u>

The proposed project must be designed to comply with Title 11, Administrative Rules Chapter 43, Community Noise Control for Oahu. Noise from all equipment and operational activities for the processing of solid waste and resource recovery must meet the allowable noise limits of the regulations.

Noise emanating from increased truck traffic travelling to and from the facility may adversely affect nearby residential areas. This impact would be especially significant if the facility is located at the Waiau site. Vehicular noise levels must be in compliance with the provisions of Title 11, Administrative Rules Chapter 42, Vehicular Noise Control for Oahu.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

Sincerely,

Melvin Koizumi

MELVIN K. KOIZUMI
Deputy Director for
Environmental Health

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Melvin K. Koizumi
Deputy Director for
Environmental Health
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Koizumi:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 15, 1983 (your reference EPHS-SS) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 621
HONOLULU, HAWAII 96809

SUSUMU ONO, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES
EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

DIVISIONS:
AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

APR 5 1983

Your: R83-164

Honorable Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 So. King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Thank you for notifying us that an environmental impact statement will be prepared for the proposed municipal solid waste power plant. We appreciate the opportunity to address some of our concerns:

Aquatic Resources

In the interest of protecting aquatic resources, the following points ought to be considered:

1. We note that consideration is given to airborne gaseous and particulate emissions. However, lack of specificity precludes us from adequately commenting on the impact of these emissions.

   The notice states that airborne emissions will be dealt with in the environmental impact statement, and that proposals have included "electrostatic precipitators" modules (definitions and capabilities not included) in their designs. We suggest that specifications, especially "module" performance records be incorporated.

2. No mention of boiler-cleaning procedures is made. If such procedures involve the disposal of cleaning solutions, the present application should address the potential impact of this action on aquatic resources.

3. A ten-degree rise is expected if ocean water is used as a cooling medium. It was not stated whether these units are in Centigrade or Fahrenheit. If the measure is in Fahrenheit units, the zone of mixing concept might be adequate in addressing environmental impact. If, however, the units are in Centigrade, then we suggest the use of cooling ponds before discharge.

4. Contingency plans should be formulated for instances where:

   a. wastewater disposal system breaks down, or

   b. if treated sewage effluent is used as a cooling medium and leakage occurs.

5. Construction materials, petroleum products, human wastes, debris, and landscaping substances (herbicides, fertilizers, pesticides) should not be permitted to fall, flow, or leach into the ocean.

6. Special precautions should be taken using vector control toxicants for rodents and insects with respect to operational use. The Waiau and Sand Island sites are specific examples because of their proximity to waterways and future public park areas, respectively.

Historic Sites

The Sand Island and Waiau sites raise no specific concerns, except that, if the undertaking involves any federal involvement (e.g., funding, loan guarantee, permit or license), the applicant should verify with the federal agency that the provisions of 36 CFR 800 (Advisory Council on Historic Preservation's Procedures for the Protection of Historic and Cultural Properties) are being complied with.

Our records indicate that the Barbers Point site does not involve historic properties listed on the Hawaii Register or the National Register of Historic Places, or determined eligible for inclusion on the National Register of Historic Places. However, there is a high probability that previously unidentified resources exist in the proposed project area. This is based on existing archaeological data which suggest this probability. The proposed undertaking is adjacent to the Barbers Point Harbor Archaeological District, determined to be eligible for inclusion on the National Register in 1977.

Therefore, we recommend that, prior to any project activity that may have an effect on resources, a reconnaissance survey be conducted by a qualified archaeologist within the proposed area, and that the survey results be forwarded to our historic sites office for evaluation. Should the existence of significant resources be substantiated, we may make additional recommendations to avoid, mitigate, or negate any adverse effects.

Recreation

There are no known significant recreation concerns at the proposed Waiau and Campbell Industrial Park sites, but there are major concerns at the Sand Island site, since it adjoins Sand Island State Recreation Area:

1. Traffic - The mixture of heavy industrial traffic and recreation traffic is a primary concern, particularly in view of the Matson container yard traffic as well as the subject proposal. The hours of operation of the subject proposal should take into account periods of heavy recreation use, particularly on weekends plus holidays when recreation traffic is heaviest and industrial traffic may be lighter. Private vehicles with individual household wastes should not be allowed in order to reduce traffic, particularly on weekends, and avoid illegal dumping and trash generated by loose materials dropped from moving vehicles.

2. Noise - Noise levels, especially high, constant noise levels of waste processing machinery could be a significant problem.

3. Air Pollution - Odors from waste are a concern, and if the waste is incinerated ash particles may be a greater concern. Presumably, stack heights would be limited by flight path requirement for Honolulu International Airport runways.

4. Visual - This problem was addressed with a proposed landscaped buffer zone of at least 300 feet. We would like to have some input into the plantings selected.

State Land

The Sand Island site is presently a portion of General Lease No. S-4341 issued to the City and County of Honolulu for its Sand Island Waste Water Treatment Plan. The lease condition specifies that if the site is not needed for the purposes demised, it must be upkept for recreational use. The lease must be amended in order to qualify for use for solid waste processing and resources recovery facility.

Water Resources

We note that in-plant water use is expected to require 100,000 to 200,000 gallons of potable water per day, exclusive of cooling water. The Board of Water Supply has indicated that this amount can be made available from the existing water system.

Various options are considered for plant cooling water, and include use of marine waters, air cooled alternatives, waste water, and potable water. Use of potable water has been proposed for the Campbell Industrial Park site. Should this site be utilized, water from Oahu Sugar Company wells would be required, in which event approval of this department will be required for the change in use.

Sincerely,

SUSUMU ONO
Chairman of the Board
and
State Historic Preservation Officer

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

July 1, 1983

R 83-437

Mr. Susumu Ono, Chairman
Board of Land & Natural Resources
Department of Land and
Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Ono:

Subject: Environmental Impact Statement for a Proposed Solid Waste Proces-sing and Resource Recovery Facility

Thank you for your letter of April 5, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document. The comments and information you provided have been helpful to us in preparing the Environmental Impact State-ment, and we expect to file it with the State Environmental Quality Commission shortly.

As you may know, the City Council has deleted the Waiau and Sand Island sites identified in the EISPN from the Development Plan for the Primary Urban Center. Hence, plans for the proposed resource recovery facility now involve only the Campbell Industrial Park site that was identified. Responses to the comments you made relative to that site are presented below.

Aquatic Resources

(1) Multi-field electrostatic precipitators (ESP) would be used to control emissions from the combustion units of the proposed facility. It is estimated that they would remove in excess of 99 percent of the particulates entrained in the exhaust gases. The EIS will discuss the ESPs in terms of their removal efficiency and the overall particulate emission rate that is to be expected. However, it will not include detailed design data. For your information, preliminary design data provided in the offerors' proposals is as follows:

(a) Combustion Engineering/Amfac. One single-chamber precipitator for each combustion unit. Each precipitator would be two cells wide, would have 16 ducts, and would have four electrical fields in series. Duct spacing and height would be 11 inches and 28 feet, respectively. Each precipitator would have approximately 80,000 square feet of effective collecting electrode area and 45,000 linear feet of effective discharge electrode. The precipitators would each have eight full wave electrical sets at 500 mA each.

(b) Wheelabrator-Frye, Inc. Electrostatic precipitators similar to those described above would be used. The equipment would be designed to reduce particulate emissions to 0.03 grains per dry standard cubic foot when the gas volume is adjusted to 12 percent carbon dioxide and to meet or exceed the 20 percent opacity limit. This performance would be maintained for exhaust gas flows up to 212,000 acfm at temperatures of up to 500 degrees Fahrenheit.

(2) In contrast to the method currently used by the Hawaiian Electric Company at many of its facilities, periodic boiler cleaning would be accomplished using an acid treatment. This would be done about once a year as part of the scheduled maintenance period. The treatment is needed to remove built up scale on the inside of the boilers. The chemicals used, together with the water used to flush them from the system, would either be treated and neutralized on-site or removed by truck and treated and disposed off-site by a licensed independent contractor.

(3) It is expected that water discharged from a water-cooled steam condenser would be as much as ten to twelve degrees centigrade warmer than the surrounding ocean. This would require the creation of a "zone of mixing" as provided for in Title 11, Chapter 54, Department of Health, Water Quality Standards. Because of the very large volume of cooling water flow (50 to 65 million gallons per day) and the relatively low temperature difference between the effluent and the atmosphere, holding ponds large enough to allow significant cooling prior to discharge would require so much land as to be impractical (150 acre-feet of storage for a 24-hour retention time).

The outfall of the Hawaiian Electric Company's nearby Kahe power plant discharges cooling water containing more than ten times the heat that would be released from the proposed resource recovery facility. It does this without significantly impacting the marine environment for more than a few hundred feet from the cooling water outlet. In view of the foregoing, the City has not required offerors proposing the use of ocean water cooling to incorporate cooling ponds in their designs. Ocean water cooling systems are subject to review and approval by the State Departments of Health, Land and Natural Resources, and Transportation; by the U.S. Army Corps of Engineers; and by the City and County of Honolulu Department of Land Utilization.

(4) The winning bidder will be required to prepare detailed contingency plans for all eventualities, including means of wastewater disposal in the event of a system malfunction. It should be noted that the availability of landfill as a backup to the resource recovery facility means that a safe and reliable disposal alternative exists which can be utilized in case of equipment failure.

(5) The only site now under consideration for the proposed project is more than 1,500 feet from the ocean. This, together with the facility design and various operational precautions should insure that there is no contamination of ocean waters from the sources mentioned in your letter.

(6) Vector control measures at the proposed facility will be described in the EIS. The Campbell Industrial Park site is removed from surface water bodies, and those measures will be in compliance with standards established by the State Department of Health and the U.S. Environmental Protection Agency. Because of this, we foresee no problem from toxicants.

Historic Sites

An archaeological reconnaissance survey of the site has been conducted by Hamilton M. Ahlo, Jr. and Robert J. Hommon of Science Management, Inc. (SMI). Results of their survey are described in the attached report. It is the City's intention to follow their recommendations.

Recreation

As indicated previously, the Sand Island site is no longer under consideration as a possible location for the proposed resource recovery facility.

State Land

The Sand Island site is no longer under consideration as a possible location for the proposed resource recovery facility. The Campbell Industrial Park site is privately owned, but use of ocean water for cooling

would require an ocean water intake and/or discharge pipe across state-owned land below the high water mark. Permission for this use, as well as a Conservation District Use Permit, would need to be sought from the Department of Land and Natural Resources in order to implement such a cooling system.

Water Resources

The Combustion Engineering/Amfac consortium has modified its proposal since the EIS Preparation Notice was issued. Their current plan still involves the use of groundwater from the Pearl Harbor Basin, but the water would be of less than potable quality. It is understood that the approval of your department would be required before the change in use could be undertaken.

Thank you again for your comments. We look forward to your review of the draft EIS when it is published in July.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

Attachment: Archaeological Reconnaissance
Survey Report

DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

Ref. No. 7290

April 5, 1983

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Subject: EIS Preparation Notice for a Solid Waste Processing and Resource Recovery Facility

We have reviewed the subject preparation notice and have the following comments to make.

We suggest that the draft EIS identify the offshore locations of the ocean outfalls and describe the effects of the discharged thermal effluent on any affected recreational resources or marine ecosystems.

Thank you for this opportunity to offer our comments.

Sincerely,

Frank Skrivanek
for Hideto Kono

cc: Office of Environmental Quality Control

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

July 1, 1983

R 83-437

Mr. Kent M. Keith, Director
Department of Planning and
Economic Development
Kamamalu Building
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Keith:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your department's letter of April 5, 1983 (your reference no. 7290) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Michael J. Chun
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TAXATION
P.O. BOX 259
HONOLULU, HAWAII 96809

March 14, 1983

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

Environmental Impact Statement Preparation Notice for a Solid Waste Processing and Resource Recovery Facility

We have reviewed your EIS preparation notice for a solid waste processing resource recovery facility document which you sent to us recently.

The State Department of Taxation has not previously reviewed any EIS documents and is not in a position to comment on such documents. We are concerned with the Hawaii tax laws and administration of such laws. If a specific reference to our State tax law is made in the EIS needing our comments, we would be happy to comment directly to you only on the specific tax law applicability. We do not find any need for us to comment on EIS documents.

In the event you may have any questions regarding the aforementioned, please feel free to contact me.

Very truly yours,

GEORGE FREITAS
Director of Taxation

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. George Freitas, Director
Department of Taxation
State of Hawaii
P. O. Box 259
Honolulu, Hawaii 96809

Dear Mr. Freitas:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 14, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

RYOKICHI HIGASHIONNA, Ph.D.
DIRECTOR

DEPUTY DIRECTORS
WAYNE J. YAMASAKI
JAMES B. McCORMICK
JONATHAN K. SHIMADA, Ph.D.

IN REPLY REFER TO:
STP 8.8988

April 8, 1983

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

EIS Preparation Notice for
Solid Waste Processing and
Resource Recovery Facility

Thank you for the opportunity to review the subject matter.

Depending on the height and location of the stack, a mass burning facility at the Sand Island location may be subject to height restrictions under the Airport Zoning rules of the Department of Transportation.

Please be informed that during the planning process for the development of Sand Island, the 20-acre expansion site for the City's waste water treatment plant was envisioned for either waterfront industrial use or as an addition to the existing park in the event the parcel was not needed. Should the City ultimately favor the Sand Island site, close coordination with our agency should be maintained especially if harbor facilities are planned to be used for any purpose. We would have no objections to the Campbell Industrial Park site for the location of the refuse processing and resource recovery facility.

Our concern regarding waterfront requirements on Sand Island is based on the fact that presently almost all of the waterfront on Sand Island is devoted to container operations. It may be difficult to find a berth where a barge can lay alongside to take processed fuel as it is delivered. Access and a staging area would be required and any resulting impact in the security of both Matson and U.S. Lines' container operations would have to be assessed.

It should be noted that the Sand Island development planning was conducted with important input from, among others, the Kalihi-Palama Community Council. Hence, we suggest KPCC be added to the list of public interest groups that should be consulted during the preparation of the EIS.

Attached is a map of Honolulu Harbor extracted from our 1995 Master Plan for Honolulu Harbor. Figure 8 of the notice should be modified accordingly.

Very truly yours,

Ryokichi Higashionna

Ryokichi Higashionna
Director of Transportation

Enclosure

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Ryokichi Higashionna
Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Higashionna:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 8, 1983 (your reference STP 8.8988) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

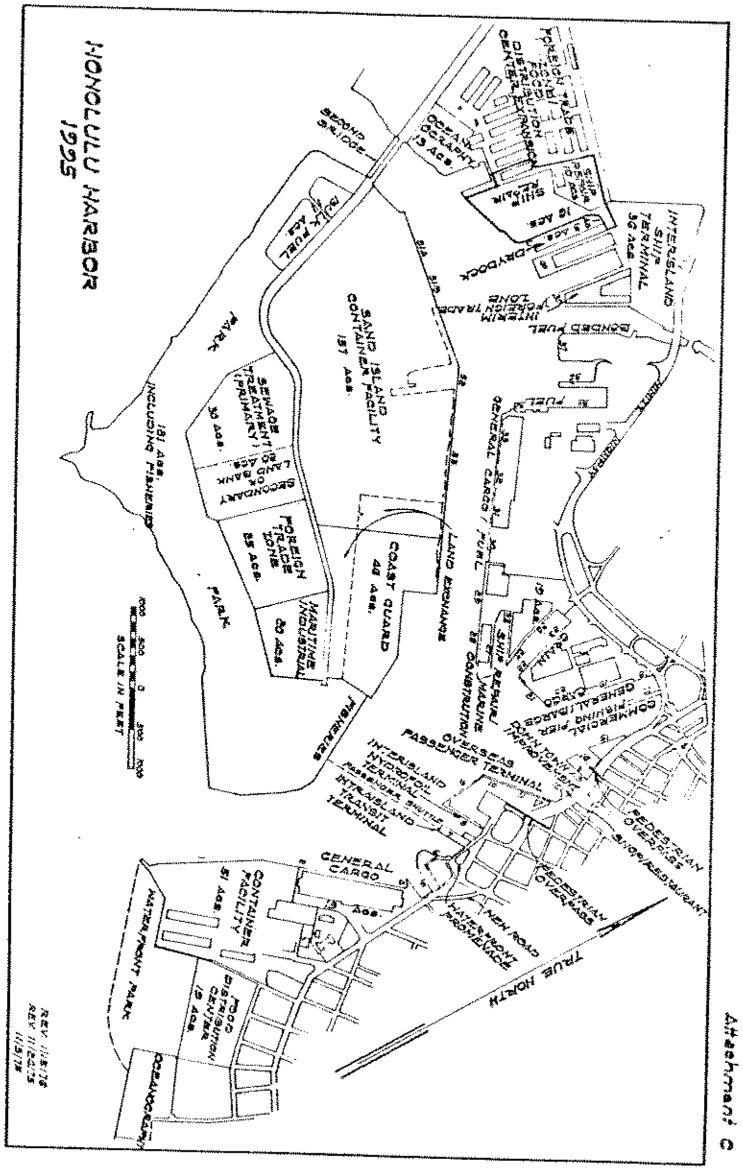
The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Michael J. Chun
Director and Chief Engineer

Attachment C



University of Hawaii at Manoa

Department of Botany
St. John Plant Science Laboratory
Room 101 • 3190 Maile Way • Honolulu, Hawaii 96822
Telephone (808) 948-8369 • Cable Address: UNIHAW

07 April 1983

Mr. Michael J. Chun
Director & Chief Engineer
Department of Public Works
City & County of Honolulu
650 So. King St.
Honolulu, Hawaii 96813

Dear Mr. Chun;

SUBJECT: HONOLULU RESOURCE RECOVERY FACILITY. PROPOSED SITE AT CAMPBELL INDUSTRIAL PARK

The makai boundary of the proposed facilities on the Campbell Industrial Park site should be set back at least 1,000 ft. inshore from the existing unpaved road, not the shoreline as proposed.

During our botanical survey of the 'Ewa Plains area for the U. S. Fish & Wildlife Service, Office of Endangered Species, we found the largest known populations of Achyranthes rotundata and Myoporum sandwicense var. stellatum (naio or false sandalwood) near the proposed Campbell Industrial Park site (see map attached).

The Achyranthes is on the proposed list of endangered plants. The Myoporum is found only on the 'Ewa Plains and has been proposed for endangered status listing.

If the Campbell site is selected for the proposed facilities the U. S. Office of Endangered Species should be contacted before the final makai boundary is defined.

Sincerely,

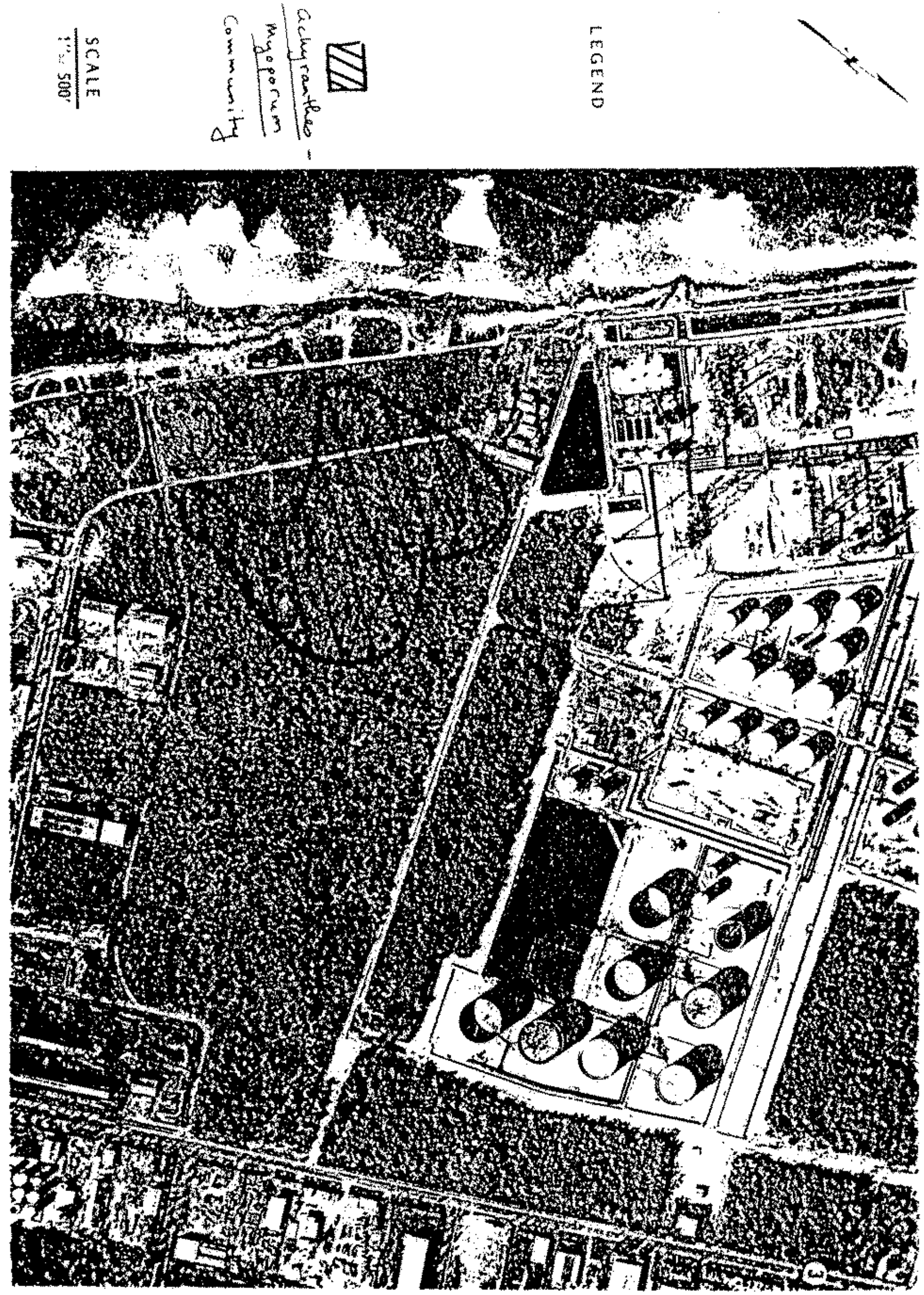
Winona P. Char

Winona P. Char

attach.:

WPC:

AN EQUAL OPPORTUNITY EMPLOYER



DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

[illegible]
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Ms. Winona P. Char
St. John Plant Science Laboratory
Department of Botany
University of Hawaii at Manoa
3190 Maile Way, Room 101
Honolulu, Hawaii 96822

Dear Ms. Char:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 7, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

University of Hawaii at Manoa

Hawaii Natural Energy Institute
Holmes Hall 246 • 2540 Dole Street • Honolulu, Hawaii 96822

March 22, 1983

AR 23 1 38 PM '83

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 S. King Street
Honolulu, HI 96813

Dear Dr. Chun:

Both Art Seki of the HNEI staff and I have reviewed the EIS Preparation Notice and can find no substantive input or constructive comments to make regarding the preparation of the final statement.

The concept of producing energy from municipal waste is strongly supported by HNEI as an alternate energy resource for contributing to energy self-sufficiency in Hawaii. The magnitude of the municipal waste generated on Oahu makes this a significant energy alternative. It is difficult to comprehend how either of the other options to solid waste recovery--landfilling or incineration without power generation--could continue to be considered as valid alternatives.

I strongly endorsed HPOWER and sincerely hope that the problems which blocked its implementation will be fully addressed and resolved, so that a Solid Waste Processing and Resource Recovery Facility will become a reality for Oahu in the very near future.

Sincerely yours,

John Shupe

John W. Shupe
Director

JWS:sy

AN EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Dr. John W. Shupe, Director
Hawaii Natural Energy Institute
University of Hawaii at Manoa
Holmes Hall 246
2540 Dole Street
Honolulu, Hawaii 96822

Dear Dr. Shupe:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 22, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We appreciate your support of our resource recovery project. We look forward to your further participation in the EIS process and your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

University of Hawaii at Manoa

Water Resources Research Center
Holmes Hall 283 • 2540 Dole Street
Honolulu, Hawaii 96822

'83 Reque

11 April 1983

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Subject: EIS Preparation Notice for a Solid Waste Processing and Recovery Facility, March 1983

We have reviewed the subject EISPN and have no comments to offer at this time. Thank you for the opportunity to comment. This material was reviewed by WRRC personnel.

Sincerely,

Edwin T. Murabayashi

Edwin T. Murabayashi
EIS Coordinator, WRRC

ETM:jmm

AN EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Edwin T. Murabayashi
EIS Coordinator
Water Resources Research Center
University of Hawaii at Manoa
Holmes Hall 283
2540 Dole Street
Honolulu, Hawaii 96822

Dear Mr. Murabayashi:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 11, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA
HONOLULU, HAWAII 96843

March 29, 1983

DEPT OF REC. WORKS
8 41 AM '83

TO: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: KAZU HAYASHIDA
BOARD OF WATER SUPPLY

SUBJECT: YOUR MEMORANDUM OF MARCH 8, 1983, ON THE ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for allowing us to review the environmental assessment for the proposed solid waste processing and resource recovery project.

We offer the following comments for your consideration:

1. Characteristics of Proposed Facilities at Sand Island, p. 18:

We can provide water service for the HPOWER Project proposed on Sand Island. However, off-site water system improvements will be required to provide adequate fire protection to the proposed project.

The existing water system serving Sand Island is only able to provide 2,200 gallons per minute fire flow to the proposed project site. The Sand Island area which is designated "Industrial" requires a fire flow of 4,000 gallons per minute. Therefore, a new pipeline will have to be installed from Dillingham Boulevard to Sand Island to upgrade the fire protection. The installation of the pipeline should be coordinated with the State Department of Land and Natural Resources.

The pipeline is also required by the State for the redevelopment of Sand Island.

Any alternative fire protection measures to be taken must be reviewed and approved by the Fire Department.

2. Characteristics of Proposed Site and Facilities at Waiau, p. 20:

We have no objections to the HECO Waiau power plant site since the proposal involves the conversion and use of existing facilities already on the site.

3. Geology, Physiography, and Soils, p. 22:

The description of the caprock should be revised to indicate that caprock consists of interbedded corraline and alluvial deposits which reach thicknesses of 800 to 900 feet. The caprock, because of its relatively low permeability, protects the underlying potable groundwater from surficial contamination.

4. Consumptive Use of Water, p. 24:

Oahu Sugar Company has many wells in the Ewa Plains which are not potable water sources, such as Pump No. 10 which is located near the Campbell Industrial Park. The use of nonpotable waters instead of potable water should be considered for the project.

If you have any questions, please contact Lawrence Whang at 548-5221.

Kazu Hayashida

KAZU HAYASHIDA
Manager and Chief Engineer

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

MEMORANDUM

TO: MR. KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY, CITY AND COUNTY OF HONOLULU

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum of March 29, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility (SWPRRF). We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and to your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

BUILDING DEPARTMENT

CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

ROY H. TANJI
DIRECTOR AND BUILDING SUPERINTENDENT

WILLIAM F. REMULAR
DEPUTY DIRECTOR

PB 83-216

March 23, 1983

TO: MR. MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: ROY H. TANJI
DIRECTOR AND BUILDING SUPERINTENDENT

SUBJECT: EIS PREPARATION NOTICE
SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for the opportunity to review the Environmental Impact Statement Preparation Notice for a Solid Waste Processing and Resource Recovery Facility.

We have no comment except to note for the record that at the time of our review, a portion of the Campbell Industrial Park site was also being considered by the Department of Transportation Services for its heavy duty maintenance facility.

ROY H. TANJI
Director and Building Superintendent

cc: J. Harada

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

MEMORANDUM

TO: MR. ROY H. TANJI, DIRECTOR AND BUILDING SUPERINTENDENT
BUILDING DEPARTMENT, CITY AND COUNTY OF HONOLULU

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum of March 23, 1983 (your reference PB 83-216) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility (SWPRRF). We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and to your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

DEPARTMENT OF THE BUDGET

CITY AND COUNTY OF HONOLULU

HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

STANLEY T. SHIRAKI
CHIEF BUDGET OFFICER

ROBERT N. KUMASAKA
DEPUTY CHIEF BUDGET OFFICER

March 23, 1983

TO: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER

FROM: STANLEY T. SHIRAKI, CHIEF BUDGET OFFICER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

We have two comments on the proposed project. First, there appears to be a typographical error in the last sentence of the first paragraph on page 5 of the EIS preparation notice. Thus, we assume that the project's low bid will be formally defined as "the lowest net (and not new) present value of the discounted cash flow for disposal including transportation over a 20-year period."

Second, the third sentence of the first paragraph on page 20 of the EIS preparation notice appears to be only partially correct. Thus, we believe that any type of facility (and not only a processing plant) at Campbell Industrial Park will necessitate the expansion of the Keehi Transfer Station.

Stanley T. Shiraki

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

MEMORANDUM

TO: MR. STANLEY T. SHIRAKI, CHIEF BUDGET OFFICER
DEPARTMENT OF THE BUDGET, CITY AND COUNTY OF HONOLULU

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum of March 23, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility (SWPRRF). We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and to your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Michael J. Chun
Director and Chief Engineer

DPL

DEPARTMENT OF GENERAL PLANNING

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

WILLARD T. CHOW
CHIEF PLANNING OFFICER

RALPH PORTMORE
DEPUTY CHIEF PLANNING OFFICER

DGP3/83-5469

March 29, 1983

Belt, Collins & Associates
606 Coral Street
Honolulu, Hawaii 96813

Gentlemen:

EIS Preparation Notice for a Solid Waste Processing and Resource Recovery Facility for the City and County of Honolulu

We have reviewed the above preparation notice and feel that information on the following should be included in the EIS.

For each of the proposed sites where applicable:

1. At water-cooled combustion/energy plants, the impact of drawing one million gallons per day from its source, i.e., (1) ocean water, (2) Oahu Sugar Company's irrigation water system, (3) the municipal water system, (4) treated effluent at Sand Island, and (5) shallow groundwater wells.

2. The system of disposal of the warm effluent from the water-cooled facility and its possible adverse impact on the environment.

3. Quantification of present and future traffic situations and the types of problems which may arise relative to road capacities, traffic volumes, the number of trucks involved in in/out resource recovery operations, impact on a.m./p.m. off-peak traffic periods, etc.

4. Traffic restricting points along affected roadways and extent of traffic problems anticipated; for Sand Island, discussion may need to address possible congestion at the Bascule Bridge, Nimitz/Sand Island Access Road intersection and along the access road because of other industrial activities competing for road use.

5. The possible impact on employees' health and comfort at installations because of excessive noise levels, dust, etc.

6. The heights and location of smoke stacks and their potential for interference with aircraft flight operations and viewing (small plane and commercial planes) near airport areas.

7. Noise, smoke, dust, traffic impacts to the small residential area bordering Kaluamoi Drive and Kaluamoi Place at Waiau.

Sincerely,

Ralph Kawamoto

RALPH KAWAMOTO
Planner

APPROVED:

W.T. Chow

WILLARD T. CHOW

bcc: Dept. of Public Works

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

July 1, 1983

R 83-437

MEMORANDUM

TO: MR. WILLARD T. CHOW, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING, CITY AND COUNTY OF HONOLULU

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your department's memorandum of March 29, 1983 (your reference DGB 3/83-5469) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility (SWPRRF). We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and to your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

DEPARTMENT OF HEALTH

CITY AND COUNTY OF HONOLULU

CITY HALL ANNEX
HONOLULU, HAWAII 96813 • AREA CODE 808 • 523-4345

EILEEN R. ANDERSON
MAYOR

ANNA MARIA BRAULT, M.D., M.P.H.
DIRECTOR

DOROTHY K. ONO
DEPUTY DIRECTOR

April 4, 1983

TO: Dr. Michael J. Chun, Director and Chief Engineer
Department of Public Works

FROM: Anna Maria Brault, M.D., Director

SUBJECT: Environmental Impact Statement Preparation Notice for a Solid Waste Processing and Resource Recovery Facility

We have reviewed your memo and attachments on the above subject and concur with the need for a solid waste processing and resource recovery facility.

Anna Maria Brault

ANNA MARIA BRAULT, M.D.

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

MEMORANDUM

TO: ANNA MARIA BRAULT, M.D., DIRECTOR
DEPARTMENT OF HEALTH, CITY AND COUNTY OF HONOLULU

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum of April 4, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility (SWPRRF). We appreciate the time you and your staff spent reviewing this document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We appreciate your support of our resource recovery project. We look forward to your further participation in the EIS process and to your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813
PHONE 523-4101

EILEEN R. ANDERSON
MAYOR

JOSEPH K. CONANT
DIRECTOR

CHARLES K. TORIGOE
DEPUTY DIRECTOR

March 31, 1983

MEMORANDUM

TO: Michael J. Chun, Director & Chief Engineer
Department of Public Works

FROM: Joseph K. Conant

SUBJECT: EIS Preparation Notice for a Solid Waste Processing and Resource Recovery Facility

Thank you for informing us of your intent to prepare an EIS for the subject project.

We have no objections to the project or any of the sites proposed for the facility. We do, however, request that the EIS include a discussion on how the surrounding areas will be impacted by the project in terms of noise, air quality, traffic, etc.

JOSEPH K. CONANT

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

MEMORANDUM

TO: MR. JOSEPH K. CONANT, DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum of March 31, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility (SWPRRF). We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and to your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Michael J. Chun
Michael J. Chun
Director and Chief Engineer

DEPARTMENT OF LAND UTILIZATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET

HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL M. McELROY
DIRECTOR

ROBERT B. JONES
DEPUTY DIRECTOR

LU3/83-984(SM)

April 8, 1983

MEMORANDUM

TO : DR. MICHAEL J. CHUN, DIRECTOR & CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM : MICHAEL M. McELROY, DIRECTOR

SUBJECT : ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISPN) SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

We have reviewed the above and find it to be one of the more comprehensive EISPNs. Of the three proposed sites for such a facility, both the Sand Island and Waiau sites are located within the Special Management Area (SMA), while the Campbell Industrial Park site lies just outside the SMA. We will reserve any further comments for our review of the Draft EIS.

If there are any questions, please contact Sampson Mar of our staff at 4077.

for Loretta Chee

MICHAEL M. McELROY
Director of Land Utilization

MMM:sl

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

MEMORANDUM

TO: MR. MICHAEL M. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION, CITY AND COUNTY OF HONOLULU

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum of April 8, 1983 (your reference LU 3/83-984/SM) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility (SWPRRF). We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and to your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

EMIKO I. KUDO
DIRECTOR

March 18, 1983

TO: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: EMIKO I. KUDO

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Inasmuch as the proposed sites for the solid waste resource recovery facility are not within close proximity to existing or proposed parks, we do not foresee detrimental impacts resulting from construction and operation of the proposed facility.

Thank you for the opportunity to review the EIS Preparation Notice.

(Mrs.) EMIKO I. KUDO, Director

EIK:vc

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

MEMORANDUM

TO: MRS. EMIKO I. KUDO, DIRECTOR
DEPARTMENT OF PARKS AND RECREATION, CITY AND COUNTY OF HONOLULU

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum of March 18, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility (SWPRRF). We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and to your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Michael J. Chun
Director and Chief Engineer

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

William A. Bonnet
DIRECTOR

GAIL RHEE
DEPUTY DIRECTOR

April 22, 1983

TE 3/83-934

MEMORANDUM

TO: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: WILLIAM A. BONNET, DIRECTOR

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

We have no comments on the EIS Preparation Notice.

If you have any questions, please contact Kenneth Hirata of my staff at 527-5031.

William A. Bonnet
WILLIAM A. BONNET

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

MEMORANDUM

TO: MR. WILLIAM A. BONNET, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum of April 22, 1983 (your reference TE 3/83-934) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility (SWPRRF). We appreciate the time you and your staff spent reviewing this document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and to your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Michael J. Chun
Michael J. Chun
Director and Chief Engineer

FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

1455 S. BERETANIA STREET, ROOM 305
HONOLULU, HAWAII 96814

EILEEN R. ANDERSON
MAYOR

M. M. NONAKA
CHIEF

April 5, 1983

TO: MICHAEL J. CHUN, DIRECTOR & CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: MELVIN M. NONAKA, FIRE CHIEF

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

We have reviewed the EIS Preparation Notice for the proposed project.

The Makakilo Fire Station is located approximately 3 miles from the proposed Campbell Industrial Park site with a response time of approximately 7 minutes. Supportive services will be provided by the Nanakuli Fire Station with response time of approximately 10 minutes. In addition, our proposed CIP includes a fire station in the Campbell Industrial Park site.

According to the NFPA and the ISO Grading Schedules, the standard requirement for a fire station should be located within 3/4 mile of a heavy industrial area. Until a fire station is constructed within these standards, existing fire protection for the proposed Campbell site will be considered inadequate.

Fire protection is available to the HECO Waiau Power Plant with a response time of approximately 2 minutes from the Pearl City Fire Station. The Waiau Fire Station provides supportive services with a response time of approximately 4 minutes.

Fire protection for the Sand Island area is furnished by the Kalihi Kai Fire Station with a response time of approximately 6 minutes. A ladder company is also available from the Kalihi Kai Fire Station. Kalihi Fire Station provides supportive services with a response time of approximately 8 minutes.

Adequate fire protection is available in the HECO Waiau Power Plant and the Sand Island areas.

MELVIN M. NONAKA,
Fire Chief

MMN:ct/NSKW

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

MEMORANDUM

TO: MR. MELVIN M. NONAKA, FIRE CHIEF
FIRE DEPARTMENT, CITY AND COUNTY OF HONOLULU

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum of April 5, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility (SWPRRF). We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and to your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Michael J. Chun
Director and Chief Engineer

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

OUR REFERENCE EC-ES

March 18, 1983

MEMORANDUM

TO: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: FRANCIS KEALA, CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Siting of this facility at either Sand Island, Waiau, or Campbell Industrial Park will pose similar hazards for traffic safety. While the necessary traffic cannot be avoided, it is important that serious consideration be given to safety at entrance and exit points of the facility, to routing of traffic in the vicinity of and at the facility, and the scheduling of refuse truck traffic to minimize conflict with normal, daily traffic.

FRANCIS KEALA
Chief of Police

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

MEMORANDUM

TO: MR. DOUGLAS GIBB, CHIEF
POLICE DEPARTMENT, CITY AND COUNTY OF HONOLULU

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR A SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum of March 18, 1983 (your reference EC-ES) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility (SWPRRF). We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and to your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Michael J. Chun
Director and Chief Engineer

COMMITTEE ON
WAYS AND MEANS
SUBCOMMITTEES:
TRADE
SELECT REVENUE MEASURES

CECIL "CEC" HEFTEL
1ST DISTRICT, HAWAII

Congress of the United States
House of Representatives
Washington, D.C. 20515

WASHINGTON OFFICE:
1030 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, D.C. 20515
(202) 225-2726

DISTRICT OFFICE:
300 ALA MOANA BOULEVARD
ROOM 4104
P.O. BOX 50143
HONOLULU, HAWAII 96850
(808) 546-8997

March 18, 1983

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

Thank you for informing me of the imminent preparation of an environmental impact statement for the City's proposed resource recovery facility. I am very interested in the project but have no comments to offer at this stage.

I would very much appreciate being informed of the project's progress in the coming year, particularly the selection of the contractor, and would welcome further details on the project as they become available.

Warmest aloha,

Cec Heftel
Cec Heftel
Member of Congress

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Honorable Cecil Heftel
1st District, Hawaii
House of Representatives
Congress of the United States
P. O. Box 50143
Honolulu, Hawaii 96850

Dear Representative Heftel:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 18, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Michael J. Chun
Director and Chief Engineer

DANIEL K. INOUYE
HAWAII

United States Senate

ROOM 722, HART SENATE BUILDING
WASHINGTON, D.C. 20510
(202) 224-3934

PRINCE KUHIO FEDERAL BUILDING
ROOM 6104, 300 ALA MOANA BOULEVARD
HONOLULU, HAWAII 96850
(808) 546-7550

March 17, 1983

Mr. Michael J. Chun
Director and Chief Engineer
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

I have received your recent correspondence and attached copy of the Environmental Impact Statement Preparation Notice for a Solid Waste Processing and Resource Recovery Facility.

I appreciate your courtesy in keeping me advised on this matter. The proposed project would fill a definite need in coping with the state's problem of solid waste disposal while furthering our goal of energy self-sufficiency.

Aloha,

DANIEL K. INOUYE
United States Senator

DKI:sgl

'83

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Honorable Daniel K. Inouye
United States Senate
Congress of the United States
300 Ala Moana Blvd., Room 6104
Honolulu, Hawaii 96850

Dear Senator Inouye:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 17, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We appreciate your support of our resource recovery project. We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

SPARK M. MATSUNAGA
HAWAII

WASHINGTON OFFICE:
109 HART BUILDING
WASHINGTON, D.C. 20510

HONOLULU OFFICE:
3104 PRINCE KUHIO BUILDING
HONOLULU, HAWAII 96850

United States Senate

WASHINGTON, D.C. 20510

CHIEF DEPUTY
DEMOCRATIC WHIP

MEMBER:
COMMITTEE ON FINANCE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
COMMITTEE ON LABOR AND HUMAN RESOURCES
COMMITTEE ON VETERANS' AFFAIRS

March 18, 1983

Honorable Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Michael: Mike

Thank you for your letter enclosing an "Environmental Impact Statement Preparation Notice for a Solid Waste Processing and Resource Recovery Facility" and inviting me to submit comments on the proposed project.

Let me say that I strongly support the objectives of the City and County of Honolulu to establish a facility that would recover and re-use the resources which we have historically discarded. You have my best wishes that your project is brought to successful completion in an environmentally sound and economical way.

Aloha and best wishes.

Sincerely,

Sparky

Spark Matsunaga
U.S. Senator

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Honorable Spark Matsunaga
United States Senate
Congress of the United States
3104 Prince Kuhio Building
Honolulu, Hawaii 96850

Dear Senator Matsunaga:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 18, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We appreciate your support of our resource recovery project. We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

HOUSE OF REPRESENTATIVES
THE TWELFTH LEGISLATURE

STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

March 14, 1983

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Dr. Chun:

In response to the Environmental Impact Statement Preparation Notice for a Solid Waste Processing and Resource Recovery Facility issued by your office on March 1, 1983, let me register my strong opposition to the siting of any Refuse Derived Fuel (RDF) powered electrical plant on the grounds of the Waiau power station.

The residents of Waiau have already tolerated the existing power plant since the 1930s. They are concerned, as I am, about the possible deleterious effects of RDF power on the area's air quality, noise level, and traffic patterns. These residents cannot tolerate further encroachment on the environmental quality of that area.

In particular, I wish to note on page 21 of the notice that traffic flow at the Waiau site on Kamehameha Highway would be periodically interrupted, whereas such conditions would not present themselves at the other sites. As for air quality, I realize that the Hawaiian Electric Company's plans for an RDF facility at Waiau include the shutdown of two existing boilers, but even with their closing, the uncertain effects of burning RDF instead of fossil fuels convince me of the inappropriateness of such a facility at Waiau.

I would further note that of the three sites being considered, only the Waiau site is in close proximity to a residential area. I, therefore, take exception to the statement on page 31 that there are "no significant direct adverse social . . . effects as a result of the project." Such a statement can only be made for the vacant Campbell Industrial Park and the Sand Island sites. I would like to stress that in the review process, the opinions and concerns of the residents on the eastern boundary of the present Waiau facility be carefully considered.

Thank you for the opportunity to comment on this matter. I would appreciate being kept informed of further developments on the site selection.

Sincerely,

Clarice Y. Hashimoto

CLARICE Y. HASHIMOTO
State Representative
32nd District

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Honorable Clarice Y. Hashimoto
House of Representatives
The Twelfth Legislature
State of Hawaii
State Capitol
Honolulu, Hawaii 96813

Dear Representative Hashimoto:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 14, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

HOUSE OF REPRESENTATIVES
THE TWELFTH LEGISLATURE

STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

83 01666

DIR MGR
Refuse

March 30, 1983

Chief
Chief
Engr.

DEPT OF PUBLIC WORKS
MAR 31 1 55 PM '83

Mr. Michael J. Chun, PH. D.
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mike:

Our recent meeting on the proposed Solid Waste Resource Recovery Facility was most informative and certainly led to my greater understanding of the review and site selection process undertaken by the City and County of Honolulu in their decision making. I can fully appreciate the rigors involved in analyzing potential sites and their environmental and social impacts. In as much as a solid waste recovery facility may be needed, and, the City and County of Honolulu and the State Department of Health will ensure that air quality and other health standards are met, I have definite objections to its location in Waiau.

The proposed Waiau site at the Hawaiian Electric Company plant is much closer to existing residential dwellings than other potential sites, thereby increasing the incidences of health hazards to an identified population growth area.

Other concerns include the effect of chemical emission, increasing odor emitted to that already existing at the Waiau Plant surroundings, the possibility of rodents and pests in the area, the visual eyesore of plant structures, heavy truck traffic, the possibility of further industrial development adjacent to the existing residential area, and the effect the plant may

have on the accessibility of the existing bike and jogging path.

I will look forward to our continued discussions and a review of your health assessment report. Please keep me apprised of any developments in your entire review and site selection process. Really appreciate your efforts. Thank you very much.

Sincerely,

Arnold Morgado
State Representative
Thirty-third District

AM:ji

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Honorable Arnold Morgado
House of Representatives
The Twelfth Legislature
State of Hawaii
State Capitol
Honolulu, Hawaii 96813

Dear Representative Morgado:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 30, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

The League of Women Voters in Hawaii

STATE & ED FUND
49 S. HOTEL #314
HONOLULU, HAWAII 96813
PHONE: (808) 533-6806

HONOLULU
49 S. HOTEL #314
HONOLULU, HAWAII 96813
PHONE: (808) 531-7448

HAWAII COUNTY
P.O. BOX 665
HILO, HAWAII 96720

KAUAI
R.R. 1 BOX 293-E-4
KAPAA, KAUAI 96746

MAUI (PROVISIONAL)
P.O. BOX 521
WAILUKU, MAUI 96793

April 15, 1983

Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu

Dear Mr. Chun:

The League of Women Voters of Hawaii supports the concept of a refuse to energy plant as an environmentally sound way to address the problems of solid waste disposal and resource recovery. We have no comments on the specific environmental impacts of the current proposals as outlined in the EIS Preparation notice but the League may wish to comment at a later time.

Sincerely,

Anna Hoover

Anna M. Hoover, Chair
Natural Resources Committee

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Ms. Anna M. Hoover, Chair
Natural Resources Committee
The League of Women Voters in Hawaii
49 South Hotel Street, #314
Honolulu, Hawaii 96813

Dear Ms. Hoover:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 15, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We understand you have no comments on the EISPN.

We expect to file the EIS with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We appreciate your support of our resource recovery project. We look forward to your further participation in the EIS process and your comments on the EIS. If you have any questions regarding this project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

LIFE OF THE LAND

Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

April 6, 1983

Subject: EIS Preparation Notice for a Solid Waste Processing and Resource Recovery Facility

Dear Mr. Chun:

Life of the Land would like to be a consulted party concerning the subject EIS. Please send us a copy of the Draft and Revised EIS documents when they become available.

We would prefer an alternative which (1) minimized the need for future landfills, (2) maximized the amount of water available for domestic use, and (3) avoided significant noise impacts on Sand Island State Park. It should be pointed out that a 1 mgd reduction in pumping of brackish water from Oahu Sugar Company wells in the Pearl Harbor aquifer would allow the BWS to increase pumping by 1 mgd from its high quality wells elsewhere in the aquifer. Over the course of a year, sale of 1 mgd of potable water would generate revenues of over $0.25 million and avert the need for substantial City expenditures to generate new water sources. These considerations belong in part of any cost/benefit analysis done as part of the selection process for the subject resource recovery facility.

Yours,

for

Arthur Mori
President

cc: OEQC

250 S. Hotel St. Rm. 211, Honolulu, Hawaii 96813. Tel. 521-1300

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Arthur Mori, President
Life of the Land
250 South Hotel Street, Room 211
Honolulu, Hawaii 96813

Dear Mr. Mori:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 6, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

The proposed resource recovery facility will minimize the need for future landfills. The use of salt water or brackish water are alternatives the contractors are considering.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

OMPO

Oahu
Metropolitan
Planning
Organization

Suite 1509
1164 Bishop Street
Honolulu, Hawaii 96813
(808) 523-4178
(808) 548-2638

March 14, 1983

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Subject: Environmental Impact Statement Preparation Notice For a Solid Waste Processing and Resource Recovery Facility.

Dear Mr. Chun:

We have reviewed the above mentioned EIS preparation notice and offer the following comments:

1. Existing traffic volumes, especially truck volumes, should be presented for roadways around the proposed sites.

2. The City Department of Transportation Services is planning to construct a heavy maintenance bus facility in the Campbell Industrial Park area. Coordination with DTS should be conducted to ensure that the combined truck and bus traffic generated from the two projects will not adversely affect the Campbell Industrial Park roadway system.

Sincerely,

Cheryl D. Soon

Cheryl D. Soon
Executive Director

CDS/lb

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Ms. Cheryl D. Soon
Executive Director
Oahu Metropolitan Planning Organization
1164 Bishop Street, Suite 1509
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of March 14, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

"REPRESENTING ALL THE PEOPLE OF WAIPAHU"

Waipahu Community Association

HONOLULU FEDERAL SAVINGS AND LOAN BUILDING
94-229 WAIPAHU DEPOT STREET
WAIPAHU, HAWAII 96797

TELEPHONE 677-4950

April 4, 1983

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, HI 96813

Dear Mr. Chun:

I have reviewed your solid waste processing and resource recovery facility Environmental Impact Statement (EIS) preparation notice dated 8 March 1983.

BACKGROUND

I am familiar with the AMFAC/CE design package, having visited the operating facility at Madison, Wisconsin, designed by Combustion Engineering.

Environmental and resident health considerations are the areas seen as critical by the residents of Waipahu. We would appreciate being informed, step by step, throughout the selection and decision-making process of this project.

COMMENTS

The present administration is taking the desired approach to the need of finding an alternative to land-fill as a method of disposing of community waste. Including the public in site location selection, processing methods offered by participants (such as sea or treated waste water for cooling as opposed to potable water use), and best available technology for reducing air pollution will aid in educating the public regarding development and implementation of such an enormous, but necessary, public facility.

Heavily populated areas should be avoided as combustion sites to reduce the probability of long-term harmful effects to residents from airborne combution residuals. There are a variety of variables that come into play, effectiveness of scrubbers (electro-static precipitators), stack height, prevailing winds, current level of ambient air quality; extended problems or neglect of one or more or these many control systems could be harmful.

SUMMARY

Sand Island/Campbell Industrial Park seem to be optimum sites for the many reasons you have cited, but, as you relate on p.28 regarding the Campbell site, "a facility at this location may have difficulty meeting ambient air quality standards due to the cumulative impact of the existing industrial sources located there." This would not be true if Hawaiian Electric Company (HECO) would continue their Kahe Point generating operations using the low sulfur fuel, as at present.

Thank you for inviting our association to participate in this important review effort.

Sincerely,

Clarence K. Nishihara

Clarence K. Nishihara
President

COA/CN/ls

cc: Senators: Kuroda, Young, Cayetano
Representatives: Shito, Kihano, Saballa, Menor
Council Chair Mink
Councilman Matsumoto
American Lung Ass'n.
Waipahu Business Ass'n.
Waipahu United Church of Christ
Leeward Oahu Lions
West Pearl Harbor Rotary
Cal Chun
Gary Weaver

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Clarence K. Nishihara
President
Waipahu Community Association
94-229 Waipahu Depot Street
Waipahu, Hawaii 96797

Dear Mr. Nishihara:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 4, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

83-02749

THE ESTATE OF JAMES CAMPBELL

May 19, 1983

Mr. Michael Chun
Director and Chief Engineer
Dept. of Public of Works
City & County of Honolulu
650 S. King Street
Honolulu, HI 96813

Dear Mr. Chun:

Environmental Impact Statement
for the City's Proposed
Waste Energy Recovery Program
<u>James Campbell Industrial Park</u>

This letter transmits our thoughts on the proposed resource recovery facility for the James Campbell Industrial Park. The following are issues we feel should be addressed in the E.I.S., which is now being drafted for public distribution in June.

1. <u>Air Quality</u>: The proposed facility will contribute to the degradation of the regional air quality which is accommodating heavy industrial uses in the Industrial Park as well as the Kahe Power Plant. Because this "air shed" has a limited capacity, the cumulative impact of the proposed resource recovery facility needs to be addressed. The facility's air quality impact should also be viewed in relationship to future industrial users. Along the same lines, the cost/benefits of strict air pollution controls being imposed upon this facility or retroactively on existing as well as other future facilites should also be addressed.

   We understand that air quality tests for the region have been conducted by the Hawaiian Electric Company. We also understand from the previous H-POWER E.I.S. that the Hawaiian Electric Company thinks the SO_2 concentrations in the area already exceed national ambient air quality standards (see Page XI-91 of that document). We hope these both can be reviewed by your air quality consultant. It should be noted that because of the current slow down in construction, Lone Star Hawaii Cement and Hawaiian Western Steel are not

   operating at normal capacity. Therefore, air quality measurements may show a lower than normal level of SO_2 concentrations.

2. <u>Water Quantity & Quality</u>: The extent of the waste facility's use of water and its impact upon existing water basins needs to be addressed. Of particular concern is the possible affect upon future allocations for Ewa, thereby, retarding the implementation of the Ewa Development Plan. All alternatives for water source and use should be investigated, including the use of nonpotable sources.

3. <u>Regional Economic Impacts</u>: It is necessary to our island-wide and statewide economy to provide for heavy industrial growth and development. At present, only the James Campbell Industrial Park provides for such growth. The Park will become more important in the future as the State's deep draft harbor takes shape. Today's decisions should not preclude further locations for or development of industrial land at Barbers Point.

4. <u>Waste Water Disposal</u>: Sewers are not available; therefore, details are required for waste water treatment and disposal. Of concern is the handling and disposal of water generated from "wash downs" of facility elements.

5. <u>Format</u>: A simplified format with a summary of conclusions should be provided at the beginning of the E.I.S. This will aid the overall understanding of the document. A summary chart of positive and negative impacts could be investigated.

We hope the foregoing will assist you in the preparation of the E.I.S. Should you or your staff have any questions, please do not hestitate to contact either Walter Yoshimitsu or myself. We would appreciate discussing this matter further with you.

Sincerely yours,

Dave McCay

Dave McCoy
Manager, Industrial Properties

ga:H222h

cc: Belt Collins & Associates
ATTN: Mr. Perry White

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

July 1, 1983

R 83-437

Mr. Dave McCoy, Manager
Industrial Properties
The Estate of James Campbell
828 Fort Street Mall, Suite 500
Honolulu, Hawaii 96813

Dear Mr. McCoy:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of May 19, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director and Chief Engineer

PRI Pacific Resources, Inc.

PRI Tower 733 Bishop Street
P.O. Box 3379 Honolulu, Hawaii 96842
Telephone 808 547-3111 Telex 0634238

April 26, 1983

Mr. Melvin Lee
Department of Public Works
Division of Refuse Collection
 and Disposal
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Subject: Solid Waste Processing and Resource
Recovery Facility - EIS Preparation Notice

Dear Mr. Lee:

Pacific Resources, Inc. (PRI) has reviewed the subject notice and would like to offer a comment regarding the potential problem with locating the RRF at the Campbell Industrial Park site. Due to existing major sources and Hawaiian Electric Company's request to burn fuel oil with 2% sulfur at the Kahe facility and their associated air quality impact, PRI feels that certain future combustion sources may not be permitted by the State and Federal regulatory agencies. The potential air quality impact from the proposed source and combined sources should be assessed prior to any further evaluation of this site option.

We appreciate the opportunity you have given us to review the notice and look forward to being kept informed of the project as it develops. If there are any questions, please feel free to call me at 547-3422.

Sincerely,

PACIFIC RESOURCES, INC.

By ______________________
Chris Jansen
Environmental Affairs Coordinator

CJ:bjm

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

July 1, 1983

R 83-437

Mr. Chris Jansen
Environmental Affairs Coordinator
Pacific Resources, Inc.
P. O. Box 3379
Honolulu, Hawaii 96842

Dear Mr. Jansen:

Subject: Environmental Impact Statement for a Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of April 26, 1983 regarding the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Solid Waste Processing and Resource Recovery Facility. We appreciate the time you and your staff spent reviewing this document.

The comments and information which you provided were valuable to us in preparing the Environmental Impact Statement. We expect to file it with the State Environmental Quality Commission shortly. As you may know, the City Council has deleted the Waiau and Sand Island sites from the development plan. We will therefore proceed with our proposed resource recovery project only at the Campbell Industrial Park site.

We look forward to your further participation in the EIS process and your comments on the EIS. If you have questions regarding the project, please contact Mr. Melvin Lee at 527-5366.

Very truly yours,

Michael J. Chun
Director and Chief Engineer

CHAPTER XII

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CHAPTER XIII
COMMENTS AND RESPONSES ON THE ENVIRONMENTAL IMPACT STATEMENT

United States Department of Agriculture

Soil Conservation Service

P.O. Box 50004
Honolulu, Hawaii
96850

July 26, 1983

Mr. Michael M. McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. McElroy:

Subject: EIS for the Solid Waste Processing and Resource Recovery Facility - Campbell Industrial Park, Oahu

We have reviewed the subject environmental impact statement and have no comments to make.

Thank you for the opportunity to review this document.

Sincerely,

Francis C.H. Lum
FRANCIS C.H. LUM
State Conservationist

cc:
Department of Public Works, City & County of Honolulu
Belt, Collins and Associates

The Soil Conservation Service is an agency of the Department of Agriculture

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 10, 1983

R83-566

Mr. Francis C.H.Lum
State Conservationist
Soil Conservation Service
U.S. Department of Agriculture
P.O.Box 5004
Honolulu, Hawaii 96850

Dear Mr. Lum:

Subject: Environmental Impact Statement for the Proposed Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of July 26, 1983 to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 15TH AIR BASE WING (PACAF)

HICKAM AIR FORCE BASE, HAWAII 96853

14 JUL 1983

REPLY TO ATTN OF: DEEV (Mr Yamada, 449-1831)

SUBJECT: Environmental Impact Statement for the Solid Waste Processing and Resource Recovery Facility

TO: Ms Jacqueline Parnell, Director
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, HI 96813

1. This office has reviewed the subject EIS and has no comment relative to the proposed project.

2. We greatly appreciate your cooperative efforts in keeping the Air Force apprised of your project and thank you for the opportunity to review the document. The EIS is returned for your files.

for ROBERT M. OKAZAKI
Chief, Engrg & Envmtl Plng Div
Directorate of Civil Engineering

1 Atch
EIS

Cy to: Dept of Land Utilization wo Atch
City & County of Honolulu
650 S. King St, 7th Flr
Honolulu, HI 96813

Dept of Public Works wo Atch
City & County of Honolulu
650 S. King St, 11th Flr
Honolulu, HI 96813

Belt, Collins & Associates wo Atch
606 Coral Street
Honolulu, HI 96813

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 10, 1983

R83-566

Mr. Robert M. Okazaki
Chief, Engineering & Environmental
Planning Division
Directorate of Civil Engineering
Headquarters 15th Air Base Wing (PACAF)
Department of the Air Force
Hickam Air Force Base, Hawaii 96853

Attention: DEEV (Mr. Yamada)

Dear Mr. Okazaki:

Subject: Environmental Impact Statement for the Proposed Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of 14 July 1983 to the Office of Environmental Quality Control concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

Very truly yours,

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

August 3, 1983

Directorate of Facilities Engineering

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

The Environmental Impact Statement (EIS) for the Proposed Solid Waste Processing and Resource Recovery Facility, Campbell Industrial Park, Oahu, has been reviewed. If the proposed facility will result in the expansion of the Keehi Transfer Station at Shafter Flats and will require utilization of nearby Department of Army (DA) property, a formal request must be submitted to the Real Estate Division, Directorate of Facilities Engineering, US Army Support Command, Hawaii for timely consideration. The request should include a map delineating the required DA tracts.

Thank you for the opportunity to comment on the EIS. We support the efforts of the Department of Public Works, City and County of Honolulu in planning for the disposal of solid waste in an environmentally acceptable manner.

Sincerely,

Signed by

R. C. Brenneman
Acting Director of Facilities
Engineering

Copies Furnished:
Department of Public Works
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Belt, Collins and Associates
606 Coral Street
Honolulu, Hawaii 96813

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

16 August, 1983

R83-573

Mr. R.C. Brenneman
Acting Director of Facilities Engineering
Department of the Army
Headquarters, U.S. Army Support Command, Hawaii
Fort Shafter, Hawaii 96858

Attention: Directorate of Facilities Engineering

Dear Mr. Brenneman:

Subject: Environmental Impact Statement for the Proposed
<u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your letter dated August 3, 1983 to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

As indicated in the EIS, integration of the proposed resource recovery facility into the City's solid waste disposal system would probably result in an increase in the amount of refuse passing through the Keehi Transfer Station. However, adequate space is available on the existing site to accommodate the increased tonnage. Hence, no expansion into adjoining Department of the Army property is envisioned at this time. Should this land become surplus to the Army's needs, however, we would greatly appreciate an opportunity to discuss with you its possible acquisition by the City for other uses.

If you have any questions, please contact Mr. Melvin Lee of the Refuse Division at 527-5366.

Very truly yours,

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

8304193

DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT SHAFTER HAWAII 96858

July 29, 1983

ENV'L
Refuse

REC'D
DEPT OF PUBLIC WORKS
AUG 2 2 24 PM '83

Dr. Michael Chun, Director
Department of Public Works
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dear Dr. Chun:

Thank you for the opportunity to review the environmental impact statment for Solid Waste Processing and Resource Recovery Facility.

Based on our review, we offer no comments in addition to our letter dated April 6, 1983 regarding Department of the Army requirements and the floodplain management.

Sincerely,

Kisuk Cheung
Chief, Engineering Division

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU HAWAII 96813

August 16, 1983

R83-573

Mr. Kisuk Cheung, Chief
Engineering Division
Pacific Ocean Division
Corps of Engineers
U.S. Department of the Army
Fort Shafter, Hawaii 96858

Dear Mr. Cheung:

Subject: Environmental Impact Statement for the Proposed Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of July 29, 1983 concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

Your comments refer to the Corps' letter dated April 6, 1983 regarding the EIS Preparation Notice for the project. It states that "a Department of the Army permit will not [emphasis added] be required". However, as discussed in Section 4.3.4 of the draft EIS, the use of a single-pass seawater cooling system is among the options under consideration, and it is our understanding that a Corps permit will be needed if this cooling option is used. This requirement is stated in Section 4.3.4.3, in the "List of Necessary Approvals" on page IX-1, in Section 6.2 "Summary of Unresolved Issues", and elsewhere in the report.

Preliminary analyses of possible seawater intake/discharge configurations conducted to date indicate that the concept can be implemented without significant adverse impacts on the marine environment. More detailed investigations will be commissioned if the winning bidder decides to pursue this alternative. If these investigations identify unexpected adverse effects which cannot be adequately mitigated, other cooling options would be used.

If you have any additional comments or questions, please call Mr. Melvin Lee of my staff at 527-5366.

Very truly yours,

for Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

HEADQUARTERS
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR HAWAII 96860

IN REPLY REFER TO:
002:09P2:jam
Ser 1690

3 AUG 1983

Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Environmental Impact Statement
for the Proposed Solid Waste Processing Resource
Recovery Facility (7/1/83)

The Subject EIS, forwarded by the Environmental Quality Commission on 6 July 1983, has been reviewed. Objections have been raised on obstruction to the navigable airspace, a category of environmental impact not considered in this EIS. These concerns have been expressed to Mayor Eileen Anderson and the Navy Representative, Western-Pacific Region of the Federal Aviation Administration (FAA) because of problems posed for the Naval Air Station Barbers Point by the proposed facility at Campbell Industrial Park.

Prior U. S. Navy comments of 24 March and 7 April 1983, published on Pages XI-12 and 13 of the EIS, pertain only to the EIS Preparation Notice in which the proposed new height for the stack was not discussed. The current request from the Director and Chief Engineer of the Department of Public Works is for 290 feet. Any height which is in excess of the existing 203 feet Pacific Resources, Inc. stack, will pose an extra hazard to air navigation. Therefore, the following comments are submitted:

a. The height of the facility stack estimate appears to have changed. In the EIS it is given on Page IV-65 as 250 to 300 feet but is discussed under the heading of "Visual Impacts".

b. The issue should be considered in the EIS under the heading of "Air Navigation Impact" (a new category) and also cited under the existing "Unresolved Issues" (VI-5).

c. Such a stack height would not only affect navigation patterns for military aircraft from the Naval Air Station, but also civilian aircraft when the station is used as an alternative to Honolulu International Airport during inclement weather.

Objection has been made in letter of 15 July 1983 from the Commanding Officer, Naval Air Station, Barbers Point, to the Navy Representative, Western-Pacific Region, FAA as follows:

002:09P2:jam
Ser 1690

"In accordance with reference (c), all standard instrument approach minimums for NAS Barbers Point will increase by the additional height over existing obstructions. For example, the TACAN 1 to Runway 4R straight in approach would increase the MDA to 500 feet vice 480 feet and visibility requirements would increase by one-fourth mile. For category C aircraft, this would exceed the MDA's of similar approaches to Honolulu International Airport for which NAS Barbers Point is the primary alternate. Additionally, the proposed obstruction would be a hazard to the normal left traffic pattern for helicopters and small fixed-wing aircrafts using 4L and the right hand pattern for 11, since their pattern altitudes are 500 and 800 feet, respectively."

The remainder of the EIS appears to be comprehensive and well written, and it is hoped that the stack height problem can be resolved at an early date.

Sincerely,

[illegible] U.S. Navy
Chief of Staff

Copy to:
Department of Public Works
City and County of Honolulu
Belt, Collins and Associates
Environmental Quality Commission

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 18, 1983 R83-593

Captain B.W. Cloud, USN
Chief of Staff
Headquarters
Naval Base Pearl Harbor
Box 110
Pearl Harbor, Hawaii 96860

Dear Captain Cloud:

Subject: Environmental Impact Statement for the Proposed
<u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your August 2, 1983 letter (reference 002:09P2:jam/Ser 1690) to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

Your concern over the proposed resource recovery facility's possible interference with flight operations at the Barbers Point Naval Air Station is understandable. Until shortly before the EIS was issued, it was believed that the height of the stack at the proposed facility would be 200 feet or less. This is below the height at which possible interference with air navigation might be expected. However, results of air quality modeling indicated that it might be advisable to raise the stack height.

As a result of this decision, the City applied to the Federal Aviation Administration for permission to erect a stack up to 290 feet high. This new height is mentioned in the "Visual Impacts" section of the EIS, but no discussion of potential effects on air navigation was incorporated in the document.

As defined in Subpart 77-C of the FAA Regulations, a 290 foot high stack constitutes an "obstruction", and the agency is currently conducting an aeronautical study to determine whether it would be a "hazard to air navigation". Its decision on this matter is expected shortly.

A new section ((4.12) is included in the Revised EIS discussing "Impacts on Air Navigation". In addition, the stack height and its potential effects on air navigation have been noted as "unresolved issues" in Section 6.2 of the EIS.

Thank you again for your comments. If you desire to discuss the matter further at this time, please contact Mr. Melvin Lee of the Refuse Division at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA MOANA BOULEVARD
P. O. BOX 50167
HONOLULU, HAWAII 96850

ES
Room 6307

JUL 19 1983

Mr. Michael M. McEnroy
Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McEnroy:

The Service has reviewed the Environmental Impact Statement (EIS) which was forwarded to us with the Environmental Quality Commission's letter of July 6, 1983 concerning the Solid Waste Processing and Resource Recovery Facility at Campbell Industrial Park, Oahu. Service concerns regarding endangered species and impacts on the marine biota have been addressed in the EIS. We offer the following additional comments:

1. It appears that the EIS proposal to honor the 1000 foot setback from the roadway (4.4.1.3) will provide adequate protection for the Achyranthes and the Myoporum species cited. However, if a seawater coolant pipeline is to be constructed, its routing should be carefully selected. The strip to be affected by the placement of such a pipeline should be thoroughly surveyed to insure that the referenced plants are not adversely affected. Placement near the C. Brewer boundary line would most likely not affect the plants in any way.

2. No listed, proposed, or candidate endangered or threatened species of animals would be affected by the project.

3. Section 4.4.1.2. incorrectly states that Achyranthes splendens var. rotundata is a "proposed" species. It was proposed as an endangered species on June 7, 1976, but was subsequently withdrawn in accordance with the 1978 amendments to the Endangered Species Act. It is now a candidate endangered species.

4. Section 4.4.1.3 (last paragraph). We are unaware of any ongoing dialog with anyone concerning this project as is stated in this section. However, the comments in item 1, above, should be considered as the formal determination of the U. S. Fish and Wildlife Service.

5. If seawater intake or discharge pipelines are to be constructed, we recommend coordinating construction with the National Marine Fisheries Service. The pipeline should be aligned to avoid areas of high coral cover.

6. Should blasting be proposed for ocean outfall construction, formal consultation with the National Marine Fisheries Service will be required under the Endangered Species Act. We recommend that preblast surveys be conducted to determine if endangered or threatened species such as the Green Sea Turtle (Mydas chelonia) or Humpback Whale (Megaptera novaeangliae) are present in the critical blast area. Small directed charges should be used and detonation should not occur until all such animals have cleared the area.

We appreciate this opportunity to comment.

Sincerely yours,

William R. Kramer
Acting Project Leader
Office of Environmental Services

cc: NMFS - WPPO
HDAR
HDF&W
EPA, San Francisco
City Department of Public Works
Belt, Collins and Associates

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

August 16, 1983 R83-573

Mr. William R. Kramer
Acting Project Leader
Office of Environmental Services
Fish and Wildlife Service
United States Department of the Interior
P.O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Kramer:

Subject: Environmental Impact Statement for the Proposed
<u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your letter of July 19, 1983 (Reference ES/Room 6307) addressed to the Department of Land Utilization regarding the Environmental Impact Statement for the proposed Resource Recovery Facility. We appreciate the time spent by you and other members of the Fish and Wildlife Service reviewing the document, and are pleased that it addressed the Service's concerns. Following are responses to the additional comments contained in your letter.

(1) As stated in the EIS, the City intends to utilize a parcel whose makai boundary is more than one thousand feet from the coastal roadway (an extension of Kaomi Loop). It is our understanding that this will provide adequate protection for the <u>Achyranthes</u> and <u>Myoporum</u> species cited.

At this time, there is still a possibility that seawater cooling will be used, and this will require the construction of at least one, and possibly two, coolant pipelines between the ocean and the facility. The exact routing has not been determined as yet, but a corridor utilizing the existing easement adjacent to the Standard Oil Company refinery and the C.Brewer property would meet the needs of the facility while avoiding significant impacts on the plants.

(2) Your statement that no listed, proposed, or candidate endangered species of animals would be affected by the project confirms our own assessment.

(3) The portion of Section 4.4.1.2 cited in your letter is a quotation from a study conducted in 1979/80 for the HPOWER project. At that time, <u>Achyranthes</u> was, as noted in your letter, a "proposed" endangered species, and I believe the quote was accurate.

However, the discussion would be clearer with a notation to the effect that its nomination was subsequently withdrawn and it is now only a candidate endangered species. This information will be included in the Revised EIS.

(4) In addition to the Environmental Impact Statement Preparation Notice transmitted to the Fish and Wildlife Service by the City, the consultants preparing the EIS have spoken informally to members of the Service on several occasions. These contacts were the basis for the assertion that "...discussions are continuing..." contained in the last paragraph of Section 4.4.1.3. We did not intend to mislead readers of the EIS, and the Revised EIS will replace this paragraph with a reference to the formal determination made under Item 1 of your letter.

(5) Because of the preliminary nature of plans for an ocean water cooling system, only a reconnaissance survey of possible pipeline alignments has been made to date. Results of that survey suggest that the impacts of pipeline construction and operation would be minimal, but further studies will be required to confirm this and to select the best design. If a decision is made to pursue ocean water cooling, the National Marine Fisheries Service will be contacted to obtain their recommendations regarding the design and construction of the underwater portion of the pipeline.

(6) Should ocean water cooling be utilized, it is likely that some underwater blasting would be required. As noted above, environmental surveys along the pipeline route would be conducted during the design process, and appropriate measures incorporated in the construction plans.

Thank you again for your thoughtful review of the EIS. The City expects to authorize offerors to prepare their price bids following final review of the EIS by the City. The current timetable calls for this authorization to be issued by September. The price bids themselves, which would contain more detailed information regarding the proposed cooling systems, are due at the end of this year. The contract would be awarded shortly thereafter.

If you have any additional comments, please call Mr. Melvin Lee of my staff at 527-5366.

Sincerely,

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

United States Department of the Interior

GEOLOGICAL SURVEY
Water Resources Division
P.O. Box 50166
Honolulu, Hawaii 96850

July 15, 1983

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

Our staff has reviewed the EIS on "Solid Waste Processing and Resource Recovery Facility, Campbell Industrial Park, Oahu", and has no additional comments. The EIS is very comprehensive and well written.

Thank you for the opportunity to review the document, and as requested, we are returning it to the Environmental Quality Commission.

Sincerely,

Reuben Lee
Acting District Chief

cc: Department of Public Works
Belt, Collins and Associates
Environmental Quality Commission

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

August 10, 1983

R83-566

Mr. Reuben Lee
Acting District Chief
Water Resources Division
Geological Survey
U.S. Department of the Interior
P.O. Box 50166
Honolulu, Hawaii 96850

Dear Mr. Lee:

Subject: **Environmental Impact Statement for the Proposed** **Solid Waste Processing and Resource Recovery Facility**

Thank you for your letter of 15 July 1983 to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document. We are pleased that you found the EIS to be comprehensive and well written.

Very truly yours,

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

Michael Chun

U.S. Department of Transportation
Federal Aviation Administration

83-03952

AIRPORTS DISTRICT OFFICE
P.O. BOX 50244
HONOLULU, HAWAII 96850
Telephone: (808) 546-7129

JUL 26 1983

ENVU
Refuse

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

This is in regard to the Environmental Impact Statement for the proposed Honolulu Solid Waste Processing and Recovery Facility which was forwarded to us by City Department of Public Works' letter R 83-490 dated July 7, 1983.

We note by the City Department of Public Works' July 1, 1983, response to NAS Barbers Point on the EIS preparation notice that a Form 7460-1, Notice of Proposed Construction or Alteration has been filed with the FAA. We confirmed with the Regional Headquarters in Los Angeles that an aeronautical study of this proposal is underway and that an airspace determination is expected to be made shortly. This will cover our interest and concern on this proposed facility.

Thank you for the opportunity to review and comment on this document. The document is returned herewith as requested.

Sincerely,

David Yokoyama
DAVID S. YOKOYAMA
Planning Engineer

James M. Cox
Airports District Office Manager

Enclosure

cc:
Michael Chun, Director
and Chief Engineer

'83 JUL 27 PM 2 21

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

August 10, 1983

R83-566

Mr. David Yokoyama
Planning Engineer
Airports District Office
Federal Aviation Administration
P.O. Box 50244
Honolulu, Hawaii 96850

Dear Mr. Yokoyama:

Subject: Environmental Impact Statement for the Proposed
Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of July 20, 1983 to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

As you noted, a form 7460-1, "Notice of Proposed Construction or Alteration of Airspace", has been filed and is currently under examination by the FAA Regional Headquarters in Los Angeles. It is our understanding that the airspace determination made in response to this application will cover the FAA's interest and concern in the proposed resource recovery facility.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

U.S. Department of Transportation
United States Coast Guard

Commander (dpl)
Fourteenth Coast Guard District

Prince Kalanianaole Federal Building
300 Ala Moana Blvd.
Honolulu, Hawaii 96850
Phone: 546-2861

11000
Serial 563
18 July 1983

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Sir:

The Fourteenth Coast Guard District has reviewed the Environmental Impact Statement for the solid waste processing and resource recovery facility at Campbell Industrial Park, Oahu, and has no objection or constructive comments to offer at the present time.

Sincerely,

J. E. SCHWARTZ
Commander, U. S. Coast Guard
District Planning Officer
By direction of
Commander, Fourteenth Coast Guard District

Copy: Department of Public Works
Belt, Collins and Associates

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

10 August, 1983

R83-566

Commander J.E. Schwartz
District Planning Officer
Fourteenth Coast Guard District
United States Coast Guard
Prince Kalanianaole Federal Building
300 Ala Moana Boulevard
Honolulu, Hawaii 96850

Dear Commander Schwartz:

Subject: Environmental Impact Statement for the Proposed Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of 18 July 1983 to the Department of Land Utilization (Reference 11000/Serial 563) concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

Very truly yours,

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

R 83-490

HONOLULU, HAWAII

JUL 1983

July 7, 1983

FEDERAL COMMUNICATIONS COMMISSION

Federal Communications Commission
Prince Kuhio Federal Building
300 Ala Moana Blvd.
Box 50023
Honolulu, Hawaii 96850

Gentlemen:

Subject: Environmental Impact Statement for the Proposed Honolulu Solid Waste Processing and Resource Recovery Facility

Attached for your review is an Environmental Impact Statement (EIS) that was prepared pursuant to Chapter 343, Hawaii Revised Statutes and the Rules and Regulations of the Environmental Quality Commission:

Title:	Honolulu Solid Waste Processing and Resource Recovery Facility
Location:	Campbell Industrial Park, Oahu
Classification:	Agency Action

Your comments or acknowledgment of no comments on the EIS are welcomed. Please submit your reply to the accepting authority or approving agency:

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Please send a copy of your reply to this office. Your comments must be received or postmarked by August 8, 1983. If you have no further use for this EIS, please return it to us. Thank you for your participation in the EIS process.

Very truly yours,

MICHAEL J. CHUN
Director and Chief Engineer

Attachment
cc: DLU
BCA
FOC

No comments
Jack Shedletsky Engineer in Charge, FCC
Box 50023 Honolulu, HI 96850

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 10, 1983

R83-566

Mr. Jack Shedletsky
Engineer in Charge
Federal Communications Commission
Box 50023
Honolulu, Hawaii 96850

Dear Mr. Shedletsky:

Subject: Environmental Impact Statement for the Proposed Solid Waste Processing and Resource Recovery Facility

Thank you for your note concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

Very truly yours,

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

(P)1615.3

JUL 20 1983

Mr. Michael McElroy
Director
Department of Land
  Utilization
City & County of Honolulu
Honolulu, Hawaii

Dear Mr. McElroy:

Subject: Solid Waste Processing and
Resource Recovery Facility
Campbell Industrial Park, Oahu
Environmental Impact Statement (EIS)

We have reviewed the subject EIS and have no comments to offer. Thank you for the opportunity to review the EIS.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

HI:jl
cc: Department of Public Works
Belt, Collins and Associates

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 10, 1983

R83-566

Mr. Hideo Murakami
State Comptroller
Department of Accounting and
  General Services
P.O. Box 119
Honolulu, Hawaii 96810

Attention: Division of Public Works

Dear Mr. Murakami:

Subject: Environmental Impact Statement for the Proposed
Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of July 20, 1983 [Reference (P) 1615.3] to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

GEORGE R. ARIYOSHI
GOVERNOR

JACK K. SUWA
CHAIRMAN, BOARD OF AGRICULTURE

SUZANNE D. PETERSON
DEPUTY TO THE CHAIRMAN

RECEIVED
JUL 20 1983
BELT, COLLINS & ASSOCIATES

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
Honolulu, Hawaii 96814

Mailing Address:
P. O. Box 22159
Honolulu, Hawaii 96822

July 18, 1983

MEMORANDUM

To: Department of Land Utilization
City and County of Honolulu

Subject: Draft Environmental Impact Statement
Solid Waste Processing and Resource Recovery
Facility

The Department of Agriculture has reviewed the subject statement and offers the following comments.

Of the two concerns raised in our memorandum of comment on the Preparation notice (April 4, 1983), the impact on agriculture in the Pearl Harbor Ground Water Control Area has been partially addressed. Of the two alternative facilities considered, the one proposed by C-E/Amfac would consume an estimated 0.8 million gallons per day (net) of groundwater supplied from the Oahu Sugar Company's irrigation system, probably requiring a reduction in use of irrigation water. Page VI-2 states, "it is believed that these changes can be made without significant adverse effect." However, neither the amount of acreage nor the location of fields to be withdrawn from sugarcane cultivation is specified. These impacts of the project's requirement for reduced irrigation water usage should be discussed.

We must take exception to the statement on page VI-5 that matters such as water system approvals "are not truly 'issues' at this point since there is little or no contention over them." On the contrary, from an agricultural standpoint there is a significant difference between the two project proposals which should be kept in mind before and during the contract approval process. As stated, the C-E/Amfac proposal would consume 0.8 MGD (net) of irrigation water for cooling, while the Wheelabrator-Frye proposal would use either an ocean water or an air cooling system. In view of the groundwater control situation in the project area, choice of facility design will make a significant difference as to whether or not a trade-off with agriculture has to be made at the time of water system approval.

"Support Hawaiian Agricultural Products"

Regarding the other concern raised in our memorandum of April 4, 1983, we have not been able to find any discussion on the potential for utilization of biomass (particularly sugarcane or cane byproducts) by the proposed facility. The economics of burning biomass from the surrounding sugarcane plantation should be considered in terms of its impacts on both the facility itself as well as Oahu Sugar Company.

Thank you for the opportunity to comment.

Jack K. Suwa

JACK K. SUWA
Chairman, Board of Agriculture

cc: Department of Public Works,
City and County of Honolulu
√ Belt, Collins and Associates
Department of Land and Natural Resources

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 16, 1983 R83-573

Mr. Jack K. Suwa, Chairman
Board of Agriculture
Department of Agriculture
State of Hawaii
1428 South King Street
Honolulu 96814

Dear Mr. Suwa:

Environmental Impact Statement for the Proposed
Solid Waste Processing and Resource Recovery Facility

Thank you for your memorandum of July 13, 1983 addressed to the Department of Land Utilization regarding the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document. Your comments focus on two issues which were also raised in your April 4, 1983 memorandum on the subject, and these are discussed separately below.

Effect of Water Use on Agriculture

At the time the EIS was written, C-E/Amfac's plans were to use marginally brackish water from the Oahu Sugar Company (OSCO) irrigation system for cooling. These plans were subsequently revised, and it is now the consortium's intention to utilize on-site wells drawing water from the surficial limestone aquifer for this purpose. Approximately 1.7 million gallons per day (MGD) of water would be withdrawn, and an average of 0.6 MGD would be reinjected via an on-site well. The remainder (approximately one MGD) would evaporate from the cooling tower.

The water that would be used for cooling is brackish to saline, and is subject to localized pollution from industrial and agricultural sources. It is not a potential source for uses where quality is a significant factor, and it is hydrologically separated from the good quality water found in the basalt aquifer which underlies the site at depth (see Section 4.1 of the EIS for a brief description of the geology). Because of this, the cooling system as now proposed would not adversely affect the island's water resources or agriculture. Approval will be required under the State Department of Land and Natural Resources Ground Water Control Area Regulations, but there is reason to believe that the use is consistent with Departmental policy.

Biomass Utilization

According to representatives of the Oahu Sugar Company, essentially all of the bagasse and cane trash produced by the Waipahu Sugar Mill (which processes all of the sugarcane grown in Ewa) is already being used by the company to generate electricity. Hence, there is virtually no potential for the utilization of bagasse or other cane by-products as a fuel at the proposed resource recovery facility. Furthermore, there is little likelihood that other biomass fuels could be grown economically on land not used for sugar. For these reasons, no discussion of biomass use was included in the EIS.

As you may know, C-E/Amfac's proposal for the HPOWER project (the current proposal's predecessor) did involve the combustion of approximately 120 tons per day of cane trash from the Oahu Sugar Company's Waipahu Sugar Mill together with the municipal solid waste. At that time the cane trash was being separated from the remainder of the sugarcane and trucked from the mill to a fill area on the Waipio Peninsula. Since then OSCO has invested approximately $900,000 in a new trash recovery system. As a result of this improvement, nearly all of the organic material delivered to the mill is now burned to generate electricity for the plantation.

Thank you again for your comments. Please be assured that the City shares your concern for the preservation of agriculture on Oahu. Should C-E/Amfac be awarded the contract for the resource recovery facility on the basis of a proposal which involves the use of groundwater, it will be necessary for it to obtain a permit from the State Department of Land and Natural Resources (DLNR) under the provisions of Title 13, Chapter 166. At that time, more detailed plans will be available, and it will be incumbent upon C-E/Amfac to demonstrate that its proposal will result in the most beneficial use of groundwater in the Pearl Harbor Ground Water Control Area. Should DLNR determine that the proposed cooling water use would adversely affect agriculture, it may refuse the permit.

Very truly yours,

for Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

State of Hawaii
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 Diamond Head Road
Honolulu, Hawaii 96816

HIENG

16 JUL 1983

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

Solid Waste Processing and Resource Recovery Facility

Thank you for providing us the opportunity to review the proposed project, "Solid Waste Processing and Resource Recovery" facility Environmental Impact Statement.

We have completed our review and have no comments to offer at this time.

Yours truly,

JERRY M. MATSUDA
Major, HANG
Contr & Engr Officer

cc: Dept of Public Works
Belt, Collins & Assoc
Env Quality Comm w/EIS

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 10, 1983

R83-566

Major Jerry M. Matsuda
Contracting and Engineering Officer
Office of the Adjutant General
Department of Defense
State of Hawaii
3949 Diamond Head Road
Honolulu, Hawaii 96816

Dear Major Matsuda:

Subject: Environmental Impact Statement for the Proposed <u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your letter of 16 July, 1983 to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

Very truly yours,

Michael J. Chun
Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

CHARLES G. CLARK
DIRECTOR OF HEALTH

In reply, please refer to:
File: EPHS-SS

August 9, 1983

MEMORANDUM

To: Mr. Michael McElroy, Director of Land Utilization
City & County of Honolulu

From: Deputy Director for Environmental Health

Subject: Environmental Impact Statement (EIS) for Solid Waste Processing and Resource Recovery Facility, Campbell Industrial Park, Oahu

Thank you for allowing us to review and comment on the subject EIS. On the basis that the project will comply with all applicable Administrative Rules, please be informed that we do not have any objections to this project.

We submit the following comments for your information and consideration:

1. The EIS should have noted that the resource recovery facility must also comply with the visible emission restriction of 20% opacity (Administrative Rules, Title 11, Chapter 60, Section 11-60-24).

2. As stated, the facility will require a variance from the State ambient air quality standard for sulfur dioxide. A variance shall not be granted if the source impacts the national ambient air quality standard (Administrative Rules, Title 11, Chapter 60, Section 11-60-36).

3. For planning purposes, the City should be fully aware of the pre-construction monitoring requirements due to the probability of exceedances to the PSD "de minimus" levels for sulfur dioxide and nitrogen dioxide in high terrain.

4. The future expansion of the facility from 1,800 TPD to 2,400 TPD may not be possible if industrial growth in the area further impacts the ambient air quality.

5. A section should present briefly the major source parameters and assumptions used in the model. This should indicate whether the modeling results are conservative or not.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

Melvin K. Koizumi
MELVIN K. KOIZUMI

cc: Dept. of Public Works
Belt, Collins & Associates ✓

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 18, 1983 R83-593

Mr. Melvin K. Koizumi
Deputy Director for Environmental Health
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Koizumi:

Subject: Environmental Impact Statement for the Proposed Solid Waste Processing and Resource Recovery Facility

Thank you for your August 9, 1983 memorandum to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document. Item-by-item responses to your comments are presented below:

(1) Opacity Limits

The Revised EIS will note that the resource recovery facility must comply with the visible emissions restriction of 20 percent opacity specified in Section 11-60-24 of Chapter 60, Administrative Rules. The facility should have no difficulty complying with that requirement since the principal particulate emitting point sources will be equipped with high-efficiency electrostatic precipitators or baghouses.

(2) State Ambient Air Quality Standard Variance

The need for a variance from the state ambient air quality standard for sulfur dioxide is recognized in the Section 4.11 of the EIS. The City is aware of the fact that a variance will not be granted unless it can be demonstrated that national ambient air quality standards can be met. As discussed in Section 4.11.6 of the EIS, it is our belief that this can be done.

(3) "De Minimus Levels"

The last paragraph on page IV-132 of the draft EIS specifically states:

> Estimates of individual ambient impact indicated that Wheelabrator Frye would exceed the PSD "de minimus" levels for lead and fluorides in both high and low terrain. Both proposals appear to exceed the "de minimus" levels for sulfur dioxide and nitrogen dioxide in high terrain. If emissions are not reduced by the time a PSD application is submitted, then EPA will require up to one year of pre-construction monitoring for those pollutants.

(4) Expansion

The City understands that expansion of the proposed facility from 1,800 to 2,400 tons per day will require reevaluation of existing and projected ambient air quality. It is also aware that other development occuring in the interim could impact on its ability to obtain the necessary air quality permits.

(5) Source Parameters

A description of the major source parameters used in the various air quality models will be included in the Revised EIS.

Thank you again for your careful review of the draft EIS. If you have any additional questions or comments, please contact Melvin Lee of the Refuse Division at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

GEORGE R. ARIYOSHI
GOVERNOR

JOSHUA C. AGSALUD
DIRECTOR

ROBERT C. GILKEY
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS
825 MILILANI STREET
HONOLULU, HAWAII 96813

83-03997

ENVUL
[handwritten initials]

RECEIVED
DEPT OF PUBLIC WORKS
JUL 25 2 10 PM '83

July 19, 1983

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

Thank you for the opportunity to comment on the Environmental Impact Statement for the proposed Solid Waste Processing and Resource Recovery Facility.

We have focused on Section 4.9.6, "Impact on the O'ahu Economy," especially on the discussion on employment in the construction and operational phases of the facility. Our only comment refers to the estimate that 25 construction jobs are supported by each million dollar increase in construction spending (p. IV-83). This number seems high if just construction jobs is meant. We refer to the 1982 publication, "Hawaii Construction Model, Further Developments," published by the Hawaii Department of Planning and Economic Development (which is included in the EIS list of references). Information therein indicates that nationally 9-12 construction jobs are created per million dollars of expenditures, depending upon the type of structure. However, an additional 12-14 non-construction jobs are supported by each million dollars, thus yielding a total of approximately 25 jobs. Clarification on this point would be appreciated.

Thank you for your attention. We hope our comment will be of assistance.

Very truly yours,

Joshua C. Agsalud
Director of Labor and
Industrial Relations

cc: Michael J. Chun, Director
Department of Public Works

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 10, 1983

R83-566

Mr. Joshua C. Agsalud, Director
Department of Labor & Industrial Relations
State of Hawaii
825 Mililani Street
Honolulu, Hawaii 96813

Dear Mr. Agsalud:

Subject: Environmental Impact Statement for the Proposed
Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of July 19, 1983 to the Department of Land Utilization concerning the environmental impact statement (EIS) for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

As noted in your letter, the EIS incorrectly states that each million dollar increase in construction spending supports 25 jobs in the construction industry. In fact, the Department of Planning and Economic Development's model of the construction industry suggests that construction employment resulting from the expenditure of a million dollars would be slightly less than half that amount. Only if both direct construction employment and the indirect and induced employment generated as construction expenditures work their way through the economy are taken into account is the employment impact 25 jobs per $1 million. To correct this error, the last paragraph in Section 4.9.8.1 will be revised to read as follows:

> In terms of jobs, each million dollar increase in annual construction spending supports from 11 to 12 jobs in the construction industry. In addition, from 12 to 14 non-construction jobs are created. Hence, the total employment impact of $1 million dollars in construction expenditures is approximately 25 jobs. Based on a two-year facility construction period, the solid waste processing and resource recovery facility would generate about 260 construction jobs (520 person-years). Non-construction employment would be increased by approximately 280 workers as a result of these expenditures, for a total of 540 jobs. The Hawaii Construction Model is believed to provide the most accurate estimate of

construction employment impacts possible with the data now readily available. However, the employment multipliers contained in it are based on industry-wide averages. Because of the specialized nature of the resource recovery facility, actual direct and indirect construction employment could differ substantially from the levels estimated using the model.

We hope the changes that have been made are satisfactory. If you have any questions or further comments, please contact Mr. Melvin Lee of the Refuse Division at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

GEORGE R. ARIYOSHI
Governor
Kent M. Keith
Director
FRANK SKRIVANEK
Deputy Director

August 4, 1983

Ref. No. 7843

COPY

Mr. Michael M. McElroy
Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Subject: Draft Environmental Impact Statement for the Proposed Solid Waste Processing and Recovery Facility, Campbell Industrial Park, Oahu

We have reviewed the subject statement with respect to the objectives and policies of the Hawaii Coastal Zone Management Program and offer the following for your consideration.

The EIS adequately establishes the need and beneficial aspects of the proposed facility. In this regard, we are fully supportive of this effort for its contributions to energy self-sufficiency, renewable energy resources, and the attendant reductions in the need for future landfills.

The only major area of concern relative to the EIS is the proposed ocean intake and outfall which would be required in one of the alternatives. We understand that the need for and specific locations of the proposed ocean intake and outfall have yet to be determined. Should this cooling method be selected, additional assessment of temperature and salinity differentials, worst case zones of mixing, marine ecosystem impacts and potential mitigating measures would be needed. We recognize that limited information has been available for the purposes of this assessment and trust that it would be available for subsequent permit reviews.

As a final note, the list of approvals in Chapter IX should also include Federal consistency review and certification by this department which would be required in conjunction with the U.S. Army Corps of Engineers permit for the proposed intake/outfall cooling system.

Thank you for this opportunity to comment.

Very truly yours,

Kent M. Keith

Kent M. Keith

cc: Department of Public Works
City and County of Honolulu
✓Belt, Collins and Associates

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 16, 1983

R83-573

Mr. Kent M. Keith, Director
Department of Planning & Economic Development
State of Hawaii
250 South King Street
Honolulu, Hawaii 96813

Dear Mr. Keith:

Subject: Environmental Impact Statement for the Proposed <u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your August 4, 1983 letter (Ref. No. 7843) to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document and for your expression of support. We believe that the resource recovery facility can contribute significantly to the State's energy self-sufficiency and utilization of renewable energy resources. At the same time, it will greatly reduce the need for additional landfill space on the island.

Your concern about potential effects of an ocean intake/outfall is understandable. As indicated in the EIS, use of ocean water to cool the steam condensers is only one of several options under consideration, but it possesses several attributes which make it desirable from an operational standpoint. Other alternatives being examined include air cooling and use of saline groundwater.

A preliminary study of potential intake/outfall impacts conducted for the City by marine biologist Steven Dollar (see attached), concluded:

> At Campbell Industrial Park, structure and bathymetry of the reef indicate that a discharge/intake system would probably terminate beyond the wave break zone at a depth of approximately 10 meters. Since this area is presently devoid of corals and other invertebrates, no negative effects from either construction or thermal stress would be realized [as a result of the project]. If [as appears likely] this area is currently undergoing recolonization after damage caused by hurricane Iwa, recovery would not be impeded or prevented by the outfall structure except within a very narrow area where temperatures [of the seawater] might exceed two degrees centigrade above ambient. Inshore areas at Barbers Point presently

contain the highest coral cover. These would not be significantly or permanently altered by construction of the intake/discharge pipes.

While it is concluded that the resource recovery facility intake and discharge would not have a significant adverse effect, it is suggested that an environmental monitoring program be implemented if offshore pipelines are built. This program should be initiated prior to construction and then repeated during construction and after the plant is operating.

In view of Dollar's findings, the City has decided to wait until the contract for the project has been awarded before undertaking further marine studies. The information already available indicates that an environmentally acceptable in-take/outfall configuration can be designed, but it appears unwise to proceed with the detailed studies necessary to demonstrate this conclusively until it is certain that such a system will be used.

Use of ocean water for cooling will require approval by both the U.S. Army Corps of Engineers and the State Department of Land and Natural Resources. The environmental permitting procedures followed by these agencies will insure that the environmental effects (including temperature and salinity differentials, worst-case zones of mixing, marine ecosystems impact, and potential mitigating measures) receive proper review. If the more detailed investigations conducted during the permitting process identify unexpected adverse effects which cannot be adequately mitigated, this cooling alternative would not be used.

The Federal Coastal Zone Management (CZM) Program consistency review and certification by your department, which would be required in conjunction with the U.S. Army Corps of Engineers permit, also provides an opportunity for comprehensive review of the project's environmental effects. CZM certification will be added to the list of approvals contained in Chapter IX.

If you have any additional questions, please contact Mr. Melvin Lee of this Department at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission
Attachment

STP 8.9253

August 1, 1983

Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Environmental Impact Statement
Solid Waste Processing as Recovery Facility
Campbell Industrial Park, Oahu

Thank you for the opportunity to comment on the subject document.

The proposed action is not anticipated to adversely impact our existing and proposed programs for the area.

However, we note that no mention was made about the involvement of harbor facilities and we advise that the present development of Barbers Point Harbor does not envision any shoreside facilities for such use.

Very truly yours,

Ryokichi Higashionna
Director of Transportation

ALK:ko

cc: City and County of Honolulu
Dept. of Public Works
Belt, Collins, & Associates

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 10, 1983

R83-566

Mr. Ryokichi Higashionna, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Higashionna:

Subject: Environmental Impact Statement for the Proposed
Solid Waste Processing and Resource Recovery Facility

Thank you for your letter dated August 1, 1983 to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document. We are pleased to know that you do not expect the proposed project to adversely impact your department's existing or proposed programs for the area.

The possibility of transporting raw refuse via barge between Sand Island and the Hawaiian Electric Company's Waiau Power Plant was under consideration at the time the EIS Preparation Notice for the project was written. Subsequent action by the City Council eliminated both sites from consideration. Hence, operation of the proposed resource recovery facility would not involve the use of shoreside harbor facilities.

If you have any further questions or comments, please contact Mr. Melvin Lee in the Refuse Division at 527-5366.

Very truly yours,

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
550 HALEKAUWILA STREET
ROOM 301
HONOLULU, HAWAII 96813

Letitia Uyehara
Interim Director
TELEPHONE NO.
548-6915

August 9, 1983

Mr. Michael Chun, Director
Department of Public Works
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dear Mr. Chun:

Subject Draft EIS for the City and County of Honolulu Solid Waste Processing and Resource Recovery Facility, Campbell Industrial Park, Oah

We have reviewed your draft EIS and find that our concerns have been adequately addressed. Thank you for the opportunity to comment on your EIS.

Sincerely,

Tish

Letitia N. Uyehara
Interim Director

cc: Department of Land Utilization
✓Belt, Collins and Associates

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 16, 1983

R83-573

Ms. Letitia N. Uyehara
Interim Director
Office of Environmental Quality Control
State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Ms. Uyehara:

Subject: Environmental Impact Statement for the Proposed <u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your August 9, 1983 letter concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

If any questions regarding the project should arise in the future, please call Melvin Lee of the Refuse Division at 527-5366.

Very truly yours,

for Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

August 5, 1983

RE:0382

Mr. Michael M. McElroy
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Draft Environmental Impact Statement
Solid Waste Processing and Resource Recovery Facility
Campbell Industrial Park, Oahu

Thank you for the opportunity to review the above cited DEIS. Our Environmental Center review has been prepared with the assistance of George Curtis, Hawaii Natural Energy Institute/Joint Institute for Marine and Atmospheric Research; Charles Lamoureux, Botany; and Jacquelin Miller and Mark Ingoglia, Environmental Center. The following comments are offered for your consideration:

Terrestrial Biota

The DEIS appears to adequately address the probable impacts on the terrestrial biota, which in this area consists largely of introduced species with a few remnant native plants. The only species of particular concern are the two rare plants Myoporum sandwicense var. stellatum and Achyranthes splendens var. rotunda.

As the DEIS indicates, these two plants are known in this immediate vicinity only from an area outside the currently proposed project boundaries since the original boundaries were modified (page IV-29) in response to earlier comments.

Since the boundaries have been expanded, the only possibility of construction damage would be from makai "boundary spillover" of construction activities into the area occupied by Myoporum and Achyranthes. What sort of visual markers will be used to indicate to the many construction workers no materials should be deposited in these off limit boundaries? Will the crews be notified of the need to restrain spillover due to these two rare plants? Otherwise, the planners have made an excellent effort to give the needed space these rare plants require to survive.

Economics

When the final system cost data are available, the operating costs could be refigured using the new energy rate schedule proposed by HECO. This may prove to be more favorable for firm generation capacity.

There is a typographical error in capacity credit in the first paragraph on page IV-76. Estimated credit ($.6) should be (¢.6).

Yours truly,

Doak C. Cox
Director

cc: OEQC
Michael Chun, Department of Public Works
✓Belt, Collins and Associates
George Curtis
Charles Lamoureux
Jacquelin Miller
Mark Ingoglia

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 16, 1983

R83-573

Dr. Doak C. Cox, Director
Environmental Center
University of Hawaii at Manoa
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

Dear Dr. Cox:

Subject: Environmental Impact Statement for the Proposed
<u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your letter of August 5, 1983 to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time George Curtis, Charles Lamoureux, Jacquelin Miller, Mark Ingoglia, and you spent reviewing the document. Point-by-point responses to the comments are presented below.

<u>Terrestrial Biota</u>

Your concern for possible "spillover" of construction activities is well taken. However, we are confident that such effects can be prevented. Our confidence stems from the following:

- o As can be seen on Figures II-5 and II-8 in the EIS, the size and shape of the parcel provide adequate space on the Hanua Street side of the property for a construction staging area. In the unlikely event that additional area is required, the vacant area adjacent to the southern boundary of the project site would be used. This would prevent the "spillover" of construction activities onto land near the plants.

- o A buffer zone several hundred feet wide exists between the makai boundary of the site and the nearest <u>Myoporum</u> and <u>Achyranthes</u>.

- o No grading of the area makai of the project site will be undertaken. Hence, the existing scrub vegetation will remain intact. As suggested by the drawing presented in Figure II-9 of the EIS, this will provide a strong visual marker for construction workers. Further protection will be provided by the construction of a fence along this boundary of the facility prior to major site clearance.

<u>Economics</u>

The City's current procurement schedule calls for offerors to submit their price bids at the end of this year. These bids will be based on firm energy purchase contracts negotiated with the Hawaiian Electric Company. The energy purchase price may prove to be more or less favorable to the project than the hypothetical rates used for illustrative purposes in the EIS.

<u>Capacity Credit</u>

Thank you for calling our attention to the typographical error in the "capacity credit" figure reported on page IV-76 of the EIS. Instead of "($0.6)", it should read "($0.6 million per year)". The Revised EIS incorporates the correct number.

If you have any further questions or comments regarding the EIS or other aspects of the project, please call Mr. Melvin Lee of the Refuse Division at 527-5366.

Very truly yours,

for Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

University of Hawaii at Manoa

Hawaii Natural Energy Institute
Holmes Hall 246 • 2540 Dole Street • Honolulu, Hawaii 96822

83-04265

August 1, 1983

ENV U
Refuse

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

Subject: Environmental Impact Statement for the Proposed Honolulu Solid Waste Processing and Resource Recovery Facility

Staff of the Hawaii Natural Energy Institute (HNEI) has given a cursory review of the Resource Recovery EIS and has no substantive input or constructive comment to submit. The basic issues seem to be well addressed.

The concept of producing energy from municipal waste is strongly supported by HNEI as an alternate energy resource for contributing to energy self-sufficiency in Hawaii. The magnitude of the municipal waste generated on Oahu makes this a significant energy alternative. It is difficult to comprehend how either of the other options to solid waste recovery--landfilling or incineration without power generation--could continue to be considered as valid alternatives.

I strongly endorsed HPOWER and sincerely hope that the problems which blocked its implementation have been fully addressed and resolved, so that a Solid Waste Processing and Resource Recovery Facility will become a reality for Oahu in the very near future.

Sincerely yours,

John Shupe

John W. Shupe
Director

JWS:sy

cc: Dr. Michael J. Chun

Mike:

I'd like to keep the copy of the EIS for the HNEI library, unless you need it.

AN EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 16, 1983

R83-573

Dr. John W. Shupe, Director
Hawaii Natural Energy Institute
Holmes Hall 246
2540 Dole Street
Honolulu, Hawaii 96822

Dear Dr. Shupe:

Subject: Environmental Impact Statement for the Proposed Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of August 1, 1983 to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

The support expressed in your letter is encouraging. We share your belief that resource recovery is superior to the other solid waste disposal options that are available. Hence, we are anxious to see it implemented.

If you have any further comments or questions regarding the EIS or the proposed project, please call me at 523-4341 or Mel Lee of the Refuse Division at 527-5366.

Very truly yours,

for Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

University of Hawaii at Manoa

Water Resources Research Center
Holmes Hall 283 • 2540 Dole Street
Honolulu, Hawaii 96822

1 August 1983

Department of Land Utilization
City & County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: Environmental Impact Statement for the Proposed Solid Waste Processing Resource Recovery Facility, July 1983

We have reviewed the subject EIS and have no comment to offer. Thank you for the opportunity to comment.

This material was reviewed by WRRC personnel.

Sincerely,

Edwin T. Murabayashi

Edwin T. Murabayashi
EIS Coordinator

ETM:jm

cc: DPW, C & C
Belt, Collins & Associates

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

August 16, 1983

R83-573

Mr. Edwin T. Murabayashi
EIS Coordinator
Water Resources Research Center
University of Hawaii
Holmes Hall 283
2540 Dole Street
Honolulu, Hawaii 96822

Dear Mr. Murabayashi:

Subject: Environmental Impact Statement for the Proposed <u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your letter of August 1, 1983 to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

Very truly yours,

for Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

RECEIVED
AUG 3 1983
BELT, COLLINS & ASSOCIATES

July 29, 1983

TO: MICHAEL McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: KAZU HAYASHIDA, BOARD OF WATER SUPPLY

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY AT CAMPBELL INDUSTRIAL PARK

We have the following comments on the environmental document:

1. Page IV-21, 3rd Paragraph: The Board exports approximately 5.0 mgd to the Waianae Coast. The 3.6 mgd figure mentioned in the document should be corrected.

2. The proposed project will not infringe on water allocations reserved for future tenants of Campbell Industrial Park as the 200,000 gallons per day for this project is a commitment that we have reserved for your project from our own sources and not from Campbell's new Makakilo Well. The water distribution system within the industrial park is adequate to service your proposed project.

If you have any questions, please call Lawrence Whang at 527-6138.

Kazu Hayashida
KAZU HAYASHIDA
Manager and Chief Engineer

cc: Department of Public Works
Belt, Collins and Associates

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

August 10, 1983

R83-566

TO: KAZU HAYASHIDA,
MANAGER & CHIEF ENGINEER
BOARD OF WATER SUPPLY

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: COMMENTS ON ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum to the Department of Land Utilization dated July 29, 1983 regarding the environmental impact statement for the proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document. Responses to your two comments are as follows:

(1) The updated information regarding the Board of Water Supply's exports to the Waianae Coast is appreciated. The 3.6 MGD figure cited in the draft will be changed to 5.0 MGD in the Revised EIS.

(2) Thank you for confirming the commitment of up to 200,000 gallons of water per day from the Board of Water Supply's own wells. The Revised EIS will indicate that this commitment will not infringe on water allocations reserved for future tenants.

If you have any further questions or comments, please contact Mr. Melvin Lee in the Refuse Division at 527-5366.

Michael J. Chun
Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

PB 83-558

July 18, 1983

TO: MR. MICHAEL McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: ROY H. TANJI
DIRECTOR AND BUILDING SUPERINTENDENT

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT
SOLID WASTE PROCESSING AND RECOVERY FACILITY
CAMPBELL INDUSTRIAL PARK, OAHU

We have reviewed the subject EIS and have no comments.

Thank you for the opportunity to review the EIS.

Roy H. Tanji
ROY H. TANJI
Director and Building Superintendent

TH:jo
cc: J. Harada
Public Works Dept.
Belt, Collins and Assoc.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

August 10, 1983

R83-566

TO: MR. ROY H. TANJI
DIRECTOR AND BUILDING SUPERINTENDENT
BUILDING DEPARTMENT

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: COMMENTS ON ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED
SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum to the Department of Land Utilization dated July 18, 1983 (Reference PB 83-558) regarding the environmental impact statement for the proposed Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document.

Michael J. Chun
Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

DEPARTMENT OF GENERAL PLANNING

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

WILLARD T. CHOW
CHIEF PLANNING OFFICER

RALPH PORTMORE
DEPUTY CHIEF PLANNING OFFICER

DGP7/83-7434

August 2, 1983

MEMORANDUM

TO: Mr. Michael M. McElroy, Director
Department of Land Utilization

VIA: Mr. Andrew I. T. Chang, Managing Director

SUBJECT: Solid Waste Processing and Resource Recovery Facility--Campbell Industrial Park

Our comments are as follows:

The EIS as prepared may need to provide additional information in the form of a supplement, should Wheelabrator-Frye's winning bid utilize an ocean water intake and discharge for cooling purposes.

While brief descriptions of the cooling system and its offshore pipeline construction are presented, the precise route that is to be followed must still be determined.

Once the alignment is known, the discussion needs expansion on (1) the significant effects on the marine environment via the discharge of warm ocean water in the zone of mixing and (2) the extent of dredging required for pipeline channeling.

Should blasting be necessary, then the adverse effects on fish and marine biota and potential disruptions to onshore activities should be discussed.

Additionally, information may be needed on the heights and location of smoke stacks and their potential for interference with aircraft flight operations (small plane and commercial planes) at Barbers Point Naval Air Station.

Ralph Kawamoto

RALPH KAWAMOTO
Planner

APPROVED:

Ralph Portmore
for WILLARD T. CHOW

cc: DPW
✓Belt, Collins & Assoc.

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 16, 1983

R83-573

TO: MR. WILLARD T. CHOW, DIRECTOR
DEPARTMENT OF GENERAL PLANNING

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: COMMENTS ON ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum to the Department of Land Utilization dated August 2, 1983 (reference DGP7/83-7434) regarding the environmental impact statement for the proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document. Responses to your individual comments are presented below.

Use of Ocean Water for Cooling

As indicated in the EIS, use of ocean water to cool the steam condensers is only one of several options under consideration. Others include air cooling and use of saline groundwater. A preliminary study conducted for the City by marine biologist Steven Dollar (see attached), concluded:

> At Campbell Industrial Park, structure and bathymetry of the reef indicate that a discharge/intake system would probably terminate beyond the wave break zone at a depth of approximately 10 meters. Since this area is presently devoid of corals and other invertebrates, no negative effects from either construction or thermal stress would be realized [as a result of the project]. If [as appears likely] this area is currently undergoing recolonization after damage caused by hurricane Iwa, recovery would not be impeded or prevented by the outfall structure except within a very narrow area where temperatures [of the seawater] might exceed 2 degrees centigrade above ambient. Inshore areas at Barbers Point presently contain the highest coral cover. These would not be significantly or permanently altered by construction of the intake/discharge pipes.

> While it is concluded that the resource recovery facility intake and discharge would not have a significant adverse effect, it is suggested that an environmental monitoring program be implemented if offshore pipelines are built. This program should be initiated prior to construction and then repeated during construction and after the plant is operating.

In view of Dollar's findings, the City has decided to wait until the contract for the project has been awarded before undertaking further environmental studies. The information already available indicates that an environmentally acceptable intake/outfall configuration can be designed, but it appears unwise to proceed with the detailed studies necessary to demonstrate this conclusively until it is certain that such a system will be used.

Implementation of an ocean cooling water system will require approval by both the U.S. Army Corps of Engineers and the State Department of Land and Natural Resources. The environmental permitting procedures followed by these agencies will insure that the proposed cooling system receives proper review. Your department will be consulted and kept informed at each step in the process, and we are confident that potential adverse effects can be adequately mitigated.

Impact on Air Navigation

The City has requested a ruling from the Federal Aviation Administration regarding the effect of the proposed project on air operations from the Barbers Point Naval Air Station, but a final decision from that agency has not yet been received. However, a new section presenting a preliminary assessment of potential navigational impacts will be included in Chapter IV of the Revised EIS. It will also be listed as an unresoved issue in Chapter VI of the revised document. The City will accept price bids for the project only from offerors whose proposals meet the FAA's stack height requirements.

If you have any additional comments or questions regarding the project or the EIS, please call Melvin Lee of the Refuse Division at 527-5366.

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813
PHONE 523-4181

EILEEN R. ANDERSON
MAYOR

JOSEPH K. CONANT
DIRECTOR

CHARLES K. TORIGOE
DEPUTY DIRECTOR

August 2, 1983

Mr. Michael M. McElroy, Director
Department of Land Utilization
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Subject: EIS: Solid Waste Processing and Resource Recovery Facility
Campbell Industrial Park
Tax Map Key: 9-1-26: 18

We appreciate the opportunity to review and comment on the EIS for the Solid Waste Processing and Resource Recovery Facility.

We have no objections to the general concept of resource recovery and the Campbell Industrial site is an appropriate location for a refuse processing facility.

We note that the proposed facility will not cause violation of federal or state ambient air quality standards.

The proposed project also would substantially reduce the amount of solid waste that would still need to be landfilled, thereby minimizing future landfill acreage requirements.

Given the short life expectancies of the existing landfills and the anticipated problems in obtaining the relatively few remaining potential sites, a further delay in action would lead to serious public safety and health hazards.

We will retain the EIS for our files.

Sincerely,

JOSEPH K. CONANT

cc: Department of Public Works
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Belt, Collins and Associates
606 Coral Street
Honolulu, Hawaii 96813

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 16, 1983

R83-573

TO: JOSEPH K. CONANT, DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: COMMENTS ON ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum to the Department of Land Utilization dated August 2, 1983 regarding the environmental impact statement for the proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

We are pleased to know that you support the general concept of resource recovery, and believe that the Campbell Industrial Park site designated is an appropriate location for a resource recovery facility. Your assessment of the need for immediate action is correct, and it is our hope that procurement of the proposed facility will proceed without delay.

With respect to the project's compliance with existing air quality standards, it is true that operation of the plant would not in and of itself produce sulfur dioxide concentrations in excess of either State or Federal ambient air quality standards. However, results of preliminary computer modeling suggest that emissions from existing and approved-but-unbuilt sources may by themselves produce technical violations of the State standard for sulfur dioxide. Since the proposed project would add a limited additional amount of sulfur dioxide to this, it appears that a variance from the State standard will be required.

These and other air quality effects are discussed at length in Section 4.11 of the EIS and are summarized on pages IV-132 and IV-133. Analyses of potential air quality effects and means of mitigating them are continuing as part of the City's effort to obtain construction and operating permits from the State Department of Health and the U.S. Environmental Protection Agency. Results of these studies will be made public as they become available.

If you have any additional questions or comments regarding this project, please contact Mr. Melvin Lee of the Refuse Division at 527-5366.

for Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

DEPARTMENT OF LAND UTILIZATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813 ■ (808) 523-4432

EILEEN R. ANDERSON
MAYOR

MICHAEL M. MCELROY
DIRECTOR

ROBERT B. JONES
DEPUTY DIRECTOR

(SM)

August 11, 1983

MEMORANDUM

TO : DR. MICHAEL J. CHUN, DIRECTOR & CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM : MICHAEL M. McELROY, DIRECTOR

SUBJECT : COMMENTS TO DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS) PROPOSED SOLID WASTE PROCESSING, RESOURCE RECOVERY FACILITY--CAMPBELL INDUSTRIAL PARK

We have reviewed the above and offer the following comments:

1. The EIS should include a discussion of the required smokestack and the effect of its potential intrusion into avigation easements. Are any governmental clearances necessary?

2. Will the proposed project require the expansion of the Keehi Transfer Station? What impacts would occur as a result of this expansion (traffic, noise, etc.)?

3. Additional information should be provided regarding the construction of the ocean outfall including construction methods, impacts of discharge on surrounding ocean environment, and permits required.

4. Comments provided by Mr. Robert N. High were extremely interesting and thought-provoking. We hope that these comments are given serious consideration, as there seem to be many valid points presented.

If there are any questions, please contact Sampson Mar of our staff at extension 5038.

MICHAEL M. McELROY
Director of Land Utilization

MMM:sl

cc: Belt, Collins & Assoc., Inc.

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 18, 1983

R83-593

TO: MR. MICHAEL M. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: DR. MICHAEL J. CHUN
DIRECTOR & CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your August 11, 1983 memorandum concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document. Item-by-item responses to your comments are presented below.

(1) Air Navigation

A section entitled "Impacts on Air Navigation" will be included in the Revised EIS. It will discuss the effect of the proposed smokestack on air operations at Barbers Point Naval Air Station. An air navigation clearance must be obtained from the Federal Aviation Administration in order to construct the stack. This requirement is stated in Chapter IX.

(2) Keehi Transfer Station

The proposed resource recovery project will not require the physical expansion of the existing Keehi Transfer Station. However, it will probably lead to a change in operational patterns and an increase in the volume of refuse handled there.

At this time the facility is somewhat underutilized, and this results in moderately high operating costs. The proposed increase in throughput from 500 to 1,000 tons per day will result in more efficient utilization of the capital plant already in place and a reduction in per-unit transfer costs. No significant adverse environmental effects are expected as a result of this, and the discussion in the EIS will be revised to make this clearer.

(3) Ocean Intake/Outfall

As indicated in the EIS, use of ocean water to cool the steam condensers is only one of several options under consideration. Others include air cooling and use of saline groundwater. A preliminary study conducted for the City by marine biologist Steven Dollar (see attached), concluded:

> At Campbell Industrial Park, structure and bathymetry of the reef indicate that a discharge/intake system would probably terminate beyond the wave break zone at a depth of approximately 10 meters. Since this area is presently devoid of corals and other invertebrates, no negative effects from either construction or thermal stress would be realized [as a result of the project]. If [as appears likely] this area is currently undergoing recolonization after damage caused by hurricane Iwa, recovery would not be impeded or prevented by the outfall structure except within a very narrow area where temperatures [of the seawater] might exceed 2 degrees centigrade above ambient. Inshore areas at Barbers Point presently contain the highest coral cover. These would not be significantly or permanently altered by construction of the intake/discharge pipes.
>
> While it is concluded that the resource recovery facility intake and discharge would not have a significant adverse effect, it is suggested that an environmental monitoring program be implemented if offshore pipelines are built. This program should be initiated prior to construction and then repeated during construction and after the plant is operating.

In view of Dollar's findings, the City has decided to wait until the contract for the project has been awarded before undertaking further marine studies. The information already available indicates that an environmentally acceptable intake/outfall configuration can be designed, but it appears unwise to proceed with the detailed field studies necessary to demonstrate this conclusively until it is certain that such a system will be used.

Implementation of an ocean cooling water system will require permits from the U.S. Army Corps of Engineers, the State Departments of Transportation and Health, and the State Department of Land and Natural Resources. It will also require a Special Management Area Permit from the Department of Land Utilization and consistency review under the Coastal Zone Management Act. Because other Federal permits are required, the U.S. Fish and Wildlife Service will also have an opportunity to review plans for the project and to recommend impact mitigation measures. These permitting requirements are already described in the EIS (see, for example, Chapter IX, "List of Necessary Permit Approvals").

If a decision is made to pursue the ocean cooling water option, the environmental permitting procedures that must be followed provide for repeated public review. The more detailed information that you have requested will be supplied at that time.

(4) Mr. High's Comments

A copy of our response to Mr. High is attached. It responds to the various questions he raised regarding the analysis of alternative contained in the EIS and explains why composting is not considered a viable alternative at this time.

Thank you again for your comments. We expect to submit the Revised EIS to your Department for final action shortly. If you have any further comments or questions, please contact Mr. Melvin Lee at 527-5366.

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

Attachment

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

EMIKO I. KUDO
DIRECTOR

SAM L. CARL
DEPUTY DIRECTOR

OSCAR K. ASAHINA
EXECUTIVE ASSISTANT

July 27, 1983

TO: MICHAEL M. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: EMIKO I. KUDO

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT (EIS)
PROPOSED SOLID WASTE PROCESSING RESOURCE RECOVERY FACILITY

We have no objections to the proposed site and resource recovery facility.

Thank you for the opportunity to review the EIS.

(Mrs.) EMIKO I. KUDO, Director

EIK:vc

cc: DPW
Belt, Collins & Asso.

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 10, 1983

R83-566

TO: EMIKO I. KUDO, DIRECTOR
DEPARTMENT OF PARKS AND RECREATION

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: COMMENTS ON ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED
SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum to the Department of Land Utilization dated July 27, 1983 regarding the environmental impact statement for the proposed Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document. We are pleased that you have no objections to the proposed project.

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

BCA

August 5, 1983 TE 7/83-2784

MEMORANDUM

TO: MICHAEL M. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: WILLIAM A. BONNET, DIRECTOR

SUBJECT: EIS FOR SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

We have reviewed the EIS and have no comments.

If you have any questions, please contact Kenneth Hirata at 527-5031.

William A. Bonnet

WILLIAM A. BONNET

cc: Department of Public Works
Belt Collins and Associates

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 16, 1983 R83-573

TO: WILLIAM A. BONNET, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: COMMENTS ON ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your August 5, 1983 memorandum to the Department of Land Utilization (TE 7/83-2784) regarding the environmental impact statement for the proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

for Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

1455 S. BERETANIA STREET ROOM 305
HONOLULU, HAWAII 96814

MELVIN M. NONAKA
FIRE CHIEF

THOMAS C. BLONDIN
FIRE DEPUTY CHIEF

July 27, 1983

Belt, Collins and Associates
606 Coral Street
Honolulu, Hawaii 96813

Re: Solid Waste Processing and Resource Recovery Facility; Campbell Industrial Park, Oahu

Gentlemen:

Thank you for providing us with the opportunity to review and comment on the proposed subject project.

We have completed our review and have no comments to offer at this time.

Very truly yours,

MELVIN M. NONAKA,
Fire Chief

MMN:ct/NSKW

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 10, 1983

R83-566

TO: MELVIN M. NONAKA, CHIEF
HONOLULU FIRE DEPARTMENT

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: COMMENTS ON ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum to the Department of Land Utilization dated July 27, 1983 regarding the environmental impact statement for the proposed Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document.

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

RECEIVED
JUL 21 1983
BELT, COLLINS & ASSOCIATES

EC-JS

July 19, 1983

TO: MICHAEL M. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: DOUGLAS G. GIBB, HONOLULU POLICE DEPARTMENT

SUBJECT: SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY, CAMPBELL INDUSTRIAL PARK, OAHU

We have no further comments to add to those submitted on March 18, 1983 in response to the EIS Preparation Notice for this project.

DOUGLAS G. GIBB
Chief of Police

cc: Department of Public Works
Belt, Collins and Associates

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 10, 1983

R83-566

TO: DOUGLAS G. GIBB, CHIEF
HONOLULU POLICE DEPARTMENT

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: COMMENTS ON ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED SOLID WASTE PROCESSING AND RESOURCE RECOVERY FACILITY

Thank you for your memorandum of July 19, 1983 to the Department of Land Utilization concerning the environmental impact statement for the proposed Resource Recovery Facility. We appreciate the time you and your staff spent reviewing the document.

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

LU 7/83 4336

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII 96813 / TELEPHONE 523-4000

MARILYN BORNHORST
COUNCILWOMAN

1983 AUG -5 AM 8 18
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

August 4, 1983

Mr. Michael M. McElroy
Director
Department of Land Utilization
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

This is in response to your request for comments on the EIS Report for the proposed Honolulu Solid Waste Processing and Resource Recovery Facility at Campbell Industrial Park. My comments are as follows:

1. Both candidate firms, Wheelabrator-Frye, Inc. (WFI) and CE/AMFAC, propose water cooling systems for the facility.

   WFI system would circulate sea water through the plant and return the water to the ocean at temperatures which will be detrimental to acres of coral reef. As noted in the report, "the potential adverse effect does exist" and should be further studied, particularly, as it relates to the Shoreline Management Area.

   CE/AMFAC plant proposes to use nearly one million gallons of water per day for "evaporative cooling." This water is to be diverted from one of the Oahu Sugar Company's water wells that is currently used for agricultural purposes. It is important to consider the impact of this proposal in light of the limited water resources in the area that could otherwise be used for agricultural or residential purposes. The use of air-cooled condensers should be more thoroughly studied.

2. The EIS Report indicates that due to existing power plants and refinery operations in the area emitting a near limit sulfur dioxide gases in the atmosphere, either of the proposed resource recovery plants would cause this type of pollution to exceed the limit permitted by the State Department of Health. It would seem more appropriate to find a means to reduce emission of some of the sulfurous

matter rather than seek a variance from the Health Department to exceed the limit. The possibility of the existing industries and the proposed resource recovery plant sharing a "scrubber" plant to reduce the emission of sulfurous gas to acceptable levels may be considered.

3. The proposed facility will double the amount of solid waste to be handled at the existing Keehi Transfer Station. The impact of the increased load at Keehi Station should also be fully addressed in conjunction with the proposal.

Thank you for the opportunity to comment on the report.

Sincerely,

Marilyn Bornhorst

MARILYN BORNHORST
Councilmember

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 18, 1983 R83-593

Honorable Marilyn Bornhorst
Councilmember
City Council
City and County of Honolulu
Honolulu, Hawaii 96813

Dear Councilmember Bornhorst:

Subject: Environmental Impact Statement for the Proposed
Solid Waste Processing and Resource Recovery Facility

Thank you for your August 4, 1983 letter to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document. Item-by-item responses to your specific comments are presented below.

(1) Water Cooling System

Wheelabrator Frye, Inc. As indicated in the EIS, a single-pass cooling system using ocean water would discharge approximately 50 to 60 million gallons of heated water per day. While the heated effluent would be about ten degrees centigrade warmer than the ocean water into which it is discharged, it would begin immediately to mix with the surrounding water, quickly dissipating the excess heat. The effects that this discharge would have on marine biota are discussed in Section 4.4.5.3.1 of the EIS.

The discussion indicates that some detrimental effects are to be expected from the thermal discharge. However, it goes on to point out that:

- o Temperature changes of one degree centigrade or more are expected to be limited to less than ten acres. The geographic extent of measurable adverse effects on coral growth would be even less.
- o The marine community in the vicinity of potential outfall locations is neither rich nor unique.
- o The benthic community that would be affected has been greatly disturbed by wave action associated with hurricane Iwa. It is in an early successional stage and would probably recover quickly from temporary construction-related disturbances.

Steve Dollar, the marine biologist who conducted a preliminary biological survey of potential outfall locations (see attached) concluded that the effects of the outfall would not be significant. If the winning bid utilizes ocean water for cooling, in-depth studies of potential impacts and mitigating measures will be conducted in support of applications for permits that will need to be obtained from the State Department of Land and Natural Resources, the U.S. Army Corps of Engineers, and the State Departments of Transportation and Health. At that time, design criteria will be finalized, and it will be possible to more completely quantify the impacts and mitigation measures that would be taken.

C-E/Amfac. Subsequent to the publication of the Draft EIS, C-E/Amfac redesigned the system used to cool the facility's steam condensers. It now proposes to use groundwater obtained from the surficial limestone aquifer via on-site wells. (See Section 4.1.2 and Figure IV-1 of the EIS for a description of the geology of the area.) The water has a chloride content approaching that of seawater and has no other known use. Moreover, the surficial aquifer from which it would be drawn is hydrologically isolated from the basalt aquifer which lies at depth beneath the site. In short, the revised proposal avoids the consumptive use of fresh or brackish water that might be better put to some other use.

Air Cooling Both offerors have indicated a willingness to utilize air-cooled condensers if necessary, thereby eliminating the need for cooling water. However, the capital cost of an air-cooled system is estimated at about ten times that of a water-cooled one, and the operating costs are higher as well. Moreover, energy recovery efficiency is lower with air-cooling, and this reduces revenues from energy sales. Hence, both offerors have indicated a strong preference for water cooling. Nevertheless, air-cooling has been retained as an option in case unexpected difficulties arise with the more efficient water-cooled approach.

From an environmental standpoint, the effects of the discharge of heated air from condensers, whether evaporative or air-cooled, are benign. The total heat transferred to the atmosphere is essentially the same for both types of cooling towers. They are commonly used on the mainland for plants with twenty times the cooling load of the proposed resource recovery facility without adverse effects. While our location allows most powerplants in the state to use single-pass water cooling, the recently constructed Lihue Plantation 25 megawatt bagasse burning facility uses a cooling tower with no apparent environmental problems.

(2) Sulfur Emissions

The EIS indicated that existing industries, primarily the two refineries, are already causing violations of the State's ambient air quality standards for sulfur dioxide (SO_2). Thus, the relatively small amount of additional SO_2 contributed by the proposed resource recovery facility will not initiate violations; rather it will aggravate existing violations.

Unlike industries operating fossil fuel fired boilers, the proposed resource recovery facility cannot reduce the sulfur content of its fuel as a means of controlling sulfur emissions. However, the sulfur content of refuse is already equivalent to that of low-sulfur fuel oil. In contrast, both refineries operating at Campbell Industrial Park currently burn high-sulfur fuel, one because it has a variance from the state and the other because it was in operation prior to the establishment of current State air pollution control regulations. For them, a switch to cleaner fuels is a viable means of control, although it is not always preferable to permanent controls such as scrubbers.

The sharing of pollution control devices such as SO_2 scrubbers is desirable whenever possible. However, engineering problems related to differences in the operating characteristics and schedules of different facilities typically make this impractical. In the present instance, the fact that the sources are geographically separate from one another combines with the engineering problems to make such joint action infeasible.

(3) Keehi Transfer Station.

No physical expansion of the Keehi Transfer Station will be needed to accommodate the proposed resource recovery operation. However, there will be an increase in the tonnage passing through that facility. Changes in traffic resulting from this and other adjustments in the City's collection and transfer network would be relatively minor. For this reason, they were not discussed in the draft EIS. However, a number of persons have expressed concern over changes at the transfer station. To clarify and expand upon this point, a new section (4.5.4) is included in the Revised EIS. It discusses the indirect effects of the resource recovery project on traffic volumes in the vicinity of the Keehi Transfer Station.

Thank you again for your comments. We appreciate your participation in the EIS process, and hope that the answers we have provided are satisfactory. If you have any further questions or would like additional clarification of specific items, please call me directly at 523-4341 or speak with Melvin Lee of the Refuse Division at 527-5366.

Very truly yours,

Michael J. Chun
Director & Chief Engineer

Attachment

cc: Department of Land Utilization
Environmental Quality Commission

FORWARDED:

Andrew I. T. Chang
Managing Director

CITY COUNCIL

CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII 96813 / TELEPHONE 523-4000

LEIGH-WAI DOO
COUNCILMEMBER

July 18, 1983

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Thank you for this opportunity to review the environmental impact statement relating to the proposed solid waste processing and resource recovery facility.

I read with interest the chronology of past planning activities associated with solid waste processing and disposal, especially in light of the events preceding this phase of the planning program. It might be instructive to have additional information in the environmental impact statement (EIS) to provide public agencies and other interested parties with a greater awareness of the need for early and continuing involvement of the public. The EIS, in addition, should underscore the fact that sanitary landfills are still required although greatly reduced by the proposed facility. Accordingly, we can expect to see future requirements for locating such facilities. The public, in short, should be an early participant in the solid waste management planning process; solid waste processing and disposal are shared concerns.

Thank you for this opportunity to provide comments.

Sincerely,

Leigh-Wai Doo

LEIGH-WAI DOO
Councilmember
District IV

cc: Department of Public Works
Michael J. Chun, Ph.D.
Director and Chief Engineer

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

R 83-573

August 16, 1983

Honorable Leigh-Wai Doo
Councilmember, District IV
City Council
City and County of Honolulu
Honolulu, Hawaii 96813

Dear Councilmember Doo:

Subject: Environmental Impact Statement for the Proposed Solid Waste Processing and Resource Recovery Facility

Thank you for your letter of July 18, 1983 to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document. This letter responds to your comments regarding the dissemination of project-related information.

Chapter II of the EIS contains a discussion of the decision process used in selecting a contractor for the proposed resource recovery project. Additional background information may be found on pages II-1 through II-4 of the EIS prepared for the previous resource recovery project.

We are acutely aware of the need for early and continuing public involvement in the decision-making process for projects such as the resource recovery facility. Since January of this year, meetings have been held with more than 20 citizen and business groups to explain the selection process and the nature of the proposed facilities and to solicit public input. The process that was followed is described in Section 2.1.5 of the EIS.

The need for continued landfilling even with construction of a resource recovery facility is discussed at length in Chapter V of the EIS, and we have stressed the need for continued landfilling at all of the public meetings that have been held. However, your suggestion that the EIS place more emphasis on the fact that the project would simply reduce, not eliminate, the need for new landfills is well taken. A brief discussion of this requirement will be added at the end of Section 2.1.3 of the EIS. This department will continue to involve the public at the earliest stages of landfill site selection.

Once again, let me thank you for your interest in the resource recovery project. If you have any additional questions, please contact me immediately at 523-4341.

Very truly yours,

for Michael J. Chun
Director and Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

FORWARDED:

Andrew I. T. Chang
Managing Director

ACI 1/83 - 4587

CITY COUNCIL

CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII 96813 / TELEPHONE 523-4000

WELCOME S. FAWCETT
COUNCILMEMBER

August 5, 1983

1983 AUG -8 PM 1:45
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

Subject: Environmental Impact Statement for the Proposed Honolulu Solid Waste Processing and Resource Recovery Facility

I have reviewed the Environmental Impact Statement for the proposed Resource Recovery project. Although most of my concerns have been adequately addressed in the Statement, several points could be clarified.

1. In light of the limited supply of fresh water for Oahu in general, and the Pearl Harbor Basin in particular, the long-range commitment of fresh water for condenser cooling should be addressed. Decisions as to the method of cooling must take into account the limited nature of this resource.

2. Specific designs for site drainage should be assessed to be sure there will be no possibility of accidental pollution of the shoreline during rains or accidents.

3. The height of the proposed stack is not discussed in the air pollution analysis section. Since the height of the stack can determine where the greatest concentration of pollutants impact, it would seem that a discussion of stack height would be desirable. I suspect that a high stack might present problems for low flying aircraft, but a low stack would mean air pollutants would impact nearer the proposed site in Campbell Industrial Park where air pollution levels are already high.

4. What are the impacts of doubling the amount of solid waste being handled at the existing Keehi Transfer Station?

5. What would be the long term effects on employees of the chemicals used as surface or space spray for insect control? Will these chemicals be used in such a way that they could contaminate the soils or groundwater?

Thank you for the opportunity to comment on this most existing and worthwhile project.

Truly yours,

Welcome S. Fawcett

WELCOME S. FAWCETT
Councilmember

WSF:AH:mal

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 18, 1983 R83-593

Honorable Welcome S. Fawcett
City Council
City and County of Honolulu
Honolulu, Hawaii 96813

Dear Councilmember Fawcett:

Subject: Environmental Impact Statement for the Proposed
Solid Waste Processing and Resource Recovery Facility

Thank you for your August 5, 1983 letter to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

Your letter requested clarification of several points. Item-by-item reponses to your inquiries are presented below.

(1) Cooling Water

At the time the draft EIS was written, C-E/Amfac's plans called for use of marginally brackish water now used for irrigation by the Oahu Sugar Company (OSCO). This water would have been made surplus by OSCO's plans to terminate sugar cultivation on approximately 1,000 acres of land now used for that purpose. Hence, its use for the resource recovery facility would not have adversely affected sugar operations in Ewa.

Subsequent to publication of the draft EIS, plans for the cooling system were revised. They now call for on-site wells drawing water from the surficial limestone aquifer for this purpose. This water is brackish to saline and subject to localized pollution from industrial and agricultural sources. It is not a potential source for uses where quality is a significant factor, and it is hydrologically separated from the good quality water found in the basalt aquifer which underlies the site at depth. Because of this, the cooling system as now proposed would not adversely affect the island's water resources.

(2) Site Drainage

Conceptual site drainage plans are described in Section 4.3.2 of the EIS. More detailed design work will not be undertaken until after a contractor has been selected. However, for reasons

outlined below, there appears to be little chance that stormwater runoff from the project site would have an adverse effect on coastal water quality.

Refuse and refuse derived fuel is kept under cover the entire time it is at the facility. Moreover, trailers carrying solid waste to the facility, and those carrying ash and process residue away, would be covered. Hence, the only possibility of contamination would result from accidental spillage and flooding. Proper site grading and conformance with the City Drainage Standards will prevent danger from flooding in this typically dry region of the island. Finally, outside areas would be cleaned regularly by plant personnel, and equipment capable of quickly removing spilled material would be available. Hence, there is no reason to believe that the project would create a significant danger of shoreline pollution.

In this regard, it is instructive to note that no water quality problems have been associated with the City's Keehi Transfer Station, which is similar in many respects to the front-end portion of the resource recovery facility and is located immediately adjacent to Moanalua Stream. It should also be noted that the resource recovery processes under consideration do not utilize chemicals or other potential pollutants which might constitute a special hazard.

(3) Stack Height

The ambient concentrations of air pollutants reported in the draft EIS were based on stack heights of 195 and 250 feet for the C-E/Amfac and Wheelabrator Frye facilities, respectively. Results of the preliminary air quality impact analysis suggest that an even higher stack may be desirable as a means of reducing ambient pollutant concentrations. Because of this, the City has applied to the Federal Aviation Administration (FAA) for permission to construct a stack up to 290 feet high.

As defined in Subpart 77-C of the FAA Regulations, a stack that high constitutes an "obstruction", and the agency is currently reviewing the proposal to determine whether it would would be a "hazard to air navigation". Its decision on the matter is expected shortly.

A tall stack does not reduce the total weight of pollutants being emitted. Only permanent controls such as electrostatic precipitators and baghouse units actually reduce the total volume of pollutants emitted to the atmosphere. These pollution control devices have been made an integral part of the proposed resource recovery facility, and it relies upon them as the primary pollution control method. However, in combination with these controls on source emissions, increased stack height does provide a cost-effective means of further ameliorating potential impacts on ambient pollutant concentrations, and it is our hope that the FAA will allow a 250 to 290 foot high stack.

It has become apparent that the relationship between stack height, air quality, and flight operations from the Barbers Point Naval Air Station should be discussed in more detail in the EIS. Because of this, a new section entitled "Impacts on Air Navigation" is being inserted in the EIS as Section 4.12.

A more definitive statement regarding the resolution of the stack height question must await the results of the FAA's aeronautical study. A copy of their report, together with this Department's final instructions to offerors regarding stack height will be transmitted to you as soon as it is available.

(4) Keehi Transfer Station

No physical expansion of the Keehi Transfer Station will be needed to accommodate the proposed resource recovery operation. However, there will be an increase in the tonnage passing through that facility. Changes in traffic resulting from this and other adjustments in the City's collection and transfer network would be relatively minor. For this reason, they were not discussed in the draft EIS. However, a number of persons have expressed concern over possible changes there. To clarify and expand upon this point, a new section (4.5.4) is being included in the Revised EIS. It discusses the indirect effects of the resource recovery project on traffic volumes in the vicinity of the Keehi Transfer Station.

(5) Insect Control Chemicals

The facility would rely mainly on good waste management practices as a means of minimizing problems from insects. The residence time of unprocessed refuse would be kept to a minimum, and the material would be turned over periodically to discourage reproduction. Poisonous sprays would be used infrequently, if ever, and only as a last resort. Application would be consistent with label directions mandated by the U.S. Environmental Protection Agency and the State Department of Health and would occur only in enclosed spaces where the potential for soil and groundwater contamination is minimal. Mechanical and other non-chemical means would be employed wherever practical. For the above reasons, the likelihood of adverse effects is believed to be minimal.

Thank you again for your comments. We appreciate your participation in the EIS process, and hope that the answers provided above are satisfactory. If you have any further questions or would like additional clarification of specific items, please call me directly at 523-4341 or speak with Melvin Lee of the Refuse Division at 527-5366.

Very truly yours,

Michael J. Chun
Director & Chief Engineer

Attachment

cc: Department of Land Utilization
Environmental Quality Commission

FORWARDED:

Andrew I. T. Chang
Managing Director

DANIEL K. INOUYE
HAWAII

DAVID M. PETERS
EXECUTIVE ASSISTANT
HAWAII

United States Senate

July 9, 1983

Michael J. Chun, Ph.D.
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mike:

Thank you for sharing with Senator Inouye a copy of the Environmental Impact Statement for the Proposed Honolulu Solid Waste Processing and Resource Recovery Facility.

Senator Inouye, who is presently away from this office, will be impressed by the proposed full-service contract and by the beneficial effects of the project.

Please continue to keep him informed.

Aloha,

Dave

DAVID M. PETERS
Executive Assistant
Honolulu Office

DMP:scy

PLEASE REPLY: PRINCE KUHIO FEDERAL BUILDING, ROOM 6104, 300 ALA MOANA BOULEVARD, HONOLULU, HAWAII 96850

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 10, 1983

R83-566

Honorable Daniel K. Inouye
United States Senate
Prince Kuhio Federal Building
Room 6104
300 Ala Moana Boulevard
Honolulu, Hawaii 96850

Subject: Environmental Impact Statement for the Proposed <u>Solid Waste Processing and Resource Recovery Facility</u>

Dear Senator Inouye:

Thank you for your office's letter of July 9, 1983 concerning the environmental impact statement for the proposed resource recovery facility. We appreciate the time your staff spent reviewing the document and will continue to keep you advised of the status of the project.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

SPARK M. MATSUNAGA
HAWAII

WASHINGTON OFFICE:
109 HART BUILDING
WASHINGTON, D.C. 20510

HONOLULU OFFICE:
3104 PRINCE KUHIO BUILDING
HONOLULU, HAWAII 96850

United States Senate
WASHINGTON, D.C. 20510

CHIEF DEPUTY
DEMOCRATIC WHIP

MEMBER:
COMMITTEE ON FINANCE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
COMMITTEE ON LABOR AND HUMAN RESOURCES
COMMITTEE ON VETERANS' AFFAIRS

July 14, 1983

Honorable Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mike:

Thank you for your July 7, 1983 letter enclosing a copy of the draft Environmental Impact Statement for the proposed Honolulu Solid Waste Processing and Resource Recovery Facility.

Although I do not have comments for the record on the Environmental Impact Statement, I greatly appreciate having a copy.

Aloha and best wishes.

Sincerely,

Sparky

Spark Matsunaga
U. S. Senator

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

August 10, 1983

R83-566

Honorable Spark Matsunaga
United States Senate
109 Hart Building
Washington, D.C. 20510

Dear Senator Matsunaga:

Subject: Environmental Impact Statement for the Proposed <u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your letter of July 14, 1983 concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

Very truly yours,

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

LU 8/83 4611

The League of Women Voters in Hawaii

1983 AUG -8 PM 2:40

DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

STATE & ED FUND
49 S. HOTEL #314
HONOLULU, HAWAII 96813
PHONE (808) 533-6806

HONOLULU
49 S. HOTEL #314
HONOLULU, HAWAII 96813
PHONE (808) 531-7448

HAWAII COUNTY
P.O. BOX 665
HILO, HAWAII 96720

KAUAI
R.R. 1 BOX 293-E-4
KAPAA, KAUAI 96746

MAUI (PROVISIONAL)
P.O. BOX 521
WAILUKU, MAUI 96793

August 8, 1983

Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

The League of Women Voters would like to comment on the Environmental Impact Statement for the proposed Solid Waste Processing Resource Recovery Facility.

Further information on cooling processes would be helpful. The ocean discharge of water which is ten degrees centigrade warmer than surrounding waters would have a substantial impact on the ocean floor and surrounding waters. Also, the use of groundwater for cooling, half of which would evaporate,would be using an already scarce resource which should be reserved for activities which would have the possibility of recharging the aquifer or used for direct human consumption. In view of the negitive impacts of the water cooled systems what are the impacts of using an air cooling system?

The air analysis does not indicate the height of the stack. The height will determine where air pollutants impact. If a low stack is built, the facility will be likely to contribute to the already high air pollution levels in Campbell Industrial Park.

Thank you for the opportunity to comment on this project.

Sincerely,

Arlene Woo, President

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 18, 1983

R83-593

Ms. Arlene Woo, President
The League of Women Voters
in Hawaii
49 South Hotel Street, #314
Honolulu, Hawaii 96813

Dear Ms. Woo:

Subject: Environmental Impact Statement for the Proposed <u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your August 8, 1983 letter to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time League members spent reviewing the document. Responses to the specific issues you raised are presented below.

<u>Discharge of Cooling Water</u>

As indicated in the EIS, a single-pass cooling system using ocean water would discharge approximately 50 to 60 million gallons of heated water per day. While the heated effluent would be about ten degrees centigrade warmer than the ocean water into which it is discharged, it would begin immediately to mix with the surrounding water, quickly dissipating the excess heat. The effects that this discharge would have on marine biota are discussed in Section 4.4.5.3.1 of the EIS.

The discussion indicates that some detrimental effects are to be expected from the thermal discharge. However, it goes on to point out that:

- Temperature changes of one degree centigrade or more are expected to be limited to less than ten acres. The geographic extent of measurable adverse effects on coral growth would be even less.

- The marine community in the vicinity of potential outfall locations is neither rich nor unique.

- The benthic community that would be affected has been greatly disturbed by wave action associated with hurricane Iwa. It is in an early successional stage and would probably recover quickly from temporary construction-related disturbances.

Steve Dollar, the marine biologist who conducted a preliminary biological survey of potential outfall locations (see attached) concluded that the effects of the outfall would not be significant. If the winning bid utilizes ocean water for cooling, in-depth studies of potential impacts and mitigating measures will be conducted in support of applications for permits that will need to be obtained from the State Departments of Land and Natural Resources, Transportation, and Health, and from the U.S. Army Corps of Engineers. At that time, design criteria will be finalized, and it will be possible to more completely quantify the impacts and mitigation measures that would be taken.

Consumptive Use of Groundwater for Cooling

Subsequent to the publication of the Draft EIS, C-E/Amfac has redesigned the system which would be used to cool the facility's steam condensers. It now proposes to use groundwater obtained from the surficial limestone aquifer via on-site wells. (See Section 4.1.2 and Figure IV-1 of the EIS for a description of the geology of the area.) The water has a chloride content approaching that of seawater and has no other known use. Moreover, the surficial aquifer from which it would be drawn is hydrologically isolated from the basalt aquifer which lies at depth beneath the site. In short, the revised proposal avoids the consumptive use of fresh or brackish water that might be better put to some other use.

Stack Height

The ambient concentrations of air pollutants reported in the draft EIS were based on stack heights of 195 and 250 feet for the C-E/Amfac and Wheelabrator Frye facilities, respectively. Results of the preliminary air quality impact analysis suggest that an even higher stack may be desirable as a means of reducing ambient pollutant concentrations. Because of this, the City has applied to the Federal Aviation Administration (FAA) for permission to construct a stack up to 290 feet high.

As defined in Subpart 77-C of the FAA Regulations, a stack that high constitutes an "obstruction", and the agency is currently reviewing the proposal to determine whether it would would be a "hazard to air navigation". Its decision on the matter is expected shortly.

A tall stack does not reduce the total weight of pollutants being emitted. Only permanent controls such as electrostatic precipitators and baghouse units actually reduce the total volume of pollutants emitted to the atmosphere. These pollution control devices have been made an integral part of the proposed resource recovery facility, and it relies upon them as the primary pollution control method. However, in combination with these controls on source emissions, increased stack height does provide a cost-effective means of further ameliorating potential impacts on ambient pollutant concentrations, and it is our hope that the FAA will allow a 250 to 290 foot high stack.

It has become apparent that the relationship between stack height, air quality, and flight operations from the Barbers Point Naval Air Station should be discussed in more detail in the EIS. Because of this, a new section entitled "Impacts on Air Navigation" is being inserted in the EIS as Section 4.12. A more definitive statement regarding the resolution of the stack height question must await the results of the FAA's aeronautical study.

Air Cooling

Studies conducted during the preparation of the EIS indicate that discharge of heated effluent through an ocean outfall would have some adverse effects on benthic organisms in the immediate vicinity of the outfall. However, in the judgment of the marine biologist who conducted the survey, they would be quite limited,

Both of the offerors have indicated a willingness to utilize air-cooled condensers if necessary, thereby eliminating the need for cooling water. However, the capital cost of an air-cooled system is estimated at about ten times that of a water-cooled one, and the operating costs are higher as well. Moreover, energy recovery efficiency is lower with an air-cooled system, and this significantly lowers revenues from energy sales. Because of this, both offerors have indicated a strong preference for water cooling. Nevertheless, air-cooling has been retained as an option in case unexpected difficulties arise with the more efficient water-cooled approach.

From an environmental standpoint, the effects of the discharge of heated air from condensers, whether evaporative or air-cooled, are benign. The total heat transferred to the atmosphere is essentially the same for both types of cooling towers. They are commonly used on the mainland for plants with twenty times the cooling load of the proposed resource recovery facility without adverse effects. While our location allows most powerplants in the state to use single-pass water cooling, the recently constructed Lihue Plantation 25 megawatt bagasse burning facility uses a cooling tower with no apparent environmental problems.

Thank you again for your comments. If you have any additional questions, please call Mr. Melvin Lee of the Refuse Division at 527-5366.

Very truly yours,

Michael J. Chun
Director & Chief Engineer

Attachment

cc: Department of Land Utilization
Environmental Quality Commission

LU 8/83 4612

SIERRA CLUB, HAWAI'I CHAPTER
P.O. BOX 22897 HONOLULU, HAWAI'I 96822
(808) 946-8494

MĀLAMA I KA HONUA

8 August 1983

1983 AUG -8 PM 3:06
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawai'i 96813

Dear Mr. McElroy:

Subject: Draft Environmental Impact Statement for Solid Waste Processing/ Resource Recovery Facility

The Honolulu Group of Sierra Club, Hawai'i Chapter appreciates the opportunity to comment on the subject dEIS. We are in general in support of the recycling and re-use of resources. Our comments on the dEIS follow, concluded by some thoughts on alternative means of accomplishing the objectives of the project.

Comments

p. I-3; 1.4, 2nd paragraph: "Rare or endangered species are present on the site" (emphasis added). This statement is not supported by sections 4.4.1, 4.4.2, or 4.4.3 and is contradicted on p. VI-2, section 6.1.4, paragraph two. Should the phrase read "are not present"?

p. IV-120 through 125: Is there a reason for the fact that the annual sulfur dioxide concentration in Table IV-38 is ten times higher than in the following tables? The 24-hour values for sulfur dioxide do not show such a change.

p. XI-4: A number of comments on the EISPN for this project expressed concerns about the use of potable or agriculturally useful water for this project. Was Mr. Kosaka's suggestion of using wastewater from Honouliuli Sewage Treatment plant given any consideration?

Accomplishment of objectives

From the conclusions noted in the dEIS, the project will reduce consumption of fuel oil (by providing an alternative source of electrical generation), extend the life of the City's landfills, and provide lower cost solid waste disposal than other alternatives considered. All of these are laudable results. However, they all might be accomplished by other means, if the City and County should decide to take a proactive, rather than reactive,approach to solid waste generation and electrical energy consumption. We realize such a question is one of policy and that this dEIS cannot deal with it, but we will be encouraging the City Council and City administration to consider the ramifications of policy in this area.

Sincerely,
Susan E. Miller
Susan E. Miller
for Honolulu Group Conservation Committee

cc: Dr. Michael Chun
Office of Environmental Quality Control

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 18, 1983

R83-593

Ms. Susan Miller
Honolulu Group Conservation Committee
Sierra Club of Hawai'i Chapter
P.O. Box 22897
Honolulu, Hawaii 96822

Dear Ms. Miller:

Subject: Environmental Impact Statement for the Proposed Solid Waste Processing and Resource Recovery Facility

Thank you for your August 8, 1983 letter to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document and your expression of support for the concept of resource recovery and re-use. Responses to the specific comments contained in your letter are presented below.

Page I-3, Section 1.4

As you surmised, the passage contains a typographical error. It should read:

> Rare or endangered species are not present on the site, and it is not an important wildlife habitat.

The Revised EIS will contain the correct wording. Thank you for calling this error to our attention.

Pages IV-120 through IV-125

The reason that the annual sulfur dioxide concentration reported in Table IV-38 is ten times higher than the concentrations reported in the subsequent tables is that it represents the highest annual concentration predicted by the model at any point. Due to the fact that the east-northeast trades prevail on an annual basis, this highest annual average is located over the ocean west of the Chevron refinery.

Table IV-39 shows the highest annual average concentration in high terrain, i.e., in the mountains north of the proposed resource recovery site. It is lower than the average annual concentration projected over the ocean (Table IV-38) because, on an annual basis, winds blow inland less frequently. The same phenomena accounts for the lower annual averages estimated in Tables IV-40 through IV-43 for specific locations on the land side of the industrial area.

While the tradewinds prevail on an annual basis, winds from other directions may persist over shorter averaging periods (e.g., 24-hours). As a result, the projected 24-hour concentrations at other receptor sites are more nearly the same as that at the over-the-ocean high point reported in Table IV-38.

Page XI-4: Use of Honouliuli Wastewater Treatment Plant Effluent

C-E/Amfac has withdrawn its proposal to utilize water from the Oahu Sugar Company irrigation system and replaced it with a system using saline groundwater from the surficial limestone aquifer. Hence, cooling options now under consideration include:

- o Air cooling;
- o Single-pass water cooling using seawater; and
- o Evaporative cooling using saline water from on-site wells.

For reasons summarized below, the use of effluent from the Honouliuli Wastewater Treatment Plant is not attractive:

Air Cooling. Cooling for the steam condensers at the proposed facility can be accomplished using forced air. No water is required. Hence, use of sewage effluent is only appropriate in association with water-cooled condensers.

Single-Pass Water Cooling. A single-pass water cooling system for the proposed resource recovery facility requires on the order of 50 to 65 million gallons per day (MGD). This is far more than the approximately 20 MGD available from the Honouliuli Sewage Treatment Plant. Even if sufficient effluent were available, its use by the resource recovery facility would require:

- o construction of a 5.7-mile long, five-foot diameter effluent transmission line between the wastewater treatment plant and the project site;
- o construction of either a new five-foot diameter outfall or a second line returning the warmed effluent to the existing Honouliuli outfall;

- o construction of a 50-million gallon storage reservoir that would allow the variable sewage flow to be matched with the constant cooling water demand;
- o continuous pumping with its attendant high energy costs.

It is estimated that such a system would cost at least $15 to $20 million dollars and would offer few, if any, compensating benefits when compared with other alternatives.

Evaportive Cooling. An evaporative cooling system would require only about two percent of the effluent needed for the single-pass approach. Hence, the pipeline delivering effluent and the reservoir could be much smaller. However, because of the pathogens which it contains, the primarily treated effluent produced by the Honouliuli Wastewater Treatmen Plant is not suitable for use in an evaportive cooling tower without further treatment, and this requirement would add complexity and cost to the system.

When all factors are taken into account, the three cooling options that are now under consideration -- air-cooling, evaporative cooling using saline water from on-site wells, and single-pass cooling using ocean water -- are more economical and less damaging to the environment than a system using treated effluent from Honouliuli.

Accomplishment of Objectives

The resource recovery project is only one facet of the City's efforts to reduce fuel oil consumption, extend the life of the City's landfills, and minimize solid waste disposal costs. It is the City's policy to encourage energy and resource conservation, as well as reclamation, and we welcome your support in this area.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

THE ESTATE OF JAMES CAMPBELL

83-04371
ENV WI
Refuse

August 8, 1983

RECEIVED
DEPT OF PUBLIC WORKS
AUG 16 2 13 PM '83

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mike:

Thanks for the opportunity to review and respond to the resource recovery project EIS on the proposed Campbell Industrial Park site. We at the Estate of James Campbell support the concept of resource recovery and its benefits of energy production and the reduced need for landfill facilities.

The EIS appears to identify most of the critical issues and thus, is a useful tool. There do, however, appear to be a number of unanswered questions which include:

1. The impact of sea cooling and the demonstration of compliance with coastal water ecologic criteria pursuant to federal and state regulations. If these issues can be resolved, the use of ocean water offers great advantages in preserving our valuable domestic water.

2. Potable water usage and the impact on the total water budget for the Pearl Harbor Basin. There may also be an indirect impact upon the Waianae aquifer.

3. Overlap between the federal and state air quality standards.

4. Air quality impact based on the existing emissions inventory and the long range effect on future development at James Campbell Industrial Park.

We look forward to working with you and the Air Quality Task Force to help resolve these questions. Our success will have a lasting effect on refuse disposal in the future and will also ensure the industrial base of the island of Oahu.

Very truly yours,

Dave McCoy

David H. McCoy
Manager, Industrial Properties

cc: James Kumagai, PhD.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 16, 1983

R83-573

Mr. David H. McCoy
Manager, Industrial Properties
The Estate of James Campbell
Suite 500
828 Fort Street Mall
Honolulu, Hawaii 96813

Dear Mr. McCoy:

Subject: Environmental Impact Statement for the Proposed
<u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your August 8, 1983 letter concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document and your expression of support for the concept of resource recovery. Your comments are addressed individually below.

<u>(1) Ocean Water Cooling</u>

Use of ocean water to cool the steam condensers is only one of several options under consideration. Others include the use of forced air and and an evaporative system using saline water drawn from on-site wells. However, as indicated in Section 4.4.5 of the draft EIS, the oceanographic and biological surveys conducted to date indicate that the proposed facility would not have significant adverse effects on the marine environment. Marine biologist Steven Dollar concluded:

> At Campbell Industrial Park, structure and bathymetry of the reef indicate that a discharge/intake system would probably terminate beyond the wave break zone at a depth of approximately 10 meters. Since this area is presently devoid of corals and other invertebrates, no negative effects from either construction or thermal stress would be realized [as a result of the project]. If [as appears likely] this area is currently undergoing recolonization after damage caused by hurricane Iwa, recovery would not be impeded or prevented by the outfall structure except within a very narrow area where temperatures [of the seawater] might exceed 2 degrees centigrade above ambient. Inshore areas at Barbers Point presently

contain the highest coral cover. These would not be significantly or permanently altered by construction of the intake/discharge pipes.

While it is concluded that the resource recovery facility intake and discharge would not have a significant adverse effect, it is suggested that an environmental monitoring program be implemented if offshore pipelines are built. This program should be initiated prior to construction and then repeated during construction and after the plant is operating.

In view of Dollar's findings, the City has decided to wait until the contract for the project has been awarded before undertaking further marine studies. The information already available indicates that an environmentally acceptable intake/outfall configuration can be designed, but it appears unwise to proceed with the detailed studies necessary to demonstrate this conclusively until it is certain that such a system will be used.

Implementation of an ocean cooling water system will require approval by both the U.S. Army Corps of Engineers and the State Department of Land and Natural Resources, as well as SMA review (for the pipeline) by the Department of Land Utilization. The environmental permitting procedures followed by these agencies will insure that the proposed cooling system receives proper review.

(2) Potable Water Usage

The proposed project would require from 40,000 to 95,000 gallons per day of potable water. This would be supplied by the Honolulu Board of Water Supply from existing sources. Infrastructure plans for Campbell Industrial Park were based on an assumed usage of 4,000 gallons per day per acre. This amounts to 112,000 gallons per day for the 28-acre site on which the resource recovery facility would be constructed. This is substantially more than the 40,000 to 95,000 gallons of potable water needed.

Several options are still under consideration for cooling. None of them depend on fresh water. Instead, the condenser would be cooled either by forced air, by a single-pass ocean water cooling system, or by an evaporative cooling tower using saline groundwater drawn from on-site wells. None of these would adversely affect the Pearl Harbor groundwater basin.

(3) Air Quality Standards and Impact

The relationship of the project to State and Federal air quality standards is discussed at great length in section 4.11 of the EIS.

Additional work is now being conducted by the U.S. Environmental Protection Agency, and preliminary results of their analyses are due at the end of this month.

As you may know, potential concentrations in excess of the standards does not mean that all development of pollutant sources must stop. The State Public Health Regulations provide for variances from the very stringent standards it sets. Federal regulations provide for "offsets", i.e., reductions in emissions from existing sources equal to proposed new sources. This, together with the fact that it is existing sources at Campbell Industrial Park which are the primary problem, not the resource recovery facility, indicates that the proposed project would not have a significant adverse effect on future development there.

Thank you again for your comments. We look forward to joining the list of industrial facilities at Campbell Industrial Park. If you have any questions, please call me at 523-4341 or Melvin Lee of the Refuse Division at 527-5366.

Very truly yours,

Michael J. Chun

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

HAWAIIAN ELECTRIC COMPANY, INC.
Box 2750 / Honolulu, Hawaii / 96840

RICHARD L. O'CONNELL, P.E.
MANAGER, ENVIRONMENTAL DEPARTMENT
(808) 548-6860

August 5, 1983

ENV 2-1
NV/G

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Subject: Environmental Impact Statement for the Proposed Honolulu Solid Waste Processing and Resource Recovery Facility

We have reviewed the subject Environmental Impact Statement and offer the following comment:

The environmental impact, if any, of the 138 kv transmission line from the generating site through the Campbell Industrial Park to Hawaiian Electric's substation is not addressed in the Environmental Impact Statement. Such a circuit tie to Hawaiian Electric's power grid should be considered an integral part of the project and any associated environmental impacts evaluated in the project EIS.

Thank you for the opportunity to comment on this Draft Environmental Impact Statement.

Sincerely,

Richard L. O'Connell
Manager, Environmental Department

JMP,Jr.:cal

cc: Dept of Public Works, C&C
Environ. Quality Commission
Belt, Collins and Associates

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 18, 1983

R83-593

Mr. Richard L. O'Connell
Manager, Environmental Department
Hawaiian Electric Company, Inc.
Box 2750
Honolulu, Hawaii 96840

Dear Mr. O'Connell:

Subject: Environmental Impact Statement for the Proposed Solid Waste Processing and Resource Recovery Facility

Thank you for your August 5, 1983 letter to the Department of Land Utilization concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you and your staff spent reviewing the document.

At your request, the environmental impacts of the 138 kv transmission line needed to link the resource recovery facility with the Hawaiian Electric Company's Campbell Industrial Park substation will be discussed in the Revised EIS.

Very truly yours,

Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

83-04277

ENVU

Refuse

Aug 6 '83 / 10 AM '83

Mr. Michael Chun
Director
Department of Public Works
City & County of Honolulu
Municipal Office Building
Honolulu, Hawaii 96812

August 6, 1983

I submit the following commentary on the draft EIS covering the Resource Recovery proposal for the City and County of Honolulu at Campbell Industrial Park, Oahu, June 1983.

Anthony Hepton

Anthony Hepton, Ph.D.

Encl.

CHAP. V - ALTERNATIVES; SEC. 5.3.4 COMPOSTING/HANDFILLING

The EIS is seriously ambivalent in discussing this aspect of the composting alternative. First it properly states that "The end product (of composting) is disposed of in agricultural fields and nurseries where it can greatly improve the ability of the soil to support growth." It then dispenses with this enormous environmental, social and economic attribute with the statement that "Unfortunately the lack of large-scale market demand for compost, together with relatively high capital and operating costs for composting solid wastes has rendered this method of solid waste disposal uneconomical in the Continental, U.S." (emphasis mine)

The EIS then attempts to carry this implication to Hawaii by the statement that "In Hawaii where the potential uses are even fewer than on the Mainland, the likelihood of significant market demand seem practically nil." This statement is difficult to reconcile with reality.

Hawaii, a State with much of its land use devoted to commercial agriculture, is a state which would offer great promise for the use of compost. Nutrients in our soil are generally low compared to other agricultural soils. Thousands of tons of compost per year could literally be applied to our soils for enhancement of crop production.

While a local market has not been established due to the lack of availability of compost, the potential value of the material has already been recognized.

Both sugar and pineapple companies, with over 43,000 acres of land on Oahu have expressed a willingness to participate in large scale evaluation of the material to determine the value and compatibility of the material with their operations. Large plantations are already using great quantities of organic material in the form of cattle and chicken manure, and are well aware of the values that can be obtained from soil conditioning.

Compost material would also be of particular value to another agricultural "industry" in Hawaii, that of flower and nursery product growing. This industry has grown rapidly in the

State during the last decade and now produces some $29,599,000 in value of products (1981). The industry has grown some 600% since 1971 and on Oahu is comprised of some 240 farms totaling 400 acres. These are crops along with truck-farm crops that are farmed intensively and offer a great potential for compost use. Work with the University of Hawaii will target this potential also.

I sincerely believe as a practicing agronomist, that the demand for compost in Hawaii will be substantial.

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

August 18, 1983

RB3-593

Anthony Hepton, Ph.D.
46-403 Holoanai Way
Kaneohe, Oahu, Hawaii 96744

Dear Dr. Hepton:

Subject: Environmental Impact Statement for the Proposed
<u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your August 6, 1983 letter concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you spent reviewing the document. Our responses to your comments are presented below.

The EIS is not ambivalent towards composting. On the contrary, it recognizes the two fundamental realities associated with it:

(1) Composting provides a desirable reuse of organic matter and a means of improving the tilth of soil.

(2) In Hawaii's circumstances, composting does not appear to be economically competitive with the proposed refuse-to-energy processes.

The first point needs no further elaboration. The second point is discussed in more detail below.

<u>Low Nutrient Content of Hawaian Soils</u>

Your observation regarding the generally low nutrient content of Hawaiian soils is correct, and there is no doubt that the application of compost to Oahu's agricultural fields would enhance crop production on them. Unfortunately, from the economic viewpoint of producers, the benefits are not sufficient to offset the cost of producing the compost, storing it, and transporting and applying it to the fields where it is needed. Because the concentration of needed nutrients in commercially available inorganic fertilizers is several hundred times higher than that of compost, most agriculturalists involved in large-scale crop production find it far easier and more economical to rely on them. Only where high value/low acreage crops such as flowers are involved does compost begin to make economic sense.

In the past, the City has been approached by persons interested in composting. Space at the Kapaa Landfill has been offered for the composting operations. The fact that no one has taken advantage of this opportunity suggests that the private sector does not consider composting to be economically viable.

In short, while the value of compost has been recognized, that value has not been deemed sufficient to warrant the cost of producing and applying it.

Use By Sugar and Pineapple Plantations

Your letter states that sugar and pineapple companies have expressed a willingness "to participate in large scale evaluation of the material to determine the value and compatibility of the material with their operations". It does not indicate the form that this "expression of interest" has taken or indicate the extent to which they would underwrite the costs of such experimentation. It is our understanding that these companies are not willing to make a significant financial commitment at this time, but we would be happy to discuss this interest with them if approached.

The plantations do, as you indicate, use a substantial amount of organic material in the form of cattle and chicken manure. Like all good agriculturalists, they are also aware of the value derived from good soil conditioning. However, compost created from municipal refuse is far different than compost produced from animal wastes, and it does not follow that they are also interested in using such material on their fields. In this respect, it is instructive to note that Amfac, one of Hawaii's largest sugar companies, has chosen to pursue a refuse-to-energy approach rather than attempting a composting operation.

Demand

It is not the City's intention to discourage composting and the benefits that can be derived from it. However, the existence of a viable market for compost has not yet been demonstrated. Until new information is available, the only prudent course of action is to assume that the product of a composting plant would have to be disposed of in a landfill. Since the volume reduction provided by composting is only about 35 percent, it would reduce landfill requirements by only one-third. In comparison, volume reduction from the refuse-to-energy facilities that have been proposed is on the order of 90 percent. In view of the limited geographic area of the island, the much smaller landfill requirement is a major advantage.

While it is our belief that the proposed project is the best alternative open to the City at the present time, we are open to new developments which could result in at least a limited opportunity for composting. The proposed resource recovery facility will

not accommodate all of the refuse generated in future years. Hence, it will be possible to entertain offers involving pilot-scale composting operations and to supply it with refuse in excess of the resource recovery facility's requirements. This would permit composters to gain first-hand experience with marketing to local users. In addition, the scale of such an operation would probably be more in keeping with demand by the high-value agricultural activities (flowers, truck farming, etc.) which are the most likely users of compost.

Thank you again for your letter, if you would like to discuss your ideas regarding composting in more detail, please call Frank Doyle, chief of the Refuse Division, at 527-5358.

Very truly yours,

Michael J. Chun
Michael J. Chun
Director & Chief Engineer

cc: Department of Land Utilization
Environmental Quality Commission

ROBERT N. HIGH

469 Ena Road, Suite 1501
Honolulu, Hawaii 96815

Phone 946-4427
946-9975

83-04285

ENV II/
Refuse

August 6, 1983

Mr. Michael Chun, Director
Department of Public Works
City and County of Honolulu
Municipal Office Building
Honolulu, Hawaii 96813

Dear Mr. Chun:

I am submitting the following comments on the draft Environmental Impact Statement entitled, Solid Waste Processing and Resource Recovery for the City and County of Honolulu at Campbell Industrial Park, prepared for your agency in July 1983:

Comments:

1. Discussion of alternative approaches to the problem of solid waste disposal for Oahu. (summary and Chapter V) - The EIS discussion of the different methods of solid waste disposal which would provide viable alternatives to the proposed "refuse-to-energy" approach is too brief and superficial to be considered adequate. This is particularly true with regard to the discussion of composting as a viable alternative approach to refuse disposal. The EIS discussion attempts to discard composting as an alternative on the basis of statements which are erroneous and therefore the conclusions reached by the EIS are misleading. For instance:

a. Cost: Although the EIS properly recognizes composting as , " .. offering environmental benefits not available from other proposals" (page I-3,1.5), it then fails to pursue a disclosure of these benfits and dispenses summarily with this very attractive alternative because it " promises to

be significantly more costly"(than refuse-burning). No data is provided to justify this statement on the alleged higher cost of the composting alternative. The following data provides a proper perspective on the costs of composting - a perspective which indicates that the EIS conclusion is erroneous:

"Assuming an average annual rate of inflation of 8% over the seven years(1972-1979), these costs (composting) would be approximately $30,000 of capital expenditures per input-ton per day and $11.00 net cost per input-ton.(In 1979, $33,000 in capital outlay per ton per day and $12.12 net cost per ton)."

Source: Resource Recovery Through Composting - A Sleeping Giant, D. Airan; J. Bell; Paper before the 1980 National Waste Processing Conference, Washington, D. C. ASME.

" These costs (composting) appear reasonable and compare very favorably with other resource recovery systems. EPA estimates showed that some systems (refuse-burning) require capital expenditures of up to $ 50,000 per ton of daily capacity (1977 costs)."

Source: Animal Waste Composting with Carbonaceous Material, Galler,W.S. et al, Cinn. Ohio, Sep 1978

The Fairfield Engineering Co. of Marion, Ohio,a manufacturing company with lengthy experience in composting machinery and composting plants in the United States estimates that operating costs for typical composting plants, including the amortization of capital expenditures range between $10.00 (500 ton plant) and $14.00 (300 ton plant) per ton.

Source: Paper by J. S. Coulson, Fairfield Engineering Co. before the National Waste Processing Conference, Washington, D. C. 1980, ASME

Using the rule of thumb provided in the Airan/Bell paper above and escalating the costs to a 1982 level (8%/year), one arrives at a probable capitalization cost of a composting plant for Oahu of $40,000 per input-ton per day. The capitalization cost for the resource recovery project discussed in the EIS is $110,000 per input-ton per day, or 175% greater than a compost plant.

These same relative proportions are obtained by comparing the cost of the existing Wheelabrator-Frye refuse-burning plant in Saugus, Mass. built in 1975 for about $50 million or $41,000 per ton of daily capacity (1200).

The pro-rated capital cost of a composting plant of this size in 1975 would have been about $20,400 per ton of daily capacity (Airan/Bell rule of thumb referenced previously). The compost plant is again some 100% lower than the refuse-burning plant. Based on estimates made previously to formulate a proposal on composting for Oahu, it appears that the proposed refuse-to-energy plant involves capital costs which are some seven (7) times greater than the potential cost of a composting plant.

In addition, the EIS discussion on economic impacts poses a hypothetical example of first year operating costs for a refuse-to-energy plant which shows a net per ton cost of $19.11. The City in its Request for Proposals (RFP) on the resource recovery project sets a criteria of $17.00 per ton as a maximum "net tipping fee" for first year operations. Consequently, it appears that the City is courting net* costs in the range of $17.00 to $20.00 per ton of refuse disposed at a refuse-burning plant. (* subtracts operating revenues from gross costs). These cost levels are from 1.75 to 2.05 times higher than the City's present cost of refuse disposal. The cost of composting refuse would be substantially lower than such levels.

European experience of recent date indicates that average

operating cost levels for the composting of municipal refuse amount to about $14.60 per gross ton (for refined compost ready for the most demanding agricultural application).(1)

Based on data gained from the construction and operation of municipal refuse compost plants in the U. S. and the economies of scale posed by the capacity of a plant capable of handling Oahu's refuse, gross per ton operating costs for such a plant are estimated to be in the range of from $13.00 to $16.00.(2)

The EIS projects an operating cost of the refuse-burning plant of $26 million. Thus gross unit costs for refuse disposal via this method will be as high as $50 per ton. This cost level is over five (5) times as high as present City costs for refuse disposal and over three (3) times higher than the projected cost of composting. This general cost expectation is corraborated by a statement of Mr. Dudley Pratt, President of the Hawaiian Electric Co.in a May 26,1983 Honolulu Advertiser article on the proposed refuse-burning plant. He said," It would cost $150 million to $200 million to build a resource recovery system and at 10 percent per year, interest alone would cost $20 million a year." Thus the gross per ton costs attributed to interest only in a refuse-burning plant will be as high as $40 per ton and over 2.5 times the cost of composting.

Not only are all projected and actual cost measurements for composting consistently less than for refuse-burning but the gross cost for composting is less than the net cost for refuse burning.

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(1) Calculations of a German Manufacturing Co. engaged in the manufacture, construction and operation of compost plants in Europe,1980

(2) Composting at Johnson City, Wiles,C.C. & Stone,G.E.,final report on a joint TVA/USPHS project, USEPA 1975, Sw-312.2

(gross per ton costs are those required to pay for the actual process of refuse disposal. Net per ton costs are obtained by subtracting revenues derived from the sale of any by-products, ie, energy or compost, from the gross per ton costs).

It is also noted here that the EIS does not discuss the gross per ton costs of the refuse-burning process. For full public disclosure gross per ton costs should be addressed in the document.

Interms of the foregoing discussion of cost, it is difficult to comprehend statements in the EIS which refer to " savings to the City and County government" accrued from generating electricity from refuse-burning and which the EIS states would be passed along to the taxpayer. The EIS is not specific as to where these savings will come from. A more extensive disclosure would point out that taxpayer costs would have to rise to cover the obviously more expensive cost of burning refuse to generate electricity as found in the CE/AMFAC and Wheelabrator projects. Such an increase would range between 75% and 97% above present City costs for refuse disposal.

If, over the long term, these costs decreased, it would only be due to a substantial increase in consumer prices for electric power. The EIS projects such a rise of 395% in electric rates by the year 2006. Consequently the consumer would be paying vastly higher electricity rates in order to realize any decrease in the high cost of refuse disposal created by going the refuse-burning route. The "trade-off" does not appear to be an advantageous one since electric rates constitute a much larger share of the cost of living than does refuse disposal. By tying the economics of refuse disposal to the economics of energy, the City government becomes an indirect

proponent of ever-increasing power costs and introduces an artificial "price-support" factor in the energy field. City officials of the future would be severely handicapped if they desired to pursue policies of maintaining or decreasing power rates for they would be suppressing their own revenues and increasing City subsidies for refuse-burning. In most cases also, the consumer and the taxpayer are one and the same and raising the spectre of savings to the taxpayer by increased prices to the consumer is a concept of questionable merit. It seems quite analogous to " robbing Peter to pay Peter."

On the basis of this data, it is difficult to rely on the EIS statement that a composting alternative promises to be significantly more costly than refuse-to-energy. By all available parameters, a composting alternative would be significantly less costly than the proposed refuse-burning approach. The absence of comparative data in the EIS such as provided above, raises questions about the acceptability of the document.

b. Market Demand for Compost : (Chapter V, Sec 5 - 3.4

The EIS states that, " In Hawaii, where the potential uses (of compost) are even fewer than on the mainland, the liklihood of any significant market demand seems practically nil." Again, no corroborating data is provided to justify this statement and it is difficult to accept in terms of Hawaii's extensive involvement in commercial agricultural industries and in terms of its geologic soil deficiencies. Both of these areas would benefit significantly from the application of large amounts of compost.

Conditioning our agricultural soils to produce healthy crops by using compost also could well be the natural answer to the problem of using chemicals to bolster crop health. Chemicals used for this purpose are known to find their way into our water supply.

In addition, the composting of municipal refuse no longer has to rely on revenues from the sale of compost to be an economically viable method of refuse disposal. The costs of composting are competitive within the range of the gross present cost of refuse disposal in Honolulu. Theoretically, if no compost at all were sold,composting would still be a good method of refuse disposal since the end-product is a sanitary, stable, environmentally sound and acceptable material - no longer refuse - which does not have to be further disposed of for the health, safety and welfare of the public. From this standpoint, it is irrelevant to the City whether there is a market for the sale of compost.

However, it is more likely in reality that there will be a significant demand for compost in Hawaii and whether it is sold or no, all of the material produced by composting our municipal refuse will be used for a beneficial purpose. Stating that the demand would be "nil" hardly reflects the true potential and need that exists on Oahu for refurbishing our soils and enhancing our agriculture.

2. Environmental Impacts of Composting

On one hand, the EIS states that," Only composting offered any benefits not available from the current proposals,ie,increased recycling of organic material ... " On the other hand, the EIS states," Overall, none of the alternatives had fewer adverse impacts than the technologies proposed by CE/AMFAC and Wheelabrator-Frye and all promised to be significantly more costly." (page I-3.Sec 1.5)

These statements are somewhat contradictory and a close analysis of the latter indicates that it is not necessarily true. A composting plant would not generate chemical dioxins or any other heat or smoke-borne pollutant simply because it burns nothing. Composting would not generate or emit sulphur dioxide ($SO2$) either. (See EIS sections 4.11.4.2.3 and 4.11.5.1 and 4.11.5.2.2 for discussion of dioxins and sulphur dioxide in relation to the proposed refuse-burning process). Composting also does not produce ash to be disposed of. A composting plant has only routine water needs and therefore would not require an intake pipe from the ocean; would not eject hot water into the ocean and would not impact marine life in any way. Due also, to these routine water needs , a compost plant would not involve a potential draw-down on the Waipahu fresh water system or require disposal of the tremendous amounts of water needed for cooling in the refuse-burning proposals.

The rather dramatic differences in costs between refuse disposal by composting and refuse disposal by burning for energy have already been discussed to show the questionability of the EIS statements on costs of composting.

In light of these considerations, it appears that a more searching analysis of the two alternatives would show that composting decidedly has fewer possible adverse environmental impacts; contains much less risk of any serious environmental influence and its beneficial products will not produce an inflationary influence on the economy.

3. Miscellaneous Comments:

a. Although in the discussion of " organic compounds" produced by the proposed refuse-burning process the generation and emission of "dioxin" is confirmed by the EIS, no satisfactory disposition for such a problem is offered. Nor is the possible emission of dioxin discussed in the summary or in the "unresolved issue" section.

b. The composting of municipal refuse has had a successful twenty-five (25) year history in Europe, the EIS is totally devoid of any reference to this European experience.[3]

c. Of the two hundred (200) references cited to substantiate statements and evaluations contained in the EIS, <u>not one</u> is a direct source on the science, history or operating experience of composting municipal solid waste in the United States or Europe. In this commentary alone, I have made reference to three such sources. All of these references are available in the Municipal Reference Library of the City and County of Honolulu and the Honolulu Office of the EPA yet none of them were utilized in the preparation of the EIS.

d. The EIS discusses the possibility of decreasing the unit cost of refuse disposal over the years by projecting increases in the rates for electricity generated by refuse-burning. The EIS calculation is based on a projected 2% increase in rates per year until 1987 and then an increase of 7% per year. (this would mean that 1 Kilowatt Hour(KWH) now costing 10¢ would cost the consumer 39.5¢ in 2006).

In fact, electric rates are falling rather than rising currently. The July 1983 newsletter of the Hawaiian Electric Co. (Vol II #7) states that electric rates in June 1983 were 18% lower than the same rates in June 1981. This actual fluctuation and the possibility of such fluctuations in the future were not considered in the projection of electric rates contained in the EIS discussion.

(3) Op Cit. <u>Composting at Johnson City</u>, Introduction

Revenues projected for the refuse-burning process may therefore turn out to be on the high side and consequently the net cost to the City understated.

I believe that all of these points are of sufficient merit and import to require additional analysis and discussion in the EIS.

Very truly yours,

Robert N. High

Robert N. High

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

August 18, 1983 R83-593

Mr. Robert N. High
469 Ena Road
Suite 1501
Honolulu, Hawaii 96815

Dear Mr. High:

Subject: Environmental Impact Statement for the Proposed <u>Solid Waste Processing and Resource Recovery Facility</u>

Thank you for your August 6, 1983 letter concerning the environmental impact statement for the City's proposed resource recovery facility. We appreciate the time you spent reviewing the document.

You raise a number of issues regarding the proposed project and the EIS's treatment of it. In particular, you suggest that composting was not given adequate consideration as an alternative to energy recovery. I believe your assertions are incorrect and that the City has made every reasonable effort to provide for the economical and environmentally responsible disposal of its waste.

The remainder of this letter outlines the steps in the decision-making process that have led to the current proposal and the reasons for the choices that have been made. It also responds to the specific objections raised in your letter. I hope you will find our answers satisfactory.

<u>Background</u>

Before beginning the individual responses, it is instructive to briefly review the steps the City has taken over the past decade in deciding to pursue a refuse-to-energy project.

<u>Pre-1982.</u> The City has for many years forseen the need to end its complete reliance on sanitary landfills for disposal of municipal solid waste. In December 1972 the <u>Hawaii State Plan for Solid Waste Recycling</u> was published. This was followed in 1975 by a report entitled <u>Feasibility of Power Generation from Solid Waste on Oahu</u> and in 1976 by the <u>Solid Waste Energy and Resources Task Force Report</u>. In 1977, the MITRE Corporation submitted its <u>Analysis of the Feasibility of Resource Recovery for Honolulu</u> recommending the issuance of a Request for Proposals (RFP) for a resource recovery facility. Subsequently, an RFP was issued for the HPOWER project. Following protracted study and negotiations, the City received six pricing proposals from two different offerors. However, the City Council tabled the bill which would have funded the contract.

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Mr. Robert N. High
August 22, 1983

<u>Current Project.</u> On August 24, 1982, the Department of Public Works issued a <u>Request for Proposals for the Financing, Design, Engineering, Construction, Shakedown, and Operation/Maintenance of a Solid Waste Processing and Resource Recovery Facility for the City and County of Honolulu</u>. (This document is referred to subsequently as the RFP.) An EIS Preparation Notice was issued in March 1983 covering proposals which had survived initial screening. As you know, the draft EIS was published in early July 1983, and covered all of the proposals still under consideration.

The August 24, 1982 RFP stated:

The City and County of Honolulu is seeking processes which will:

a. Raise steam for use as is, or to generate electrical power;

b. Exhibit a demonstrated performance record operating for the past two years at a minimum capacity of 30 tons per hour (tph) and an annual throughput of 50,000 tons per year (tpy); and

c. produce marketable products, which have been sold on a commercial basis.

Because composting does not involve energy recovery, either in the form of steam or electricity, technologies which employ it did not qualify under the terms of item "a." The requirement stipulated in item "c." also poses a problem for composting in that it would be very difficult to demonstrate the existence of a paying market for the quantity of compost that would be produced by a facility or facilities processing 1,800 tons per day.

In addition to these requirements, the RFP contains another which is applicable to <u>all</u> disposal technologies and which cannot be met by composting. Specifically, Section 4.4.2.1 (c) of the RFP stipulates that:

> offerors shall...meet the weight and volume reduction requirements of producing not more than twenty-five (25) percent by weight (wet) and ten (10) percent by volume of the incoming refuse.

The proposals submitted by Wheelabrator-Frye and by C-E/Amfac meet this volume reduction requirement. The scientific literature indicates that the volume reduction produced by composting is on the order of 30 to 35 percent, a fraction of that available through refuse-to-energy processes. Hence, the City would need to dispose of the remaining 65 to 70 percent in a landfill, unless the compost could be marketed or given to agriculturalists who would carry it away for use on their fields. At this time the existence of a market for compost (even if it is given away) has not been demonstrated. Hence, prudence dictates that the necessity of landfilling the compost be assumed.

While the focus of the City's recent non-landfill solid waste disposal efforts has been in the refuse-to-energy area, the department has continued to informally evaluate alternative disposal strategies, and we are always open to new approaches that meet our objectives.

Alternative Approaches to Waste Disposal

Your letter states:

> The EIS discussion of the different methods of solid waste disposal which would provide viable alternatives to the proposed "refuse-to-energy" approach is too superficial to be considered adequate. This is particularly true with regard to the discussion of composting as a viable alternative approach to refuse disposal. The EIS discussion attempts to discard composting as an alternative on the basis of statements that are erroneous and therefore the conclusions reached by the EIS are misleading.

It then goes on to cite a number of examples of these. The examples are divided into ones having to do with cost and those related to market demand for compost.

a. Cost

Comment. You state that the EIS:

> ...fails to pursue a disclosure of these benefits [of composting] and dispenses summarily with this very attractive alternative because it 'promises to be significantly more costly (than refuse-burning)'. No data is provided to justify this statement on the alleged higher cost of the composting alternative.

You then go on to cite several studies (including one by Galler, *et al.* on composting of animal waste, a material very different from municipal refuse, and another by a manufacturer with a stake in a proprietary composting process) which conclude that the "capitalization costs" of a composting facility would be markedly less than those of refuse-to-energy facilities.

Response. First, and most importantly, it should be recognized that it is net cost, not capital costs alone, which are of most concern to the City. Hence, your attempt to demonstrate that refuse-to-energy plants involve greater capital investment per ton of capacity than do composting plants is largely irrelevant. Except insofar as a particular capital expenditure carries with it undue risk or would adversely affect the City's borrowing capacity, there is no reason to avoid it *if* it will result in lower overall costs. The proposed resource recovery facility utilizes proven technology, and the contractor, not the City, would be liable for repayment of the Special Purpose Revenue bonds used to finance the project. Hence, we believe the risks are small.

In addition to this fundamental difference, there are several other points at which we believe your arguments concerning costs go astray.

(1) In comparing composting with the hypothetical refuse-to-energy facility costs presented in the EIS, you appear to utilize the assumed bond issue amount as the "capitalization costs" of the proposed facility. The amount of the bond issue includes contingency amounts, working capital, design fees, and other amounts not accounted for in the composting facility cost estimates cited in your letter. If adjustments are made to make the various sets of figures comparable, the apparent cost advantage of composting is reduced.

(2) Your conclusion that:

> It appears that the proposed refuse-to-energy plant involves capital costs which are some seven (7) times greater than the potential cost of a composting plant.

is unsubstantiated by the material you have provided. In fact, it is contradicted by estimates made elsewhere on the third page of your letter to the effect that capital costs for the proposed resource recovery plant would be from 100 to 175 percent greater than capital costs of a composting plant.

(3) The composting cost estimates you cite do not include the cost of disposing of (i) solid waste which cannot be composted and

(ii) compost which cannot be sold or given away. Costs in the two hypothetical examples discussed in the EIS do provide for disposal of non-combustible refuse.

As noted above, there is no demonstrated market for the large amounts of compost that would be produced by an 1,800 ton per day plant. Hence, it must be assumed that the City would need to landfill the equivalent (in volume) of over 360,000 tons per year. This is roughly two-thirds of the 560,000 tons per year that must be landfilled now. This would leave the City with the difficult problem and cost of obtaining several hundred additional acres of landfill space. Moreover, when the projected rise in per-ton landfill costs is added to the cost of constructing and operating the composting plant, composting is much less economical than the proposed refuse-to-energy facility.

(4) A comparison table (Table 2) contained in the General Electric Company's Solid Waste Management Technology Assessment, one of the sources referenced in your letter, illustrates the effect that several circumstances relevant to the Honolulu situation have on the relative costs of composting versus energy recovery. First, it shows that composting is more expensive than energy recovery unless income from the sale of compost is assumed, an assumption which is unwarranted here. (In fact, as already explained, the need to landfill the compost actually adds a very significant cost.) Secondly, it shows the significant effect that higher than average energy revenues can have on per ton disposal cost-- an important consideration when it is recognized that Honolulu's electricity prices are among the highest in the nation.

(5) According to a study published by the General Electric Company, composting accounts for only about three percent of the municipal solid waste disposed of in Europe, where the process has historically been more widely used than it has been in the United States. Moreover, a large part of the composting done in Europe is in the Netherlands where nurseries account for much of the sales. Composting has actually lost ground recently as a method of solid waste disposal as new municipal refuse processing plants incorporate other, less costly techniques.

(6) The EIS's assertion that the proposed project would result in savings to the City and County government are based on analyses showing it would have 20-year costs lower than that of landfill, the disposal method judged to be the most economical alternative.

The proposed project would not result in significantly lower electrical power rates because State law requires the Hawaiian Electric Company to pay the "avoided costs" for the power it purchases from the facility. However, the net cost of operating

the City's solid waste disposal system would be reduced. The short-term disposal costs may not be lowered, as the refuse-to-energy facility is more expensive than landfill during the first few years of operation.

(7) The City has no intention of propounding increased electrical energy prices as a means of enhancing its revenues from the proposed project. The energy price escalation rate assumed in the EIS analysis was two percent per annum through 1986 and seven percent per annum thereafter. This is the same rate used for operation and maintenance (O&M) costs.

In view of recent experience, and of projections by recognized authorities in the energy field that energy prices will rise at least two percent per year faster than O&M, this is believed to be conservative. The City is not a proponent of such an increase, but abandonment of the proposed refuse-to-energy project would not reduce electricity prices. It would result in higher disposal costs. With energy recovery, the savings that will result as compared to a less efficient disposal method can be returned to the public.

Market Demand for Compost

(1) The City has been approached by and cooperated with persons interested in composting. Unfortunately, the plans of such persons have not been realized. If the economics of composting were as favorable as your letter argues, it is difficult to believe that private industry would be so reluctant to take advantage of this opportunity. In reality, compost is so bulky and contains nutrients in such limited concentrations, that the cost of transporting it from a composting plant to agricultural fields, applying it, and supplementing it with additional nutrients, has made it economical only for use in the cultivation of high value crops such as flowers. (It takes approximately one ton of compost to supply the nutrients contained in about five pounds of commercially available fertilizer.)

(2) At the top of page 7 of your letter you state:

> ...the composting of municipal refuse no longer has to rely on revenues from sale of compost to be an economically viable method of refuse disposal. The costs of composting are competitive within the range of gross present cost of refuse disposal in Honolulu. Theoretically, if no compost at all were sold, composting would still be a good method of refuse disposal since the end product is a sanitary, stable, environmentally sound and acceptable material -- no longer refuse -- which

does not have to further disposed of for the health, safety, and welfare of the public. From this standpoint, it is irrelevant to the City whether there is a market for the sale of compost.

The statement is incorrect and/or mis-leading in a number of respects. Most importantly, it ignores the cost of disposing of compost which no user is willing to haul away.

It must be remembered that nearly 1,200 tons per day of compost would require disposal, and that the per-ton cost for landfilling the compost would be only slightly less than that for normal municipal solid waste. Hence, just by itself the cost of landfilling unwanted compost makes this alternative more expensive than resource recovery over the twenty-year life of the project. If the cost of operating the composting facility is added to this, the comparison becomes even more unfavorable to composting.

Only in the very early years of the project would composting be superior with respect to cost. In later years, its lack of escalating revenues from the sale of electricity together with rising O & M costs would make composting far more expensive than the current proposal unless a market for the product can be found. And as previously stated, no such market has been demonstrated.

Environmental Impacts of Composting

The cost issues raised in your letter are discussed above. This section focuses on your assertions regarding the relative impacts of composting versus refuse-to-energy systems.

Your statement regarding the absence of sulfur dioxide and chemical emissions from composting plants is correct. However, this is not to say that such operations are entirely without their adverse effects. The processing portions involve the same type of shredding, sorting, and grinding as the RDF system proposed by C-E/Amfac. Thus, particulates and other airborne pollutants are still of concern for composting. More importantly, several times as much landfill area is required in support of composting unless there is a market for the compost, and compost can become odorous if the processing goes temporarily awry.

Potable water use by the proposed resource recovery facility is for domestic purposes and normal plant cleanup. C-E/Amfac has withdrawn its proposal to use brackish irrigation water for cooling in favor of air cooling or a system that employs saline groundwater drawn from on-site wells.

The use of ocean water for cooling is an option under study because of the potential increase in operational efficiency and cost savings which it may offer. However, such a system would not "eject hot water into the ocean". Effluent from such a system would be approximately 10 to 12 degrees centigrade warmer than the surrounding ocean; this differential would disappear within a short distance of the discharge point.

Preliminary surveys by a marine biologist indicate that the required intake and outfall would not have a significant adverse impact on the marine environment. None of the refuse-to-energy proposals under consideration would involve a potential drawdown of the Waipahu freshwater system.

In short, none of the dire hydrologic consequences which you attributed to the refuse-to-energy facility are likely to occur. The sanitary landfills needed to accommodate unmarketable compost would be at least as likely to have adverse impacts.

Miscellaneous Comments

(a) You are correct in noting that dioxins were not singled out by name in the Summary or Unresolved Issues sections (6.1.9 and 6.2). However, they were addressed generically as organic, non-criteria (unregulated) pollutants, in both sections by statements indicating that the level of emissions was very low and that the available scientific evidence indicates they would not constitute a significant health hazard.

(b) Composting is more prevalent in Europe than it is in the United States. Nevertheless, it accounts for less than three percent of total solid waste disposal, and its share has been declining in recent years. The countries where it is most strongly entrenched are those having unique applications in high-value agriculture. Such a strong market does not exist on Oahu. However, mention of the European experience will be added to the EIS.

(c) The bibliography does not adequately reflect the number of references concerning composting that have been consulted in preparing the EIS. The Revised EIS will list the additional references on this topic that were used.

(d) The electrical rates assumed in the discussion of project economics were based on a projected average annual increase of seven percent per year over the twenty-year life of the project. Over the past decade, changes in energy prices have occurred in fits and starts rather than evenly, and this pattern may be expected to continue. The decline in oil prices that has led to the current reduction in electricity prices is not expected to continue.

Please note that the estimates are in inflated, rather than constant, dollars. The general rate of inflation (as evidenced by projected operation and maintenance costs for the facility) was also assumed to be seven percent per year. Hence, there would be no increase in real terms. The estimate is based on the best information information available at this time. Many less-conservative projections assume that electrical power costs will rise faster than the general rate of inflation. If this occurs, the economic advantages of a capital-intensive resource recovery facility such as is proposed would be even greater than we have shown.

Thank you again for your comments. If you have additional questions, please contact Mr. Melvin Lee of the Refuse Division at 527-5366.

Yours very truly,

Michael J. Chun

Michael J. Chun

cc: Department of Land Utilization
Environmental Quality Commission

APPENDIX A

PLANT SPECIES ON HANUA STREET PARCEL

CHECKLIST OF SPECIES FOR HANUA STREET PARCEL

Scientific Name	Common Name Hawaiian Name	Status
MONOCOTYLEDONEAE		
Gramineae - Grass Family		
Chloris inflata Link	Swollen fingergrass Mau'ulei	Exotic
Cynodon dactylon (L.) Pers.	Bermuda grass Mānienie	Exotic
Panicum maximum Jacq.	Guinea grass	Exotic
Pennisetum setosum (Sw.) L.C. Rich. in Pers.	Feathery pennisetum	Exotic
Unidentified grass (dried)		
DICOTYLEDONEAE		
Acanthaceae - Acanthus Family		
Asystasia gangetica (L.) T. Anders	Asystasia; Chinese violet	Exotic
Aizoaceae - Carpetweed Family		
**Sesuvium portulacastrum* (L.) L.	Sea purslane 'Akulikuli	Indigenous
Amaranthaceae - Amaranth Family		
Achyranthes indica (L.) Mill.		Exotic
***Achyranthes splendens* var. *rotundata* Hbd.		Endemic (Oahu)
Batidaceae - Batis Family		
Batis maritima L.	Pickle weed 'Akulikuli-kai	Exotic

Scientific Name	Common Name Hawaiian Name	Status
Boraginaceae - Heliotrope Family		
**Heliotropium curassavicum* L.	Seaside heliotrope Hena	Indigenous
Chenopodiaceae - Goosefoot Family		
Atriplex semibaccata R. Br.	Australian salt bush	Exotic
Compositae - Sunflower Family		
Pluchea xfosbergii Cooperrider & Galang		Exotic
Pluchea indica (L.) Less.	Indian pluchea	Exotic
Pluchea odorata (L.) Cass.	Pluchea; sour bush	Exotic
Verbesina encelioides (Cav.) B. & H. ex Gray	Golden crown-beard	Exotic
Convolvulaceae		
**Ipomoea cairica* var. *cairica* (L.) Sweet	Koali	Indigenous
Euphorbiaceae - Spurge Family		
Euphorbia glomerifera (Millsp.) L.C. Wheeler	Graceful spurge	Exotic
Euphorbia hirta L.	Garden spurge Koko-kahiki	Exotic
Ricinus communis L.	Castor bean Koli	Exotic
Leguminosae - Pea Family		
Acacia farnesiana (L.) Willd.	Klu Kolū	Exotic
Desmanthus virgatus (L.) Willd.	Virgate mimosa	Exotic
Leucaena leucocephala (Lam.) de Wit	False koa Koa-haole	Exotic
Prosopis pallida (Humb. & Bonpl. ex Willd.) HBK.	Mesquite Kiawe	Exotic

Scientific Name	Common Name Hawaiian Name	Status
Malvaceae - Mallow Family		
**Sida cordifolia* L.	Lei ilima 'ilima	Indigenous
**Sida fallax* Walp.	Ilima 'ilima	Indigenous
Myoporaceae - Naio Family		
**Myoporum sandwicense* var. *stellatum* Webster	False sandalwood Naio	Endemic (Oahu)
Passifloraceae - Passion Flower Family		
Passiflora foetida var. *foetida* L.	Scarlet-fruited passionflower Pohāpohā	Exotic
Solanaceae - Nightshade Family		
Nicotiana glauca Grah.	Tree tobacco Mākahala	Exotic
Sterculiaceae - Cocoa Family		
**Waltheria americana* L.	Waltheria Hi'aloa; 'uhaloa	Indigenous

* Native species

** Endangered species

APPENDIX B

LISTS OF DISEASES SOMETIMES TRANSMITTED BY VECTORS TO HUMANS

Diseases Potentially Transmitted by Murine Rodents

S	P	N	
		X	Echinostomiasis
	X		Septicemica
		X	Histoplasmosis
		X	Lymphocytic Choriomeningitis
X			Plague
	X		Rat-Bite Fever
	X		Rat-Mite Dermatitis
	X		Rat Tapeworm Infection
		X	Rocky Mountain Spotted Fever
		X	Salivary Gland Virus Infection
	X		Salmonellosis
		X	Schistosomiasis
		X	Bilharziasis
		X	Sporotrichosis
		X	Swine Erysipelas
X			Trichinosis
X			Eosinophilic Meningoencephalitis
X			Leptospirosis
		X	Relapsing Fever
		X	Tularemia
		X	Rickettsial Pox
X			Murine Typhus

Source: Robert W. Jones (1956). "The Public Health Significance of Rodents in California," California Vector News 3:7:32-34.

Diseases Potentially Transmitted by Flies

S	P	N	Known
		X	Typhoid
	X		Bacillary Dysentery
	X		Amebic Dysentery
	X		Diarrheas
		X	Asiatic Cholera
		X	Helminth Infections
	X		Myasisis
		X	Loiasis
		X	Onchocerciasis
		X	Ozzards Filariasis
		X	Leishmaniasis
		X	African Sleeping Sickness (Trypanosomiasis)
	X		Yaws
		X	Tularemia
	X		Bartonellosis
	X		Catarrhal Conjunctivitis
		X	Sandfly Fever
			Suspected
		X	Anthrax
	X		Salmonellosis
	X		Protozoal Infestations
		X	Trachoma
		X	Poliomyelitis
	X		Tuberculosis
		X	Hepatitis

Source: G.W. Hunter, W.W. Frye, and S.C. Swartzwelder (1960). A Manual of Tropical Medicine. W.B. Saunders Co.:Philadelphia.

Diseases Potentially Transmitted by Mosquitoes

S	P	N	
X			Dengue
	X		Encephalitis (St. Louis and Japanese B)
	X		Filariasis
		X	Malaria
X			Yellow Fever
		X	Tularemia
		X	Lymphocytic Choriomeningitis
		X	Melioidosis

Sources: G.W. Hunter, W.W. Frye, and S.C. Swartzwelder (1960). A Manual of Tropical Medicine. W.B. Saunders Co.: Philadelphia.

T.G. Hull (1963). Diseases Transmitted from Animals to Man. Charles C. Thomas: Springfield.

Diseases Potentially Transmitted by Cockroaches

S	P	N	
			Known
	X		Food Poisoning
	X		Dysentery
	X		Diarrhea
			Suspected
	X		Salmonellosis
	X		E. Coli Bacterial Infection

Sources: M.E. Rueger and T.A. Olson (1969). "Cockroaches as Vectors of Food Poisoning and Food Infection Organisms", Journal of Medical Entomology 6:185-89.

R.V. Cardone and J.J. Gauthier (1979). "How Long Will Salmonella Bacteria Survive in German Cockroach Intestines?" Pest Control Magazine 47:6:28-30.

Diseases Potentially Transmitted by Birds

S	P	N	
	X		Ornithosis
	X		Encephalitis
	X		Histoplasmosis
	X		Salmonellosis
	X		Toxoplasmosis
X			Bird Ectoparasite Dermatitis

Source: L.C. Truman, G.W. Bennett, and W.L. Butts (1976). Scientific Guide to Pest Control Operations. Harvest Publishing Co.: Purdue University.

Note: All vector-borne diseases are rated as to their significance as a public health concern in Hawaii. All diseases were ranked as follows:

S = Significant public health concern in Hawaii. Known cases of the disease have occurred here.

P = Possible public health concern in Hawaii. Either the vector species or pathogen exists here.

N = Not presently a public health concern in Hawaii. Neither the vector species nor pathogen exists here.

Rating provided by Mr. James Ikeda (1980) Entomologist, Vector Control Branch, Hawaii State Department of Health, except ratings on bird-transmitted diseases provided by Mr. Allen Y. Miyahira (1980), Extension Specialist in Veterinary Science, University of Hawaii.