

United States and other countries are evaluating landfill alternatives and have observed some progress. Some of the results of those evaluations are used in this section to identify the advantages and disadvantages of the alternatives and compare them to the City's criteria, which are also listed in this section.

The alternatives fall into several categories:

- Thermal processes which use heat to reduce the waste to other reusable products or a fuel. Pyrolysis and hydrolysis are examples of thermal processes.
- Non-thermal processes that produce a material, such as compost, that is sold.
- Enhanced recycling.
- Expansion of H-POWER.

All of these alternatives have the potential for reducing the amount of waste disposed at the Waimanalo Gulch Sanitary Landfill. Each process produces a residue that, at this time, can only be landfilled.

6.1 City Requirements for Alternative Technologies

The consideration of alternative technologies has been ongoing in the C&C for many years. Those efforts have included implementing new recycling programs, bans on disposing certain recyclable materials in the landfill, and issuance of an RFP for Alternative Technologies or another boiler for H-POWER. It has since selected the addition of a third boiler at H-POWER to increase diversion of waste from the landfill.

Where an Alternative Technology is proposed, the C&C identified the following six minimum requirements.²¹

- "There exists at least one (1) operational facility processing municipal solid waste that over the past two (2) years has been operating at a rate of at least five hundred (500) TPD in which the Offeror or its design and operational members have been substantially involved. Names, addresses, and phone numbers of persons that can be contacted at the facility or at the agency responsible for the facility shall be provided.

21 City and County of Honolulu, Notice to Bidders, Project to Construct and Operate Alternative Energy Facility and/or H-POWER Facility. Competitive Sealed Proposals (CSP) NO. 037, January 16, 2007.

- Such facility has been operated successfully for the past two (2) years and has been fully operational eighty five percent (85%) of this time while meeting all performance and environmental compliance requirements.
- The facility without major modification or equipment changes, other than for the acceptable application of good engineering practice for scale up or scale down, would substantially represent the system proposed for Honolulu.
- The product produced at the facility has for the past two (2) years been marketed and resulted in the beneficial reuse of energy. The Offeror shall provide descriptions and documentation of the beneficial reuse such as, operating reports, weight records, names of purchasers, revenues from sales, etc. in sufficient detail to demonstrate fulfillment of this requirement. For example, producing steam for steam sale is not as complex as producing steam for generating electric power. For an Offeror to be able to claim an ability to contract for electric power to a utility, the Offeror must demonstrate that it has power purchase contracts on going and that the utility or energy customer, to which the power is to be sold, provides evidence in writing that it shall enter into a power purchase contract based on its understanding of the proposed facility's ability to produce such power. If energy sales at existing facilities are not comparable to those proposed, anticipated revenues shall not be included in the Offeror's Price Proposal. Research and development projects or similar efforts that have not resulted in a contracted marketed product with actual sales are not acceptable and shall not be included as Revenue in the Offeror's Price Proposal. For the Options proposed, the selected Offerors shall participate with the City in the development and maintenance of the Power Purchase Agreement (PPA) between the City and the Utility similar to the PPA included as Appendix D of the Contract Documents. In order to assure a good understanding of the Hawaiian Electric Co., Inc. service requirements, the Offeror shall complete and submit Sections 1 and 2 of Attachment 'A' as part of its Proposal. In addition, the selected Contractor shall be required to enter into an Interconnection Requirements Study Agreement as provided for in Attachment 'B'. Attachment 'C' Sample Information on Performance Requirements is provided as information for the bidders. The specific values for these performance parameters would be finalized in the course of the PPA negotiations. It is understood that the selected Contractor shall be responsible for the payment of all cost required for the development of and adherence to conditions of the Power Purchase Agreement and those of Attachments 'A', 'B' and 'C' of this Notice to Bidders and for the payment of all penalties for non performance due to Contractors fault associated with these Contract Documents.

- The proposed Facility shall be commercially available such that: (1) The design is proven and the proposed facility is not the first of its kind; (2) The equipment proposed has operated successfully at least eighty-five percent (85%) of rated capacity while at the same time operating for at least eighty-five percent (85%) of the time during the past twenty-four (24) month period; (3) The equipment is regarded as being reliable and not subject to excessive maintenance, operational problems, or requires major re-designs; (4) The facility has processed a minimum of five hundred (500) TPD of municipal solid waste while operating in accordance with all environmental permits.
- Certification that the ash slag and residue by products from the proposed facility have met all environmental requirements for either marketing or landfill disposal including passage of the [Toxicity Characteristic Leaching Procedure (TCLP)] test and classification as non-hazardous materials, or, if deemed hazardous certification from the final disposal site that materials have been properly disposed of and how it would be disposed of for this project.”

In its RFP, the C&C encouraged both thermal and non-thermal technologies. With thermal technologies the by-product is steam or electricity which can be sold. The by-products of non-thermal technologies are materials that require development of a market (i.e., building material, or compost). Technologies that produce a product that must be sold into a market (other than an energy market) will be more difficult in Honolulu. For example, a market does not currently exist for an alternative technology that produces an MSW compost product. The reason is that the market for MSW compost is restricted on the mainland and has faced controversy in Honolulu.²² The proponent of a technology that produces a solid MSW fuel would need to find a fuel user and there are only two solid fuel users, H-POWER and the AES coal fired power plant. The current H-POWER facility is operating at capacity. To handle an MSW fuel at AES would probably require a revision to its permits, a lengthy and expensive process, provided AES wished to pursue it.

6.2 Non-Thermal

Non-thermal or non-combustion technologies are those that do not require and/or produce large quantities of heat. Non-thermal technologies included in this analysis are digestion and hydrolysis.

Digestion is the decomposition of MSW with the use of microorganisms. The process can either be anaerobic or aerobic.

²² Leone, Diana. *Waianae Compost Plan Hits Turbulence*. Star Bulletin. August 17, 2006.

6.2.1 Anaerobic Digestion

Anaerobic digestion is the decomposition of MSW without the introduction of oxygen. End by-products tend to be liquid, gas, and solid materials. The organic fractions of MSW are converted into single-celled proteins, which can be used for compost and fertilizers. Due to the length of time anaerobic digestion takes, more land is required to process the amount of MSW the C&C requires of an alternative technology.

Examples of anaerobic technologies include:

- ArrowBio
- Orgaworld
- Organic Waste Systems' DRANCO Dry Anaerobic Digestion

The discussions in this section are based on information about the ArrowBio process. ArrowBio uses naturally occurring microbes to break down the organic fraction of MSW. Others will have different approaches and equipment, but produce similar products.

Currently, Orgaworld has two operating facilities, each with a capacity of 96 TPD, while Organic Waste Systems' facilities process up to 137 TPD. Both are less than the C&C minimum requirements and the Orgaworld and Organic Waste Systems are not discussed further.

ArrowBio has a 200 TPD plant operating.

6.2.1.1 How It Works

Using a separation-dissolving tank, organic and inorganic materials are separated based on buoyancy. Heavier inorganic materials, such as metal and glass, sink to the bottom of the tank and are taken for further separation and then are recycled or disposed. Plastics, which remain floating, are separated pneumatically, while the remaining organic fraction is shredded and more water is introduced to further the biodegrading process. The remaining organic material is treated in acetogenic and methanogenic reactors producing fertilizer and biogas. The biogas, made up of approximately 75 percent methane, can be sold as clean, green energy for use in transportation and power facilities, or used internally to power the facility. The technology vendor is responsible for the disposal of these residues.

The demonstration facility, located in Hadera, Israel, processed more than 30 TPD of MSW and operated from 1996 to 1999. The facility was designed to process 11 TPD of MSW.

One full scale ArrowBio facility located at the Hiriya transfer station in Tel Aviv, Israel has been in operation since 2002. The facility processes approximately 210 TPD of MSW and generates biogas sufficient to produce three MW.²³

6.2.1.2 Other Jurisdictions Using This Technology

Currently the only ArrowBio facility in operation is at the Hiriya transfer station in Tel Aviv, Israel. ArrowBio technology may soon be added as part of Australia's Macarthur Resource Recovery Park, a proposed integrated waste facility on the current Jacks Gully landfill site.²⁴

6.2.1.3 Physical, Regulatory, and Environmental Requirements

The ArrowBio facility at the Hiriya transfer station in Israel has one 200 TPD module and requires approximately two acres of land, with an additional one-half to one acre for long-term storage of materials. If it were sized up to meet the 500 TPD requirement, an estimated six acres would be needed.

This facility would require 0.05 MW of electricity per ton of MSW processed, which is met with the generation from the biogas. Water consumption data is not readily available; however, ArrowBio claims the consumption is low due to moisture in the MSW. Additional water is required for the separation/dissolving tank.

ArrowBio claims no negative environmental impacts. There is no significant odor potential as the MSW is immediately placed into the separation-dissolving tank. The treatment takes place in enclosed tanks, also reducing potential odors. Water used throughout the process is reused in the separation-dissolving tank, which results in low water consumption. A small amount of wastewater is generated from the process, but is expected to be suitable for release into the sanitary sewer system.

The company provided no information regarding economic benefits associated with the technology.²⁵

23 Arrow Ecology www.arrowecology.com, March 11, 2008.

24 Marshall, A.T. and Morris, J.M., "A Watery Solution," Chartered Institute of Waste Management Journal, August 2006.

25 *Evaluation of New and Emerging Solid Waste Management Technologies*, New York City Economic Development Corporation and New York City Department of Sanitation, September 16, 2004.

6.2.1.4 Potential Issues

- There may be size-up issues unless units of the same size as the existing facility are used.
- A market will need to be developed for the MSW compost, which may be difficult. MSW compost is not currently marketed on Oahu so it may be challenging and time consuming to develop the market.
- A market will be needed for biogas or it will need to be used to generate electricity and sold to HECO.

6.2.1.5 Consistency With City Requirements

The anaerobic digestion facilities do not meet the City's requirements:

- The existing facilities either process less than the City's minimum waste stream (the existing ArrowBio facility 210 TPD of MSW, 300 TPD less than what the C&C requires) or they process source-separated organics.²⁵ ArrowBio could use multiple units to meet the City requirement.
- The facility design for the ArrowBio is the first fullsize facility.
- There is no proven market for the MSW compost product.

6.2.2 Aerobic Digestion

Aerobic digestion is the decomposition of MSW with the introduction of air. Examples of aerobic digestion include Mining Organics, Real Earth Technologies, and Herhof Environmental's MBT Process. Due to the lack of readily available information about both Mining Organics and Real Earth Technologies, a generic explanation of Herhof Environmental's MBT Process is included. Different companies use different approaches and equipment, but produce similar products.

6.2.2.1 How It Works

The aerobic digestion process can be either wet or dry. Dry aerobic digestion is similar to in-vessel aerobic composting.²⁵ Inorganic materials, such as glass, metals, and plastics are removed from the MSW for recycling. The remaining material is shredded, mixed, and put into a vessel with a controlled amount of air and heat. Liquid is removed thereby reducing the volume. The mixture continues to be aerated, mixed, and depending on the reactor used, heated.²⁶

Wet aerobic digestion removes inorganic materials, such as glass, metals, and plastics, and pulps the organic materials from the MSW. The slurry is then mixed, aerated, and heated. Heating dries some of the organic material, reducing the total volume. Microbes are then introduced, which reduce the slurry to solid and liquid soil amendments for use in fertilizers.²⁵ The technology vendor is responsible for the marketing these materials.

6.2.2.2 Other Jurisdictions Using This Technology

Composting of kitchen, food, and green waste scraps is well established in Europe. Germany has more than 500 biochemical treatment facilities processing more than eight million TPY of food and green wastes; the majority of those facilities are aerobic compost facilities. However, these facilities are not processing MSW.²⁷ Vancouver, Canada has a 30 TPD demonstration plant by Herhof in operation processing separated food and other organic wastes.²⁵ There are currently seven commercial MSW Herhof plants in operation in Germany, Belgium, and Italy, with one proposed for the United Kingdom that will use the solid fuel produced by the MBT Process in a combustion plant.

6.2.2.3 Physical, Regulatory, and Environmental Requirements

These requirements are unknown as there are currently no aerobic facilities that meet the requirements of the C&C.

6.2.2.4 Potential Issues

The process results in a compost that would have to be sold, and no markets have been demonstrated in Honolulu. Even with a solid fuel by-product, Honolulu does not have an existing, market for the fuel.

26 Kumar, Surendra, Shashi and Salman Zafar. "Composting Technology." *MSW Management, The Journal for Municipal Solid Waste Professionals*. May/June 2006.

27 Oaktech Environmental, <http://www.oaktech-environmental.com/>, March 11, 2008.

The process requires source-separated organics; it does not process mixed MSW.

6.2.2.5 Consistency With City Requirements

None of the Herhof Environmental plants currently in operation process more than 500 TPD of MSW. However, Herhof Environmental states their MBT Process is capable of processing up approximately 1,095 TPD.²⁸

6.2.3 Hydrolysis

Hydrolysis is a chemical reaction in which water and another substance react, forming two or more new substances. With the hydrolysis of MSW, the reaction is between water and the cellulose fraction of the wastes to produce sugars. To obtain the cellulose fraction of the MSW, glass, metals, and other inorganic materials must first be removed.

Several types of hydrolysis technologies exist. The description by Arkenol Fuels is provided as an example for discussion. Another technology is the Masada Oxynol process.

6.2.3.1 How It Works

Arkenol Fuel technology, also named Concentrated Acid Hydrolysis, uses the source-separated fraction of MSW. The process first sorts out recyclable materials. The remaining material is ground for further processing. Sulfuric acid decrystallizes the material and breaks the organic fraction into its component sugars (cellulose and hemicellulose). The material is then hydrolyzed; the chemical bonds are broken, producing hexose and pentose sugars required for commercial fermentation. Insoluble materials are filtered for processing for other uses. The entire process runs on biomass, including agricultural residues, crops grown specifically for use as biomass, paper, wood, and green waste.²⁵

The pilot facility for Arkenol Fuels is in Orange, California, and processed one TPD of MSW. This facility operated for five years beginning in 1992.²⁹

The only commercialized Arkenol Fuel facility is in Izumi, Japan. It has been in operation since 2002, using waste wood chips as feedstock.³⁰

28 [http:// www.herhof.com/en/](http://www.herhof.com/en/), March 11, 2008.

29 Arkenol Fuels, <http://www.arkenol.com/>, March 11, 2008.

30 California Integrated Waste Management Board, Session Summary: Emerging Technology Forum, Brief summary of presentations by Rick Diederich prepared by CIWMB staff, April 17–18, 2006.



6.2.3.2 Other Jurisdictions Using This Technology

There are no hydrolysis facilities currently in operation that process MSW as feedstock and none of the size the City requires.³¹

6.2.3.3 Physical, Regulatory, and Environmental Requirements

A Masada facility that could process about 600 TPD is expected to require 10-acres. The environmental impacts include emissions from the process, waste water discharges, and other impacts. The facility will need to satisfy the State's regulatory and environmental process for MSW processing plants.

6.2.3.4 Potential Issues

The use of MSW as feedstock has not successfully been demonstrated except at a pilot facility scale, although Masada is developing a commercial facility.²⁵

A market for the ethanol produced is expected to exist in the City, but has not been proven. An uncertain market for ethanol is believed to be one of the reasons an Arkenol Fuel project failed, according to Arnold Klann, President, and Chief Executive Officer for Arkenol, Inc.³⁰

6.2.3.5 Consistency With City Requirements

Hydrolysis is inconsistent with the C&C requirements because there has not yet been a successful facility at the size required by the City operating on MSW.

6.3 Thermal

Thermal or combustion technologies produce a significant amount of heat. During the processes, both organic and non-organic materials are combusted while the non-combustible materials can be recycled either before or after combustion. Common thermal technologies are gasification, plasma arc, pyrolysis, and incineration. Examples of thermal technologies include:

- Covanta Energy — the City's H-POWER facility.
- Rigel Resource Recovery — Westinghouse Plasma Gasification.
- Dynecology — Gasification with Briquetting of Refuse Derived Fuel (RFD)/Coal/Sewage Sludge.

31 Interstate Waste Technologies, <http://www.iwtonline.com/>, March 11, 2008.

- Ebara Corporation — Fluidized Bed Gasification with Ash Vitrification.
- GEM America — GEM Thermal Cracking Technology (Gasification).
- Global Energy Solutions — Thermal Converter Technology (Gasification and Vitrification).
- Interstate Waste Technologies — Thermoselect Gasification.
- Pan American Resources — Destructive Distillation Lantz Converter.
- Pratt Industries/VISY Paper (RDF).
- Comprehensive Resources, Recovery, & Reuse, Inc. (RDF).
- Takuma Mass Burn Renaissance System.
- Resource Recycling, L.L.C. (Mass Burn).

H-POWER technology is discussed in its own section since it is a proven technology that is currently in use by the C&C.

6.3.1 Plasma Arc

This technology uses large carbon rods in a sealed vessel to generate a high temperature arc that converts the materials in the vessel into plasma (ionized air). Heat generated by the arc melts the inorganic fractions into a glass and vaporizes the organic fractions, which become a synthetic fuel gas. The glass can be disposed in a landfill or may be used for beneficial purposes, such as for replacement of imported sand for sand blasting. The synthetic gas is cleaned and burned to produce power.

There are several vendors of plasma systems, including Westinghouse, and other project developers. A four TPD plasma system was operating near the H-POWER plant to process medical waste.

The City Council Public Works and Economic Development Committee heard from some plasma system representatives during its review of potential landfill sites.³² The representatives that addressed the Committee were identified in the report as:

³² November 16, 2004 memorandum from Councilmember Rod Tam to Concerned Citizens of Oahu transmitting the report titled "Committee on Public Works and Economic Development's Summary Report on its Landfill Site Selection Process."

“... the following companies with the plasma gasification technology have made presentations or submitted materials to the Committee on Public Works and Economic Development ...:

- (1) JDI/Geoplasma, LLC;
- (2) Environmental Solutions Corporation representing the Solena Group;
- (3) EnviroDyne;
- (4) Startech Environmental Corporation;
- (5) Scientific Utilization, Inc. /Waste To Energy; and
- (6) Phoenix Consulting Group International, LLC, for Biomass Conversion Technology, LLC”.

6.3.1.1 How It Works

Plasma arc technology gasifies MSW with high pressure air and an electric arc that produces very high temperatures (up to 8,000 ° F). These temperatures virtually vaporize the waste into its elemental components, creating syngas, which can then be used to generate electricity.

6.3.1.2 Other Jurisdictions Using This Technology

Currently, there are two operating plasma arc facilities that process MSW. The longest running one and the only one that is not a demonstration plant is the Eco Valley Utashinai facility located in Utashinai, Japan. The facility processed more than 270 TPD of MSW and 130 TPD of automobile shredder residue and generates approximately 4,700 kWh of salable energy in fiscal year 2005.³³

The City of St. Lucie, Florida has begun the negotiations for a plasma arc facility. The Georgia-based company, Geoplasma, has agreed to build and operate the facility and claims the facility will process 2,000 TPD of MSW and 1,000 TPD of MSW mined from a landfill while producing 120 MW of electricity.³⁴

33 Shigehiro, Michiaki, General Manager of Eco Valley Utashinai.

34 Sladky, Lynne. “Florida county plans to vaporize landfill trash.” USA Today. September 9, 2006 and Margasak, Gabriel. “Trash zapper in St. Lucie County gets shot in arm from Crist”, TCPalm, November 10, 2007.

Geoplasma has agreed to build and operate the facility, estimating that within the next 15 to 18 years the facility will have disposed of all the current waste in the landfill. Ron Roberts, the Assistant Solid Waste Director in St. Lucie, estimates the plant will be finished within 25 to 30 months.³⁵

A second plasma plant operating on MSW started operation in late January 2008 in Ottawa, Canada. It is a demonstration project. The information about the plant was obtained from news sources³⁶, which stated:

“A demonstration waste-to-energy plant in Ottawa has finally turned its first load of trash into power...

... The \$27 million plant uses a process called plasma gasification to decompose waste under high heat and low oxygen into a gas mixture called syngas, and a glass-like material that can be turned into asphalt or concrete....

Once the plant is running at full capacity, it is to divert 85 tonnes of waste a day from the city's landfills while generating enough electricity to run the facility and power 3,600 homes....

Plasco hopes its demonstration plant in Ottawa will persuade other cities to buy the technology....

Construction of the plant started in September 2006. It was to run as a two-year pilot project.”

The PLASCO plant was partially funded by the Canadian government.

35 Miller, Dan. “State-of-the-art plant makes trash vanish into thin air.” County News Online. National Association of Counties, Washington, D.C., October 2, 2006.

36 Information from <http://www.cbc.ca/technology/story/2008/02/07/ot-plasco-080207.html>, March 12, 2008

"This brings to over C\$90 million the equity invested in PlascoEnergy since August 2005. The Company had nominal debt and a modest cash position prior to this issue, and is well funded for development of commercial facilities next year," said Rod Bryden, PlascoEnergy President and CEO. "Commitment of funding from Sustainable Development Technology Canada ('SDTC') to the Ottawa demonstration project was a key factor in bringing the PlascoEnergy technology to reality and to attracting private capital that will fund its future commercial use around the world. SDTC has committed a non-repayable contribution of C\$9.5 million," he said.³⁷

6.3.1.3 Physical, Regulatory, and Environmental Requirements

The Eco-Valley Utashinai facility is the only one of its kind that has been operating. If a similar facility were built on Oahu, it would have to meet the same requirements of both State and Federal regulations as any new alternative technology. *Table 5, Actual Treatment Record in 2005 (Fiscal Year)* was provided by the plant operator to the City staff and shows the operational record for one year. "ASR" refers to Automobile Shredder Residue.

Table 5, Actual Treatment Record in 2005 (Fiscal Year)³⁸

Month	Receipt of Waste (Tons)		Treatment of Waste (Tons)		Slag (Tons)	Electric Power (MWh)			Operating (day) Line1+Line2
	MSW	SR,ASR	MSW	SR,ASR		Generation	Consumption	Sold	
Apr	2,118	850	1,447	238	314	305	1,659	0	25+10
May	2,288	665	2,406	443	372	1,172	2,098	25	25+27
June	2,317	561	2,063	913	651	1,063	2,059	19	22+30
July	2,186	1,083	2,625	743	450	1,053	2,317	0	31+31
Aug	2,391	939	1,527	881	443	637	1,862	0	21+21
Sept	2,169	93	2,302	895	469	840	2,202	0	30+24
Oct	2,206	449	1,773	671	453	548	1,963	0	22+19
Nov	2,067	619	3,364	896	676	1,360	2,397	0	30+30
Dec	1,965	718	1,164	387	308	297	1,388	0	20+1
Jan	1,722	519	2,207	737	451	613	1,881	0	14+22
Feb	1,398	702	1,612	788	345	356	1,510	0	0+28
Mar	1,877	1,353	1,247	741	278	341	1,522	0	0+19
Total	24,704	8,551	23,737	8,333	5,210	8,585	22,858	44	240+262

37 Information from PLASCO new release dated December 12, 2007, http://www.plascoenergygroup.com/?News/23/2007-12-03:First_Reserve_leads_PlascoEnergy_equity_funding, March 12, 2008.

38 Nomura, Akira. Hitachi Metals. Actual Treatment Record for Utashinai Eco Valley. 2005. Correspondence to Wilma Namumnart. August 10, 2006.

6.3.1.4 Potential Issues

The experience with plasma operating on MSW has been limited to one full-scale plant.

The cost of the facility is believed to be \$425,000,000.³⁹ Until a full scale plant is operating on MSW, the actual cost of operations will not be known.

6.3.1.5 Consistency With City Requirements

Currently, plasma arc technology does not meet the C&C requirements:

- One of the two operating facilities has required maintenance for the furnace reflectors and the other started operations this year.³⁵
- The Eco Valley Utashinai facility processes 270 TPD of MSW, 230 TPD short of the C&C requirements. The Ottawa facility at 85 metric TPD is also short of the C&C requirements.
- These facilities are the only ones operating on MSW.

6.3.2 Gasification/Pyrolysis

Gasification is the process of reducing MSW to a synthesis gas. Pyrolysis is similar to gasification and often considered a type of gasification technology. The by-products of gasification are syngas and vitrified material (slag) and pyrolysis by-products are solid carbon and liquid fuel. Pyrolysis generally takes place during the first steps of gasification. Examples of gasification technologies are:

- Dynecology—Gasification with Briquetting of Refuse Derived Fuel (RDF)/Coal/Sewage Sludge.
- Ebara Corporation—Fluidized Bed Gasification with Ash Vitrification.
- GEM America—GEM Thermal Cracking Technology (Gasification).

³⁹ Waste Age Magazine, September 13, 2006. "Florida county to generate energy by vaporizing solid waste". Also their web page at <http://wasteage.com/news/Geoplasma/?cid=most-popular>, March 11, 2008.

- Global Energy Solutions—Thermal Converter Technology (Gasification and Vitrification).
- Interstate Waste Technologies—Thermoselect Gasification.
- Pan American resources—Destructive Distillation Lantz Converter.

6.3.2.1 How It Works

Dynecology's Gasification with Briquetting of RDF/Coal/Sewage Sludge technology processes MSW into RDF and then blends RDF and dewatered sewage sludge together with coal making briquettes. The briquettes are then introduced to the gasifier, or high-pressure, fixed-bed reactors. The inorganic fraction melts and is removed from the bottom of the chamber as slag and the synthesis gas is removed from the top. Dynecology has no facilities currently operating on MSW.

GEM America's GEM Thermal Cracking technology processes unsorted MSW. Recyclable materials, such as metals, glass, and cardboard are separated and the remaining materials are shredded, dried, and granulated. The MSW is then gasified and converted into synthesis gas. The synthesis gas can be used to generate electricity. GEM America has no commercial facilities currently in operation, but has two demonstration plants processing 73 TPD that have been in operation since 2000.

Ebara Corporation's Fluidized Bed Gasification with Ash Vitrification technology introduces shredded MSW into a fluidized bed reactor vessel. Gasification takes place in the reactor at atmospheric pressure. Temperatures range between 1,022–1,166° F, reducing the MSW to ash. The ash and synthesis gas enter into a second chamber where the materials are heated again at higher temperatures (2,372–2,642° F). Fine particles are collected on the walls and become molten slag collected at the bottom of the chamber and cooled to form a vitrified granulate. The synthesis gas is used to produce energy. The largest Ebara plant is its Kawaguchi City reference plant which processes 462 TPD of MSW.

With Global Energy Solutions' Thermal Converter technology (Gasification and Vitrification), unsorted MSW is introduced into the gasification reactor. Preheated air (660–840° F) is then introduced and the MSW is passed to a conversion chamber heated between 2,200–2,500° F and then to a second conversion chamber heated between 3,000–3,100° F. This secondary chamber cleans the gases and vitrifies the residue using a bed of molten material. The synthesis gas produced is used in a boiler to produce steam or to generate electricity.

Interstate Waste Technologies uses a waste treatment process called Thermoselect Gasification. The system compacts unsorted MSW thereby removing most of the air and evenly distributing the moisture content. The compacted waste is then pushed through a high temperature chamber where the inorganic waste turns molten and the organic waste converts into gas. The organic gases enter a lower temperature chamber and are shock cooled to avoid the formation of dioxins or furans. The gases are then shuttled through scrubbers to remove sulfur, heavy metals and other toxins. The resulting synthesis gas can be used for energy production or as a base material for chemical synthesis. The molten inorganic waste is also shock cooled and results in reusable mineral substances and metals. The water condensed during the different phases of the gas treatment is fed into the water treatment chambers where it undergoes a multiple-stage treatment. The processed water is then used for cooling purposes.⁴⁰

6.3.2.2 Other Jurisdictions Using This Technology

Global Energy Solutions has 14 facilities in operation in Japan, Asia, and Europe. Two facilities operating in Japan process solely MSW.

Interstate Waste Technologies has the following facilities:⁴¹.

- Fondotoce, Italy, operated the demonstration Thermoselect facility for six years, with commercialization commencing in 1994, from 1992-1998. The plant was decommissioned in 1999.
- Karlsruhe, Germany, operated a Thermoselect facility from 1999 until 2004, when it was closed due to “general business strategy decisions.” The facility processed 225,000 TPY of waste from surrounding towns and rural districts.
- Currently, seven Thermoselect facilities are operating in Japan. Three of the facilities operate on MSW. Commercialization of the Matsu facility began in 2003 and currently processes 140 TPD. The Nagasaki and Tokushima facilities commenced operations in 2005, with the Nagasaki facility processing 300 TPD and the Tokushima facility processing 120 TPD of MSW.

40 http://www.iwtonline.com/docs/Thermoselect_process_description.pdf, March 12, 2008.

41 http://www.iwtonline.com/docs/Thermoselect_process_description.pdf, March 12, 2008

6.3.2.3 Physical, Regulatory, and Environmental Requirements

Global Energy Solutions states that their Thermal Converter technology exceeds all known emission standards worldwide and that there are no odors due to their storage of MSW inside a building. Global Energy Solutions also states that their technology requires less land than traditional incinerators; however, no documentation of land requirements was found.⁴²

The synthesis gas produced is sufficient to power the Thermoselect facility.

Water consumption is 560 gallons/ton of MSW. Wastewater is treated and reused.⁴²

6.3.2.4 Potential Issues

- Global Energy Solutions' Thermal Converter technology vitrified residual by-product requires a market.
- Interstate Waste Management's Thermoselect technology requires a market for the metal pellet and vitrified granulate by-products.

6.3.2.5 Consistency With City Requirements

Global Energy Solutions' Thermal Converter technology might be consistent with the C&C requirements; there is no information readily available regarding how long either of the two MSW facilities in Japan have been in operation. This by-product residual requires a market that is not proven on Oahu.

Interstate Waste Management's Thermoselect technology is inconsistent with the C&C requirements. Although there are seven Thermoselect facilities in Japan, only three operate on MSW, none at the size the City requires (the Matsu facility processes 140 TPD, the Nagasaki processes 300 TPD, and the Tokushima facility processes 120 TPD.) All those listed here have been in operation for more than two years. The market for the metal pellets and vitrified granulate by-products would have to developed on Oahu.

42 Global Energy Solutions. <http://www.teamges.com/>, March 11, 2008.

6.4 Waste-To-Energy

H-POWER is a working example of the waste-to-energy (WTE) alternative technology. It is proven in long-term operation in Honolulu where it converts MSW into energy, with residue of ash, by-passed material, and unacceptable waste. An expansion of H-POWER was approved by the Mayor on January 18, 2008. The expansion is included as an alternative.

6.4.1 How It Works

There are two general approaches to WTE, mass burn and RDF. In a RDF plant (the H-POWER facility is an RDF plant) MSW is processed through shredders and screens, through which dirt, glass, and other recyclable and non-burnable materials are sorted out. The remaining material is incinerated, resulting in the creation of ash (approximately ten percent of the original volume), residue, and steam used to generate electricity. Metals are separated in the pre-combustion processing and from the ash post-combustion and are recycled.

Mass burn plants combust MSW without pre-processing. Waste is introduced into the furnace after being unloaded from the collection vehicle. The waste combustion creates steam, which is used to make electricity. By-products are ash and residual waste. Metals are separated from the ash and are recycled.

The project host and technology vendor are responsible for the disposal of ash and residual waste.

The H-POWER facility in Kapolei is a RDF plant and is capable of processing 2,160 TPD of MSW. It generates seven percent of Oahu's energy, enough electricity to support 45,000 homes. Residual waste and ash are disposed at the Waimanalo Gulch Sanitary Landfill.

6.4.2 Jurisdictions Using This Technology

WTE is a proven technology with facilities found throughout the United States. Covanta, the operator of H-POWER, operates plants in Alabama, California, Connecticut, Florida, Indiana, Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New York, Oregon, Pennsylvania, and Virginia. WTE is used in many other countries where it has been operating for more than 75 years.⁴³

H-POWER itself has been continuously operating since 1989.

⁴³ Covanta Holding, <http://www.covantaholding.com/>, March 11, 2008.

6.4.3 Physical, Regulatory, and Environmental Requirements

The physical, regulatory, and environmental requirements of a third boiler at H-POWER are well understood since the C&C already has one of these plants in operation. Land is available on the H-POWER site for the expansion.

6.4.4 Potential Issues

WTE requires a landfill for the disposal of ash and residual wastes. The market for the electricity is already contracted for with the current facility. The technology is well understood.

6.4.5 Consistency With City Requirements

WTE is consistent with the C&C requirements.

6.5 Expanded Recycling

Expanding current recycling infrastructure within the C&C would not eliminate the need for landfills; however, expanded programs would decrease the amount of materials sent to landfills. The expanded recycling could include expansion of the number of sites that accept materials from the HI5 beverage container program, addition of more sites to the school drop-off program, increasing the frequency of curbside collection of residential green waste, and adding a program to collect other recyclables from residences at the curb.

6.5.1 Improvements to Current Recycling Infrastructure

The C&C has stepped up efforts to increase the recovery of recyclable materials island-wide. The City wants to expand the community recycling bins program by 40, 40-cubic-yard recycling roll-off bins, totaling 120 island-wide. This would not only increase the amount of recyclable materials being diverted, but it would also increase the amount of funding schools receive; the main participant in this program. Further, the City is offering support for schools to establish recycling projects on campus and coordinate HI5 fundraising events.

Additional City sites are being considered to increase the number of HI5 redemption sites, particularly in underserved areas. Kiosk systems with automated reverse vending machines that would be open to the public 24 hours a day, seven days a week, are also being considered.

In March 2006, the City changed its residential curbside green waste recycling program by automating 50,000 homes. The automated program is expected to expand throughout the island in phases. The City expects green waste recycling to increase to between 50,000 and 80,000 tons annually with the new bin system.

The C&C is also evaluating the possibility of implementing a residential curbside recycling program for bottles, cans, and paper. Curbside recycling could capture as much as 40,000 tons of recyclable materials from more than 160,000 homes, according to ENV.

A pilot program is operating in Mililani and Hawaii Kai to test weekly collection with weekly recycling. Waste is collected on the first collection day of each week. Green waste is collected on the second collection day. On the second collection day the next week, the other recyclables are collected.

6.5.2 Recycling to Energy

Recycling materials into products, as is done with the green waste program (made into mulch and compost) and the collection of bottles and paper (made into new bottles and paper products) is one form of recycling. Recycling to energy (conversion of the waste to energy) is another.

WTE, such as H-POWER, is a technology of choice due to the direct benefits of energy production and reduction in disposal. Approximately 90 percent of the residential garbage and 77 percent of the commercial waste collected on Oahu is disposed at the H-POWER facility and is turned into energy that powers approximately 45,000 homes.⁴⁴ Incinerating 90 percent of the garbage that goes through the H-POWER facility means only one-tenth, by volume, remains to be landfilled. Expanding the H-POWER facility would be the most beneficial to the C&C in reducing the amount of waste sent to the landfill.

6.6 Wet Cell Landfill

Wet cell, or bioreactor landfills, use accelerated decomposition to create additional landfill gas to convert to energy and recover landfill space as the waste decomposes. The wet cell would enhance energy recovery from the landfilled waste and extend the life of the landfill.

⁴⁴ City and County of Honolulu Department of Environmental Services. Solid Waste Integrated Management Plan. Updated: November 2007. Table 63a, Table 63b and Table 2-7.

There are three forms of wet cell landfills: aerobic, with the presence of oxygen; anaerobic, without the presence of oxygen; or a combination. Both processes accelerate the decomposition of the waste. Conventional landfills take 30 to 50 years for the waste to decompose, while wet cell landfills take only five to ten years.⁴⁵

6.6.1 How It Works

Aerobic wet cell landfills collect leachate from the bottom layer of the landfill, pump it into a storage unit (water is added if required), and then redistribute the liquid throughout the landfill. Air is then injected to encourage aerobic decomposition and stabilization of the waste.

Anaerobic wet cell landfills add moisture to the landfill through re-circulated leachate and other sources to achieve optimal moisture levels, but do not add air. A biogas is produced comprised mostly of methane, carbon dioxide, and volatile organic compounds. The gas can be used to create electricity.

Hybrid wet cell landfills use both aerobic and anaerobic processes to rapidly accelerate the biodegradation and decomposition of the landfilled waste. Biogas can also be collected from hybrid wet cell landfills; this by-product occurs much earlier than during the anaerobic process.

6.6.2 Other Jurisdictions Using This Technology

Currently the Federal Environmental Protection Agency (EPA) is conducting case studies of bioreactor landfills within its Project XL, which begun in 1995. Project XL provides flexibility to regulated entities to conduct pilot projects demonstrating the ability to “achieve superior environmental performance.” Since September of 2001, 51 pilot experiments have been implemented. Of those 51, four have been approved to operate as wet cell landfills. The landfills are Buncombe County Landfill Project, North Carolina; the Maplewood Landfill and King George County Landfill, both in Virginia; and the Yolo County Bioreactor Landfill, California. The EPA is evaluating the advantages and disadvantages of bioreactor landfills. The studies are expected to be completed between 2006 and 2026.

45 County of Yolo Planning and Public Works Department Division of Integrated Waste Management, EPA Project XL, Final Project Agreement for the Yolo County Accelerated Anaerobic & Aerobic Composting (Bioreactor) Project, September 14, 2000.

6.6.3 Physical, Regulatory, and Environmental Requirements

A wet cell landfill requires a different liner design, leachate collection system, and monitoring system. One concern regarding wet cell landfills is the increased possibility for leachate. Therefore, one of the EPA's requirements for their case study is liner design to address the increased production of leachate.⁴⁶ The Yolo County Module D Bioreactor proposes a liner over five feet thick with earth and clay layers alone, as well as a collection system that would recycle the leachate and reintroduce it to the landfill.⁴⁵ The permitting process for wet cell landfills is also different. Only the EPA through its XL project program grants permits for wet cell landfills. The expansion space at the Waimanalo Gulch Sanitary Landfill could have cells that could be used for wet cell landfilling; however, major changes in site design, and potentially site life, would be required. The benefit to justify such an expense has not been shown with only four test sites in operation.

6.6.4 Issues

The cost of the wet cell and potential environmental effects has not been determined. The wet cell technology must also be demonstrated in relation to current plans for the use of the WGSL expansion area.

6.6.5 Consistency With City Requirements

The wet cell is a variant of traditional landfilling practice and could be consistent with City & County of Honolulu requirements. The cost and environmental implications of using the technology would have to be evaluated by the City and landfill operator.

6.7 Co-Disposal

Co-disposal is the dumping of MSW and ash together in a landfill, where the ash replaces the dirt cover and fills the voids in the MSW. By integrating with the landfilled materials, the ash takes up much less space than if it is disposed in separate cells, as is the current practice. The ash would replace the use of soil for cover.

6.7.1 How It Works

At the end of the operating day, the ash would be used as alternate daily cover to replace the soil cover now used.

46 United States Environmental Protection Agency. <http://www.epa.gov/>

6.7.2 Physical, Regulatory, and Environmental Requirements

The State DOH approved the use of H-POWER ash as ADC at the Waimanalo Gulch Sanitary Landfill provided that a number of requirements are followed:⁴⁷

- A six-month demonstration project to evaluate the performance of ADC in meeting the requirements of daily cover.
- Ash must be used within 24 hours of its creation.
- Ash must contain less than 25% moisture.
- Ash can only be used between 3 and 5 p.m.
- No more than 300 tons of ash can be used per day.
- Equipment must not be used on ash, a two foot depth and 15-foot buffer must be in place to protect the general public.
- Equipment operators must use positive pressure cabs, while spotters must wear personal protective gear.
- Warning signs must be posted to inform the general public.
- A wind shut-down trigger must be in place (to be determined from the six-month demonstration project).
- A rain shut-down trigger must be in place to prevent ash from entering the storm water system.
- Total metals must be tested quarterly.
- An engineering study evaluating the landfill's static and seismic stability is required.
- A lime depletion study is required.

6.7.3 Issues

The operational issues introduced by the DOH requirement may preclude the co-disposal option.

⁴⁷ Hawaii State Department of Health. Response to Comments on the Draft Conditions for the Use of H-POWER MST Ash as Alternative Daily Cover at the Waimanalo Gulch MSW Landfill. April 12, 2001.



6.7.4 Consistency With City Requirements

Co-disposal is consistent with the C&C requirements.

6.8 Response To Scoping Questions Regarding Alternative Technology

The C&C conducted scoping sessions on the following dates at the locations indicated:

- Monday, July 10, 2006, at Nanakuli High School.
- Tuesday, July 11, 2006, at Ben Parker Elementary School.
- Thursday, July 27, 2006, at Mission Memorial Auditorium.
- Thursday, August 10, 2006, at Kapolei Hale.

Several of the audience members offered their comments in response to the information presented by the C&C. This portion of the analysis presents the comments that related to technology. The response to questions relating to siting is later in this document.

Comments will be denoted by a 'C,' questions by a 'Q,' and answers by an 'A.'

Q: What is the status of the ideas presented to Mayor Harris regarding alternatives (i.e. Plasma Arc technology, Gasification)?

A: They are all considered as alternatives (see section 5.3.1). The City requested that vendors of these technologies and others to present information to the City about their technology. That process concluded on January 18, 2008 with the City selecting expansion of H-POWER on the current site.

Q: Was a portion or all of the tipping fees supposed to be earmarked for developing alternatives? If so, how much and was this fund used for other purposes by the Harris administration? If so, what and why?

A: We are unaware of a portion of the tipping fees being earmarked for developing alternatives.

C: The community has said, "No more landfills!" When will the City get the message—No Landfills, Yes JDI Plasma Arc Gasification—stop thinking about the money; think and look at our community, our families' health and safety.

A: Plasma Arc technology was considered as a potential alternative technology. The discussion is located in section 5.3.1.

C: Before any approval of the requested permits are considered, the C&C administration must be required to demonstrate the following: The issuance of an RFP notice and initiation of the review process for the consideration of alternative MSW processing technologies by October 2006 as stated by Director Takamura at the last City Council Public Works committee meeting held July 27, 2006.

A: This was discussed in the City Council Public Works committee meeting, November 2, 2006. A Competitive Sealed Proposal (RFP) was issued on January 16, 2007 and the City's decision announced on January 18, 2008.

C: Before any approval of the requested permits are considered, the C&C administration must be required to demonstrate the following: The presentation of a plan to the Honolulu City Council for the execution of a long overdue comprehensive and mandatory island-wide Recycling program by December 2006.

A: An island-wide mandatory recycling program is currently under review by the City Council members. Mayor Hannemann signed Bill 57 into law requiring an island-wide recycling program be initiated by summer 2007. The City has instituted a pilot program and is testing the cost and effectiveness of the recycling program.

C: Immediately start an easy-to-use, comprehensive recycling program throughout the island. After all, this is an island and our land and resources are even more precious here than on continental places in the world. Glass, plastic, metal, and newspapers should all go into one bin and be picked up and sorted for recycling.

A: Section 2.3 discusses current recycling programs available island-wide, while section 5.5.1 discusses proposed expansions to the current recycling programs. See the earlier discussion of the pilot program.

C: Start innovative programs to encourage us all to use less and re-use what we have. The C&C could and should become a national and international leader in this area.

A: The C&C has an active public outreach program that encourages recycling. That program has expanded each year and continues to reach residents with a message to conserve resources and recycle.

C: With the latest innovative technology in mind, open a new landfill at another site on another part of the island. Start over the right way. We know that this is a political challenge, but done right, it will help to teach us all—on all sides of the island—to be better stewards of the land; educate us in the latest landfill technologies; and say to the people of the Waianae coast that you value this area and do not see it—or its people—as a place of garbage.

A: The recent landfill site selection activities the C&C has had, suggests that the Waimanalo Gulch Sanitary Landfill is the most appropriate site to use until it has reached full capacity. The C&C has encouraged alternative technologies and has used them (for example, H-POWER and the sludge dryer at Sand Island Waste Water Treatment Plant) to reduce the amount of material needing landfill disposal.

Landfills have been used in many locations of Oahu including Ala Moana Park and the Kakaako Waterfront Park. Windward Oahu has served to provide landfills for the island for at least a 40 year period.

7 Alternative Sites

This section reviews potential landfill sites that are feasible for consideration as alternatives to the Waimanalo Gulch Sanitary Landfill. The alternative sites discussed in this document were previously identified in the December 2003 report by the Mayor's Advisory Committee on Landfill Site Selection (Advisory Committee).

Since the Advisory Committee completed its report, several changes have occurred that are mentioned in this report if needed to update the situation with four of the alternative sites. For example, the Makaiwa Gulch site has construction occurring as this document is being completed. Information about the landfill capacity needed has been updated to include consideration of the reduction in landfill disposal expected because of from H-POWER boiler #3. The effect of reducing the landfill capacity needed is to increase the life of alternative landfill sites, but would not change their relative scores.

The process for identifying the sites used by the Advisory Committee is summarized here. That process was useful for this analysis because:

- It used a committee that included professionals and residents, from the areas most likely to be the location of a future landfill, to identify the screening criteria for evaluation of the new landfill site. The Advisory Committee represented a broad range of interests and expertise and relied on the consultant and ENV staff for technical input. The Advisory Committee made all the decisions relative to inclusion or exclusion of the sites.
- The inventory of potential sites that was the starting point for the Advisory Committee analysis was comprehensive, drawn from reports and other work between two and 28 years old (at the time of the Advisory Committee work in 2003). The Advisory Committee members, were asked, but had no additional sites of sufficient capacity that could be added to the list. In fact, the list of potential sites was reduced substantially due to land use development that encroached on some sites.
- The Advisory Committee focused its evaluations on the community perspective and most of their criteria were community-based considerations. While technical issues were considered, the Committee placed most of its emphasis on potential landfill impacts on the community where the sites were located. These potential impacts are also assessed as part of this EIS.
- The Advisory Committee recommendations were submitted to the Honolulu City Council on December 1, 2003.

The work of the Advisory Committee was part of the basis for a review of potential sites conducted by the City Council Committee on Public Works and Economic Development. The Committee Chair, Mr. Rod Tam, reported the results of his Committee's evaluation to the full council on November 16, 2004.⁴⁸ The following statement is taken from Mr. Tam's report:

"...Landfills, in my view, should no longer be considered our primary depository of unwanted waste. We should be making every effort to divert all of our solid waste to recycling and reprocessing into energy or other useful products. Our goal should be to initially process all our solid waste in some form or fashion so that what ends up in our landfills is only the by-products of that initial processing that has no current use. This will reduce significantly the volume of waste going into our landfills thereby extending its useful life...."

The Committee conducted meetings on the Leeward and Windward sides of the island to receive public input. The memorandum reporting the results⁴⁸ made no recommendation regarding a specific site, but provided background for the final site selection. Information gathered in Councilmember Tam's investigation has been used in this analysis.

This section discusses the landfill site selection process, identifies the features of the sites recommended by the Advisory Committee that caused them to have different scores on the evaluation process, and discusses the City's general requirements for a landfill site.

7.1 City Landfill Requirements

The C&C has not published its "requirements" for a potential landfill site but uses the following general precepts:

- Environmental — The site must not have physical features that make it more difficult to minimize environmental impacts. For example, if two sites were otherwise equal, the one with the lesser impact on wetlands would be preferred.

48 November 16, 2004 memorandum from Councilmember Rod Tam to Concerned Citizens of Oahu transmitting the report titled "Committee on Public Works and Economic Development's Summary Report on its Landfill Site Selection Process."

- Landfill capacity or life span — A site needs to accommodate at least 10 years disposal to justify the time and expense of permitting it. A landfill with a long life also minimizes the environmental impacts compared to landfilling at smaller landfill sites. The longer the life of a landfill the more waste it can accept, thus reducing disposal cost.
- Disaster debris — Having the space and equipment to manage and temporarily store disaster debris will be important. A potential landfill site needs to have space for disaster debris storage or disposal to preserve public health, safety, and welfare.
- Reasonable cost — The City provides the lowest cost, environmentally sound disposal to benefit the taxpayer.
- Proximity to the H-POWER facility — The contract with Covanta to operate H-POWER provides for a price increase for ash transportation if the landfill is more than 12 miles from the plant site. In addition, the more miles traveled by trucks transporting ash, the greater the opportunity for accidents.

7.2 Report of the Mayor's Advisory Committee on Landfill Site Selection

The Mayor's Advisory Committee on Landfill Site Selection was formed in response to Condition No. 1, of the approved State Special Use Permit⁴⁹ calling for the formation of a "Blue Ribbon Site Selection Committee". The Committee started with the reports of studies done by the City over the past 30 years to identify potential landfill sites. ENV and the Advisory Committee consultant assembled a list of 45 potential sites for the Advisory Committee to consider from those reports:

- (1) *Inventory of Potential Sanitary and Demolition Landfill Sites*, August 1977.
- (2) *Supplement to Inventory of Potential Sanitary and Demolition Landfill Sites*, November 1979.
- (3) *Revised Environmental Impact Statement for Leeward Sanitary Landfill at Waimanalo Gulch Site and Ohikilolo Site*, 1984.
- (4) *Solid Waste Integrated Management Plan Update, Final Report*, 1995.

49 Decision and Order Approving Amendment to State Special Use Permit, Docket No. SP87-362, Waimānalo Gulch Sanitary Landfill, June 5, 2003.

(5) *Final Supplemental Environmental Impact Statement, Waimanalo Gulch Sanitary Landfill Expansion, December 2002.*

The remainder of this section discusses how the Advisory Committee evaluated the 45 sites, identifies the specific criterion used, and summarizes their recommendations to the City Council.

7.2.1 Sites Considered

The sites that were considered as potential landfill sites are listed in *Table 6, Potential Landfill Sites*. This table shows the site name, the tax map key (TMK), the estimated acreage, the estimated volume, and the landfill life (the number of years the landfill could provide disposal capacity at the estimated disposal needs in the C&C.) The estimated disposal need is calculated in *Table 11, Estimate of Landfill Capacity Needs*

Table 6, Potential Landfill Sites

Site Name	TMK	Size (Acres)	Capacity (MM cy)	Life (Years)
Auloa	4-2-14:por 1	55	2.8	4.7
Ameron Quarry	4-2-15:01	391	9.0	15.0
Barbers Point	9-1-16:18, por 1	15	0.7	1.2
Bellows	4-1-15: por. 01	173	7.5	12.5
Diamond Head Crater	3-1-42:por 6	115	4.3	7.2
Ewa No. 1	9-1-17	-	-	
Ewa No. 2	9-1-10	-	-	
Halawa A	9-9-10:8,9,por 10 & 26	40	1.5	2.5
Halawa B	9-9-10:27, por 10	60	2.2	3.7
Heeia Kai	4-6	-	-	
Heeia Uka	4-6-14:01	163	2.4	4.0
Honouliuli	9-1-17:por 4	22	1.7	2.8
Kaaawa	5-1	150	5.6	9.3
Kaena	6-9-1:por 3, 33 & 34	40	1.5	2.5
Kahaluu	4-7	-	-	
Kahe	9-2-3:por 27	200	7.4	12.3
Kalaheo (landfill reuse)	4-2-15:por 1 & 6	134	4.3	7.2
Kaloi	9-2-02:por 1; 9-2-3:por 2; 9-2-4:por 5	400	24.3	40.5
Kapaa No. 1	4-4-14:por 2	60	3.0	5.1
Kapaa No. 2 & 3 (closed)	4-2-15:por 1, 3, 4, 7	-	-	
Kaukonahua	7-1	34	1.3	2.2
Keekee	6-9-1:por 3 & 4, 6-9-3: por 2	40	1.2	2.0
Koko Crater	3-9-12: por 1	140	5.5	9.2
Kunia A	9-4-4: por 4	150	5.6	9.3
Kunia B	9-4-3: por 19	190	7.0	11.7
Mali	8-7-10:por. 03	200	9.2	15.3
Makaiwa	9-2-3: por. 02	338	15.0	25.0
Makakilo Quarry	9-2-3:82	175	10.0	16.7
Makua	8-1-1, 8-2-1	600	7.4	12.3
Mililani	9-5	34	2.2	3.7
Nanakuli A	8-7-9:1 & 3 and 8-7-21:26	179	4.0	6.7
Nanakuli B	8-7-9: pors. 1 & 7	432	9.4	15.6
Ohikilolo	8-3-1: 13	706	15.6	26.0
Olomana	4-2	-	-	
Poamoho	7-1	5	0.7	1.2
Punaluu	5-3	200	7.4	12.3
Sand Island	1-5-41	150	5.6	9.3
Waiahole	4-8	60	2.3	3.8
Waianae Expansion	8-5-3 and 6	140	6.8	11.3
Waihee	4-7	61	2.3	3.8
Waikane	4-8	200	9.0	15.0
Waimanalo Gulch Exp.	9-2-3: 72 & 73	60	12.0	20.0
Waimanalo North	4-1-8: 13	171	9.6	16.0
Waimanalo South	4-1	355	14.0	23.3
Waipio	9-3-2	60	2.5	4.2

*Million cubic yards (cy)

**Information has been updated since the Mayor's Committee Report by engineering. Current fillable acreage equals 92.5 acres.

Note: The size, capacity, and life shown in this table for the Waimanalo Gulch Sanitary Landfill reflects data available to the Advisory Committee. The current estimate shows increased remaining life because of refined estimates.

7.2.2 Site Evaluation Process

The Advisory Committee first developed siting criteria to use to quantitatively compare the characteristics of one site to another and allow identification of the “best” site. The siting criteria were divided into three groups: exclusionary, evaluation, and Advisory Committee criteria.

The Exclusionary Criteria included:

- EPA siting criteria as promulgated in the Resource and Conservation Recovery Act, Subtitle D (RCRAD).
- Sites located in areas which have since been developed or are closed landfills with no further expansion potential.
- The Honolulu Board of Water Supply (BWS) evaluation governing whether a site should be protected in consideration of its proximity to the Groundwater Protection Zone and Underground Injection Control (UIC) Line zone; and
- The Advisory Committee’s capacity criterion stating that the site must have a minimum life of more than 10 years.

For the qualitative evaluation of the potential sites, the Advisory Committee developed 31 Screening Criteria following extensive discussion and deliberation. After applying the criteria, the Advisory Committee used the numeric scores for the sites, which compared one site to another on the basis of community, economics, land use, and technical considerations.

The Advisory Committee members applied their own insights regarding each site as the final step in the siting evaluation.

After application of all of the criteria, the Advisory Committee deliberated on the remaining sites and arrived at its recommendations for the Mayor and City Council by vote.

Table 7, Sites Eliminated at Each Stage in the Evaluation, shows the number of potential sites eliminated at each step in the evaluation process.

Table 7, Sites Eliminated at Each Stage in the Evaluation

Phase of Evaluation	Number of Sites	
	Before Application of Criteria	After Application of Criteria
Exclusionary Criteria		
RCRA Subtitle D Criteria	45	40
Sites in Developed Areas or Closed Landfills w/No Expansion Potential	40	34
BWS Staff Review and Evaluation	34	16
Committee Evaluation Process		
Landfill Capacity Requirement ⁵⁰	16	8
31 Screening Criteria	8	8
Committee Vote	5	4

An initial list of 45 sites was assembled by ENV and the consultant after review of prior work completed by the City in the siting and evaluation of MSW landfills. The *Exclusionary Criteria*, which included EPA criteria and local exclusionary criteria, were applied to the initial list of 45 potential landfill sites. Sixteen of the 45 sites remained after application of the Exclusionary Criteria. The *Landfill Capacity* criterion was applied to the 16 sites remaining with eight remaining for further evaluation. The Advisory Committee's 31 *Screening Criteria* were applied to the remaining eight reducing the number of sites to five and putting them in order of usefulness as a landfill. Up to this point in the evaluation, the Advisory Committee had acted by consensus. At this point in the process, the Committee voted to remove the Waimanalo Gulch Sanitary Landfill from consideration. ⁵¹

⁵⁰ The capacity evaluation was completed before the Committee's site evaluations.

⁵¹ The capacity evaluation was completed before the Committee's site evaluations.

This section contains a description of each *Exclusionary Criteria*, *Landfill Capacity*, and *Screening Criteria* used by the Advisory Committee to rank the sites and identify the five alternative sites appropriate for landfilling.

7.2.3 EPA Exclusionary Criteria

The EPA Exclusionary Criteria are:⁵²

- **Airport Restriction** – Owners/operators must demonstrate that the landfill site does not constitute a bird hazard if the facility is located within 10,000 feet of the end of any airport runway used by turbojet aircraft, or within 5,000 feet of any airport runway used only by piston driven aircraft.

If the owner/operator proposes construction of a landfill or expansion of an existing landfill within five miles of any airport, the airport and the Federal Aviation Administration must be notified.

- **Floodplains** – Landfills located within a 100-year floodplain cannot restrict storm flows within the floodplain, reduce the temporary water storage capacity of the floodplain, or allow the washout of solid waste.
- **Wetlands** – Owners/operators of a proposed landfill may not build or expand into wetlands. An exception to this rule may be permitted by the EPA-approved permitting programs to construct or expand a landfill only if the following can be demonstrated:
 - No other siting alternative is available.
 - Construction and operation of the landfill will not violate applicable State regulations governing water quality or discharges of toxic or hazardous effluent; jeopardize threatened or endangered species, or critical wildlife habitat; or, violate protection of a marine sanctuary.
 - The landfill will not contribute to the significant deterioration of the wetland.
 - Steps are taken to achieve no net loss of wetlands by avoiding potential for impacts where possible, sufficiently minimizing unavoidable impacts; or, making proper compensation; for example, through the restoration of damaged wetlands or the creation of manmade wetlands.

52 40 CFR 258

- **Fault Areas** – New landfills or landfill expansions are generally prohibited within 200 feet of fault areas that have shifted since the last Ice Age. However, the DOH may permit an alternative setback distance of less than 200 feet if the owner/operator can demonstrate that the landfill will maintain structural integrity in the event of a fault displacement.
- **Seismic Impact Zones** – Landfills located in a seismic impact zone must demonstrate that the facility including, but not limited to, its liners, leachate collection system, surface water control system, and other engineering features have been designed to resist the effects of ground motion due to earthquakes.
- **Unstable Areas** – All owners/operators must demonstrate that the structure of their units will not be compromised during geologically destabilizing events including:
 - Debris flows resulting from heavy rainfall or storm conditions.
 - Fast formation of sinkholes caused by excessive groundwater withdrawal.
 - Rockfalls that are initiated by explosives or sonic booms.
 - The sudden liquefaction of soil after prolonged periods of repeated wetting and drying.

Application of the EPA exclusionary criteria reduced the number of sites under consideration from 45 to 40. *Table 8, Site Evaluation with EPA Exclusionary Criteria* shows the sites that failed the review for these criteria.

Table 8, Site Evaluation with EPA Exclusionary Criteria

Site Name	Sites Failing EPA Criteria					
	Airport Restriction	Flood Plain	Wetlands	Fault Areas	Seismic Impact Zone	Unstable Area
Auloa						
Ameron Quarry						
Barbers Point	X					
Bellows						
Diamond Head Crater			X			
Ewa No. 1						
Ewa No. 2						
Halawa A						
Halawa B						
Heeia Kai						
Heeia Uka						
Honouliuli						
Kaaawa						
Kaena	X					
Kahaluu						
Kahe						
Kalaheo (landfill reuse)						
Kaloi						
Kapaa No. 1						
Kapaa No. 2 & 3 (closed)						
Kaukonahua						
Keekee	X					
Koko Crater						
Kunia A						
Kunia B						
Mali						
Makaiwa						
Makakilo Quarry						
Makua						
Mililani						
Nanakuli A						
Nanakuli B						
Ohikilolo						
Olomana						
Poamoho						
Punaluu						
Sand Island	X	X				
Waiahole						
Waianae Expansion						
Waihee						
Waikane						
Waimanalo Gulch Exp.						
Waimanalo North						
Waimanalo South						
Waipio						

7.2.4 Local Exclusionary — Developed Areas

In the 30 years that elapsed since most of the sites on the list in *Table 6, Potential Landfill Sites* were identified many of the original landfill locations have been developed, primarily with residential housing. Some locations that were previously considered possible landfill sites may either have buildings on-site, or are so close to developed areas that a landfill would now be an incompatible land use. The City therefore determined that it would not propose new landfills within such developed areas.

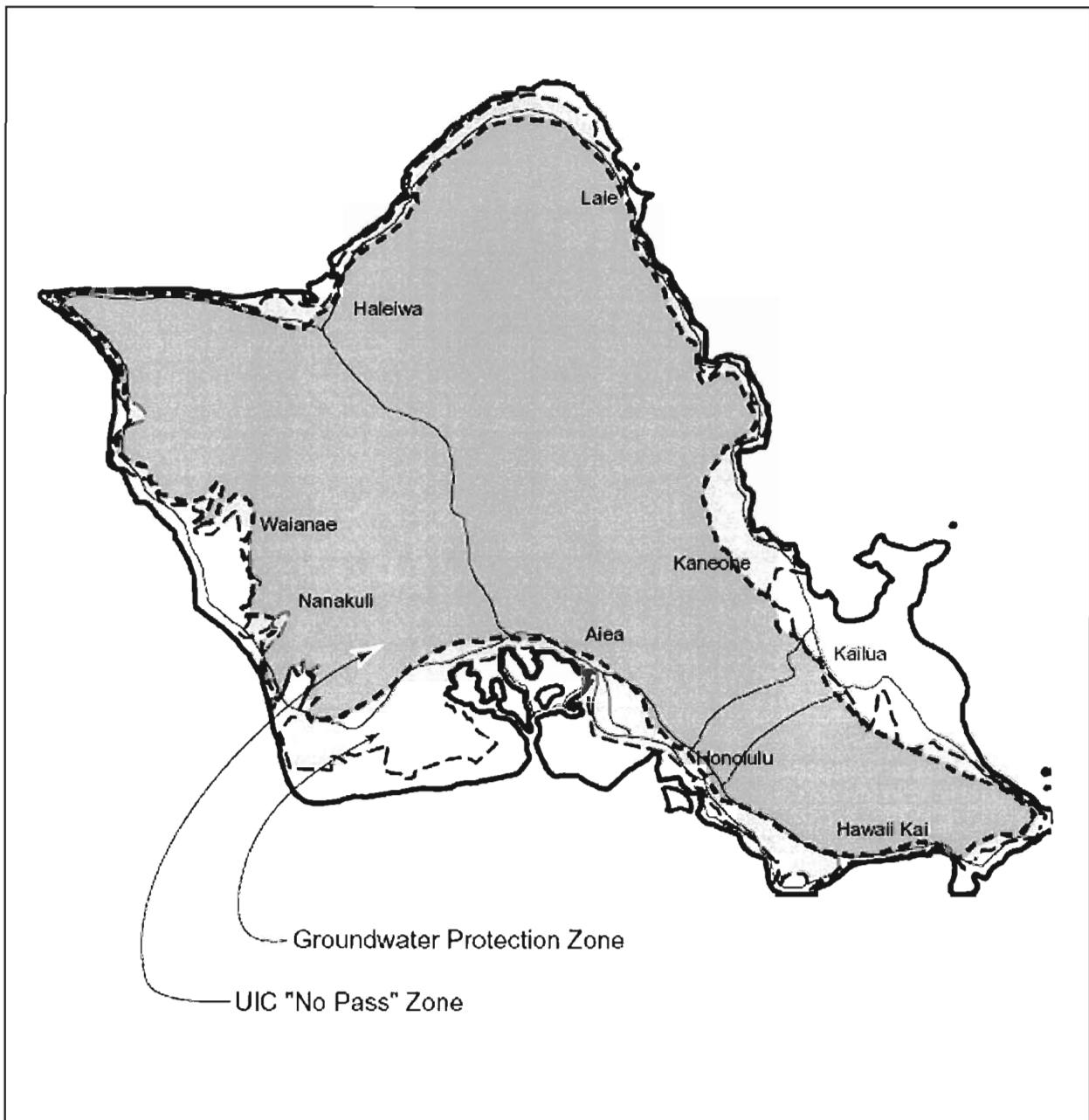
The City also reviewed potential sites that were expansions of closed landfills. Landfills on the original list that have been filled to capacity and closed were removed from further consideration.

This step reduced the potential site list from 40 to 34. *Table 9, Site Evaluation with Developed Area Criteria*, indicates the sites eliminated by application of these local exclusionary criteria.

Table 9, Site Evaluation with Developed Area Criteria

Site Name	Sites Failing Criteria for	
	Developed Area	Closed Landfill
Auloa		
Ameron Quarry		
Bellows		
Ewa No. 1	X	
Ewa No. 2	X	
Halawa A		
Halawa B		
Heeia Kai	X	
Heeia Uka		
Honouliuli		
Kaaawa		
Kahaluu	X	
Kahe		
Kalaheo (landfill reuse)		
Kaloi		
Kapaa No. 1		
Kapaa No. 2 & 3 (closed)		X
Kaukonahua		
Koko Crater		
Kunia A		
Kunia B		
Maili		
Makaiwa		
Makakilo Quarry		
Makua		
Mililani		
Nanakuli A		
Nanakuli B		
Ohikilolo		
Olomana	X	
Poamoho		
Punaluu		
Waiahole		
Waianaë Expansion		
Waihee		
Waikane		
Waimanalo Gulch Expansion		
Waimanalo North		
Waimanalo South		
Waipio		

Figure 2, Groundwater Protection Zone and Underground Injection Control (UIC) Zone



7.2.5 Local Exclusionary Criteria — Groundwater

Local exclusionary criteria include groundwater restrictions. Groundwater resources of Oahu are protected through the State DOH, UIC program, and the BWS Groundwater Protection Zones.

The UIC program was established in 1984. The purpose of the program is to protect the State's potable groundwater resources from pollution by subsurface wastewater disposal. The program regulations are accompanied by UIC maps that demarcate a boundary line known as the "UIC Line." Landfills are restricted on lands that are landward of the UIC Line. Lands seaward of this line, however, are not restricted from subsurface wastewater disposal by underground injection (Figure 2). Sanitary landfills and waste disposal facilities may therefore be sited makai of this zone.

Prior to 1987, groundwater recharge areas for the Island of Oahu were identified by BWS. Since 1987, the State DOH has administered the No Pass Program (also shown in Figure 2). The BWS Groundwater Protection Zones identifies areas of groundwater recharge, areas of brackish groundwater supplies, and additional areas that may be acceptable for landfill development. Areas that are considered critical for groundwater recharge have been designated the "No Pass Zone." Within this area sanitary landfill and waste disposal systems are generally not permitted. All other areas are identified as within the "Pass Zone" and have been determined to be areas where landfills and shallow waste disposal systems may be permitted. These facilities are limited to a maximum depth of 30 feet.

Protection of ground and surface water, and air quality, from facilities such as sanitary landfills, is through the existing environmental permit process. Protection of ground and surface waters is delegated by EPA to the State DOH under provisions of the Federal Safe Drinking Water Act and Clean Water Act. These federal regulations enable the State DOH to protect Hawaii's drinking and surface waters from the siting of facilities, such as sanitary landfills, through Hawaii Administrative Rules, Chapter 11-23, UIC; Chapter 11-55, Water Pollution Control, and the National Pollution Discharge Elimination System Permit program. Regulation of air quality standards are similarly delegated from EPA to the State DOH, through the Clean Air Permit.

The State DOH has provided some guidance about what might be needed to establish a landfill outside the UIC line.⁵³ In part that guidance stated:

“Should a solid waste permit applicant propose to site a landfill over drinking water resources, the permittee will be required to demonstrate that the proposed project is protective of our groundwater resource. As seen in other states, the design of this landfill will likely be at a minimum a double composite liner system. In addition, other requirements, such as screening and monitoring, may become more stringent. Needless to say, siting a landfill over drinking water resources will increase our scrutiny over the design and operation of the landfill, as well as significantly increase the cost to design, construct, and operate the landfill.”

After application of the Groundwater Exclusionary Criteria, the potential list of sites decreased from 34 to 16. *Table 10, Site Evaluation with Groundwater Criteria*, shows the sites that were eliminated after review by the BWS staff and their comments on each of the 34 sites they reviewed.

⁵³ Letter dated May 23, 2002, from Dr. Bruce Anderson, Director, State Department of Health, to Mr. Timothy Steinberger, Director, City Department of Environmental Services.

Table 10, Site Evaluation with Groundwater Criteria

Site Name	BWS Evaluation Notes	Sites Failing Review
Auloa	Very little to no groundwater resources. Within a rock complex. BWS does not consider feasible for use.	
Ameron Quarry	Dike type rocks associated with caldera complex. Very little groundwater resources.	
Bellows	No potable resources. Non-potable irrigation developed. BWS does not consider feasible for use.	
Halawa A	Site within BWS groundwater resource.	X
Halawa B	Site within BWS groundwater resource.	X
Heeia Uka	Site outside BWS designed groundwater resource zone.	
Honouliuli	Site just outside BWS designated groundwater resources zone, but within area considered subject to groundwater impact.	X
Kaaawa	Very little to no groundwater resources. BWS does not consider feasible for use.	
Kahe	BWS plans to use site for future desalination facility.	X
Kalaheo (landfill reuse)	Very little to no groundwater resources. BWS does not consider feasible for use.	
Kalo	Groundwater resources present or nearby.	X
Kapaa No. 1	Very little to no groundwater resources. BWS does not consider feasible for use.	
Kaukonahua	Site within BWS groundwater resource.	X
Koko Crater	Very little to no groundwater resources. BWS does not consider feasible for use.	
Kunia A	Groundwater resources present or nearby.	X
Kunia B	Groundwater resources present or nearby.	X
Maili Quarry	Brackish groundwater present but BWS does not consider feasible for use.	
Makaiwa Gulch	No potable resources. BWS does not consider feasible for use.	
Makakilo Quarry	Groundwater resources present or nearby.	X
Makua	Groundwater resources present or nearby.	X
Millilani	Site within BWS groundwater resource.	X
Nanakuli A	Very little to no groundwater resources. BWS does not consider feasible for use.	
Nanakuli B	Very little to no groundwater resources. BWS does not consider feasible for use.	
Ohikilolo	Only half of site available for development where there is very little to no groundwater resources in the lower half of property. BWS does not consider feasible for use.	
Poamoho	Groundwater resources present or nearby.	X
Punaluu	Groundwater resources present or nearby.	X
Waiahole	Groundwater resources present or nearby.	X
Waianae Expansion	Groundwater resources present or nearby.	X
Waihee	Groundwater resources present or nearby.	X
Waikane	Groundwater resources present or nearby.	X
Waimanalo Gulch Expansion	Very little to no groundwater resources. BWS does not consider feasible for use.	
Waimanalo North	Very little to no groundwater resources. BWS does not consider feasible for use.	
Waimanalo South	Groundwater resources present or nearby.	X
Waipio	Very little to no groundwater resources. BWS does not consider feasible for use.	

7.2.6 Landfill Capacity

The C&C and Advisory Committee established 10 years of landfill capacity as the lower limit for a site to be considered. The capacity of each site was determined from the earlier siting reports, which were listed in section 7.2. Those capacity calculations were done with topographic data of varying levels of detail and used requirements for landfill design and operation that preceded RCRAD, which made major changes to earlier landfill practice. As a result, the capacity evaluation would likely be different if recalculated with more detailed topographic information following current landfill practice.

In addition to the comments regarding the capacity calculations made earlier, it should be noted that the Waimanalo Gulch Sanitary Landfill has been designed after extensive evaluations of information such as:

- Civil engineering design supported by geotechnical investigations and soils evaluations so that the landfill will provide environmentally sound containment of the waste and maximize the capacity at the site
- The engineering design calculations that account for slope stability considerations so that the filled areas are stable under normal loading and potential seismic conditions
- Balancing the soil needed for cover with the excavation needed to maximize the landfill capacity is a complex engineering calculation that accounts for sequencing of fill at the landfill and other site specific factors.

These costly analyses can be completed only after a landfill site has been selected and they all impact the amount of capacity, and therefore, the number of years a site can be used as a landfill. The information available for the Waimanalo Gulch Sanitary Landfill reflects these calculations, whereas the information available for the alternative sites does not. As such, one must expect that the estimates of capacity for the alternative sites are subject to much more variability than for the Waimanalo Gulch Sanitary Landfill.

The amount of capacity needed was estimated using 2003 disposal data, and updated with the results of the November 2007 draft Update of the Solid Waste Integrated Management Plan and the City's announcement that the third boiler at H-POWER would be constructed. This data provides realistic information to estimate site life. The estimated volume that would be used for the estimated tonnage disposed is calculated below. The volume estimate includes the waste material as compacted before it is



covered and the amount of dirt used to cover the waste. The key assumptions in estimating the volume are:

- MSW is compacted to a density of approximately 1,600 pounds per cubic yard.
- An additional 20 percent of the MSW and ash volume is added as cover material.
- The H-POWER ash is covered. It has a density of 1 cubic yard per ton.

*Table 11, Estimate of Landfill Capacity Needs,*⁴⁴ provides the calculation of volume needed. The estimates in this table reflect the estimated capacity of the third boiler at H-POWER provided by the Mayor’s press release on January 18, 2008.

Table 11, Estimate of Landfill Capacity Needs (TPY)

Year	Landfill	H-Power	Additional WTE *	Landfill w/e-Additional WTE	Ash/Residue **	Total Landfilled	Total Waste
2009	359,980	610,000		359,980		359,980	969,980
2010	379,070	610,000		379,070		379,070	989,070
2011	400,330	610,000	150,000	250,330	37,500	287,830	1,010,330
2012	403,270	610,000	300,000	103,270	75,000	178,270	1,013,270
2013	425,010	610,000	300,000	125,010	75,000	200,010	1,035,010
2014	447,010	610,000	300,000	147,010	75,000	222,010	1,057,010

* Mass burn facility: See Mayor’s Press Release January 18, 2008.

** Assumed that the expansion would be operational at mid-year and 25 percent of Additional WTE becomes ash/residue that is landfilled.

Using the estimates from *Table 11*, the total landfill volume required for 10 years is 6,712,670 cubic yards (10 times the estimated annual requirement).

Of course, this estimate of need will vary with waste flow changes. For example, if a natural disaster occurs there will be an increase in the material entering the landfill and the estimated life of the site will decrease. If the residential curbside recycling program is more successful than expected and the curbside yard waste program expanded to weekly, the material needing disposal will decrease and the site life will increase.

The amount of landfill capacity needed will also vary if new means to process MSW prior to disposal are implemented. This Alternatives Analysis includes several technologies that could reduce the need for a landfill. It also discusses the approved addition of a third boiler to H-POWER to reduce the volume of waste that needs disposal. The use of transshipment could divert 100,000 tons per year to a landfill off the island, reducing the need for a local landfill. Implementation of any of these programs, or economic changes that decrease or increase waste production, will change the estimate of volume needed and change the expected life of the landfill.

The evaluation summarized in Table 12 assumes that the landfill site is used to its capacity, with the necessary excavation and lateral expansion. Excavation is needed to take advantage of the capacity at the site and minimize the cost and environmental impact of landfilling. The changes to the site capacity reported in this EIS assume that the landfill will be excavated.

The application of the capacity criterion is shown in *Table 12, Results of Application of Landfill Capacity Criterion*. The 16 sites evaluated were reduced to eight after the 10-year site life was considered. The capacity of the Waimanalo Gulch Sanitary Landfill was based on calculations that are updated as the design of the expansion is being done. As a result, the capacity of the expansion will be revised during the processing of the EIS.

Table 12, Results of Application of Landfill Capacity Criterion

Site Name	Landfill Life (years)	Capacity Less Than 10 Years
Auloa	4.7	X
Ameron Quarry	15.0	
Bellows	12.5	
Heeia Uka	4.0	X
Kaaawa	9.3	X
Kalaheo (landfill reuse)	7.2	X
Kapaa No. 1	5.1	X
Koko Crater	9.2	X
Maili	15.3	
Makaiwa	25.0	
Nanakuli A	6.7	X
Nanakuli B	15.6	
Ohikilolo	26.0	
Waimanalo Gulch Expansion	15.0	
Waimanalo North	16.0	
Waipio	4.2	X

7.2.7 Other Considerations

Two of the sites shown in *Table 12*, were also disqualified based on input from other governmental bodies that had control of the sites. *Table 13, Sites Considered After Capacity Criterion Applied*, lists the sites for which input from other agencies was sought.

Table 13, Sites Considered After Capacity Criterion Applied

Site Name	TMK	Acreage	Million Tons Capacity	Years of Capacity
Ameron Quarry	4-2-15:01	391	9.0	15.0
Bellows	4-1-15: por. 01	173	7.5	12.5
Maili	8-7-10:por. 03	200	9.2	15.3
Makaiwa	9-2-3: por. 02	338	15.0	25.0
Nanakuli B	8-7-9: pors. 1 & 7	432	9.4	15.6
Ohikilolo	8-3-1: 13	353	7.8	13.0
Waimanalo Gulch Expansion	9-2-3: 72 & 73	60	12.0	20.0
Waimanalo North	4-1-8: 13	171	9.6	16.0

Comments were received from the US Marine Corps regarding the Bellows site and from the State regarding the Waimanalo North site.

- The Bellows Air Force Base site is in federal control and cannot be condemned. A reply from the Marine Corps further indicated that the site is not available.
- The Waimanalo North site was designated as a State Forest Preserve, according to a letter the City received from the State Department of Land and Natural Resources. The State will not support its use for landfill and the City cannot condemn state land.

Several Advisory Committee members had reservations about the Ohikilolo site. The site was removed from further consideration based on these reservations:

- The site had the strong possibility of significant archeological and cultural resources (although studies had not been done to confirm the resources).
- It is remote from where the waste is collected and would require trucks to travel long stretches of road through the Waianae and Leeward Coast communities (where frequent accidents have occurred) to get to the site. This thoroughfare (Farrington Highway) is the only road providing access to the site.

- There were potential Native Hawaiian title issues regarding use of this site.
- It is one of very few remote coastal areas left on Oahu and is considered culturally sensitive by the community.

Eight sites were on the list before the Advisory Committee discussed its *other considerations*. Five remained on the list after the other considerations were reflected and they are shown in *Table 14, Potential Sites to which Advisory Committee Siting Criteria Applied*.

Table 14, Potential Sites to which Advisory Committee Siting Criteria Applied

Site Name	TMK	Acreage	Million Tons Capacity	Years of Capacity
Ameron Quarry	4-2-15:01	391	9	15
Maili	8-7-10:por. 03	200	9	15
Makaiwa	9-2-3: por. 02	338	15	25
Nanakuli B	8-7-9: pors. 1 & 7	432	9	16
Waimanalo Gulch Expansion	9-2-3: 72 & 73	200	9	15

7.2.8 Advisory Committee Siting Criteria

The criteria discussed in the previous sections relate to general limitations on locating landfills. The Advisory Committee considered local community concerns to be highly important and not adequately reflected in the above exclusionary criteria. Therefore, Screening Criteria were established to compare potential sites using factors considered important to the Advisory Committee. The Screening Criteria allow numerical comparisons of the different factors (the Advisory Committee identified 31 of them) for different sites to rank the sites in order of suitability as a landfill.

The site evaluations were done with a “double blind” process. That is, the Advisory Committee assigned one of the factors for numerically judging a site without the City or consultant’s knowledge. The consultants evaluated the sites and assigned numeric value of the other factor without the Advisory Committee’s knowledge of which sites were being evaluated. When the two parts of the evaluation were combined, the resulting site scores were insulated from undue influence or bias from any party.

The Screening Criteria were identified in five categories:

- Community,
- Environmental and Land Use,
- Economic,
- Technical, and
- Other considerations.

7.2.9 Screening Criteria Development

The general approach to developing local Screening Criteria involved identifying the impacts a landfill could have in a region and a method to numerically measure those impacts. These criteria were organized into two parts: *Point Value* and *Weighting Factor*.

- The *Point Value* measured how well a potential site satisfied a criterion.
- The *Weighting Factor* reflected the Advisory Committee's assessment of how important one criterion was compared to the other criteria. The *Weighting Factor* was multiplied by the *Point Value* to calculate the score for each criterion.

The sum of the criterion scores was the site score. The higher the final score for a site, the more appropriate it was for a landfill site.

The *Point Values* ranged from one to three. The higher the *Point Value* the better a site met a criterion. For example, a good landfill should be in an area with low rainfall. A site with annual rainfall of more than 60 inches received one point; a site with 20 to 60 inches of rain received two points; and a site with less than 20 inches of rain received three points.

The *Weighting Factors* also varied from one to three with a *Factor* of three giving the best score.

The *Weighting Factors* were determined by the Committee members. Each member voted on the 10 criteria most important to them. There were 31 criteria. Criteria that received the most votes were assigned a *Weighting Factor* of three. The votes fell into three distinct groupings. Six criteria received the most votes and were assigned a *Weighting Factor* of three; seven had a *Weighting Factor* of two; and 18 had the fewest votes and were assigned a *Weighting Factor* of one. Several criteria received no votes and were also assigned a *Weighting Factor* of one.

The higher the product of the *Weighting Factor* and the *Point Value*, the better the site's characteristics are for use as a landfill.

The Screening Criteria and *Weighting Factor* assigned to each are shown in *Table 15, Screening Criteria*. The type of criteria is shown in the table for convenience. The type of criteria had no influence on the site screening.

Table 15, Screening Criteria

Criterion		Weighting Factor
Community		
1	Displacement of residences and businesses	1
2	Distance to nearest residence, school or business	3
3	Wind direction relative to populated areas	2
4	Population density near the site	3
5	Proximity to parks and recreational facilities	1
Environmental and Land Use		
6	Zoning	1
7	Compatibility with/distance to existing land uses	1
8	Visibility from a general use public road	1
9	Visibility from residences and/or schools.	2
10	Groundwater	3
11	Wetlands	3
12	Flora and fauna habitat	2
13	Site aesthetics	1
14	Residential units along access road	1
15	Schools or hospitals along access road	1
16	Final use of the site when the landfill is closed	1
17	Archeological and/or historical significance	3
Economic		
18	Cost of site acquisition	1
19	Cost of development	1
20	Cost of operations	1
21	Impact of removal of site on tax base	1
22	Haul distance from H-POWER	2
Technical		
23	Landfill capacity or site life	3
24	Annual precipitation	2
25	Adequacy of drainage	1
26	Access to fire protection	1
27	Length of haul	2
28	Geology	1
29	Closure and post-closure cost	1
Other Considerations		
30	Employment	1
31	Access	2

7.2.10 Site Scoring

The five sites listed in *Table 14*, were scored using the Screening Criteria. Each criterion had specific methods to assess the Point Value of the criterion. The information needed to make the assessment was gathered by observation at the site, through review of technical literature, or by calculation from known data. The information for each site was extensive and compiled in several attachments to the Advisory Committee report. A summary of the conditions at each of the five sites is provided in sections 7.3 to 7.7.

The results of the application of the 31 criteria for each of the five sites is shown in *Table 14, Potential Sites to which Advisory Committee Siting Criteria Applied*. That table also summarizes the data included in the site information attached to the Advisory Committee report. The methods to evaluate the *Point Value* of some of the criterion used data specific to the site, where such data was available. For example, the soil data was in soil reports that provided information about soils in the general area of the site. The criterion relating to cost used the best information available at the time.

Table 16, Results of Application of Screening Criteria shows the scores of each site for each of the criteria.

The methodology for site scoring for each of the 31 criteria is in Attachment C. The information in that attachment was taken from the attachments to the Advisory Committee report relating to each of the five alternative sites.

Table 16, Results of Application of Screening Criteria

Criterion	Ameron	Maili	Makaiwa	Nanakuli B	Waimanalo Gulch
Community					
1 Displacement of residences and businesses	3	3	3	3	3
2 Distance to nearest residence, school or business	3	3	3	3	3
3 Wind direction relative to populated areas	6	2	2	2	2
4 Population density near the site	3	3	3	6	6
5 Proximity to parks and recreational facilities	2	2	1	2	2
Environmental and Land Use					
6 Zoning	1	3	3	3	3
7 Compatibility with/distance to existing land uses	2	1	1	1	2
8 Visibility from a general use public road	2	3	2	1	3
9 Visibility from residences and/or schools.	6	2	2	2	2
10 Groundwater	9	9	9	9	9
11 Wetlands	3	3	6	6	3
12 Flora and fauna habitat	6	6	6	2	6
13 Site aesthetics	2	1	1	2	3
14 Residential units along access road	3	1	3	3	3
15 Schools or hospitals along access road	3	2	3	3	3
16 Final use of the site when the landfill is closed	1	1	1	1	1
17 Archeological and/or historical significance	6	6	3	6	6
Economic					
18 Cost of site acquisition	2	2	2	3	3
19 Cost of development	2	2	2	2	3
20 Cost of operations	1	2	3	1	3
21 Impact of removal of site on tax base	1	1	1	1	3
22 Haul distance from H-POWER	4	4	6	6	6
Technical					
23 Landfill capacity or site life	6	6	9	6	6
24 Annual precipitation	2	6	4	4	6
25 Adequacy of drainage	1	2	2	2	1
26 Access to fire protection	1	2	2	3	2
27 Length of haul	4	2	6	4	6
28 Geology	2	2	2	2	3
29 Closure and post-closure cost	3	3	2	1	3
Other Considerations					
30 Employment	1	3	2	3	2
31 Access	6	2	4	4	6
Total Site Score	107	102	113	109	131

Since the Advisory Committee report was completed, additional information has been provided regarding the cost of acquiring the Ameron Quarry and Makaiwa Gulch sites. In the Advisory Committee report, the cost of acquisition was the assessed value for property purposes. Parties representing Ameron Quarry and Makaiwa Gulch provided information to correct that information in letters appended to a letter from City Councilmember Tam to the State LUC⁵⁴.

Mr. Tam's letter reported on a meeting his Committee conducted in which it received testimony from representatives of Ameron Quarry and accepted a letter from the Estate of James Campbell, owner of the Makaiwa Gulch site. Mr. Tam's letter stated that:

"... A presentation was made by Ameron Hawaii, the lessee of the Kapaa Quarry site, and by the Estate of James Campbell, owner of the Makaiwa Gulch site. Ameron Hawaii cited an economic impact of \$109-\$133 million should it have to shut down its operations and relocate (full report attached). The Kaneohe Ranch, owner of the Kapaa Quarry site did not testify but offered written testimony which stated its estimate of land acquisition cost to be \$22-\$46 million as opposed to the City's estimate of \$3.7 million (letter attached). The Estate of James Campbell provided testimony suggesting that the economic impact should the Makaiwa Gulch site is chosen would be in the area of \$121 million cost to the City ..."

The cost evaluations used in the Advisory Committee report have been revised to reflect the added costs stated in Mr. Tam's report to the State LUC. The cost of acquiring the site was assessed by criterion number 18, Cost of Site Acquisition. *Table 17, Revised Evaluation of Criterion 18, Cost of Site Acquisition*, shows the original calculation of the Point Value for this criterion and the revised calculation using the revised site cost for Ameron Quarry and Makaiwa Gulch.

54 August 3, 2004 letter from Mr. Rod Tam, Chair Committee on Public Works & Economic Development, City Council, City and County of Honolulu to Mr. Anthony Ching, Executive Officer of the State Land Use Commission.

Table 17, Revised Evaluation of Criterion 18, Cost of Site Acquisition

Item	Ameron	Mali	Makiawa Gulch	Nanakuli B	Waimanalo Gulch
Cost in Advisory Committee Report	\$3,184,200	\$3,912,500	\$16,516,900	\$545,200	\$0
Years of Life	15	15.33	25	15.7	15
Cost/Year of Life	\$212,280	\$255,219	\$660,676	\$34,726	\$0
Point Value	2	2	2	3	3
Revised Cost	\$46,000,000	\$3,912,500	\$121,000,000	\$545,200	\$0
Years of Life	15	15.33	25	15.7	15
Cost/Year of Life	\$3,066,667	\$255,219	\$4,840,000	\$34,726	\$0
Revised Point Value	1	2	1	3	3

The result of that change is shown in *Table 18, Comparison of Site Scores*. That table shows the total site score with the original acquisition cost and the revised cost. It also shows that there was no change in the numerical order of the site scores with either acquisition cost. The detailed changes resulting from the change in site scoring for criterion number 18 is shown in *Table 19, Results of Application of Screening Criteria with Revised Cost of Acquisition*. The only change in this table is in criterion number 18. The number of points for Ameron Quarry and Makaiwa Gulch changed from six to three when using the increased cost numbers provided in Councilman Tam’s report to the State LUC.⁵⁴

Table 18, Comparison of Site Scores

Site	Original Acquisition Cost		Revised Acquisition Cost	
	Score	Rank	Score	Rank
Ameron Quarry	97	4	96	4
Mali	90	5	90	5
Makaiwa Gulch	99	2	98	2
Nanakuli B	97	3	97	3
Waimanalo Gulch	113	1	113	1

Table 19, Results of Application of Screening Criteria with Revised Cost of Acquisition

Criterion	Ameron	Maili	Makaiwa	Nanakuli B	Waimanalo Gulch
Community					
1 Displacement of residences and businesses	3	3	3	3	3
2 Distance to nearest residence, school or business	3	3	3	3	3
3 Wind direction relative to populated areas	6	2	2	2	2
4 Population density near the site	3	3	3	6	6
5 Proximity to parks and recreational facilities	2	2	1	2	2
Environmental and Land Use					
6 Zoning	1	3	3	3	3
7 Compatibility with/distance to existing land uses	2	1	1	1	2
8 Visibility from a general use public road	2	3	2	1	3
9 Visibility from residences and/or schools.	6	2	2	2	2
10 Groundwater	9	9	9	9	9
11 Wetlands	3	3	6	6	3
12 Flora and fauna habitat	6	6	6	2	6
13 Site aesthetics	2	1	1	2	3
14 Residential units along access road	3	1	3	3	3
15 Schools or hospitals along access road	3	2	3	3	3
16 Final use of the site when the landfill is closed	1	1	1	1	1
17 Archeological and/or historical significance	6	6	3	6	6
Economic					
18 Cost of site acquisition	1	2	1	3	3
19 Cost of development	2	2	2	2	3
20 Cost of operations	1	2	3	1	3
21 Impact of removal of site on tax base	1	1	1	1	3
22 Haul distance from H-POWER	4	4	6	6	6
Technical					
23 Landfill capacity or site life	6	6	9	6	6
24 Annual precipitation	2	6	4	4	6
25 Adequacy of drainage	1	2	2	2	1
26 Access to fire protection	1	2	2	3	2
27 Length of haul	4	2	6	4	6
28 Geology	2	2	2	2	3
29 Closure and post-closure cost	3	3	2	1	3
Other Considerations					
30 Employment	1	3	2	3	2
31 Access	6	2	4	4	6
Total Site Score	96	90	98	97	113

7.3 Ameron Quarry

7.3.1 Description of Site

Ameron Quarry is 391-acres located on the windward side of Oahu, within the Kapaa watershed, capable of holding nine million cubic-yards of MSW. The site was once the caldera of an ancient volcano, making the rock almost completely impermeable and of high quality for construction purposes.⁵⁵ Due to the fine grained materials of the quarry, such as Alaeloa and Helemano silty clays, there are no sensitive or endangered flora and fauna habitat found inside and within a half-mile of the quarry. Archaeological and/or historical significance is low due largely to late twentieth century land disturbances. However, thirty-one sites of known archaeological and/or historical importance are located within one mile of the quarry.

7.3.2 Landfill Infrastructure

7.3.2.1 On-Site

Ameron Quarry currently does not have landfilling infrastructure on-site and there is no space on-site for that infrastructure. As the site currently operates as a rock quarry, the existing infrastructure would need to be modified for the quarry to operate as a landfill, but much of the heavy equipment services needed for the quarry could also be used for the landfill.

7.3.2.2 Off-Site

The area within the quarry is used for the necessary infrastructure and for landfilling; space would be needed off-site for offices and other support facilities.

7.3.3 Capacity

Ameron Quarry has an estimated 15-year life span as a landfill. The site life was estimated from existing information (listed in section 7.2) and does not reflect current landfilling practices. The landfill life was estimated based on data available in existing reports. The life should be recalculated to reflect current landfilling practices, allowing for an adequate buffer around the site boundary, and filling to the natural grade.

⁵⁵ KBAC Streamwalks, <http://www.kbac-hi.org/>, March 11, 2008.

7.3.4 Opportunities and Constraints

Ameron Quarry has some major advantages as a landfill:

- It has significant capacity in an area where the City has operated a landfill. It will be closer to the point of waste generation for the windward side waste than the Waimanalo Gulch Sanitary Landfill.
- The site has existing infrastructure for quarry operations that could be used for a landfill, reducing the startup cost.
- Roadways are wide enough and designed to carry heavy trucks.
- The site geology includes Alaeloa and Helemano silty clays that will help protect against leakage. Under State regulations, a landfill liner would be installed.
- The quarry operation has created a hole that may need to be filled.

There are constraints with using Ameron Quarry as a landfill:

- The quarry receives more than 60 inches of precipitation annually, making this site the wettest of the five alternatives. However, landfills operated in wetter areas in the mainland U. S. must do so under stringent EPA Subtitle D regulations.
- The site is the furthest from the H-POWER facility and population centers.
- The cost of acquisition is likely to be significantly more than shown in the Advisory Committee siting report. In addition, the land owner has stated that costs will be associated with moving the operation to another location.^{48 54}
- In its report on its review of potential sites the Council Committee on Public Works and Economic Development (PWED) commented: "The PWED Committee has received testimony in opposition to siting a landfill at the Ameron Quarry site including testimony in opposition from the landowner Kaneohe Ranch, the lessee Ameron Hawaii, the Kailua Neighborhood Board and various city and State elected officials. No testimony has been received in support of a landfill at the Ameron Quarry site."⁴⁸
- The loss of construction material resources would be significant, according to the quarry operator. The operator stated that 10 years of capacity remain at the quarry that would be lost if the site were converted to a landfill, when the Advisory Committee report was issued in December 2003.⁵⁴

7.4 Maili Quarry

7.4.1 Description of Site

Maili Quarry is 200-acres, capable of holding 9.2-million cubic-yards of MSW; located in the Waianae District of Leeward Oahu. The site is 3,500 feet mauka of Farrington Highway, four miles northwest of Nanakuli, and three miles south of Waianae. Elevation of the site averages approximately 40 feet above mean sea level (MSL). Soils are predominantly sand and gravel materials of the quarry, including Lualualei clay and Mamala stony silty clay loam. Sensitive and endangered flora and fauna are not known to exist inside the quarry, nor within a half-mile distance. No archaeological or historical areas of significance have been documented within the Maili Quarry; however, 16 sites do exist within a quarter-mile of the site boundaries, eight sites between a quarter-mile and half-mile, and six sites between a half-mile and mile.

7.4.2 Landfill Infrastructure

7.4.2.1 On-Site

Maili Quarry currently has infrastructure on-site to support the existing quarrying operation. However, there is space available on-site for necessary infrastructure. As the site currently operates as a recycler of concrete, improvements and modifications to the existing concrete recycling infrastructure may be necessary for Maili Quarry to operate **as a landfill**.

7.4.2.2 Off-Site

No facilities are needed off-site as space appears to be available on-site.

7.4.3 Capacity

Maili Quarry has an estimated 15.33 year life span. This equates to an estimated capacity for the disposal of approximately 9.2-million cubic-yards of waste. The landfill life was estimated based on data available in existing reports (listed in section 7.2). The life should be recalculated to reflect current landfilling practices, allowing for an adequate buffer around the site boundary and filling to the natural grade.

7.4.4 Opportunities and Constraints

The advantages of using Maili Quarry as a landfill are:

- On-site cover,
- On-site brackish well for dust control,
- Consistent zoning in the State Agricultural District
- Utilities on-site,
- Low precipitation,
- Close proximity to H-POWER.

Constraints on using Maili Quarry as a landfill are:

- The distance to residents, schools, and businesses. The site is located 1,139 feet from Maili Elementary School and 875 feet from the nearest resident. It is just over 100 feet from single-family residential units, and the Waianae Coast Comprehensive Health Center is located along the access road to the quarry.
- Traffic accidents cause major delays; only one road access.
- Significant pedestrian cross-traffic.
- Access road privately owned.
- Only coral quarry on-island.
- In its report on its review of potential sites the Council Committee on Public Works and Economic Development commented: "The PWED Committee has received testimony in opposition to a landfill at the Maili site and anywhere on the Leeward coast in general. No testimony has been received in support of a landfill at the Maili site."⁴⁸

7.5 Makaiwa Gulch

7.5.1 Description of Site

Makaiwa Gulch is 338-acres, capable of holding 15-million cubic-yards of MSW (25-years capacity). The site is located on West Oahu, 1.5 miles northwest of Puu Palailai, north of Farrington Highway, 1.6 miles south of Puu Manawahua, and 1.3 miles east of Kahe Point. Elevation ranges from approximately 120 feet to over 600 feet MSL. Soils are generally associated with sand and gravelly materials of the gulch and include Stony steep land, Lualualei extremely stony clay, Helemano silty clay, and Mahana-Badland complex soils. Sensitive and endangered flora and fauna are not known to exist within the site, but do exist at distances greater than a half-mile away. Seven sites of archaeological and/or historical significance are located within and on the edge of the site. Twenty-three sites are located within a mile, fourteen within a quarter-mile (although only two have been evaluated as possibly meriting preservation), four between a quarter-mile and half-mile, and five sites are between a half-mile and mile. Makaiwa Hills, LLC has submitted an Environmental Impact Statement Preparation Notice (EISPN) for the development of a residential community on 1,781 acres of undeveloped land in Ewa, Oahu; the same land proposed as an alternative landfill site. The notice was submitted October 2006, and is available on the Office of Environmental Quality Control (OEQC) web page.⁵⁶ Construction is currently underway.

7.5.2 Landfill Infrastructure

7.5.2.1 On-Site

There is space available on-site for the construction of landfill infrastructure.

7.5.2.2 Off-Site

Construction of infrastructure off-site is not anticipated to be required.

⁵⁶ A final environmental impact statement (FEIS) has been filed. Office of Environmental Quality Control, The Environmental Notice. November 8,2007.

7.5.3 Capacity

Makaiwa Gulch has an estimated 25 year life as a landfill, or disposal ability to process 15-million cubic-yards of waste. The landfill life was estimated in data available from existing reports (listed in section 7.2). The life should be recalculated to reflect current landfilling practices, allowing for an adequate buffer around the site boundary, and filling to the natural grade. With evaluations based on current practice, it is likely that significantly more life is available at this site than the estimate included in this report.

7.5.4 Opportunities and Constraints

The Makaiwa Gulch site has several advantages:

- It has a significant amount of capacity – 25 years.
- Access is potentially available off main highway.
- Consistent zoning in the State Agricultural District
- The property is currently not being used, although development for a residential subdivision has been proposed.
- It is the shortest distance of the alternative sites from the H-POWER facility and close to service population (short haul distance).
- Extensive archeological/flora/fauna surveys have been completed.
- The area has low precipitation, which will mean less water from rainfall that must be managed at a landfill.

There are several major constraints:

- The current development under construction at the site precludes its use as a landfill
- Acquisition Costs.⁵⁴
- Upwind from heavily populated residential and resort areas.
- No on-site utilities or access road.
- Rockfall hazards may exist along the highway to Makaiwa Gulch.
- Not consistent with development plan which is planned for residential subdivision development.

- Close to a transition between H-1 and Farrington Highway
- HECO electric power lines (138 KV) cross the site.
- View planes readily seen.
- Perception that a landfill would create a major economic impact that would “close down” residential and resort development, according to developer’s representative⁵⁴
- Close to center of area of major population growth
- In its report on its review of potential sites the Council Committee on Public Works and Economic Development commented: “The PWED Committee has received testimony in opposition to a landfill at the Makaiwa Gulch site including testimony in opposition from the landowner and also testimony was received in opposition to siting a landfill anywhere on the Leeward coast in general. No testimony has been received in support of a landfill at the Makaiwa Gulch site.”⁴⁸

7.6 Nanakuli B

7.6.1 Description of Site

Nanakuli B is 432.3-acres, capable of holding 9.4-million cubic-yards of MSW, on West Oahu, south of Maili Quarry. The site is located 2,000 feet mauka of Farrington Highway and Nanaikapono Beach Park, 4,000 feet west of Puu Helakala, and 4,000 feet east, southeast of Puu O Hulu Uka. Elevation ranges from approximately 40 feet to over 300 feet MSL. Nanakuli B borders a critical habitat area for sensitive and endangered flora and fauna. Although the potential landfill site does not contain any archaeological and/or historical sites within its boundaries, sixty-two archaeological and/or historical sites can be found within one mile of the site boundaries; with the majority of the sites located closer to one mile out. Three of these archaeological and/or historical sites are less than a quarter-mile from site boundaries, nine are located between one-quarter and one-half mile, while fifty are located between one-half and one mile.

Leeward Land LLC has submitted an EISPN for the construction and operation of an MSW landfill and composting facility on an approximate 172-acre site on Nanakuli B. The notice was submitted May 23, 2006, and is located on the State OEQC web page.

7.6.2 Landfill Infrastructure

7.6.2.1 On-Site

Nanakuli B currently does not have landfilling infrastructure on-site; however, there is space available.

7.6.2.2 Off-Site

Off-site space is not needed for infrastructure.

7.6.3 Capacity

Nanakuli B has an estimated 15.6 year life, or capacity of 9.4-million cubic-yards. The landfill life was estimated in data available in existing reports (listed in section 7.2). The life should be recalculated to reflect current landfilling practices, allowing for an adequate buffer around the site boundary, and filling to the most advantageous grade. With evaluations based on current practice, it is likely that more life is available at this site than the estimate included in this report.

7.6.4 Opportunities and Constraints

The Nanakuli B site has several advantages:

- The zoning is consistent.
- The area gets low precipitation.
- The landfill would be close to existing C&D landfill.
- Utilities are readily accessible.
- The site is not currently being used.
- Site acquisition costs relatively low.
- Brackish wells are available on-site for water for dust control.

The disadvantages of this site include:

- Hazardous rockfalls on highway to site.
- Traffic accidents cause major delays on Farrington Highway and could slow access to the site.

- Pedestrian cross traffic on Farrington Highway and the access road.
- The Navy owns the access road, which may necessitate the City paying for access.
- Upwind of Maili Elementary School and residences. It is surrounded by single-family residences less than 300 feet away, on the southern and western boundaries. Nanakuli Elementary is 1,372 feet away, Nanaikapono Elementary is 2,190 feet away, and the Pacific Shopping Mall is 1,335 feet away. Residences are located on the far west side of Lualualei Naval Road.
- Dust could impact nearby homes.
- Trucks would pass schools and medical facilities to get to site.
- In its report on its review of potential sites the Council Committee on Public Works and Economic Development commented: "The PWED Committee has received testimony in opposition to a landfill at the Nanakuli B site and anywhere on the Leeward coast in general. No testimony has been received in support of a landfill at the Nanakuli B site."⁴⁸

7.7 Waimanalo Gulch Sanitary Landfill

7.7.1 Description of Site

Waimanalo Gulch Sanitary Landfill is a 200-acre site, with approximately 92.5-acres remaining for expansion and capable of holding 9-million cubic-yards of MSW, on the Leeward side of Oahu. Waimanalo Gulch is owned by the C&C and operated under contract by Waste Management of Hawai'i, Inc. The site currently receives the H-POWER facility's ash and residual wastes. It is also the landfill site for commercial MSW that exceeds the capacity at H-POWER.⁵⁷ The site adjoins Farrington Highway. To the northwest is the Hawaiian Electric Kahe Power Generating Station. South of the site are the Ko Olina Resort, while southeast of the site is the Honokai Hale residential subdivision.

The on-site soils including Rock land, Stony steep land, Lualualei extremely stony clay, and Mahana-Badland complex, provide an improved barrier between surface and groundwater. Sensitive and endangered flora and fauna habitat are not known to exist within the boundaries or within a half-mile of the site. Archaeological and/or historically significant sites are not found within the majority of the landfill site. An archaeological

⁵⁷ Waste Management, Keeping Hawaii Clean, <http://www.keepinghawaiiiclean.com/waimanalo.htm>, March 11, 2008.

site comprised of three stone uprights was recently discovered. Mitigation to address the find is underway with the State Historic Preservation Division and community informants to identify an appropriate and culturally sensitive means of preserving the stones. No other sites are known within the property. Surrounding the site, 30 sites of potential archaeological and/or historical significance can be found between a quarter-mile and half-mile of the site boundaries.

Construction and operating practices at the Waimanalo Gulch Sanitary Landfill are consistent with state and City & County of Honolulu requirements for site and soils stability and environmental compliance. The operation of the landfill had been the subject of DOH action regarding a notice of violation and fine. The DOH and Waste Management of Hawai'i, Inc., the site operator, have agreed to a settlement. DOH proposed fining the landfill \$2.8 million (DOH and the operator settled for \$1.5 million) for 18 alleged violations of the operating permit that were self-reported by Waste Management.

7.7.2 Landfill Infrastructure

7.7.2.1 On-Site

Waimanalo Gulch currently has landfilling infrastructure on the landfill property, as well as additional space available for the expansion of such infrastructure.

The infrastructure is part of the landfill property, but not part of the area permitted for use as the disposal site. The area permitted for landfilling is 107.5 acres of the total 200 acre site.

7.7.2.2 Off-Site

Facilities are not needed off-site.

7.7.3 Capacity

Waimanalo Gulch Sanitary Landfill has an estimated minimum 15 year life, or ability to dispose of nine million cubic-yards of waste. The capacity is expected to be reevaluated as the EIS is processed.

7.7.4 Opportunities and Constraints

The continued use of the Waimanalo Gulch Sanitary Landfill offers the following opportunities:

- Least costly site to acquire and operate as it is owned by the C&C and the necessary infrastructure is already in place.
- Close to H-POWER.
- The technical information needed to design the landfill is known. With the other sites, a significant amount of technical information will be needed before they can be designed and permitted.
- Road access acceptable.
- Close to the service population centers – shorter haul distance than all alternative sites, except Makaiwa Gulch.
- Low precipitation.
- It is good policy to use a resource, like the Waimanalo Gulch Sanitary Landfill property, until it is no longer capable of providing the service.
- In its report on its review of potential sites the PWED Committee commented: “There was some testimony received in favor of including the Waimanalo Gulch Landfill as one of the sites under consideration by the City Council and some testimony received supporting the continued use of the Waimanalo Gulch Landfill including testimony from the current operator, Waste Management Hawaii.”⁴⁸

There are several disadvantages to the continued use of the Waimanalo Gulch Sanitary Landfill, including:

- It is located upwind and visible from a major resort area.
- Further effort involving landscaping is needed to reduce viewplanes of the landfill facing Farrington Highway and Ko Olina.
- Developers’ representatives have claimed there would be major economic impact on residential development and resort development with continued operation of the Waimanalo Gulch Sanitary Landfill.⁵⁴
- Trucks are visible lined on-site and along Farrington Highway.

- The site is located close to the center of population growth.
- In its report on its review of potential sites the PWED Committee commented: "The PWED Committee has received testimony in opposition to continued use of the Waimanalo Gulch Landfill and also testimony in opposition to siting a landfill anywhere on the Leeward coast in general."⁴⁸

7.8 Response to Scoping Questions to Alternative Sites

The C&C conducted scoping sessions on the following dates at the locations indicated:

- Monday, July 10, 2006 at Nanakuli High School.
- Tuesday, July 11, 2006 at Ben Parker Elementary School.
- Thursday, July 27, 2006 at Mission Memorial Auditorium.
- Thursday, August 10, 2006 at Kapolei Hale.

Several of the audience members offered their comments in response to the information presented by the C&C. This portion of the analysis presents the comments that related to alternative sites.

Comments will be denoted by a 'C', questions by a 'Q', and answers by an 'A'.

Q: LUC and City Planning Commission said to close Waimanalo Gulch. In light of this, how are you proposing to expand it and keep it open?

A: The City will seek an amendment to the State SUP to allow an expansion at Waimanalo Gulch Sanitary Landfill. The amendment will be submitted to the City Planning Commission for approval and forwarding to the State LUC.

Q: What is the status of other public and private landfill operations and proposed sites?

A: The only State-permitted public operating landfill is Waimanalo Gulch Sanitary Landfill. The only State-permitted private landfill is PVT Landfill. PVT Landfill accepts C&D wastes. The City Department of Planning and Permitting has received an EISPN for Nanakuli B.

Q: Why is the City not honoring its commitment to close the Waimanalo Gulch Sanitary Landfill by May 2008?



A: The City acknowledges that commitments were made to close Waimanalo Gulch Sanitary Landfill with the implied understanding that a new landfill could be located and permitted on the island to accept waste. The issue of selecting a new landfill that would be operational, despite having been reviewed by several parties, could not be accomplished by the May 2008 deadline when the current State SUP Amendment will expire. The parties reviewing this matter included the ENV, the prior administration's Report of the Mayor's Advisory Committee on Landfill Site Selection on Landfill Siting, the current Administration, and the Honolulu City Council.

Q: Why did the previous assessment of landfill sites not include excavation costs for the expansion, as excavation was needed for the current site?

A: The assessment of landfill sites evaluated all sites with similar technical information. All sites would require some amount of excavation; however, precise costs could not be determined with the information available, so excavation costs were not used as part of the evaluation criteria.

C: The community has said, "No more landfills!" When will the City get the message – No Landfills, Yes JDI Plasma Arc Gasification – stop thinking about the money; think and look at our community, our families' health, and safety.

A: The C&C cannot immediately close down all landfills on Oahu. Section 3.1 gives an explanation as to why a sudden cease of landfills is not the best solution, as well as a catastrophe to Oahu residents and visitors' health and safety.

C: Legislation should be passed requiring each council district to be responsible for the trash from their district being buried in their district. If the residents of the Districts will not consent to a landfill in their district it may be buried in the Waimanalo Gulch Sanitary Landfill at an additional tipping charge. These charges must be of sufficient rate as to (A) encourage each district to be responsible for their trash or (B) be adequate enough for the residents of the 1st district to accept the trash from any other districts. These monies would be used for the sole benefit of the legal residents of the 1st district and only them.

A: The general concept that this comment refers to is a Host Benefit Fee. The Community Benefits Package was proposed by the Mayor and \$1,000,000 in grants has been made to Leeward nonprofit groups.

C: With the latest innovative technology in mind, open a new landfill at another site on another part of the island. Start over the right way. We know that this is a political challenge, but done right, it will help to teach us all – on all sides of the island – to be better stewards of the land; educate us in the latest landfill technologies; and say to the people of the Waianae coast that you value this area and do not see it – or its people – as a place of garbage.



A: Past siting efforts can be found in section 6.2. This section discusses the Report of the Mayor's Advisory Committee on Landfill Site Selection and the work accomplished in determining the best site for Oahu's next landfill. The sites chosen are discussed in sections 6.4-6.8.

It should also be noted that the Waimanalo Gulch Sanitary Landfill is only the latest site the City has used. Others have been located at Kapaa and Ala Moana.



8 Preferred Alternative

Several of the alternative technologies and the transshipment alternative show promise to offer the C&C an option to continued use of the Waimanalo Gulch Sanitary Landfill for the MSW that exceeds H-POWER capacity. The time between preparation of this EIS and the date to comply with the State LUC Order, November 1, 2009, is insufficient for the administrative processes to arrange for another alternative for all of the MSW and H-POWER refuse being disposed at the Waimanalo Gulch Sanitary Landfill.

A viable alternative must meet several considerations:

- It needs to provide for the health and safety of Honolulu residents and visitors by properly managing the waste produced on the island.
- Any alternative, whether it is technology, another site, or transshipment, needs to be contracted for, permitted, and made operational by November 1, 2009.
- Because of the complexity of the siting requirements in Hawaii, the high degree of public interest and input into any siting process, the environmental clearance needed, and the permitting process, a significant amount of time (some say up to 10 years for a new landfill site or new alternative technology) may be needed for an alternative to become operational.

The Waimanalo Gulch Sanitary Landfill is the only alternative currently available to dispose of MSW and H-POWER ash and residue. Continued use of the Waimanalo Gulch Sanitary Landfill until it has been filled to its physical capacity to accept waste is the Preferred Alternative.

8.1 Continued Use of Waimanalo Gulch Sanitary Landfill

The Waimanalo Gulch Sanitary Landfill has capacity to handle MSW for at least 15 years. The site is providing that service today.

It was the site selected by the City Council on December 1, 2004, as stated in Resolution 04-348, C.D.1, F.D.1. That resolution includes the following statements:

“...BE IT FURTHER RESOLVED by the council, and in accordance with the conditions set forth by the state land use commission, that the Waimanalo Gulch site is selected as the site for the city’s landfill because:

- (1) The site currently has over 15 years capacity left with further expansion, and this capacity can be further extended should the city be successful in reducing the amount of waste currently entering the landfill through recycling and the use of new technologies;
- (2) The city already owns the property and the infrastructure is already in place, making the site the most economical and least expensive to develop and maintain as a landfill;
- (3) Other sites will require a large capital outlay by the city to acquire the land through condemnation and to develop and construct the site and required supporting infrastructure;
- (4) A landfill management contract is already in place for 15 years;
- (5) This is the only site where the costs and revenues for a landfill are known factors; and
- (6) The current landfill operator is committed to implementing necessary improvements to landfill operations to address community concerns regarding visual impact, odors, airborne waste, litter and dust control; and

BE IT FURTHER RESOLVED that the city administration is requested to immediately contact the planning commission, the state department of health and state land use commission to satisfy any necessary requirements for the use of the selected landfill site; ...”

8.2 Transshipment Alternative

Transshipment of waste transfers the responsibility for stewardship of the land to the mainland landfill that disposes of the transshipped waste. However, operation of transshipment in conjunction with continued use of the Waimanalo Gulch Sanitary Landfill, expansion of recycling alternatives, and addition of a third boiler to H-POWER offers the C&C another alternative for reducing the material being landfill. The C&C has issued a Notice to Bidders to determine if transshipment is advantageous in the time before addition of a third boiler to H-POWER. However, transshipment cannot handle all the waste going to the landfill, so the landfill will continue to be needed.

The regulatory process for transshipment requires considerable time. It involves federal approval of the transshipment of waste materials from Honolulu to the mainland and local approval of the facilities used to prepare the waste for shipment.



There are at least two companies that have expressed interest in transshipping Honolulu's waste: Pacific Rim and Hawaiian Waste Services. At the time this EIS is being prepared, Hawaiian Waste Services has received the federal approvals needed to ship the waste from its point of arrival on the mainland up the Columbia River to the Roosevelt Landfill in Washington State.^{58 59}

Transshipment may offer near term advantages to the C&C to reduce disposal at the Waimanalo Gulch Sanitary Landfill. The C&C may wish to issue a Request for Proposal or other solicitation for transshipment to identify the costs and other considerations.

While transshipment offers an alternative for some of the MSW, there are parts of the waste stream that cannot be shipped due to federal restrictions, some items that cannot be accepted due to the process used, and financial and solid waste management considerations that may limit transshipment to a select portion of the waste stream. The continued use of the Waimanalo Gulch Sanitary Landfill offers a means to handle the prohibited material, offers an essential safety net if transshipment is interrupted, and is an integral part of the C&C waste management system.

In addition to the other disadvantages of transshipment, that activity produces over 200 percent more emissions than disposal at the Waimanalo Gulch Sanitary Landfill. The difference in emissions compared to taking the waste to H-POWER is even more dramatic. H-POWER shows a reduction in island-wide emissions (or negative emissions) of 28,711 metric tons per year of CO₂ equivalent compared to a positive generation from transshipment of 3,978.

The Waimanalo Gulch Sanitary Landfill cannot be replaced by transshipment, although the amount of MSW needing on-island landfill disposal can be reduced.

58 United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine. Compliance Agreement with Roosevelt Landfill. January 10, 2007.

59 United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine. Compliance Agreement with the State of Hawaii. January 19, 2007.

8.3 Technology Alternative

Technology has progressed since the last EIS was completed for this site. The references used for this evaluation note that alternative technologies have operated in Europe and Japan processing MSW for two or more years. Other alternatives are showing promise and other jurisdictions (e.g., New York City⁶⁰ and Los Angeles County⁶¹) are investing a significant amount of time and money studying technologies and evaluating proposals to provide them with technology solutions. The jurisdictions considering alternative technologies have a landfill within reasonable distance by rail or truck transport to provide backup if the technology does not perform as expected. That is not the case in Honolulu, making the use of an alternative technology and closure of the Waimanalo Gulch Sanitary Landfill a risky concept.

None of the technologies meet all of the City requirements as listed in section 6.1. In addition, none of the alternative technologies can have the environmental, land use, permitting, and administrative contracting completed before the November 1, 2009, State LUC deadline.

Expansion of recycling offers advantages for reducing waste going into the Waimanalo Gulch Sanitary Landfill. It should be pursued, but cannot be relied upon to completely eliminate the need for the Waimanalo Gulch Sanitary Landfill.

Addition of a third boiler to H-POWER will reduce the amount of material needing disposal and generate energy needed on the island. However, landfill capacity is needed for the non-processible materials. In addition, the environmental, land use, permitting and administrative contracting cannot be completed before the November 1, 2009, State LUC deadline.

60 New York City Economic Development Corporation and New York City Department of Sanitation. Evaluation of New and Emerging Solid Waste Management Technologies. September 16, 2004.

61 County of Los Angeles Department of Public Works. Los Angeles County Conversion Technology Evaluation Report, Phase II- Assessment. October 2007.



8.4 Site Alternative

None of the alternative sites offer the advantages that the Waimanalo Gulch Sanitary Landfill site does. Since it is an operating site with remaining capacity, it has many benefits the others do not have. Assuming that the State LUC and DOH both extend the existing permits, there will be no delay in its use.

The four alternative sites have the capacity and other important features that make them reasonable candidates. However, there are considerations with all four sites that make them less attractive.

The representatives of the Ameron Quarry and the James Campbell Estate, owner of the Makaiwa Gulch site, have both provided estimates of significantly increased cost to acquire the sites and have highlighted several additional complicating issues. Using either of these two sites as a landfill will require potentially protracted action to obtain the site in addition to the lengthy time for the environmental, land use, and permitting processes. In addition, the Makaiwa Gulch site is currently being developed for other purposes.

The other two sites, the Maili Quarry and Nanakuli B are both located further into the Waianae area, which would probably result in increased opposition from the community. Also, the Nanakuli B site has been proposed as a landfill by a private developer, so the cost of acquiring the site should be expected to be greater than estimated here.

The only landfill site that can be in use before the November 1, 2009, State LUC deadline is the Waimanalo Gulch Sanitary Landfill.



Attachment A — August 22, 2006 USDA Decision Regarding Transshipment

Rules and Regulations

Federal Register

Vol. 71, No. 163

Wednesday, August 23, 2006

This section of the FEDERAL REGISTER contains regulatory documents having general applicability and legal effect, most of which are keyed to and codified in the Code of Federal Regulations, which is published under 50 titles pursuant to 44 U.S.C. 1510.

The Code of Federal Regulations is sold by the Superintendent of Documents. Prices of new books are listed in the first FEDERAL REGISTER issue of each week.

DEPARTMENT OF AGRICULTURE

Animal and Plant Health Inspection Service

7 CFR Part 330

9 CFR Part 94

[Docket No. 05-002-4]

RIN 0579-AC12

Interstate Movement of Garbage From Hawaii; Municipal Solid Waste

AGENCY: Animal and Plant Health Inspection Service, USDA.

ACTION: Final rule.

SUMMARY: We are amending the regulations pertaining to certain garbage to provide for the interstate movement of garbage from Hawaii subject to measures designed to protect against the dissemination of plant pests into noninfested areas of the continental United States. We are amending these regulations upon request in order to provide the State of Hawaii with additional waste disposal options, and after determining that the action is highly unlikely to result in the introduction and dissemination of plant or animal pests or diseases into the continental United States from Hawaii. We are also making other amendments to the garbage regulations to clarify their intent and make them easier to understand.

DATES: *Effective Date:* September 22, 2006.

FOR FURTHER INFORMATION CONTACT: Ms. Shannon Hamm, Assistant Deputy Administrator, Policy and Program Development, APHIS, 4700 River Road Unit 20, Riverdale, MD 20737-1231; (301) 734-4957.

SUPPLEMENTARY INFORMATION:

Background

Under 7 CFR 330.400 and 9 CFR 94.5 (referred to elsewhere in this document as the regulations), the Animal and Plant Health Inspection Service (APHIS) regulates the importation and interstate movement of garbage that may pose a risk of introducing or disseminating animal or plant pests or diseases that are new to or not widely distributed within the United States. Not all movements of waste material are regulated by APHIS; only movements of waste that meets APHIS's definition of "garbage" are regulated, and even then, only under certain circumstances. Under the regulations, the term "garbage" is defined as "all waste material derived in whole or in part from fruits, vegetables, meats, or other plant or animal (including poultry) material, and other refuse of any character whatsoever that has been associated with any such material on board any means of conveyance, and including food scraps, table refuse, galley refuse, food wrappers or packaging materials, and other waste material from stores, food preparation areas, passengers' or crews' quarters, dining rooms, or any other areas on means of conveyance." Garbage also means "meals and other food that were available for consumption by passengers and crew on an aircraft but were not consumed."

Waste material that meets the definition of garbage is regulated by APHIS if it is removed from a means of conveyance that:

- Within the last 2 years, has been in any port outside the United States or Canada; or
- Within the last year, has moved from Hawaii or a U.S. territory to another U.S. State.²

However, garbage onboard a conveyance that meets one of the two conditions above may be exempted from regulation if the conveyance is cleared of all regulated garbage, and after cleaning and disinfection, an Inspector certifies that the conveyance contains no garbage that poses a risk of pest

¹The operation of landfills and incinerators and the intrastate and interstate movement of garbage are regulated predominantly by State and local governments. The U.S. Environmental Protection Agency (EPA) regulates the interstate movement of hazardous wastes. See EPA's Web site for additional information: <http://www.epa.gov/epaosvr/osw/index.htm>.

²"State" is defined as any of the 50 States and any U.S. territory or possession.

introduction into the United States. Garbage from Canada is also exempted from regulation.

The regulations were established to address the risk posed by garbage that originates on or is onboard conveyances that have been located in areas where exotic animal or plant pests or diseases are present. Such garbage includes waste generated during the course of commercial and private air travel and commercial or private transit of goods or persons by sea. The regulations were not intended to address risks posed by movements of municipal solid waste (MSW).

Due to a limited availability of landfill space in Hawaii, business interests and public officials are exploring other options for disposal of the State's waste. These persons have requested that APHIS allow the interstate movement of MSW from Hawaii. We believe the regulations require amendment to provide for the movement of garbage generated in Hawaii.

Pest Risk Assessment

As part of our evaluation of the request by business interests and public officials in Hawaii, we prepared a draft pest risk assessment (PRA), titled "The Risk of Introduction of Pests to the Continental United States via Plastic-Baled Municipal Solid Waste from Hawaii" (March 2006) to evaluate the interstate movement of garbage from Hawaii to the mainland of the United States. The objective of the PRA was to evaluate whether a baling technology that would bundle, wrap, and seal the MSW into airtight bales will effectively mitigate potential plant pest risks associated with MSW from Hawaii. The PRA focused on the planned use of the baling technology because airtight enclosure from creation to burial will mitigate the risks of establishment by any plant pests. The PRA addressed the following three issues:

- The ability of the baling technology to provide a strong, airtight barrier;
- The examination of the occurrence of ruptures or punctures; and
- The examination of general pathway procedures to reduce pest incidence in the bales and the chances of escape in the event of accidental ruptures or punctures.

In addition, the PRA provides qualitative risk ratings for different pest types based on the likelihood of introduction. Only those pathway

processes likely to be common to all company proposals to transport baled Hawaiian waste were considered. We will prepare separate assessments for other company proposals which will address factors such as the destination landfill, type of transportation to be used on the mainland, and pest species that may pose particular threats.

The PRA concluded that transporting MSW from Hawaii to the continental United States in airtight bales poses a low risk of pest introduction and dissemination because the baling technology mitigates the risk from all types of plant pests. In addition, the other pathway procedures should adequately protect against accidental ruptures or punctures in bales during the handling and transport process. Pest mitigation processes such as the baling technology itself or features of the proposed pathway, including the waste type, and how bales are staged, handled, transported, and buried, are added safeguards that we conclude will prevent the introduction and dissemination of exotic pests. As a complement to the baling technology, the PRA recommends proper staging of bales and certification that they are mollusk-free to mitigate against contaminating pests. As long as those processes and the procedures proposed by the companies (including diversion of yard and agricultural waste, prompt shipment, monitoring and inspection of bales, and thorough cleanup of any ruptures that do occur) are followed, establishment of Hawaiian plant pests via this pathway is highly unlikely.

On April 19, 2006, we published in the *Federal Register* (71 FR 20030–20041, Docket No. 05–002–2) a proposal⁴ to amend the regulations in “Subpart—Garbage” (7 CFR 330.100 through 330.400) and 9 CFR 94.5 pertaining to certain garbage to provide for the interstate movement of garbage from Hawaii subject to measures designed to protect against the dissemination of plant pests into noninfested areas of the continental United States.

We solicited comments on the proposed rule for 30 days ending on May 19, 2006. We received five comments by that date, including a request to extend the comment period. In a document published in the *Federal Register* on May 31, 2006 (Docket No. APHIS–2005–0047, 71 FR 30834), we

⁴ To view the proposed rule and the comments we received, go to <http://www.regulations.gov>, click on the “Advanced Search” tab, and select “Docket Search.” In the Docket ID field, enter APHIS–2005–0047, then click on “Submit.” Clicking on the Docket ID link in the search results page will produce a list of all documents in the docket.

reopened and extended the deadline for comments until June 5, 2006. We received an additional seven comments by that date. The comments came from several municipalities in Hawaii, waste companies, congressional representatives, the State of California, a tribal representative, and members of the general public. Of the 12 comments, 8 fully supported the proposal. The remaining commenters raised several issues, which are discussed below.

Bale Technology

Comment: APHIS must test the bale technology to ensure that the plastic bales will not breach. In addition, APHIS should use its own experts to validate the research data provided by the technology vendors and their consultants regarding the safety of bale technology.

Response: As cited in the PRA, independent researchers have tested the baling technology in a variety of situations and firmly established its utility and effectiveness at creating airtight bales of MSW. Because these studies have been peer reviewed, APHIS believes that it is not necessary to repeat the testing performed in the underlying research.

Pest Risk Assessment

Comment: APHIS should revisit its PRA to clarify the roles played by compaction and shredding because whole fruit containing fruit fly or other insect eggs or larvae will not be affected by the anoxic conditions of the bales.

Response: While insect eggs and larvae, including those of fruit flies and other agricultural pests, could theoretically survive in whole fruit under short-term anoxic conditions, whole fruit would not be present in the bales due to the processing, i.e., pulverizing or shredding followed by compaction, of the MSW prior to being baled. As described in the PRA, bale densities are expected to be in excess of 800 kg/m³, so compaction will likely kill most insects, including fruit flies, regardless of stage, and may also neutralize some weed seeds and nematodes. Moreover, bales that remain airtight from creation until burial completely mitigate the risk from all plant pests because the pests and pest propagules cannot escape. That mitigation is universal, i.e., it does not depend on pest type or taxonomy, and probably applies equally to both current and future pests that establish in Hawaii.

Comment: How will APHIS ensure that noxious weeds would not be included in the bales of MSW?

Response: As we discussed in the PRA, the exclusion of most yard and agricultural waste from the baling process will greatly reduce the likelihood that seeds of regulated pest plants will be present in the baled MSW. In addition, very few regulated species are likely to have viable seeds in the bales, either because they mostly reproduce vegetatively, or because they are not found in yards and gardens in residential areas in Hawaii. Species of concern to particular mainland States will be further evaluated in site-specific PRAs to identify any exceptions and assess their potential risks.

Environmental Impacts

Comment: APHIS should research the consequences of any spill of baled MSW during transport.

Response: APHIS conducted several evaluations, including a PRA and an EA to determine the consequences of any spill involving bales containing MSW during transport from Hawaii to the mainland United States. We have determined that there is a very low likelihood that plant pests or noxious weeds would be introduced and disseminated into the mainland United States as a result of this action. As described in the PRA, there is a series of mitigations that would take place including limiting waste materials that would exist in the bales and ensuring proper staging, handling, transport, and burial of these bales. There will also be specific contingency plans for emergency response to potential spills outlined in compliance agreements with specific sites. In addition, short of a barge capsizing (which would be considered catastrophic events and would be cause to initiate emergency consultation), there is essentially no risk of impact on aquatic life from the transport of baled MSW from Hawaii to the mainland United States. Situations where there is potential for impacts occur wherever bales are moved from one staging area or mode of transportation to another. These transfer points include: The facility in Honolulu where bales are initially loaded onto the barges; the unloading facility on the mainland where bales are unloaded from the barges and loaded onto trucks; and the final destination where bales are unloaded from trucks and placed into the landfill. In some scenarios there could be intermediate steps requiring the handling of bales, e.g., an ocean-going barge may offload its bales onto smaller-sized barges to navigate a river; an ocean-going barge may offload its bales onto railcars; and railcars would then need to transfer their bales onto

trucks for the final leg of the trip to the landfill.

At each of the bale transfer points identified above, there is a small potential for dropping a bale into the water or, more likely, compromising the integrity of one or more bales of MSW which could result in spillage of the contents on the ground or into the water. In most cases the spilled MSW would be retrieved and the bale repackaged. If this were to happen over water, it would be more difficult to retrieve the spilled MSW, particularly if the integrity of the bale was breached. Any spill, in the event of a broken bale, would be handled in accordance with a spill cleanup plan, attached to each compliance agreement, that provides guidance on what detergents and disinfectants to use, how to safely use them, and how to avoid aquatic contamination.

Comment: Shipping MSW to the mainland from Hawaii should only be done if alternative disposal options are not available.

Response: Municipal jurisdictions within the State of Hawaii will be responsible for determining which disposal option to pursue. APHIS will be responsible for ensuring that if the disposal option includes the movement of MSW from Hawaii to the mainland United States, it occurs in accordance with conditions provided in our regulations and compliance agreements.

Comment: Sending barges with MSW through the Columbia and Snake Rivers would negatively impact the number of fish in the area.

Response: We do not believe that there will be a significant increase in barge traffic in this region due to this action. We will have the opportunity to quantify this assertion when we conduct a site specific PRA and EA for the Columbia River Basin. In addition, APHIS does not regulate barge traffic. Under our authority we ensure that safeguards are in place to prevent the introduction and dissemination of plant pests, noxious weeds, and animal diseases.

APHIS did conduct a biological assessment for this action to determine impacts on listed species of fish and wildlife. We found that there are two types of risks that must be considered in such a situation. One is a physical disruption of the environment caused by the broken bales and the physical retrieval of their strewn contents. Compromised bales or spilled MSW that is on land can be retrieved relatively easily. MSW that is spilled into waterways will be more difficult to retrieve, and some may not be retrievable, resulting in an incremental

degradation of the natural aquatic environment. Since hazardous wastes are not permitted, any negative impacts will be restricted to physical ones and no chemical pollution is likely to result from the MSW itself.

The second type of risk that could result from breaking bales and the spilling of MSW could be from detergents and disinfectants that may be used during a cleanup of any spilled MSW that may occur on land. Detergents and disinfectants would not be effective in aquatic situations, and therefore, would not be used if spills were in or over water. If such tools were used during a cleanup effort, care must be taken to prevent them from entering waterways. Their use would be in accordance with a spill cleanup plan, attached to each compliance agreement, that provides guidance on what detergents and disinfectants to use, how to safely use them, and how to avoid aquatic contamination.

As mentioned above, APHIS will develop a site-specific pest risk assessment and environmental assessment which will examine any risks associated with transporting MSW into specific regions. The public will have an opportunity to comment on those documents before they are finalized.

Comment: Has APHIS conducted any studies on the potential to introduce new plant and animal pathogens to the Columbia Basin Region?

Response: This final rule provides a general framework which will allow for the interstate movement of MSW from Hawaii under certain conditions. One condition of that movement will be that shipments will be moved under provisions outlined in a compliance agreement. A compliance agreement will be developed for each individual site on the mainland of the United States into which these shipments would be moved. For each compliance agreement, APHIS will develop a site-specific pest risk assessment and environmental assessment to examine the risks associated with transporting MSW into the specific region, including into the Columbia Basin region.

Requested Change to the Regulations

Comment: APHIS should add the staging requirement and certification of snail free shipments language found in the PRA to the regulatory text.

Response: The regulations state that garbage must be processed, packaged, safeguarded, and disposed of using a methodology that the Administrator has determined is adequate to prevent the introduction and dissemination of plant pests into noninfested areas of the

United States. In addition, specific provisions will be outlined in individual compliance agreements for site-specific shipments. These provisions would be consistent with those in § 318.13-8, which pertain to inspection of articles and persons moved from Hawaii. We believe that the current provisions in the regulations, combined with site-specific compliance agreements, are sufficient to prevent the introduction and dissemination of snails and other hitchhikers.

Tribal Consultation

Comment: APHIS did not consult with Indian Tribes as directed under Executive Order (EO) 13175 and requested government-to-government consultation.

Response: We were petitioned to amend our regulations by the operators of several landfills located in the area of the Columbia River Basin who expressed an interest in receiving MSW from Hawaii. Therefore, our initial contacts were limited to tribes located within that area. To comply with EO 13175, APHIS contacted the tribal chairs of each of the 13 tribes generally considered as Columbia River Basin Tribes (Burn Paiute Tribe, Coeur d'Alene Tribe, Colville Tribe, Kalispel Tribe, Kootenai Tribe, Nez Perce Tribe, Salish Kootenai Tribes, Shoshone Bannock Tribes, Shoshone Paiute Tribe, Spokane Tribe, Umatilla Indian Reservation, Warm Springs Reservation, and Yakama Indian Nation) in early November 2005. Each of these tribes has ties to the land and resources in and near the Columbia River and its drainage. APHIS believes that if there were any effects on tribes resulting from this rule, these are the tribes most likely to be affected. Each tribe was provided information on our proposed rule, environmental assessment, and pest risk analysis and offered an opportunity to request consultation.

At about the same time, APHIS contacted tribal organizations to determine which additional tribes may be affected and should be contacted. The tribal organizations contacted were the Affiliated Tribes of Northwest Indians (ATNI), the National Congress of American Indians, the National Tribal Environmental Council, and the Intertribal Agriculture Council. In addition, APHIS contacted the Columbia Basin Fish and Wildlife Authority.

In mid-February 2006, an Agency official provided a presentation about the proposed rule at the Winter Conference of the ATNI, and invited requests for tribal consultation. ATNI represents over 55 tribes in the Pacific

Northwest. In early March 2006, the Agency sent reminders to tribal chairs stating that APHIS would consider requests for consultation until March 20, 2006. Although we received both oral and written comments from tribes and tribal members, we received no requests for consultation.

In mid-April 2006, upon publication of the proposed rule, copies of the proposed rule, environmental assessment, and pest risk analysis were mailed to the tribal chairs of each of the above-listed tribes and also to the listed tribal organizations. APHIS encouraged tribes and tribal organizations to submit comments. Based on our actions as described above, we believe that we have complied with EO 13175 for the purposes of this rulemaking. We will follow this final rule with risk and environmental assessments as well as compliance agreements with specific waste management sites located on the mainland of the United States that have expressed interest in receiving MSW from Hawaii. At the time that we make the site-specific assessments available to the public, we will also invite potentially affected tribal governments to engage in consultations with APHIS.

Change Regarding Agricultural and Yard Waste

In the proposed rule, the regulations in 7 CFR 330.402(a)(2) and 9 CFR 94.5(d)(1)(ii) provided that "The interstate movement of agricultural wastes and yard waste from Hawaii to the continental United States is prohibited." After further consideration, we have concluded that this provision, which implies a zero tolerance for agricultural or yard waste, is unrealistic. Despite the presence of yard waste recycling programs in Hawaii and the efforts of waste management companies to separate various types of waste, the presence of an incidental amount of agricultural or yard waste in baled MSW is, in practical terms, unavoidable. This situation was taken into account in the PRA, which recognized that there will likely be some minimal volume of agricultural and yard waste entering the pathway despite efforts to exclude that waste. Therefore, we have modified 7 CFR 330.402(a)(2) and 9 CFR 94.5(d)(1)(ii) in this final rule to read: "The interstate movement from Hawaii to the continental United States of agricultural wastes and yard waste (other than incidental amounts (less than 3 percent) that may be present in municipal solid waste despite reasonable efforts to maintain source

separation) is prohibited."⁴ We believe this change will establish a more practical standard with respect to agricultural and yard waste while continuing to prohibit the interstate movement of dedicated shipments or large quantities of such waste.

Therefore, for the reasons given in the proposed rule and in this document, we are adopting the proposed rule as a final rule, with the change discussed in this document.

Executive Order 12866 and Regulatory Flexibility Act

This rule has been reviewed under Executive Order 12866. The rule has been determined to be not significant for the purposes of Executive Order 12866 and, therefore, has not been reviewed by the Office of Management and Budget.

We are amending the regulations pertaining to certain garbage to provide for the interstate movement of garbage from Hawaii subject to measures designed to protect against the dissemination of plant pests into noninfested areas of the continental United States. We are amending these regulations upon request in order to provide the State of Hawaii with additional waste disposal options, and after determining that the action will not result in the introduction of plant or animal pests or diseases into the continental United States from Hawaii.

For the purposes of this analysis, we have determined that the Island of Oahu (where Honolulu is located) is expected to be the source of most, if not all, of any MSW that is moved to the continental United States under the regulations. Oahu has only one municipal landfill (Waimanalo Gulch), and there is no alternative landfill on the island at the present time.

Oahu generates approximately 1.6 million tons of MSW per year. That figure is expected to rise an additional 20,000 tons and remain at that level for the next 10 years. Of the current total, 500,000 tons are recycled, 600,000 tons are burned for electricity, and 500,000 tons are landfilled. Of the 500,000 tons that are landfilled, 200,000 tons go to a privately operated construction and demolition landfill and 300,000 tons go to Waimanalo Gulch municipal landfill. Waimanalo Gulch landfill is owned by the City of Honolulu and managed by a private company.

⁴ Based on the mean percentage of yard waste at the Waimanalo Gulch landfill, Oahu (6.0 percent ± 3.4 percent) and on Hawaii (5.4 percent). If companies are only 50 percent effective with additional screening and removal of visible yard waste in transfer stations or on bales processing lines, the fraction of yard waste in baled Hawaiian MSW should be reduced to 3 percent or less.

The Island of Hawaii (where Hilo is located) is another potential source of MSW that would move to the continental United States if the proposal is adopted. The island's only two landfills are located approximately 75 miles apart, and one (South Hilo Sanitary Landfill) may be nearing capacity. To date, one waste management service company has proposed to bale and move at least some of the island's MSW to a landfill in Washington State. Approximately 200 tons of garbage per day is landfilled at the South Hilo facility.⁵

This rule will allow for the garbage to be compacted into bales, and then wrapped in plastic for transport to the mainland (the baling and wrapping would take place in the State of Hawaii). Estimates of the annual volume of MSW that would be shipped from Oahu to the continental United States range from 100,000 tons to 350,000 tons.⁶

Need for Rule and Alternatives Considered

These are being amended upon request to provide public officials in Hawaii another option for disposal of the State's waste. The only other regulatory alternative is to leave the regulations unchanged, but that alternative would unnecessarily limit Hawaiian officials' disposal options.

Small Entity Impact

The Regulatory Flexibility Act (RFA) requires that agencies consider the economic impact of rules on small entities, i.e., small businesses, organizations, and governmental jurisdictions. The changes to the regulations will allow for the movement of MSW from Hawaii to the continental United States.

These changes will not have a significant economic impact on a substantial number of small entities, because few entities, large or small, are likely to be affected. Only a handful of businesses are potentially affected by the rule—e.g., the company or companies that would secure the contract to move the waste from Hawaii, the barge line or lines that would physically move the waste to the mainland, the trucking company/railroad on the mainland that would physically move the waste to the interior landfill locations, and perhaps a few companies on Hawaii that would be forced to discontinue participation (or play a reduced role) in the State's waste

⁵ Source: News accounts in the *Honolulu Star-Bulletin*.

⁶ Source: News accounts in the *Honolulu Star-Bulletin* and APHIS staff. Similar estimates for the island of Hawaii are not available.

disposal process once shipments to the mainland began. Those businesses that will participate in the movement of the waste to the mainland could be expected to benefit, since they will generate additional revenue and, presumably, profits from the increased business activity. Conversely, those businesses that will either no longer participate or will play a reduced role in Hawaii's waste disposal process could be expected to suffer lost revenue.

The revenues generated by the private company that manages the Waimanalo Gulch landfill, for example, are presumably tied to the volume of waste that is landfilled there. If waste is diverted from Waimanalo Gulch to the mainland, that company's revenues are likely to be reduced. The City of Honolulu and the County of Hawaii are also potentially affected by the proposed changes.

The preceding discussion assumes that the rule will not have significant environmentally related economic consequences for small entities. There are several reasons. First, the environmental assessment in this document concludes that the movement of MSW from Hawaii to the continental United States (using the plastic-baled methodology) will not have a significant impact on the environment. Second, site-specific environmental assessments will also be prepared as requests for compliance agreements are made. The site-specific assessments, which will be made available for public comment, will allow APHIS to address any environmental issues that may arise based on precise destination and handling protocols for the proposed movements, which are now unknown.

Although the size of virtually all of the businesses potentially affected by the rule is unknown, it is reasonable to assume that at least some could be small. This assumption is based on composite data for providers of the same and similar services in the United States. As an example, North American Industry Classification System (NAICS) category 562 ("Waste Management and Remediation Services") consists of establishments engaged in the collection, treatment, and disposal of waste materials. Under the U.S. Small Business Administration's (SBA) size standards, the small entity threshold for establishments that fall into most of the activity subcategories under NAICS 562 is annual receipts of \$10.5 million. For all 18,405 U.S. establishments in NAICS 562 in 2002, average per-establishment receipts that year were \$2.8 million, an indication that most waste management

service companies are small entities.⁷ Annual receipt data for three of the four firms that have proposed to move Hawaii's waste to the mainland are not available. Although annual receipt data for the fourth company are also not available, that company is considered large by virtue of it being a subsidiary of a publicly owned firm with receipts (operating revenues) of over \$13 billion in 1999.⁸ The private company that currently manages the Waimanalo Gulch landfill is also a subsidiary of that publicly owned firm.

As another example, there were 677 U.S. entities in NAICS category 483113 in 2002. NAICS 483113 consists of entities primarily engaged in providing deep sea transportation of cargo to and from domestic ports. For all 677 entities, average per-entity employment that year was 36, well below the SBA's small entity threshold of 500 employees for entities in that NAICS category.⁹

Under the RFA, the term "small governmental jurisdiction" generally means cities, counties, townships, etc., with a population of less than 50,000. The City of Honolulu, which owns the Waimanalo Gulch landfill, does not qualify as a small entity because its population exceeds 50,000. The County of Hawaii, where Hilo is located, also has a population that exceeds 50,000.

The changes to the regulations will not, as noted previously, have a significant economic impact on a substantial number of small entities, because few entities, large or small, are likely to be affected. The size of virtually all of the businesses potentially affected by the changes to the regulations is unknown, but it is reasonable to assume that at least some could be small.

Under these circumstances, the Administrator of the Animal and Plant Health Inspection Service has determined that this action will not have a significant economic impact on a substantial number of small entities.

Executive Order 12372

This program/activity is listed in the Catalog of Federal Domestic Assistance under No. 10.025 and is subject to Executive Order 12372, which requires intergovernmental consultation with State and local officials. (See 7 CFR part 3015, subpart V.)

Executive Order 12088

This final rule has been reviewed under Executive Order 12088, Civil

⁷ Source: U.S. Census Bureau (2002 Economic Census) and SBA.

⁸ Source: Various Internet sites.

⁹ Source: U.S. Census Bureau (2002 Economic Census) and SBA.

Justice Reform. This rule: (1) Preempts all State and local laws and regulations that are inconsistent with this rule; (2) has no retroactive effect; and (3) does not require administrative proceedings before parties may file suit in court challenging this rule.

National Environmental Policy Act

An environmental assessment and finding of no significant impact have been prepared for this final rule. The environmental assessment provides a basis for the conclusion that the importation of MSW from Hawaii to the mainland United States will not have a significant impact on the quality of the human environment. Based on the finding of no significant impact, the Administrator of the Animal and Plant Health Inspection Service has determined that an environmental impact statement need not be prepared.

The environmental assessment and finding of no significant impact were prepared in accordance with: (1) The National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321 *et seq.*), (2) regulations of the Council on Environmental Quality for implementing the procedural provisions of NEPA (40 CFR parts 1500–1508), (3) USDA regulations implementing NEPA (7 CFR part 1b), and (4) APHIS' NEPA Implementing Procedures (7 CFR part 372).

The environmental assessment and finding of no significant impact may be viewed on the Regulations.gov Web site.¹⁰ Copies of the environmental assessment and finding of no significant impact are also available for public inspection at USDA, room 1141, South Building, 14th Street and Independence Avenue, SW, Washington, DC, between 8 a.m. and 4:30 p.m., Monday through Friday, except holidays. Persons wishing to inspect copies are requested to call ahead on (202) 690-2817 to facilitate entry into the reading room. In addition, copies may be obtained by writing to the individual listed under FOR FURTHER INFORMATION CONTACT.

Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*), the information collection or recordkeeping requirements included in this rule have been approved by the Office of Management and Budget

¹⁰Go to <http://www.regulations.gov>, click on the "Advanced Search" tab and select "Docket Search." In the Docket ID field, enter APHIS-2005-0047, click on "Submit," then click on the Docket ID link in the search results page. The environmental assessment and finding of no significant impact will appear in the resulting list of documents.

(OMB) under OMB control number 0579-0292.

E-Government Act Compliance

The Animal and Plant Health Inspection Service is committed to compliance with the E-Government Act to promote the use of the Internet and other information technologies, to provide increased opportunities for citizen access to Government information and services, and for other purposes. For information pertinent to E-Government Act compliance related to this rule, please contact Mrs. Celeste Sickles, APHIS' Information Collection Coordinator, at (301) 734-7477.

List of Subjects

7 CFR Part 330

Customs duties and inspection, Imports, Plant diseases and pests, Quarantine, Reporting and recordkeeping requirements, Transportation.

9 CFR Part 94

Animal diseases, Imports, Livestock, Meat and meat products, Milk, Poultry and poultry products, Reporting and recordkeeping requirements.

■ Accordingly, we are amending 7 CFR part 330 and 9 CFR part 94 as follows:

Title 7—[Amended]

PART 330—FEDERAL PLANT PEST REGULATIONS; GENERAL; PLANT PESTS; SOIL, STONE, AND QUARRY PRODUCTS; GARBAGE

■ 1. The authority citation for part 330 continues to read as follows:

Authority: 7 U.S.C. 450, 7701-7772, 7781-7786, and 8301-8317; 21 U.S.C. 136 and 136a; 31 U.S.C. 9701; 7 CFR 2.22, 2.80, and 371.3.

■ 2. In § 330.100, a definition for *State* is added and the definition for *United States* is revised to read as follows:

§ 330.100 Definitions.

* * * * *

State. Any of the several States of the United States, the Commonwealth of the Northern Mariana Islands, the Commonwealth of Puerto Rico, the District of Columbia, Guam, the Virgin Islands of the United States, or any other territory or possession of the United States.

* * * * *

United States. All of the States.

* * * * *

■ 3. Subpart—Garbage, § 330.400, is revised to read as follows:

Subpart—Garbage

Sec.

- 330.400 Regulation of certain garbage.
- 330.401 Garbage generated onboard a conveyance.
- 330.402 Garbage generated in Hawaii.
- 330.403 Compliance agreement and cancellation.

Subpart—Garbage

§ 330.400 Regulation of certain garbage.

(a) *Certain interstate movements and imports—(1) Interstate movements of garbage from Hawaii and U.S. territories and possessions to other States.* Hawaii, Puerto Rico, American Samoa, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, Guam, the U.S. Virgin Islands, and the Republic of Palau are hereby quarantined, and the movement of garbage therefrom to any other State is hereby prohibited except as provided in this subpart in order to prevent the introduction and spread of exotic plant pests and diseases.

(2) *Imports of garbage.* In order to protect against the introduction of exotic animal and plant pests and diseases, the importation of garbage from all foreign countries except Canada is prohibited except as provided in § 330.401(b).

(b) *Definitions—Agricultural waste.* Byproducts generated by the rearing of animals and the production and harvest of crops or trees. Animal waste, a large component of agricultural waste, includes waste (e.g., feed waste, bedding and litter, and feedlot and paddock runoff) from livestock, dairy, and other animal-related agricultural and farming practices.

Approved facility. A facility approved by the Administrator, Animal and Plant Health Inspection Service, upon his determination that it has equipment and uses procedures that are adequate to prevent the dissemination of plant pests and livestock or poultry diseases, and that it is certified by an appropriate Government official as currently complying with the applicable laws for environmental protection.

Approved sewage system. A sewage system approved by the Administrator, Animal and Plant Health Inspection Service, upon his determination that the system is designed and operated in such a way as to preclude the discharge of sewage effluents onto land surfaces or into lagoons or other stationary waters, and otherwise is adequate to prevent the dissemination of plant pests and livestock or poultry diseases, and that is certified by an appropriate Government official as currently complying with the applicable laws for environmental protection.

Carrier. The principal operator of a means of conveyance.

Garbage. All waste material that is derived in whole or in part from fruits, vegetables, meats, or other plant or animal (including poultry) material, and other refuse of any character whatsoever that has been associated with any such material.

Incineration. To reduce garbage to ash by burning.

Interstate. From one State into or through any other State.

Sterilization. Cooking garbage at an internal temperature of 212 °F for 30 minutes.

Stores. The food, supplies, and other provisions carried for the day-to-day operation of a conveyance and the care and feeding of its operators.

Yard waste. Solid waste composed predominantly of grass clippings, leaves, twigs, branches, and other garden refuse.

§ 330.401 Garbage generated onboard a conveyance.

(a) *Applicability.* This section applies to garbage generated onboard any means of conveyance during international or interstate movements as provided in this section and includes food scraps, table refuse, galley refuse, food wrappers or packaging materials, and other waste material from stores, food preparation areas, passengers' or crews' quarters, dining rooms, or any other areas on the means of conveyance. This section also applies to meals and other food that were available for consumption by passengers and crew on an aircraft but were not consumed.

(1) Not all garbage generated onboard a means of conveyance is regulated for the purposes of this section. Garbage regulated for the purposes of this section is defined as "regulated garbage" in paragraphs (b) and (c) of this section.

(2) Garbage that is commingled with regulated garbage is also regulated garbage.

(b) *Garbage regulated because of movements outside the United States or Canada.* For purposes of this section, garbage on or removed from a means of conveyance is regulated garbage, if, when the garbage is on or removed from the means of conveyance, the means of conveyance has been in any port outside the United States and Canada within the previous 2-year period. There are, however, two exceptions to this provision. These exceptions are as follows:

(1) *Exception 1: Aircraft.* Garbage on or removed from an aircraft is exempt from requirements under paragraph (d) of this section if the following

conditions are met when the garbage is on or removed from the aircraft:

(i) The aircraft had previously been cleared of all garbage and of all meats and meat products, whatever the country of origin, except meats that are shelf-stable; all fresh and condensed milk and cream from countries designated in 9 CFR 94.1 as those in which foot-and-mouth disease exists; all fresh fruits and vegetables; and all eggs; and the items previously cleared from the aircraft as prescribed by this paragraph have been disposed of according to the procedures for disposing of regulated garbage, as specified in paragraphs (d)(2) and (d)(3) of this section.

(ii) After the garbage and stores referred to in paragraph (b)(1)(i) of this section were removed, the aircraft has not been in a non-Canadian foreign port.

(2) *Exception 2: Other conveyances.* Garbage on or removed in the United States from a means of conveyance other than an aircraft is exempt from requirements under paragraph (d) of this section if the following conditions are met when the garbage is on or removed from the means of conveyance:

(i) The means of conveyance is accompanied by a certificate from an inspector stating the following:

(A) That the means of conveyance had previously been cleared of all garbage and of all meats and meat products, whatever the country of origin, except meats that are shelf-stable; all fresh and condensed milk and cream from countries designated in 9 CFR 94.1 as those in which foot-and-mouth disease exists; all fresh fruits and vegetables; and all eggs; and the items previously cleared from the means of conveyance as prescribed by this paragraph have been disposed of according to the procedures for disposing of regulated garbage, as specified in paragraphs (d)(2) and (d)(3) of this section.

(B) That the means of conveyance had then been cleaned and disinfected in the presence of the inspector; and

(ii) Since being cleaned and disinfected, the means of conveyance has not been in a non-Canadian foreign port.

(c) *Garbage regulated because of certain movements to or from Hawaii, territories, or possessions.* For purposes of this section, garbage on or removed from a means of conveyance is regulated garbage, if at the time the garbage is on or removed from the means of conveyance, the means of conveyance has moved during the previous 1-year period, either directly or indirectly, to the continental United States from any territory or possession or from Hawaii, to any territory or possession from any

other territory or possession or from Hawaii, or to Hawaii from any territory or possession. There are, however, two exceptions to this provision. These exceptions are as follows:

(1) *Exception 1: Aircraft.* Garbage on or removed from an aircraft is exempt from requirements under paragraph (d) of this section if the following two conditions are met when the garbage is on or removed from the aircraft:

(i) The aircraft had been previously cleared of all garbage and all fresh fruits and vegetables, and the items previously cleared from the aircraft as prescribed by this paragraph have been disposed of according to the procedures for disposing of regulated garbage, as specified in paragraphs (d)(2) and (d)(3) of this section.

(ii) After the garbage and stores referred to in paragraph (c)(1)(i) of this section were removed, the aircraft has not moved to the continental United States from any territory or possession or from Hawaii; to any territory or possession from any other territory or possession or from Hawaii; or to Hawaii from any territory or possession.

(2) *Exception 2: Other conveyances.* Garbage on or removed from a means of conveyance other than an aircraft is exempt from requirements under paragraph (d) of this section if the following two conditions are met when the garbage is on or removed from the means of conveyance:

(i) The means of conveyance is accompanied by a certificate from an inspector stating that the means of conveyance had been cleared of all garbage and all fresh fruits and vegetables; and the items previously cleared from the means of conveyance as prescribed by this paragraph have been disposed of according to the procedures for disposing of regulated garbage, as specified in paragraphs (d)(2) and (d)(3) of this section.

(ii) After being cleared of the garbage and stores referred to in paragraph (c)(2)(i) of this section, the means of conveyance has not moved to the continental United States from any territory or possession or from Hawaii; to any territory or possession from any other territory or possession or from Hawaii; or to Hawaii from any territory or possession.

(d) *Restrictions on regulated garbage.*

(1) Regulated garbage may not be disposed of, placed on, or removed from a means of conveyance except in accordance with this section.

(2) Regulated garbage is subject to general surveillance for compliance with this section by inspectors and to disposal measures authorized by the Plant Protection Act and the Animal

Health Protection Act to prevent the introduction and dissemination of pests and diseases of plants and livestock.

(3) All regulated garbage must be contained in tight, covered, leak-proof receptacles during storage on board a means of conveyance while in the territorial waters, or while otherwise within the territory of the United States. All such receptacles shall be contained inside the guard rail if on a watercraft. Such regulated garbage shall not be unloaded from such means of conveyance in the United States unless such regulated garbage is removed in tight, covered, leak-proof receptacles under the direction of an inspector to an approved facility for incineration, sterilization, or grinding into an approved sewage system, under direct supervision by such an inspector, or such regulated garbage is removed for other handling in such manner and under such supervision as may, upon request in specific cases, be approved by the Administrator as adequate to prevent the introduction and dissemination of plant pests and animal diseases and sufficient to ensure compliance with applicable laws for environmental protection. *Provided that*, a cruise ship may dispose of regulated garbage in landfills at Alaskan ports only, if and only if the cruise ship does not have prohibited or restricted meat or animal products on board at the time it enters Alaskan waters for the cruise season, and only if the cruise ship, except for incidental travel through international waters necessary to navigate safely between ports, remains in Canadian and U.S. waters off the west coast of North America, and calls only at continental U.S. and Canadian ports during the entire cruise season.

(i) Application for approval of a facility or sewage system may be made in writing by the authorized representative of any carrier or by the official having jurisdiction over the port or place of arrival of the means of conveyance to the Administrator, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Washington, DC 20250. The application must be endorsed by the operator of the facility or sewage system.

(ii) Approval will be granted if the Administrator determines that the requirements set forth in this section are met. Approval may be denied or withdrawn at any time, if the Administrator determines that such requirements are not met, after notice of the proposed denial or withdrawal of the approval and the reasons therefor, and an opportunity to demonstrate or achieve compliance with such

requirements, has been afforded to the operator of the facility or sewage system and to the applicant for approval. However, approval may also be withdrawn without such prior procedure in any case in which the public health, interest, or safety requires immediate action, and in such case, the operator of the facility or sewage system and the applicant for approval shall promptly thereafter be given notice of the withdrawal and the reasons therefor and an opportunity to show cause why the approval should be reinstated.

(e) The Plant Protection and Quarantine Programs and Veterinary Services, Animal, and Plant Health Inspection Service, will cooperate with other Federal, State, and local agencies responsible for enforcing other statutes and regulations governing disposal of the regulated garbage to the end that such disposal shall be adequate to prevent the dissemination of plant pests and livestock or poultry diseases and comply with applicable laws for environmental protection. The inspectors, in maintaining surveillance over regulated garbage movements and disposal, shall coordinate their activities with the activities of representatives of the Environmental Protection Agency and other Federal, State, and local agencies also having jurisdiction over such regulated garbage

§ 330.402 Garbage generated in Hawaii.

(a) *Applicability.* This section applies to garbage generated in households, commercial establishments, institutions, and businesses prior to interstate movement from Hawaii, and includes used paper, discarded cans and bottles, and food scraps. Such garbage includes, and is commonly known as, municipal solid waste.

(1) Industrial process wastes, mining wastes, sewage sludge, incinerator ash, or other wastes from Hawaii that the Administrator determines do not pose risks of introducing animal or plant pests or diseases into the continental United States are not regulated under this section.

(2) The interstate movement from Hawaii to the continental United States of agricultural wastes and yard waste (other than incidental amounts (less than 3 percent) that may be present in municipal solid waste despite reasonable efforts to maintain source separation) is prohibited.

(3) Garbage generated onboard any means of conveyance during interstate movement from Hawaii is regulated under § 330.401.

(b) *Restrictions on interstate movement of garbage.* The interstate movement of garbage generated in

Hawaii to the continental United States is regulated as provided in this section.

(1) The garbage must be processed, packaged, safeguarded, and disposed of using a methodology that the Administrator has determined is adequate to prevent the introduction or dissemination of plant pests into noninfested areas of the United States.

(2) The garbage must be moved under a compliance agreement in accordance with § 330.403. APHIS will only enter into a compliance agreement when the Administrator is satisfied that the Agency has first satisfied all its obligations under the National Environmental Policy Act and all applicable Federal and State statutes to fully assess the impacts associated with the movement of garbage under the compliance agreement.

(3) All such garbage moved interstate from Hawaii to any of the continental United States must be moved in compliance with all applicable laws for environmental protection.

§ 330.403 Compliance agreement and cancellation.

(a) Any person engaged in the business of handling or disposing of garbage in accordance with this subpart must first enter into a compliance agreement with the Animal and Plant Health Inspection Service (APHIS). Compliance agreement forms (PPQ Form 519) are available without charge from local USDA/APHIS/Plant Protection and Quarantine offices, which are listed in telephone directories.

(b) A person who enters into a compliance agreement, and employees or agents of that person, must comply with the following conditions and any supplemental conditions which are listed in the compliance agreement, as deemed by the Administrator to be necessary to prevent the dissemination into or within the United States of plant pests and livestock or poultry diseases:

(1) Comply with all applicable provisions of this subpart;

(2) Allow inspectors access to all records maintained by the person regarding handling or disposal of garbage, and to all areas where handling or disposal of garbage occurs;

(3)(i) If the garbage is regulated under § 330.401, remove garbage from a means of conveyance only in tight, covered, leak-proof receptacles;

(ii) If the garbage is regulated under § 330.402, transport garbage interstate in packaging approved by the Administrator;

(4) Move the garbage only to a facility approved by the Administrator; and

(5) At the approved facility, dispose of the garbage in a manner approved by the Administrator and described in the compliance agreement.

(c) Approval for a compliance agreement may be denied at any time if the Administrator determines that the applicant has not met or is unable to meet the requirements set forth in this subpart. Prior to denying any application for a compliance agreement, APHIS will provide notice to the applicant thereof, and will provide the applicant with an opportunity to demonstrate or achieve compliance with requirements.

(d) Any compliance agreement may be canceled, either orally or in writing, by an inspector whenever the inspector finds that the person who has entered into the compliance agreement has failed to comply with this subpart. If the cancellation is oral, the cancellation and the reasons for the cancellation will be confirmed in writing as promptly as circumstances allow. Any person whose compliance agreement has been canceled may appeal the decision, in writing, within 10 days after receiving written notification of the cancellation. The appeal must state all of the facts and reasons upon which the person relies to show that the compliance agreement was wrongfully canceled. As promptly as circumstances allow, the Administrator will grant or deny the appeal, in writing, stating the reasons for the decision. A hearing will be held to resolve any conflict as to any material fact. Rules of practice concerning a hearing will be adopted by the Administrator. This administrative remedy must be exhausted before a person can file suit in court challenging the cancellation of a compliance agreement.

(e) Where a compliance agreement is denied or canceled, the person who entered into or applied for the compliance agreement may be prohibited, at the discretion of the Administrator, from handling or disposing of regulated garbage.

(Approved by the Office of Management and Budget under control numbers 0579-0015, 0579-0054, and 0579-0292)

Title 9—[AMENDED]

PART 94—RINDERPEST, FOOT-AND-MOUTH DISEASE, FOWL PEST (FOWL PLAGUE), EXOTIC NEWCASTLE DISEASE, AFRICAN SWINE FEVER, CLASSICAL SWINE FEVER, AND BOVINE SPONGIFORM ENCEPHALOPATHY: PROHIBITED AND RESTRICTED IMPORTATIONS

■ 4. The authority citation for part 94 continues to read as follows:

Authority: 7 U.S.C. 450, 7701–7772, 7781–7786, and 8301–8317; 21 U.S.C. 136 and 136a; 31 U.S.C. 9701; 7 CFR 2.22, 2.80, and 371.4.

■ 5. In § 94.0, a definition for *State* is added and the definition for *United States* is revised to read as follows:

§ 94.0 Definitions.

* * * * *

State. Any of the several States of the United States, the Commonwealth of the Northern Mariana Islands, the Commonwealth of Puerto Rico, the District of Columbia, Guam, the Virgin Islands of the United States, or any other territory or possession of the United States.

* * * * *

United States. All of the States.

* * * * *

■ 6. Section 94.5 is revised to read as follows:

§ 94.5 Regulation of certain garbage.

(a) *General restrictions*—(1) *Interstate movements of garbage from Hawaii and U.S. territories and possessions to the continental United States.* Hawaii, Puerto Rico, American Samoa, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, Guam, the U.S. Virgin Islands, Republic of the Marshall Islands, and the Republic of Palau are hereby quarantined, and the movement of garbage therefrom to any other State is hereby prohibited except as provided in this section in order to prevent the introduction and spread of exotic plant pests and diseases.

(2) *Imports of garbage.* In order to protect against the introduction of exotic animal and plant pests, the importation of garbage from all foreign countries except Canada is prohibited except as provided in paragraph (c)(2) of this section.

(b) *Definitions—Agricultural waste.* Byproducts generated by the rearing of animals and the production and harvest of crops or trees. Animal waste, a large component of agricultural waste, includes waste (e.g., feed waste, bedding and litter, and feedlot and paddock

runoff) from livestock, dairy, and other animal-related agricultural and farming practices.

Approved facility. A facility approved by the Administrator, Animal and Plant Health Inspection Service, upon his determination that it has equipment and uses procedures that are adequate to prevent the dissemination of plant pests and livestock or poultry diseases, and that it is certified by an appropriate Government official as currently complying with the applicable laws for environmental protection.

Approved sewage system. A sewage system approved by the Administrator, Animal and Plant Health Inspection Service, upon his determination that the system is designed and operated in such a way as to preclude the discharge of sewage effluents onto land surfaces or into lagoons or other stationary waters, and otherwise is adequate to prevent the dissemination of plant pests and livestock or poultry diseases, and that is certified by an appropriate Government official as currently complying with the applicable laws for environmental protection.

Carrier. The principal operator of a means of conveyance.

Continental United States. The 49 States located on the continent of North America and the District of Columbia.

Garbage. All waste material that is derived in whole or in part from fruits, vegetables, meats, or other plant or animal (including poultry) material, and other refuse of any character whatsoever that has been associated with any such material.

Incineration. To reduce garbage to ash by burning.

Inspector. A properly identified employee of the U.S. Department of Agriculture or other person authorized by the Department to enforce the provisions of applicable statutes, quarantines, and regulations.

Interstate. From one State into or through any other State.

Person. Any individual, corporation, company, association, firm, partnership, society, or joint stock company.

Shelf-stable. The condition achieved in a product, by application of heat, alone or in combination with other ingredients and/or other treatments, of being rendered free of microorganisms capable of growing in the product under nonrefrigerated conditions (over 50 °F or 10 °C).

Sterilization. Cooking garbage at an internal temperature of 212 °F for 30 minutes.

Stores. The food, supplies, and other provisions carried for the day-to-day operation of a conveyance and the care and feeding of its operators.

Yard waste. Solid waste composed predominantly of grass clippings, leaves, twigs, branches, and other garden refuse.

(c) *Garbage generated onboard a conveyance*—(1) *Applicability.* This section applies to garbage generated onboard any means of conveyance during international or interstate movements as provided in this section and includes food scraps, table refuse, galley refuse, food wrappers or packaging materials, and other waste material from stores, food preparation areas, passengers' or crews' quarters, dining rooms, or any other areas on the means of conveyance. This section also applies to meals and other food that were available for consumption by passengers and crew on an aircraft but were not consumed.

(i) Not all garbage generated onboard a means of conveyance is regulated for the purposes of this section. Garbage regulated for the purposes of this section is defined as "regulated garbage" in paragraphs (c)(2) and (c)(3) of this section.

(ii) Garbage that is commingled with regulated garbage is also regulated garbage.

(2) *Garbage regulated because of movements outside the United States or Canada.* For purposes of this section, garbage on or removed from a means of conveyance is regulated garbage, if, when the garbage is on or removed from the means of conveyance, the means of conveyance has been in any port outside the United States and Canada within the previous 2-year period. There are, however, two exceptions to this provision. These exceptions are as follows:

(i) *Exception 1: Aircraft.* Garbage on or removed from an aircraft is exempt from requirements under paragraph (c)(4) of this section if the following conditions are met when the garbage is on or removed from the aircraft:

(A) The aircraft had previously been cleared of all garbage and of all meats and meat products, whatever the country of origin, except meats that are shelf-stable: all fresh and condensed milk and cream from countries designated in § 94.1 as those in which foot-and-mouth disease exists; all fresh fruits and vegetables; and all eggs; and the items previously cleared from the aircraft as prescribed by this paragraph have been disposed of according to the procedures for disposing of regulated garbage, as specified in paragraphs (c)(4)(ii) and (c)(4)(iii) of this section.

(B) After the garbage and stores referred to in paragraph (c)(2)(i)(A) of this section were removed, the aircraft

has not been in a non-Canadian foreign port.

(ii) *Exception 2: Other conveyances.* Garbage on or removed in the United States from a means of conveyance other than an aircraft is exempt from requirements under paragraph (c)(4) of this section if the following conditions are met when the garbage is on or removed from the means of conveyance:

(A) The means of conveyance is accompanied by a certificate from an inspector stating the following:

(1) That the means of conveyance had previously been cleared of all garbage and of all meats and meat products, whatever the country of origin, except meats that are shelf-stable; all fresh and condensed milk and cream from countries designated in § 94.1 as those in which foot-and-mouth disease exists; all fresh fruits and vegetables; and all eggs; and the items previously cleared from the means of conveyance as prescribed by this paragraph have been disposed of according to the procedures for disposing of regulated garbage, as specified in paragraphs (c)(4)(ii) and (c)(4)(iii) of this section.

(2) That the means of conveyance had then been cleaned and disinfected in the presence of the inspector; and

(B) Since being cleaned and disinfected, the means of conveyance has not been in a non-Canadian foreign port.

(3) *Garbage regulated because of certain movements to or from Hawaii, territories, or possessions.* For purposes of this section, garbage on or removed from a means of conveyance is regulated garbage, if at the time the garbage is on or removed from the means of conveyance, the means of conveyance has moved during the previous 1-year period, either directly or indirectly, to the continental United States from any territory or possession or from Hawaii, to any territory or possession from any other territory or possession or from Hawaii, or to Hawaii from any territory or possession. There are, however, two exceptions to this provision. These exceptions are as follows:

(i) *Exception 1: Aircraft.* Garbage on or removed from an aircraft is exempt from requirements under paragraph (c)(4) of this section if the following two conditions are met when the garbage is on or removed from the aircraft:

(A) The aircraft had been previously cleared of all garbage and all fresh fruits and vegetables, and the items previously cleared from the aircraft as prescribed by this paragraph have been disposed of according to the procedures for disposing of regulated garbage, as specified in paragraphs (c)(4)(ii) and (c)(4)(iii) of this section.

(B) After the garbage and stores referred to in paragraph (c)(3)(i)(A) of this section were removed, the aircraft has not moved to the continental United States from any territory or possession or from Hawaii, to any territory or possession from any other territory or possession or from Hawaii, or to Hawaii from any territory or possession.

(ii) *Exception 2: Other conveyances.* Garbage on or removed from a means of conveyance other than an aircraft is exempt from requirements under paragraph (c)(4) of this section if the following two conditions are met when the garbage is on or removed from the means of conveyance:

(A) The means of conveyance is accompanied by a certificate from an inspector stating that the means of conveyance had been cleared of all garbage and all fresh fruits and vegetables, and the items previously cleared from the means of conveyance as prescribed by this paragraph have been disposed of according to the procedures for disposing of regulated garbage, as specified in paragraphs (c)(4)(ii) and (c)(4)(iii) of this section.

(B) After being cleared of the garbage and stores referred to in paragraph (c)(3)(i)(A) of this section, the means of conveyance has not moved to the continental United States from any territory or possession or from Hawaii; to any territory or possession from any other territory or possession or from Hawaii; or to Hawaii from any territory or possession.

(4) *Restrictions on regulated garbage.*

(i) Regulated garbage may not be disposed of, placed on, or removed from a means of conveyance except in accordance with this section.

(ii) Regulated garbage is subject to general surveillance for compliance with this section by inspectors and to disposal measures authorized by the Plant Protection Act and the Animal Health Protection Act to prevent the introduction and dissemination of pests and diseases of plants and livestock.

(iii) All regulated garbage must be contained in tight, covered, leak-proof receptacles during storage on board a means of conveyance while in the territorial waters, or while otherwise within the territory of the United States. All such receptacles shall be contained inside the guard rail if on a watercraft. Such regulated garbage shall not be unloaded from such means of conveyance in the United States unless such regulated garbage is removed in tight, covered, leak-proof receptacles under the direction of an inspector to an approved facility for incineration, sterilization, or grinding into an approved sewage system, under direct

supervision by such an inspector, or such regulated garbage is removed for other handling in such manner and under such supervision as may, upon request in specific cases, be approved by the Administrator as adequate to prevent the introduction and dissemination of plant pests and animal diseases and sufficient to ensure compliance with applicable laws for environmental protection. *Provided that,* a cruise ship may dispose of regulated garbage in landfills at Alaskan ports only, if and only if the cruise ship does not have prohibited or restricted meat or animal products on board at the time it enters Alaskan waters for the cruise season, and only if the cruise ship, except for incidental travel through international waters necessary to navigate safely between ports, remains in Canadian and U.S. waters off the west coast of North America, and calls only at continental U.S. and Canadian ports during the entire cruise season.

(A) Application for approval of a facility or sewage system may be made in writing by the authorized representative of any carrier or by the official having jurisdiction over the port or place of arrival of the means of conveyance to the Administrator, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Washington, DC 20250. The application must be endorsed by the operator of the facility or sewage system.

(B) Approval will be granted if the Administrator determines that the requirements set forth in this section are met. Approval may be denied or withdrawn at any time, if the Administrator determines that such requirements are not met, after notice of the proposed denial or withdrawal of the approval and the reasons therefor, and an opportunity to demonstrate or achieve compliance with such requirements, has been afforded to the operator of the facility or sewage system and to the applicant for approval. However, approval may also be withdrawn without such prior procedure in any case in which the public health, interest, or safety requires immediate action, and in such case, the operator of the facility or sewage system and the applicant for approval shall promptly thereafter be given notice of the withdrawal and the reasons therefore and an opportunity to show cause why the approval should be reinstated.

(iv) The Plant Protection and Quarantine Programs and Veterinary Services, Animal, and Plant Health Inspection Service, will cooperate with other Federal, State, and local agencies

responsible for enforcing other statutes and regulations governing disposal of the regulated garbage to the end that such disposal shall be adequate to prevent the dissemination of plant pests and livestock or poultry diseases and comply with applicable laws for environmental protection. The inspectors, in maintaining surveillance over regulated garbage movements and disposal, shall coordinate their activities with the activities of representatives of the U.S. Environmental Protection Agency and other Federal, State, and local agencies also having jurisdiction over such regulated garbage.

(d) *Garbage generated in Hawaii*—(1) *Applicability.* This section applies to garbage generated in households, commercial establishments, institutions, and businesses prior to interstate movement from Hawaii, and includes used paper, discarded cans and bottles, and food scraps. Such garbage includes, and is commonly known as, municipal solid waste.

(i) Industrial process wastes, mining wastes, sewage sludge, incinerator ash, or other wastes from Hawaii that the Administrator determines do not pose risks of introducing animal or plant pests or diseases into the continental United States are not regulated under this section.

(ii) The interstate movement from Hawaii to the continental United States of agricultural wastes and yard waste (other than incidental amounts (less than 3 percent) that may be present in municipal solid waste despite reasonable efforts to maintain source separation) is prohibited.

(iii) Garbage generated onboard any means of conveyance during interstate movement from Hawaii is regulated under paragraph (c) of this section.

(2) *Restrictions on interstate movement of garbage.* The interstate movement of garbage generated in Hawaii to the continental United States is regulated as provided in this section.

(i) The garbage must be processed, packaged, safeguarded, and disposed of using a methodology that the Administrator has determined is adequate to prevent the introduction and dissemination of plant pests into noninfested areas of the United States.

(ii) The garbage must be moved under a compliance agreement in accordance with paragraph (e) of this section. APHIS will only enter into a compliance agreement when the Administrator is satisfied that the Agency has first satisfied all its obligations under the National Environmental Policy Act and all applicable Federal and State statutes to fully assess the impacts associated

with the movement of garbage under the compliance agreement.

(iii) All such garbage moved interstate from Hawaii to any of the continental United States must be moved in compliance with all applicable laws for environmental protection.

(e) *Compliance agreement and cancellation*—(1) Any person engaged in the business of handling or disposing of garbage in accordance with this section must first enter into a compliance agreement with the Animal and Plant Health Inspection Service (APHIS). Compliance agreement forms (PPQ Form 519) are available without charge from local USDA/APHIS/Plant Protection and Quarantine offices, which are listed in telephone directories.

(2) A person who enters into a compliance agreement, and employees or agents of that person, must comply with the following conditions and any supplemental conditions which are listed in the compliance agreement, as deemed by the Administrator to be necessary to prevent the introduction and dissemination into or within the United States of plant pests and livestock or poultry diseases:

(i) Comply with all applicable provisions of this section;

(ii) Allow inspectors access to all records maintained by the person regarding handling or disposal of garbage, and to all areas where handling or disposal of garbage occurs;

(iii)(A) If the garbage is regulated under paragraph (c) of this section, remove garbage from a means of conveyance only in tight, covered, leak-proof receptacles;

(B) If the garbage is regulated under paragraph (d) of this section, transport garbage interstate in sealed, leak-proof packaging approved by the Administrator;

(iv) Move the garbage only to a facility approved by the Administrator; and

(v) At the approved facility, dispose of the garbage in a manner approved by the Administrator and described in the compliance agreement.

(3) Approval for a compliance agreement may be denied at any time if the Administrator determines that the applicant has not met or is unable to meet the requirements set forth in this section. Prior to denying any application for a compliance agreement, APHIS will provide notice to the applicant thereof, and will provide the applicant with an opportunity to demonstrate or achieve compliance with requirements.

(4) Any compliance agreement may be canceled, either orally or in writing, by an inspector whenever the inspector

finds that the person who has entered into the compliance agreement has failed to comply with this section. If the cancellation is oral, the cancellation and the reasons for the cancellation will be confirmed in writing as promptly as circumstances allow. Any person whose compliance agreement has been canceled may appeal the decision, in writing, within 10 days after receiving written notification of the cancellation. The appeal must state all of the facts and reasons upon which the person relies to show that the compliance agreement was wrongfully canceled. As promptly as circumstances allow, the Administrator will grant or deny the appeal, in writing, stating the reasons for the decision. A hearing will be held to resolve any conflict as to any material fact. Rules of practice concerning a hearing will be adopted by the Administrator. This administrative remedy must be exhausted before a person can file suit in court challenging the cancellation of a compliance agreement.

(5) Where a compliance agreement is denied or canceled, the person who entered into or applied for the compliance agreement may be prohibited, at the discretion of the Administrator, from handling or disposing of regulated garbage.

(Approved by the Office of Management and Budget under control numbers 0579-0015, 0579-0054, and 0579-0292)

Done in Washington, DC, this 17th day of August 2006.

Kevin Shea,

Acting Administrator, Animal and Plant Health Inspection Service.

[FR Doc. E6-13968 Filed 8-22-06; 8:45 am] BILLING CODE 3410-34-P

DEPARTMENT OF AGRICULTURE

Animal and Plant Health Inspection Service

7 CFR Part 352

[Docket No. 00-086-2]

Untreated Oranges, Tangerines, and Grapefruit From Mexico Transiting the United States to Foreign Countries

AGENCY: Animal and Plant Health Inspection Service, USDA.

ACTION: Final rule.

SUMMARY: We are amending the regulations to allow untreated oranges, tangerines, and grapefruit from Mexico to be moved overland by truck or rail to Corpus Christi and Houston, TX, for export to another country by water. We

Attachment B — E-mail from Jim Hodges Regarding Transshipment of Honolulu MSW.

E-mail sent 12/14/2006 at 3:21 pm from Jim Hodges to Mark White, Subject: Summary

Mark,

In summary of our conversation, a potential interim disposal alternative for the City of Honolulu is our export model to Roosevelt Landfill in Washington State with the following core/essential stipulations:

- HWS would be willing to limit our export to 100,000 – 150,000 tons per year
- the cost would be approximately \$80/ton escalated annually by 80% of the CPI
- a five-year minimum commitment at the above stated volumes
- HWS would cooperate with the City on integrating our facility into the City's solid waste system. The mechanism for this integration would have to be determined with the City and HWS, but certainly could result in the City's managing the gate at HWS' processing facility

We feel that this could be, at the very least, an excellent interim measure for the City's solid waste system. Let me know if there is additional information that you need or further questions about anything we have discussed.

Thanks, Jim



Attachment C — Evaluation of CO₂ Emissions from Disposal of Waste at Waimanalo Gulch Sanitary Landfill, H-POWER, and Washington State

**Attachment D — Evaluations of Potential Landfill Sites
Prepared as Part of the Report of the Mayor’s
Committee on Landfill Site Selection, December 2003**



*Evaluation of CO₂ Emissions from Disposal
of Waste at Waimanalo Gulch Sanitary Landfill,
H-POWER, and Washington State*



Pacific Waste
CONSULTING GROUP

April 2008

*Evaluation of CO₂ Emissions from Disposal of
Waste at Waimanalo Gulch Sanitary Landfill, H-
POWER, and Washington State*

April 2008

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Prepared for:

Waste Management of Hawaii, Inc.

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1 Introduction

This report is an evaluation of the greenhouse gas (GHG) emissions that would be produced by disposing of 100,000 tons per year (TPY) of municipal solid waste (MSW) in three different locations. The three disposal locations evaluated are:

1. Roosevelt Landfill at 500 Roosevelt Grade Road, Roosevelt, Washington (Roosevelt).
2. Waimanalo Gulch landfill at Waimanalo Gulch, Kahe Valley, Hawaii (Waimanalo Gulch).
3. H-POWER incinerator at 91-174 Hanua Street, Kapolei, Hawaii (H-POWER).

The transfer to Roosevelt would begin at the Hawaiian Waste Systems (HWS), LLC Transfer Station at 91-165 Kalaeloa Boulevard, Kapolei, Hawaii. HWS is one of the proponents of transshipment of the waste. Data in documents filed by HWS was used in this analysis because more information was available about its plans than the other options for transshipment.

The calculated emissions include indirect emissions from electricity use and direct emissions from mobile combustion (truck transportation, tugboat barging, and forklift operation), incineration of waste, and landfilling waste.

This summary is based on an evaluation of the emissions from readily available published sources or direct contact with representatives of firms that provide the services used (e.g., barging companies). The summary is not intended, nor is it appropriate to use, as an assessment of emissions that will satisfy the requirements for a verifiable greenhouse gas emissions inventory.

There are six primary GHGs. This review is concerned only with CO₂.

2 Calculation Envelope

The envelope for evaluating emissions at each of the three disposal sites starts at a base point, the intersection of H-1 and Kalaeloa Boulevard. This location is the point at which a decision is made to take the waste to Waimanalo Gulch, to H-POWER, or to the HWS Transfer Station for transshipment to Roosevelt. It provides a common point to start the evaluation.

The path for calculating the emissions was:

- Transporting the waste from the base point to the HWS Transfer Station, processing it there, transporting it to Roosevelt, and disposal at Roosevelt.
- Transporting the waste from the base point to Waimanalo Gulch and landfill disposal.
- Transporting the waste from the base point to H-POWER and incineration.

The emissions associated with collecting and transporting the waste to the base point would have occurred regardless of the disposal point and are not included in this evaluation.

2.1 Steps in Transporting Waste to Roosevelt

The emission sources associated with processing the waste at HWS and moving it to disposal at Roosevelt are summarized below.

1. Transport waste from base to HWS Transfer Station
2. Bale the waste
3. Plastic wrap the bales
4. Load flatbed trailers
5. Transport bales to Barbers Point port facility
6. Unload flatbed trailers
7. Load barge
8. Barge to the Port of Portland
9. Unload barge
10. Reposition bales
11. Load flatbed trailers for transport to Roosevelt
12. Unload flatbed trailers
13. Landfill waste

3 Basis for Emissions Calculations

This section discusses the information needed to quantify the source of emissions and the CO₂ emission factors. The emissions are calculated based on the quantity of resource consumed (diesel fuel for transportation and electricity for the equipment) and the emissions resulting from landfilling or incineration. The emissions are dependent on the amount of activity that results in the emissions being produced. For example, every mile a truck is driven carrying waste for disposal generates GHG emissions.

3.1 Emission Factors

The emission factors used are summarized in *Table 1, Emission Factors*. The source from which the factor was taken is also shown. The factors that are indicated as being taken from the California Climate Action Registry (CCAR)¹ are from that organization's *General Reporting Protocol*, Version 3.0, March 2008, the latest CCAR general guidance available. The *Protocol* is used to calculate greenhouse gas emissions from a wide variety of sources.

Table 1, Emission Factors

Emission Source	Emission Factor	Source
Indirect emissions from electricity use	1,728.12 lb CO ₂ /MWh	CCAR Table C.2*
Direct emissions from mobile combustion using diesel fuel	10.15 kg CO ₂ /gallon	CCAR Table C.4 (Diesel)*
Direct emissions from mobile combustion using gasoline	8.81 kg CO ₂ /gallon	CCAR Table C.4 (Motor Gasoline)*
Waimanalo Gulch Landfill		EPA WARM model
Roosevelt Landfill		EPA WARM model
H-POWER	0.12 tonne/MWh	CCAR Registry
H-POWER Reduction	1,728.12 lb CO ₂ /MWh	CCAR Table C.2*

*CCAR is California Climate Action Registry General Reporting Protocol, Version 3.0, April 2008

3.1.1 Incinerator Emissions

Covanta has chosen to register its emissions with CCAR. The blended emission factor for all of the Covanta plants was used to estimate the emissions for the H-POWER facility. The emission factor includes all six GHGs. As a result, the emissions indicated for incineration at H-POWER are higher than they would have been if only CO₂ was included. The emission factor used for Covanta was an average of all the plants they operate. It was not possible to disaggregate the CO₂ factor for H-POWER from the other plants and other five GHGs.

¹ The CCAR registers emissions from companies and provide guidance for calculating the emissions.

By selling electricity produced from the incineration of waste to the grid, Covanta displaces CO₂ emissions that would otherwise have been generated using oil and coal. The blended emission factor for electricity on Oahu (from CCAR) was used to calculate the emissions reduction due to the generation by H-POWER.

3.1.2 Indirect Emissions from Electrical Use

The emissions from use of electricity shown by CCAR were calculated for utilities in different areas of the country. The emission factor for the electricity use at the HWS Transfer Station was the CCAR factor specifically for Oahu.

3.1.3 Direct Emissions from Mobile Combustion

The emission factor for diesel use was the CCAR value for diesel fuel and the factor for gasoline use was taken from CCAR for motor gasoline.

3.1.4 Landfill Emissions

The emissions from landfill disposal are assumed to be for a landfill compliant with Subtitle D, the federal regulations on landfill design and operations, and other federal regulations related to the capture and control of landfill gas. Both Roosevelt and Waimanalo Gulch are consistent with those assumptions.

Landfill emissions were calculated using the U.S. Environmental Protection Agency (EPA) Waste Reduction Model (WARM), which is used to calculate comparative emissions from a variety of solid waste management practices. The factors in the model were developed following a life-cycle assessment methodology using estimation techniques developed for national inventories of GHG emissions². The model automatically applies emission factors to the quantity of MSW input. 100,000 TPY were input into the model to calculate landfill emissions. Both landfills have gas recovery systems.

- We calculated the emission factor for 100,000 tons of MSW at Waimanalo Gulch assuming a landfill gas control efficiency of 90 percent and a gas flare.
- We calculated the emission factor for 100,000 ton of MSW at Roosevelt assuming a landfill gas control efficiency of 79 percent³ and the recovered gas being used to produce electricity.

² EPA's report "Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks" describes their methodology in detail.

³ Washington State Department of Ecology, Central Regional Air Quality Section. Roosevelt Regional Landfill, Regional Disposal Company Statement of Basis for Final Air Operating Permit No. 03AQ-C005 Second Revision. November 2005.

The emission factor includes all six GHGs. As a result, the emissions indicated for decomposition in the landfills are higher than they would have been if only CO₂ was included. It was not possible to disaggregate the CO₂ factor.

The emissions from the plastic wrapped waste in Roosevelt are assumed to be the same as the emissions from the non-wrapped waste at Waimanalo Gulch. The baled waste in Roosevelt will decompose and release GHG emissions at a slower rate than waste disposed in Waimanalo Gulch. The amount of delay in emissions occurring is unknown.⁴ Two summary points from the reference report illustrate this situation:

- “The baling-wrapping system assures that emissions are highly reduced in the short term and half-term. This refers to both the emission of gases and the production of leachates, once the plastic wrapped bales have been deposited in a landfill where the current concepts of design and control are applied, or stored for their subsequent incineration.”
- “Long term impacts of baling-wrapping remain uncertain.”

3.2 Emission Calculations

The activities associated with disposal at H-POWER and Waimanalo Gulch involve two steps: transportation from the base point and disposal. In both cases, the amount of disposal was 100,000 TPY. For H-POWER, the disposal emissions were reduced by the estimated energy production from incinerating the waste. The amount of fuel used for transportation depends on the distance from the base point to the disposal point and was determined using Googlemaps[®]. The distance from HWS Transfer Station to the port was taken from the compliance agreement.

- From the base point to H-POWER — 2.4 miles one-way and 4.8 miles roundtrip.
- From the base point to Waimanalo Gulch — 2.5 miles one-way and 5.0 miles roundtrip.

The emissions resulting from disposal at Roosevelt involved several more steps, as listed in *Table 2, Unit Quantities Associated with Disposal at Roosevelt*, which shows the level of activity for each operation.

⁴ Baldasano, J.M., S. Gasso and C. Perez. “Environmental Performance Review and Cost Analysis of MSW Landfilling by Baling-Wrapping Technology Versus Conventional System.” *Waste Management* 23.9 (2003): 795-806.

Table 2, Unit Quantities Associated with Disposal at Roosevelt

Activity	Quantity	Source
Transport raw waste from base to HWS (roundtrip)	4.40 miles	Googlemaps©
Baling waste	4.73 kWh/bale	Calculated
Plastic wrapping bales	9.75 kWh/bale	Estimates for Sierra International Macpresse wrapping machine
Loading flatbed trailer	0.94 gallons/flatbed	Beck Report*
Transport bales to Barbers Point (roundtrip)	5.00 miles	HWS Compliance Agreement, page 4
Unloading flatbed trailer	0.94 gallons/flatbed	Beck Report*
Loading barge	262.56 gallons	Beck Report*
Barging Port of Portland	14 days	Beck Report: confirmed with personal communication
Unloading barge	262.56 gallons	Beck Report*
Repositioning bales	262.56 gallons	Beck Report*
Loading flatbed trailer	1.22 gallons/flatbed	Beck Report*
Transport bales to Roosevelt (roundtrip)	282.00 miles	Beck Report*
Unload flatbed at landfill	1.22 gallons/flatbed	Beck Report*
Decomposition of waste	100,000 TPY	EPA WARM model

* Estimated from data provided in the Beck Report.

The calculation of the data in Table 2 is detailed in tables that follow.

3.2.1 Port Operations Information

Much of the information for the operations associated with disposal at Roosevelt was taken from the report *Draft Integrated Solid Waste Management Plan Update*, November 2007 by RW Beck that was prepared for the City and County of Honolulu. Appendix C in that report titled *Trans-shipment of Waste Analyses* (Beck Report) was prepared with assistance from Transportation-Logistics Consulting and Mainline Management, Inc. (referred to in the Beck Report as TLC and MLM). We used portions of Appendix C as the source for details of the activities necessary to move the waste between the points of loading the barge at Barbers Point and unloading the trucks after transport to Roosevelt.

We relied on the Beck Report to identify the steps necessary to transport the waste after it was baled (particularly the steps in handling at the ports) because it seemed to be directed at identifying the reasonable cost to dispose of the bales at Roosevelt, given the physical constraints and cargo management practices at each port. The report indicated that:

- “The receiving parameters outlined by the Roosevelt Regional Landfill management that required that the bales be received on flatbed truck so “special handling procedures” were employed in compliance with USDA, Animal Health Inspection Regulatory guidelines.”
- “Economics for intermodal rail line haul proved too costly, given minimal distance (150 miles one way) and equipment repositioning costs.”

The Beck Report identified the amount of time and type of equipment required for each step in the transfer at the ports for 600,000 TPY of waste. This evaluation is for 100,000 TPY. The assumptions used from the Beck Report were:

- The amount of time used by forklifts to load and unload flatbeds, load barges, and reposition bales at Portland.
- The weight a barge can accommodate — 7,000 tons
- The time to barge the bales from Barbers Point to Portland — 14 days
- The acceptable load on a flatbed truck in Hawaii — 55,000 pounds
- The acceptable load on a flatbed truck in Oregon and Washington — 65,000 pounds

3.2.2 Emissions Occurring before Shipment from Honolulu

The pre-shipment emissions are created during the transportation of waste from the base point to the HWS Transfer Station, baling and shrink wrapping the waste, transport to Barbers Point, and moving the bales to the barge at Barbers Point.

Transportation estimates used a collection truck carrying 8 tons and fuel economy of 7 miles per gallon.⁵

⁵ CCAR General Reporting Protocol, v2.2, page 37.

The estimates of energy required to bale and shrink wrap the waste at HWS Transfer Station was taken from data provided by suppliers of that type of equipment (since we are not aware of the specific make and model of equipment that HWS proposes to use). The assumed baler was an American Baler Company RAM II-1124 series- 200 T9(B) that can process 53 TPH and the shrink wrapping machine was a Sierra Industries Macpresse model that can wrap 35 bales per hour⁶.

The amount of fuel used to move the bales from the HWS Transfer Station to Barbers Point assumed use of a heavy truck with 50,000 pound load capacity and fuel economy of 7 miles per gallon.

3.2.3 Emissions Generated During Shipment from Honolulu to Portland

The barging emissions are dependent on the number of barge trips needed and the time required for each trip. The number of trips is dependent on the capacity of the barge. As noted earlier, the Beck Report stated that a barge can accommodate 7,000 tons and the trip takes 14 days.

The amount of fuel required to transport from Barbers Point to the Port of Portland was estimated from the following information provided by a barging company representative⁷:

- Two types of tugs are used to move cargo: an open wheel tug and a tug with an upgraded propulsion system. The upgraded tug uses less horsepower than an open wheel and can move the same load. For this evaluation, we used the tug with upgraded propulsion because they are widely used now because of their efficiency over a standard open wheel tug.
- The fuel usage ranges from 2,800 to 3,300 gallons per day, depending on the barge loading plan, the draft of the barge and other factors. We used an average value of 3,048 gallons per day.

The haul from Barbers Point to Portland can benefit from a backhaul of a second cargo, reducing the total trip distance associated with this operation by half. We assumed that backhaul was used and the trip would be one way at 14, not 28 days⁸.

⁶ Data received from distributors of the equipment.

⁷ Personal communication between PWCG staff member and expert staff member at Young Brothers, Ltd on February 28, 2008.

⁸ Meeting on December 14, 2006, with Jim Hodge and Mark White held in Sacramento, California.

3.2.4 Emissions from Transporting from Portland to Roosevelt

The ground transportation emissions are created during the transportation of bales from the barge at the Port of Portland to a temporary dockside location, relocating the bales, loading the bales onto a flatbed for transport to Roosevelt, transporting to Roosevelt, unloading the bales at Roosevelt, and disposal. The load capacity of the flatbed truck was stated in the Beck Report as 65,000 pounds and that was the value we used to calculate emissions.

3.2.5 Emissions from Decomposition at Roosevelt

This analysis assumes that over the long term, the GHG emissions from waste decomposition are the same at Roosevelt and Waimanalo Gulch.

4 Summary of Results

Transshipping and disposing of waste at Roosevelt produced the most emissions of the three disposal locations evaluated. *Table 3, Total Emissions from Three Alternatives* shows the total emissions for each alternative. Emission details for each alternative are described in the sections that follow.

Table 3, Total Emissions from Three Alternatives

Disposal Location	Emissions (MTCO ₂ e per year)
H-POWER	(28,711)
Waimanalo Gulch	(3,686)
Roosevelt	3,978

4.1.1 H-POWER Emissions

The emissions resulting from the transport of 100,000 TPY of waste to H-POWER and incineration were 3,978 metric tons of carbon dioxide equivalent (MTCO₂e) per year. Approximately 41,631 MTCO₂e per year would have been emitted if the energy created by H-POWER was produced by the local power generation resources (HECO and AES). H-POWER reduces 37,653 MTCO₂e per year. The H-POWER alternative shows the lowest emissions (including and excluding the reduction) compared to the two landfill alternatives.

As described in Section 3.1.1, the emissions from the incineration are higher than they would have been if only CO₂ was included. Covanta reported its emissions of all six primary GHGs. We were unable to disaggregate the CO₂ emissions from other gases in the emission factor we used to calculate the emissions. *Table 4, Total Emissions from Transporting and Disposing at H-POWER*, details the emissions produced.

Table 4, Total Emissions from Transporting and Disposing at H-POWER

Activity	Quantity	Emission Factor	Emissions (MTCO ₂ e per year)
Transport collected waste from base to H-POWER	8,571 gallons	10.15 kg CO ₂ /gallon	87
Incineration of waste	100,000 tons	0.12 tonne/MWh	6,373
Energy reduction	53,110 MWh	1,728.12 lb CO ₂ /MWh	(35,171)
Total Emissions			(28,711)

4.1.2 Waimanalo Gulch

The emissions resulting from the transport and disposal at Waimanalo Gulch of 100,000 TPY of waste is -3,686 MTCO₂e per year. Most of the emissions are a result of decomposition of the waste in the landfill, but the 90 percent efficiency gas collection system reduces overall emissions significantly. As described in Section 3.1.4, the emissions from the landfill are higher than they would have been if only CO₂ was included. We were unable to disaggregate the gases from the emission factor we calculated using the WARM model. *Table 5, Total Emissions from Transporting and Disposing at Waimanalo Gulch* summarizes the emissions produced.

Table 5, Total Emissions from Transporting and Disposing at Waimanalo Gulch

Activity	Quantity	Emission Factor	Emissions (MTCO ₂ e per year)
Transport collected waste from base to Waimanalo Gulch	8,929 gallons	10.15 kg CO ₂ /gallon	91
Decomposition of waste	100,000 tons		(3,777)
Total Emissions			(3,686)

4.1.3 Roosevelt

The emissions resulting from transshipping the waste and disposing it at Roosevelt were 3,978 MTCO₂e per year and represents the greatest quantity of emissions of the three disposal locations evaluated. The emissions were significantly higher than disposal at Waimanalo Gulch due to processing and transportation..

The largest emissions from the Roosevelt alternative were from barging the waste from Honolulu to the Port of Portland. Barging the waste from Honolulu to Portland alone represented 72 percent of the mobile emissions. Transportation of bales from the Port of Portland to Roosevelt alone represented 15 percent of the mobile emissions. The emissions from *Table 6, Total Emissions from Transporting and Disposing at Roosevelt* details the emissions produced.

As described in Section 3.1.4, the emissions from the landfill are higher than they would have been if only CO₂ was included. We were unable to disaggregate the gases from the emission factor we calculated using the WARM model.

Table 6, Total Emissions from Transporting and Disposing at Roosevelt

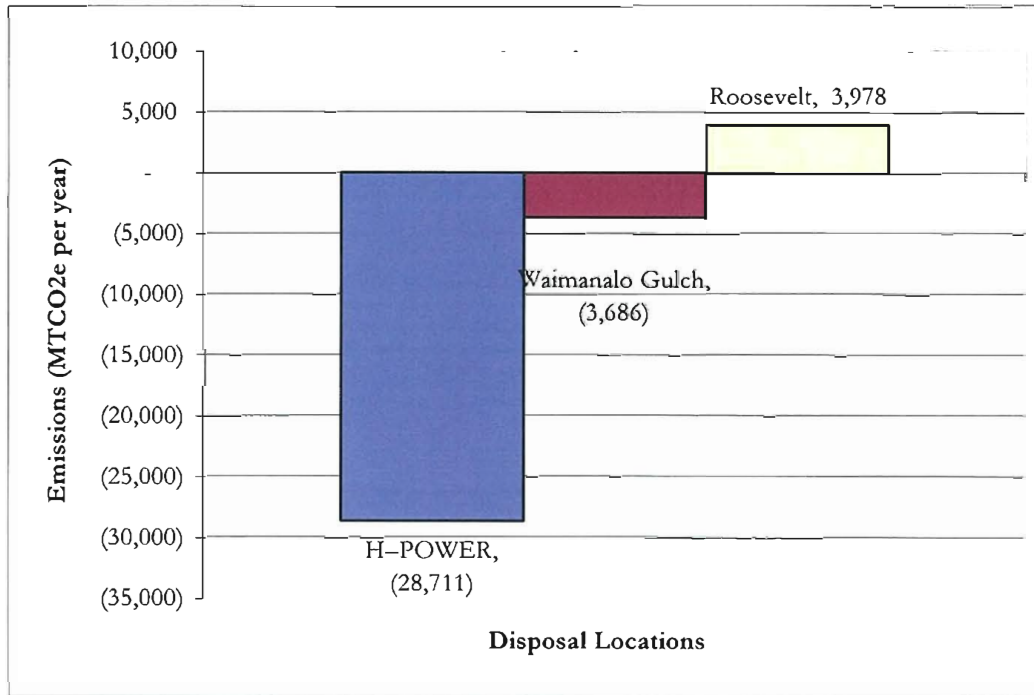
Activity	Quantity	Emission Factor	Emissions (MTCO ₂ e per year)
Transport collected waste from base to HWS Transfer Station	7,857 gallons	10.15 kg CO ₂ /gallon	80
Baling waste	337,736 kWh	1,728.12 lbs/MWh	265
Plastic wrapping bales	666,279 kWh	1,728.12 lbs/MWh	522
Loading flatbed trailers	3,751 gallons	8.81 kg CO ₂ /gallon	33
Transport bales to Barbers Point	2,857 gallons	10.15 kg CO ₂ /gallon	29
Unloading flatbed trailers	3,751 gallons	8.81 kg CO ₂ /gallon	33
Loading barge	3,751 gallons	8.81 kg CO ₂ /gallon	33
Barging to Port of Portland	609,600 gallons	10.15 kg CO ₂ /gallon	6,189
Unloading barge	3,751 gallons	8.81 kg CO ₂ /gallon	33
Repositioning bales	3,751 gallons	8.81 kg CO ₂ /gallon	33
Loading flatbed trailers	3,751 gallons	8.81 kg CO ₂ /gallon	33
Transport bales to Roosevelt	123,956 gallons	10.15 kg CO ₂ /gallon	1,258
Unload bales at landfill	3,751 gallons	8.81 kg CO ₂ /gallon	33
Decomposition of waste (including gas recovery for energy)	100,000 tons		(4,596)
Total Emissions			3,978

4.1.4 Conclusion

The CO₂ emissions from transshipment to Roosevelt for disposal are significantly higher than either of the two on-island alternatives. The relative CO₂ emissions from landfill disposal are much higher, given the reduced emissions of avoiding generating energy without using fossil fuels with H-POWER.

The relative emissions at each disposal site are shown in the figure below *Figure 1, Relative Emissions at Each Location*.

Figure 1, Relative Emissions at Each Location



Report of the
Mayor's Advisory Committee
(Blue Ribbon Committee)
on
Landfill Site Selection

December 1, 2003

**Report of the
Mayor's Advisory Committee (Blue Ribbon Committee)
on Landfill Site Selection
Final**

December 1, 2003

**Prepared by
The Committee's Report Subcommittee
R.M. Towill Corporation
Pacific Waste Consulting Group**

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Attachments

- Attachment A – Planning Commission Recommendation and Land Use Commission Decision for State Special Use Permit for Waimanalo Gulch Sanitary Landfill Expansion
- Attachment B – Mayor’s Letter to Committee Members; List of Committee Members and Meeting Schedule; Meeting Sign-In Sheets; and Group Memory from the Meetings
- Attachment C – Application of Preliminary Siting Criteria
- Attachment D – Individual Site Evaluations (Provided on CD)
- Attachment E – Correspondence
- Attachment F – Host Community Benefit Summary

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1 EXECUTIVE SUMMARY

This report summarizes the efforts of the Mayor's Advisory Committee on Landfill Selection (Committee) to identify potential landfill site(s) for consideration by the Mayor and City Council when it prepares an Environmental Impact Statement for a new landfill site.

1.1 Need for a New Landfill

The Committee was convened by the Mayor pursuant to a proposal by the City and in response to a decision by the State Land Use Commission (LUC) which extended the use of the Waimanalo Gulch Sanitary Landfill until 2008 (**Attachment A**). A major condition of the LUC, as part of the amendment to the City's State Special Use Permit, required that the City identify a new landfill site prior to closure of the existing site. Several Committee members noted that representatives of the current City Administration speaking at public meetings for the Waimanalo Gulch Sanitary Landfill Expansion committed to closure and to identify a new site by then.

The provision of municipal solid waste landfill capacity is a critical infrastructure element provided by the City to its citizens. A landfill is necessary for the disposal of non-combustible municipal solid waste and bulky items that cannot be recycled or reused. Further, a landfill provides for the disposal of municipal solid waste in a secure and economic manner. There are limited areas of Oahu where a landfill will have a *lesser* overall impact. Finding these locations and recommending *sites* was the task of the Committee.

1.2 Mayor's Landfill Site Selection Committee

The Mayor appointed a 15-member committee composed of citizens representing various communities on Oahu. Committee members provided experience and expertise from a broad range of backgrounds that included: public and community interests; state and City officials; environmental and health sciences; legal, financial, business, and education professions; and, corporate administration. The Committee was directed by the Mayor to recommend one or more landfill sites. (See **Attachment B** for a list of members and a copy of the Mayor's letter.) The Committee deliberated between June and December 1, 2003, identified four potential sites, and developed recommendations.

1.3 The Process

The process began with an inventory of 45 potential landfill sites identified by the Department of Environmental Services (ENV) and consultant from the City's previous studies and investigations (See Section 2.2 for a list of them). The Committee was also asked for nominations of new potential

sites. No additional viable sites were recommended.

Landfill Siting Criteria to supplement those mandated by state and federal government agencies were developed to enable comparison of key considerations for a new landfill that were important to the Committee (e.g., proximity to residences, groundwater protection, and travel distances).

Various methods and criteria were applied to reduce the number of sites at each step. The methods and criteria included: application of the U.S. Environmental Protection Agency (USEPA) siting criteria; consideration of whether residential or other incompatible land uses had become developed near the proposed site; consideration of the location of the site in relation to potable groundwater resources; the minimum capacity criteria developed by the Committee; and finally, the 31 criteria developed by the Committee (which included the capacity criteria). The Committee evaluation was to review the site-specific factors that were important with respect to each of the site finalists. In this process, the Committee started with a list of eight sites distilled from the list of 45 sites after application of the criteria noted above and the minimum capacity criterion. The Committee reduced the list of eight sites to five as consensus could not be reached to remove any of the five sites from consideration. The five sites were at the last meeting reduced to four through a vote which prompted the resignation of four Committee members. The remaining Committee members are recommending four sites to the Mayor for forwarding to the City Council for further consideration.

The Committee in evaluating the remaining eight sites went through a process called a double blind evaluation. First, the Committee did not know the names of the sites to be evaluated until the criteria were developed and weighting was assigned. Second, the consultant did not know the weighting assigned by the Committee to the 31 criteria until they had finished their analysis and scoring of the sites using the 31 criteria. See Table 2 for a list of the criteria and their weighting factors.

Attachment C, provides the name, tax map key (TMK), and location of each of the 45 potential landfill sites.

1.4 Process Changes

The Committee removed one site from consideration at its December 1, 2003 meeting as a result of a vote, which was a change from the consensus process the Committee had employed up until this meeting. As a result of a successful motion to further limit the number of recommended sites through voting Bruce Anderson, Kathy Bryant-Hunter, Eric Guinther, and Representative Cynthia Thielen resigned from the Committee stating that they did not want to be part of a vote that would remove one or more sites from consideration. They felt that the Committee had done an excellent job and that the original five sites should go forward for the following reasons:

- That this Committee was not constituted to represent the interests of all the residents of the island of Oahu. Indeed, it was heavily weighted with members representing Leeward Oahu communities. Thus, it is inappropriate for the Committee to pretend that they represent these interests by voting to eliminate any site that, based on criteria developed by the

Committee, should be included just as it would be inappropriate to add sites based on a vote. The City Council, the duly elected legislative body representing the interest of all residents of Oahu, should make a final decision based on the best information that is available on all the alternatives.

- The Committee went as far as it could in reducing the list from eight sites to five sites with the limited information that was available to the Committee on each site. Unsolicited comments and information was received from developers and individuals who owned land adjacent to only three of the five sites. Further information is required on environmental, social and economic impacts associated with establishing a landfill at all five sites before a decision should be made to drop any of the sites from consideration. When the Land Use Commission made their decision only to extend the permit at Waimanalo Gulch landfill until 2008, they did not consider alternatives or the impacts at alternative sites. They need this information to make a good decision. Likewise, the City Council should be provided the best available information on all the alternatives to make a decision that best serves residents of the island of Oahu. Therefore, some members of the committee felt it was inappropriate and premature to eliminate any of the sites from further consideration by a vote.
- Waimanalo Gulch got the highest score in the Committee's double blind process
- It is an irresponsible land use decision to walk away from an operating landfill with 20 years of life left
- Some of the members felt that a letter sent by Ko Olina negated the integrity of the Committee's deliberations because it was perceived by some as threatening a lawsuit against individual Committee members (the letter can be found in Attachment E)
- The LUC made its order on the Waimanalo Gulch Landfill without the benefit of all the information the Committee had and without input as to the potential economic and other impacts that might result should a new site be chosen
- Although the City Administration had made a commitment to the Community, this commitment does not bind the City Council and the LUC has a process for revisiting its decision should the Waimanalo Gulch Landfill become the preferred site.

Members of the Committee requesting a vote to remove Waimanalo Gulch felt that the City had not made its commitment to the community lightly as implied by others. They felt strongly that the City had to honor that commitment and therefore the site should not be recommended by the Committee. They noted that the commitment to leave Waimanalo Gulch Landfill resulted from two years of study which occurred during the process to extend the Landfill for 15 years.

Todd Apo moved and Shad Kane seconded the motion to change the process from consensus to voting; the motion carried. Those voting for the motion were: Todd Apo, Shad Kane, Gary Slovin, Michael Chun, Gary Tomita, George Yamamoto, Cynthia Rezentes, Ted Jung, and Robert Tong.

Those opposed to the motion were: Cynthia Thielen, Kathy Bryant-Hunter, Eric Guinther, and Bruce Anderson.

Todd Apo then moved and Shad Kane seconded the motion to remove the Waimanalo Gulch Landfill from the list of sites. Prior to consideration of the motion, several of the members resigned, as noted above. Those voting for the motion were: Todd Apo, Shad Kane, Gary Slovin, Gary Tomita, Ted Jung, Cynthia Rezentes, George Yamamoto, Robert Tong, and Michael Chun. There were no votes in opposition.

1.5 Committee Recommendations

The four sites recommend by the remaining Committee members are listed in **Table ES-1, Recommended Sites**. The location of those sites is shown in **Figure ES-1, Location of Four Recommended Sites**. The sites are listed in alphabetical order and no prioritization of the sites was done by the Committee. The intent was that the sites would be evaluated through an Environmental Impact Statement (EIS) process.

Table ES – 1, Recommended Sites

Site Name	TMK	Acreage	Million Tons Capacity	Years of Capacity
Ameron Quarry	4-2-15:01	391	9	15
Mali	8-7-10:por. 03	200	9	15
Makaiwa	9-2-3: por. 02	338	15	25
Nanakuli B	8-7-9: pors. 1 & 7	432	9	16

The Committee evaluated the sites using a two-step process. The first step was to apply the criteria and weighting factor to come out with a numerical scoring of sites based on the data available to the Committee. The second step was to discuss the various positive and negative attributes of each site to arrive at a list of recommended sites. The summary of the pros and cons is presented in Section 5, Committee Evaluation and Analysis. The pros and cons were not arrived at by consensus but were a compilation of Committee members' individual thoughts and concerns.

The Committee's recommended list of sites started with five, including the existing Waimanalo Gulch Landfill. As part of its deliberations, the Committee considered whether to remove Waimanalo Gulch Landfill. Prior to this time, the Committee had made its determinations by consensus. In coming to a recommendation regarding the Waimanalo Gulch Landfill, the Committee decided to vote as noted in Section 1.4.

Other important recommendations of the entire Committee included: (1) the City Administration and City Council should not zone or permit any site unless a Host Community Benefits package is negotiated with the affected community where a landfill is sited; and, (2) the City is encouraged to Land Bank sites to reduce the potential for future land use conflicts when another landfill is needed.

1.6 Other Considerations of the Entire Committee

The entire Committee during its deliberations spent considerable time discussing costs and benefits of various options. This included discussion on the role of and need for the City to move quickly to develop alternative technologies to landfilling, the impact such technologies could have on the necessary size of the sites, and whether or not it would be appropriate to develop several smaller sites. The Committee strongly feels that whatever site is selected that the City maximize the life of the site through aggressive actions to remove and reduce waste from being disposed in a landfill. Further discussion on these issues can be found in Section 6, Committee Recommendations, and the meeting notes found in **Attachment B**.

With these considerations, the Committee anticipates that the City will prepare an Environmental Impact Statement to evaluate in detail the benefits and constraints of each site and determine which site should be the preferred alternative for a new landfill.

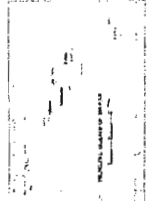
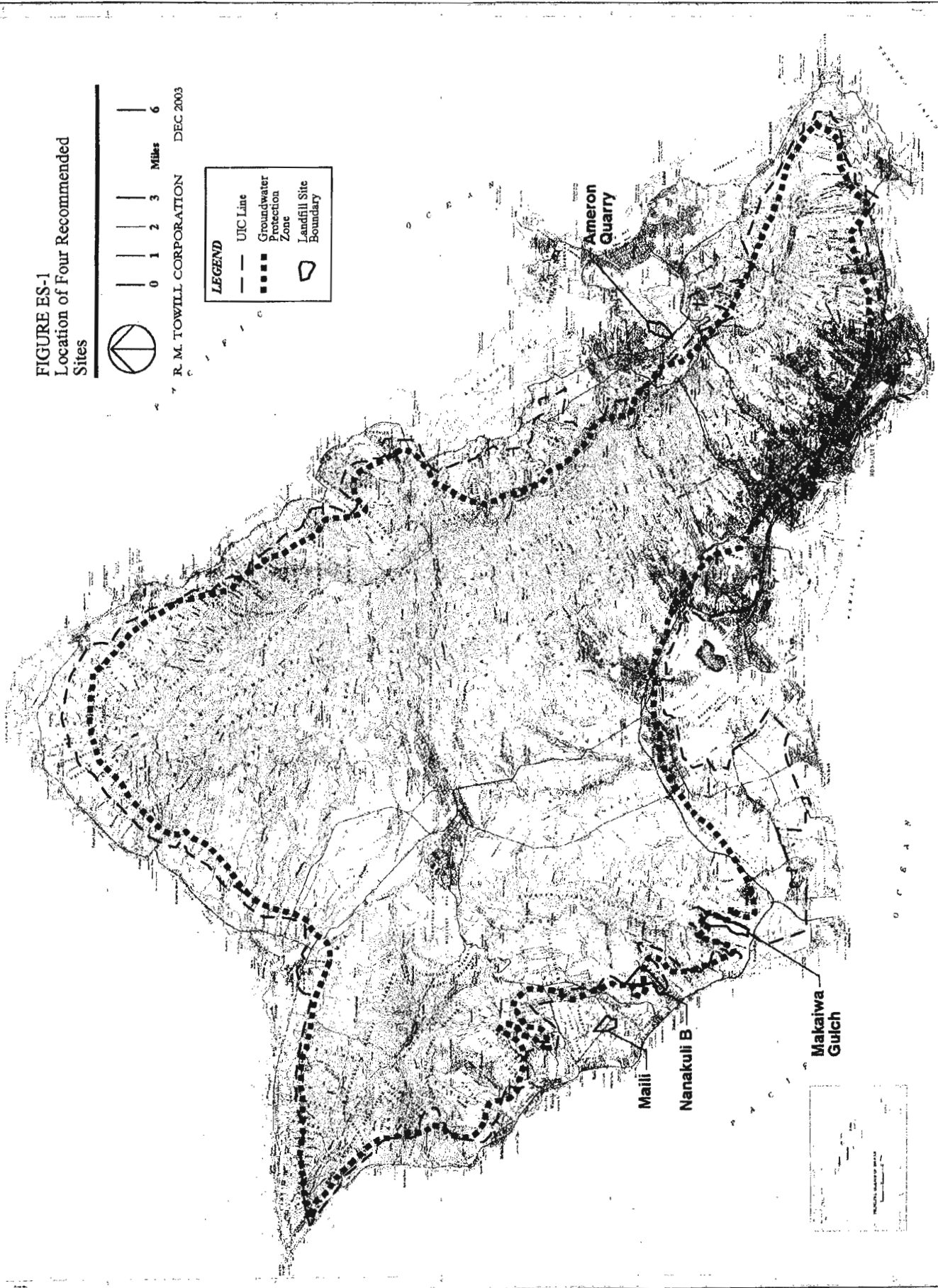
FIGURE ES-1
Location of Four Recommended
Sites



R. M. TOWILL CORPORATION DEC 2003

LEGEND

- UIC Line
- Groundwater Protection Zone
- Landfill Site Boundary



O A H I I

2 INTRODUCTION

2.1 Background and Purpose of Committee

On June 5, 2003, the State Land Use Commission (LUC) approved an amendment to the Special Use Permit for the Waimanalo Gulch Sanitary Landfill Expansion, the only municipal solid waste landfill disposal site on Oahu. According to those attending, the City made a promise to close the Waimanalo Gulch Landfill within that timeframe. Based on this and community input, the LUC decision allows landfilling at the site for a period of five years, which will expire on May 1, 2008. The LUC decision also directed the City to achieve certain milestones in siting a new landfill. The LUC and Planning Commission decisions are in **Attachment A**.

The provision of disposal is one of the City's health and safety responsibilities. While H-POWER provides disposal capacity for the majority of the waste produced (generating electricity in the process), landfill disposal capacity is needed for municipal solid waste that cannot be further recycled or reused. The Mayor convened the Advisory Committee on Landfill Selection (Committee) in June 2003 to forward a recommendation for one or more potential sites to the Mayor before December 1, 2003. The Mayor's letter to the Committee is in **Attachment B**.

The Committee was made up of 15 appointed members. Participation was excellent from a majority of the members, with very few exceptions. The Committee consisted of representation from each geographic area of the Island with a possible municipal solid waste landfill site (see **Attachment B** for a list of members). The Committee worked by consensus until the December 1, 2003, meeting, at which point they voted to reduce the number of recommended sites resulting in the resignation of four Committee members. The Committee was assisted by the Department of Environmental Services (ENV), R.M. Towill Corporation as consultant, and a neutral facilitator. The group memories from each of the meetings, the meeting schedule, and the attendance lists are also in **Attachment B**.

An initial list of 45 sites was identified from a previous City EIS and other reports and processes completed between 1977 and 2002. The Committee was asked to nominate other sites that should be considered. No additional viable sites were suggested.

From the beginning the Committee had three concerns about the process. First, they recognized that no ideal site would be found and that any site would have community impacts. The Committee agreed that any site that was ultimately chosen would have to include a Host Community Benefits package (see **Attachment F**), and that the package should be negotiated with the affected community prior to the permitting of the site.

Second, the LUC decision created several problems. Some read the decision as requiring the Committee to forward only one site, while others felt that the decision allowed the Committee to

forward more than one site for further analysis through an Environmental Impact Statement process. The City verbally requested that the Committee select from three to five sites as the basis for further evaluation. The City also agreed that if it was determined that the Committee was required to forward no more than one site, the Committee would be reconvened to identify that site.

Third, the LUC decision raised the question of whether or not the Committee could consider a new or second expansion of the Waimanalo Gulch Sanitary Landfill as a potential site. Some felt it was clear that they could not, and others felt that it was a viable or the best site under the criteria developed by the Committee, and that it should be considered. Some Committee members went so far as to say it would be irresponsible to not consider it. The Committee chose to keep a possible second expansion on the list of sites it reviewed, because consensus could not be reached to remove it or any of the other sites on the list. At the last Committee meeting, the Waimanalo Gulch Landfill was removed from the recommended list by vote. Four Committee members resigned because they did not wish to participate in a process (voting) which was not consensus based. The section on recommendations discusses the positive and negative features of the final sites and provides the reader a more complete analysis regarding the five consensus sites including the four recommended sites.

The Committee chose to work by consensus through some very difficult and potentially polarizing issues. It chose a two-step process. In the first step, the Committee developed and applied 31 siting criteria to sites remaining after EPA, developed areas, groundwater, and the Committee's capacity criteria were applied. The second step determined the recommended sites after a discussion of the positive and negative aspects of each of the finalist sites. This process is described in further detail within this document.

It is important to recognize that the Committee focused on evaluating the potential sites from the perspective of the community. Therefore, many of the criteria developed reflect community-based considerations. Technical issues were also considered, but the Committee placed most of its emphasis on those impacts of a landfill that have the greatest effect on the community in which the site is located.

As the Committee progressed to the most difficult part of their charge (i.e., determining the final recommended sites), there was agreement that the time spent by the Committee and the objectivity with which they developed the criteria and applied the site analyses provided a high degree of confidence in the Committee's recommendations. It also recognized that its final recommendations would be based more importantly on its deliberations and not solely on the application of the siting criteria. The Committee's decision to forward four sites is the result of careful deliberation and a final vote to reduce the number of recommended sites to four. This vote led to polarization among some Committee members. Four members resigned from the Committee preferring to send a consensus report forward rather than a report that used voting to narrow the sites.

With this report the Committee concludes its charge.

2.2 Work Plan

The identification of sites selected for evaluation started with a review of prior work completed by the City in the siting and evaluation of municipal solid waste landfills. ENV and the consultant assembled a list of 45 sites from the following City sources:

1. *Inventory of Potential Sanitary and Demolition Landfill Sites*, August 1977.
2. *Supplement to Inventory of Potential Sanitary and Demolition Landfill Sites*, November 1979.
3. *Revised Environmental Impact Statement for Leeward Sanitary Landfill at Waimanalo Gulch Site and Obikilolo Site*, 1984.
4. *Solid Waste Integrated Management Plan Update, Final Report*, 1995.
5. *Final Supplemental Environmental Impact Statement, Waimanalo Gulch Sanitary Landfill Expansion*, December 2002.

The Committee was next asked to nominate additional sites. Since no additional viable sites were nominated, the sites initially evaluated were the 45 identified from the sources indicated. The names and location of sites are provided in **Attachment C**.

After identification of the list of sites to evaluate, ENV and the consultant reviewed the sites against the most restrictive siting criteria. These criteria included: Environmental Protection Agency (USEPA) siting criteria as promulgated in the rules of the Resource and Conservation Recovery Act Subtitle D (RCRAD); sites located in areas which have since been developed or are closed landfills with no further expansion potential; Honolulu Board of Water Supply evaluation governing whether a site should be protected in consideration of proximity to the Groundwater Protection Zone and Underground Injection Control Line (UIC) zone; and, the Committee's capacity criterion that the site have a minimum life of more than 10 years.

During the preliminary evaluation by ENV and the consultant, the Committee undertook extensive discussion and deliberation to develop 31 Siting Criteria and Weighting Factors to be applied following the ENV and consultant evaluation of remaining sites (Section 3 provides more detail about the process). After applying the criteria, the Committee used the numerically weighted scores for the sites that enabled comparison of one site to another on the basis of community, economic, land use, and technical considerations. Finally, the Committee applied its own insights regarding each site to develop the list recommended to the Mayor. The reduction in the number of sites at each step is shown in **Table 1, Attrition of Sites During the Evaluation Process**.

Table 1, Attrition of Sites During the Evaluation Process

Phase of Evaluation	Number of Sites	
	Before Application of Criteria	After Application of Criteria
ENV/Consultant Evaluation Process		
RCRA Subtitle D Criteria	45	40
Sites in Developed Areas or Closed Landfills w/No Expansion Potential	40	34
Board of Water Supply Staff Review and Evaluation	34	16
Committee Evaluation Process		
Landfill Capacity Requirement 1	16	8
31 Criteria	8	8
Committee Consensus Deliberations	8	5
Committee Vote (four members resigned in protest over voting)	5	4

2.3 Considerations Regarding the Waimanalo Gulch Landfill and This Process

Some of the Committee members recognized that the City committed to no further expansion of the Waimanalo Gulch Sanitary Landfill and that the LUC decision required the City to close the landfill by 2008. Other members felt: the landfill had significant remaining capacity (20 years); the landfill was a known usable resource; the landfill should be used to its fullest capacity to conserve Oahu's precious and finite land resources; and, that it would be irresponsible to not continue with further examination of the site.

The Committee removed one site from consideration at its December 1, 2003 meeting as a result of a vote, which was a change from the consensus process the Committee had employed up until this meeting. As a result of a successful motion to further limit the number of recommended sites through voting Bruce Anderson, Kathy Bryant-Hunter, Eric Guinther, and Representative Cynthia Thielen resigned from the Committee stating that they did not want to be part of a vote that would remove one or more sites from consideration. They felt that the Committee had done an excellent job and that the original five sites should go forward for the following reasons:

¹ The capacity evaluation was completed before the Committee's site evaluations.

- That this Committee was not constituted to represent the interests of all the residents of the island of Oahu should be a consideration. Indeed, it was heavily weighted with members representing Leeward Oahu communities. Thus, it is inappropriate for the Committee to pretend that they represent these interests by voting to eliminate any site that, based on criteria developed by the Committee, should be included just as it would be inappropriate to add sites based on a vote. The City Council, the duly elected legislative body representing the interest of all residents of Oahu, should make a final decision based on the best information that is available on all the alternatives.
- The Committee went as far as it could in reducing the list from eight sites to five sites with the limited information that was available to the Committee on each site. Unsolicited comments and information was received from developers and individuals who owned land adjacent to only three of the five sites. Further information is required on environmental, social and economic impacts associated with establishing a landfill at all five sites before a decision should be made to drop any of the sites from consideration. When the Land Use Commission made their decision only to extend the permit at Waimanalo Gulch landfill until 2008, they did not consider alternatives or the impacts at alternative sites. They need this information to make a good decision. Likewise, the City Council should be provided the best available information on all the alternatives to make a decision that best serves residents of the island of Oahu. Therefore, some members of the committee felt it was inappropriate and premature to eliminate any of the sites from further consideration by a vote.
- Waimanalo Gulch got the highest score in the Committee's double blind process
- It is an irresponsible land use decision to walk away from an operating landfill with 20 years of life left
- Some of these members felt that a letter sent by Ko Olina negated the integrity of the Committee's deliberations because it was perceived by some members as threatening a lawsuit against individual Committee members (the letter can be found in **Attachment E**)
- That the LUC made its order on the Waimanalo Gulch Landfill without the benefit of all the information the Committee had and without input as to the potential economic and other impacts that might result should a new site be chosen
- That although the City Administration had made a commitment to the Community, this commitment does not bind the City Council and that the LUC has a process for revisiting its decision should the Waimanalo Gulch Landfill become the preferred site.

Members of the Committee requesting a vote to remove the Waimanalo Gulch landfill felt that the City had not made its commitment to the community lightly as implied by others. They felt strongly that the City had to honor that commitment and therefore the site should not go forward. They noted that the commitment to leave the Waimanalo Gulch Landfill resulted from two years of study that occurred during the process to extend the Landfill for 15 years.

Todd Apo moved and Shad Kane seconded to change the process from consensus to voting the motion carried. Those voting for the motion were: Todd Apo, Shad Kane, Gary Slovin, Michael Chun, Gary Tomita, George Yamamoto, Cynthia Rezentes, Ted Jung, and Robert Tong. Those opposed to the motion were: Cynthia Thielen, Kathy Bryant-Hunter, Eric Guinther, and Bruce Anderson.

Todd Apo then moved and Shad Kane seconded the motion to remove the Waimanalo Gulch landfill from the list of sites. Several of the members resigned from the Committee, prior to the vote, as noted above. Those voting for the motion were: Todd Apo, Shad Kane, Gary Slovin, Gary Tomita, Ted Jung, Cynthia Rezentes, George Yamamoto, Robert Tong, and Michael Chun. No votes were cast opposing the motion.

3 CONSULTANT'S APPLICATION OF PRELIMINARY SITING CRITERIA

This section includes a description of preliminary siting criteria. The preliminary siting criteria were applied by ENV and the consultant to the initial list of 45 potential landfill sites. The results of application of these criteria are provided in Attachment C.

The preliminary siting criteria includes: Environmental Protection Agency (USEPA) exclusionary criteria; restrictions on developed areas where a new landfill cannot be sited (included in these criteria are closed landfills with no further capacity); ground water restrictions as identified by the Board of Water Supply (BWS); and, the Committee's minimum capacity requirement of more than 10 years for a new landfill.

3.1 Environmental Protection Agency (USEPA) Exclusionary Criteria

The USEPA enforces six siting criteria that were adopted as part of the Resource Conservation and Recovery Act, subpart D (RCRAD). The six criteria are:

- 1. Airport Restriction** — If a proposed landfill is located within 10,000 feet of the end of any airport runway used by turbojet aircraft, or within 5,000 feet of any airport runway used only by piston driven aircraft, the proponent must demonstrate that the landfill will not constitute a bird hazard and must notify the Federal Aviation Administration.
- 2. Floodplains** — Potential landfill sites located within a 100-year floodplain cannot restrict storm flows within the floodplain, reduce the temporary water storage capacity of the floodplain, or allow the washout of solid waste.
- 3. Wetlands** — Proposed landfills may not be built or expanded into wetlands; exceptions are allowed.
- 4. Fault Areas** — New landfills or landfill expansions are generally prohibited within 200 feet of fault areas that have shifted since the last Ice Age; exceptions are allowed.
- 5. Seismic Impact Zones** — If a landfill is to be located in a seismic impact zone, the proponent must demonstrate that the facility and its environmental and engineering features have been designed to resist the effects of ground motion due to earthquakes.
- 6. Unstable Areas** — All owners/operators must demonstrate that the structure of their units will not be compromised during geologically destabilizing events.

A total of five sites were eliminated by application of the RCRAD criteria, which brought the potential site list from 45 to 40.

3.2 Developed Areas

In the 30 years that have elapsed since most of the sites on the list were identified, many of original landfill locations have been developed, primarily with residential housing. Some locations that were previously considered possible landfill sites may either have buildings on-site, or are so close to developed areas that a landfill would now be an incompatible land use. The City therefore determined in these instances that it would not propose new landfills within developed areas.

The City also reviewed potential sites that were expansions of closed landfills. Landfills on the original list that have been filled to capacity and closed were removed from further consideration.

This step brought the potential site list from 40 to 34.

3.3 Ground Water Restrictions

The State Department of Health has established an Underground Injection Control (UIC) Line and the BWS established a Ground Water Protection Zone (No Pass Line) around the island of Oahu that preclude the siting of certain types of facilities mauka of these areas. The lines were developed to identify inappropriate locations for injection wells and septic or cesspool development. The City Council in 2003 by Resolution 03-09, applied these criteria to protect Oahu's groundwater, by precluding the siting of landfills in these areas. However, the delineation of lines shown on a map is not as useful as having input from the BWS on the water development potential of these locations.

ENV and the consultant chose a less conservative, but more accurate approach to determining whether a potential site was appropriate by interviewing BWS staff responsible for ensuring future safety and sufficiency of Oahu's water supply. BWS staff identified sites, which they believe are important for future potable water supply or which are critical to protection of the groundwater resource. Sites, which did not meet BWS review, were eliminated from further consideration.

This step brought the site list from 34 to 16 sites remaining for further evaluation.

3.4 Committee Decision on Minimum Capacity

The Committee decided to limit its consideration to sites that had more than 10 years of capacity based on: the assumption that demand projections from the City remain unchanged; the City's experience with the length of time needed to implement new and feasible waste reduction technologies; and the cost and time required to identify and permit a new landfill site. The annual capacity demand was determined based on the amount of municipal solid waste disposed at the Waimanalo Gulch Landfill in fiscal year 2002/2003, adding the amount of cover material needed,

and including an allowance for growth in municipal solid waste disposal demand.² The capacity needed was divided into the expected disposal volume at the site, as determined in earlier studies. The result was the number of years of landfilling capacity available at the site.

Of the 16 sites at the beginning of the minimum capacity analysis, 8 remained for further evaluation.

² The capacity calculation did not assume the addition of another unit to H-POWER, implementation of alternative technologies, or implementation of additional recycling programs.

4 COMMITTEE SITING CRITERIA

The criteria discussed in Section 3 related to general limitations on locating landfills. The Committee recognized that there are local community concerns that may not be adequately reflected in the criteria in Section 3. The Committee Siting Criteria were employed to numerically compare potential sites using factors considered important to the Committee. The evaluation of the Criteria had two parts and the Criteria themselves were in five categories. This Section summarizes the Committee Siting Criteria to measure community, environmental, engineering, and cost considerations related to a landfill site. The Committee developed these criteria and weighting factors independent of knowledge of the identity of the sites. During this time, the remaining eight sites were only identified by number. The purpose was to avoid influencing the evaluation of any specific sites.

4.1 Methodology

The general approach to developing local Siting Criteria involved identifying the impacts a landfill could have on a region and then developing measures to enable the Committee to compare the magnitude of local impacts for each of the potential landfill sites. The Siting Criteria also included operational and economic considerations.

The site evaluations were done with a “double blind” process. That is, the Committee assigned the Weighting Factors without the City or consultant’s knowledge and the consultants evaluated the sites and assigned point values without the Committee’s knowledge of which sites were being evaluated. When the two parts of the evaluation were combined, the resulting site scores were insulated from undue influence or bias from any party.

The Committee recognized that the data needed to evaluate all factors thoroughly was not readily available and that the time schedule precluded additional data collection and analysis. As a result, the Siting Criteria used existing data. All potential sites were evaluated with data of the same age and extent although some of the data used were not as recent as the Committee would have preferred. The evaluations were all fairly and evenly done.

No site was subjected to a different level of analysis or evaluated with a different quality of data than another.

The Committee also recognized that further detailed evaluation would be done on the sites recommended in the Environmental Impact Statement (EIS) that is to be prepared. The EIS has specific requirements for assessing the environmental and social impacts of sites, and those evaluations are subjected to extensive public scrutiny.

It is important to restate that the Committee Siting Criteria were developed by the Committee independent of the consultant’s site elimination process outlined in Section 3.

4.2 Development of Siting Criteria

The Committee's Siting Criteria were organized in two parts:

- The measure of how well a potential site satisfied the criterion. This measure was the Point Value assigned to a site for a criterion.
- The Committee's assessment of how important one criterion was compared to the others. This measure was the Weighting Factor, which was multiplied by the Point Value to arrive at the score for each site and each criterion.

Each criterion included Point Values between one and three. The point values assigned were completed after the range of possible conditions across each of the sites were determined. The higher the number of points the better a site met the needs for a municipal solid waste landfill. For example, a good landfill should be in an area with low rainfall. A site with annual rainfall of more than 60 inches received one point; a site with 20 to 60 inches of rain received two points; and a site with less than 20 inches of rain received three points. For the criteria that measured physical parameters such as rainfall, the measure used was the range found on the island for the criterion; the values used were specific to this situation.

The Point Value was multiplied by a Weighting Factor to obtain a final score for a criterion. The higher the final scores received for a site, the more appropriate it was for a landfill site.

4.3 Weighting Factors

All Siting Criteria are not equally important. The difference in importance is reflected in the Weighting Factor, which varied from one to three.

The Weighting Factors were determined by the Committee members. Each member had ten votes to assign to the criteria they felt were most important. There were 31 criteria. Criteria that received the most votes were assigned a Weighting Factor of three. The votes fell into three distinct groupings. Six criteria received the most votes and were assigned a Weighting Factor of three; seven had a Weighting Factor of two; and 18 had the fewest votes and a Weighting Factor of one. Several criteria received no votes and were assigned a Weighting Factor of one. The higher the product of the Weighting Factor and the Point Value, the better the site's characteristics are for use as a landfill.

It is also important to acknowledge that the Committee requested that the City and the consultant team that supported the evaluation be excused while the Weighting Factors were developed. The Committee did not want more analytical effort to be devoted to a criterion with a greater Weighting Factor than to one that had a lesser Factor.

The final Siting Criteria with the Weighting Factors are listed in **Table 2, Siting Criteria**. The Siting Criteria were divided into categories as a convenience to the Committee. The number of criteria in any category was not selected, but the number of criteria within categories does indicate the Committee's general focus in this process. The higher the value of the site score, which is the

Weighting Factor multiplied by the Point Value, the better a site is for use as a landfill.

Table 2, Siting Criteria

Criterion	Weighting Factor
Community	
1 Displacement of residences and businesses	1
2 Distance to nearest residence, school or business	3
3 Wind direction relative to populated areas	2
4 Population density near the site	3
5 Proximity to parks and recreational facilities	1
Environmental and Land Use	
6 Zoning	1
7 Compatibility with/distance to existing land uses	1
8 Visibility from a general use public road	1
9 Visibility from residences and/or schools.	2
10 Groundwater	3
11 Wetlands	3
12 Flora and fauna habitat	2
13 Site aesthetics	1
14 Residential units along access road	1
15 Schools or hospitals along access road	1
16 Final use of the site when the landfill is closed	1
17 Archeological and/or historical significance	3
Economic	
18 Cost of site acquisition	3
19 Cost of development	3
20 Cost of operations	3
21 Impact of removal of site on tax base	1
22 Haul distance from H-POWER	2
Technical	
23 Landfill capacity or site life	3
24 Annual precipitation	2
25 Adequacy of drainage	1
26 Access to fire protection	1
27 Length of haul	2
28 Geology	1
29 Closure and post-closure cost	1
Other Considerations	
30 Employment	1
31 Access	2

4.4 Committee Siting Criteria Application

The Committee Siting Criteria was applied to the list of remaining sites following application of the Preliminary Siting Criteria. At this point in the evaluation, the Committee did not know the name of the sites.

The evaluation of the eight sites required extensive time to review the factors relevant to each criterion and to assemble the results. A compendium of data was prepared for each site detailing the evaluation for each criterion and, in many cases, included the back-up information used to determine the point value for the criterion. The individual site compendia with the details of the evaluations are in Attachment D.

4.5 Results of Committee's Application of Siting Criteria

Table 3, Sites for Committee Consideration, lists the sites to which the Siting Criteria were applied. The scores for each of the criteria and for each of the sites are shown in **Table 4, Site Scores**. These scores are the result of multiplying the Weighting Factors (shown in Table 2) and the point values for the criterion. The possible values for one site for one criterion ranged from one to nine, depending on the point value assigned (ranging from one to three) and the Weighting Factor (ranging from one to three). As noted, the higher the site's score, the better the site characteristics are for a municipal solid waste sanitary landfill.

Table 3, Sites for Committee Consideration

Site Name	TMK	Acreage	Million Tons Capacity	Years of Capacity
Ameron Quarry	4-2-15:01	391	9	15
Bellows	4-1-15: por. 01	173	8	12
Mali	8-7-10:por. 03	200	9	15
Makaiwa	9-2-3: por. 02	338	15	25
Nanakuli B	8-7-9: pors. 1 & 7	432	9	15
Ohikilolo	8-3-1: 13	353	8	13
Waimanalo Gulch New Exp.	9-2-3: 72 & 73	60	12	20
Waimanalo North	4-1-8: 13	171	10	16

Dis	Wiri	Pof	Pro	Zor	Cor	Visi	Visi	Gro	We	Flor	Site	Res	Sch	Fin	ARC	Cos	Cos	Cos	Imf	Hal	Lan	Anr	Ade	Acc	Len	Gec	Clo	Emj	Acc	Tot
men	rect	on d	y to	En	ility	ron	ron	water	ls	d fat	thetr	ial u	or ht	ae of t	glica	site a	level	pper	il of s	n H-	Tr	ir site	on	y of	o fire	y hal	and J	ent	ent	e Scc
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5 COMMITTEE EVALUATION AND ANALYSIS

5.1 Committee's Brainstorming Positive and Negative Features of Sites

After evaluating the eight sites using the Committee Siting Criteria, the Committee reviewed each to identify features that may or may not have been measured by the criteria and to reflect other local concerns and considerations relative to the sites.

A summary of positive and negative site attributes listed by the individual Committee members is provided below. It is important to note that the comments are not the consensus of the Committee, but a compilation of the brainstorming efforts of the various individual Committee member's thoughts and concerns. There was no discussion or evaluation of the listed site attributes. Further information regarding these comments is in **Attachment B** (see Group Memory of November 7, 2003).

AMERON QUARRY

Positives

- Pretty good access
- Has existing ground cover
- Proximity to former landfill
- The quarry operation has created a hole in the ground that will need to be filled
- Potentially compatible for co-existence of landfill and quarry

Negatives

- Site not viable given its importance as rock quarry, cost of acquisition, and relatively limited capacity
- Increased operational cost if it coexists with landfill
- Economic impacts
 - 59 years lost lease revenue to landowner
 - Phase 1 – active for next 10-20 years
 - Loss of income and excise taxes paid to State and County, plus income taxes paid to

Federal government

- Environmental consequences – existing permits and stormwater retention lost
- Difficult to resite quarry
- Impacts construction industry/other businesses/government projects including roads and government building
- Distance from population centers / H-POWER
- Proximity to Kawainui Marsh; federal protection issues
- Highest level of precipitation of any sites on the list
- Access road substandard; private owners
- Visibility from Kailua town

BELLOWS AFB

Positives

- Federal land – use of government land is cheap if the government entity cooperates
- High unemployment area
- Two access routes to landfill
- Not super environmentally sensitive area – no wetlands

Negatives

- Federal land – cannot be condemned
- Bellows is an environmentally protected area
- Relatively small capacity – 12 ½ years
- Two access routes poor – two lane road
- Coastal area; probably was wetland

MAILI

Positives

- Approximately 20 years life
- Onsite cover
- Onsite brackish well for dust control
- Consistent zoning

- Utilities onsite
- Low precipitation

Negatives

- Traffic
- Hazardous rockfalls on highway to site (#11 out of 117 potential rockfall sites studied by DOT)
- Planned highway/drainage projects
- Traffic accidents cause major delays; one road
- Significant pedestrian cross-traffic
- Access road privately owned – Lonestar- use by farmers only
- Upwind of Maili Elementary School and major subdivision
- Schools and medical facilities along the route
- Only coral quarry on island
- Loss of taxes – income and excise

MAKAIWA GULCH

Positives

- Potential access available off main highway
- Large capacity – 25 years
- Zoning consistent
- Property currently not being used
- Shortest distance from H-POWER and close to service population (short haul distance)
- Extensive archeological/flora/fauna surveys completed
- Low precipitation

Negatives

- Acquisition Costs (see letter in **Attachment E**)
- Upwind from heavily populated residential and resort area
- No onsite utilities or access road
- Not consistent with development plan, planned for upscale residential development
- Close to transition between H-1 and Farrington Highway

- Power lines (138 KV) transit site
- View planes readily seen
- Major economic impact that would close down residential and resort development according to developer's representative
- Close to center of population growth
- Archeological information (i.e., Hawaiian cultural sites)

NANAKULI B

Positives

- Zoning Consistent
- Low precipitation
- Proximity to existing C&D landfill
- Utilities readily accessible
- Currently not being used
- Site acquisition costs relatively low
- Brackish wells for dust control
- 22.3 year life span

Negatives

- Traffic, planned highway and drainage projects
- Bad access
- Hazardous rockfalls on highway to site (#11 out of 117 potential rockfall sites studied by DOT)
- Traffic accidents cause major delays
- Pedestrian cross traffic
- Ownership of NAV-MAG road may necessitate the City paying for access
- Upwind of Maili Elementary School and residences behind Pacific Mall – potential odors could wipe out businesses

- Dust problems
- Pass schools, medical facilities to get there

OHIKILOLO

Positives

- Low precipitation
- Far removed from most residences
- Large acreage
- Access road already onsite
- Utilities onsite
- Zoning consistent
- Acquisition cost low

Negatives

- Most remote – one of the last remote coastal areas on Oahu
- Access will be bad; numerous churches, schools, medical facilities along the route
- Hazardous rockfalls on highway to site
- Numerous known archeological sites
- Traffic
- Pedestrian cross traffic
- Construction and planned future highway improvements
- 13-year lifespan – smaller capacity site
- Operation cost high
- Potential Native Hawaiian land title issue

WAIMANALO GULCH

Positives

- Least cost site to acquire and operate
- Lifespan of 20+ years
- Proximity to existing landfill; H-POWER
- All factors of site are known

- Road access reasonably good
- Close to the service population centers – short haul distance
- Low precipitation

Negatives

- Land Use Commission, Planning Commission and current City Administration are on record as not supporting continued use of the site (see **Attachment A**)
- Upwind and visible from major resort area
- Control of operations/management improved, but need further improvement (escaping waste)
- Based on past experience and slope makes site hard to hide
- Major economic impact that would close down residential development at resort and resort development, according to developer's representative
- Truck visibility – lineups onsite and along Farrington Highway
- Traffic – projected increase in traffic
- Road access problem
- Close to center of population growth

WAIMANALO NORTH

Positives

- Life capacity higher than other sites
- Moderate precipitation

Negatives

- City can not condemn state land (See **Attachment E**, DLNR letter)
- Traffic problems
- Long haul distance

5.2 Final List of Sites

The Committee decided that the following four sites should be eliminated from further consideration; three were eliminated by consensus and one by voting. The letters and other correspondence related to the sites are in **Attachment E**. The Committee decided by consensus to remove the following sites.

- The Bellows AFB site is in federal control and cannot be condemned. A reply from the Marine Corps further indicated that the site is not available.
- The Ohikilolo site has the strong possibility of significant archeological and cultural resources (although the studies have not yet been done to confirm the resources), is remote, and would require trucks to pass through a long stretches of road through the Leeward Coast Communities (where frequent accidents have occurred) to get to the site. The potential for Native Hawaiian title issues regarding use of this site was also a reason for its removal. It is also one of very few remote coastal areas left on Oahu.
- The Waimanalo North site has been designated as a State Forest Preserve, according to a letter the City received from the State Department of Natural Resources. The State will not support its use for landfill and the City cannot condemn state land.

The Committee voted to eliminate the Waimanalo Gulch Landfill from the list of recommended sites. As a result of the voting on the final site list (other than voting on procedural matters, all other Committee decisions were made by consensus), four of the 15 Committee members resigned (prior to the vote).

6 COMMITTEE RECOMMENDATIONS

6.1 List of Sites Recommended

The Committee evaluated the remaining five sites to determine if any of them should be removed from the list recommended to the Mayor for forwarding to the City Council. The final determination was made at the last Committee meeting. The members of the Committee present at the last meeting were Anderson, Apo, Bryant-Hunter, Chun, Guinther, Jung, Kane, Rezentes, Slovin, Thielen, Tomita, Tong, and Yamamoto. Holmes and Paty were not present. The Committee's earlier determinations had all been arrived at by consensus. A motion was made by Todd Apo and seconded by Kane to move the process from consensus to voting. The motion passed with Todd Apo, Chun, Jung, Kane, Rezentes, Slovin, Tomita, Tong, and Yamamoto voting in favor. Anderson, Bryant-Hunter, Guinther, and Thielen voted against.

Another motion was made by Todd Apo and seconded by Kane to remove the Waimanalo Gulch Landfill from the list of recommended sites. Prior to a vote, four Committee members (Anderson, Bryant-Hunter, Guinther, and Thielen) resigned because they did not want to be part of a recommendation that was decided by voting rather than by consensus. There were nine votes in favor of removing the Waimanalo Gulch Landfill from the list of recommended sites (Todd Apo, Chun, Jung, Kane, Rezentes, Slovin, Tomita, Tong, and Yamamoto). There were no votes against the motion.

Table 5, *Sites Recommended to the Mayor*, lists the four sites forwarded by the Committee to the Mayor.

Table 5, *Sites Recommended to the Mayor*

Site Name	TMK	Acreage	Million Tons Capacity	Years of Capacity
Ameron Quarry	4-2-15:01	391	9	15
Mali	8-7-10:por. 03	200	9	15
Makaiwa	9-2-3: por. 02	338	15	25
Nanakuli B	8-7-9: pors. 1 & 7	432	9	16

6.2 Other Recommendations of the Entire Committee

6.2.1 *Host Community Benefits*

Host Community Benefits (HCB) is a benefits package designed to address local impacts to the siting of landfills, which are essential to meet the City and County's future infrastructure needs. This section discusses the concept and summarizes the Committee's feelings regarding the use of such

benefits in siting a new landfill for Oahu. **Attachment F** provides more information about the use of HCB in other jurisdictions on the mainland. These points include:

- HCB can generate a significant amount of revenue to help meet local needs.
- HCB can be used for any type of project, in addition to landfill impact mitigation projects.
- HCB are not unusual. States that have them include New Jersey, Pennsylvania, Illinois, Iowa, Georgia, Michigan, West Virginia, Tennessee, California, and North Carolina.

The Committee recommends that the City Administration and City Council should not zone or permit any site unless a Host Community Benefits package is negotiated with the affected community where a landfill is sited. These benefits should be an integral part of the mitigation measures included in the EIS for the site.

The Committee further notes that HCB should not be mistaken for basic improvements that must be completed prior to operating a landfill, e.g., necessary highway or infrastructure improvements.

6.2.2 Land Banking Sites

The Committee agreed that the selection of the next landfill site will serve a critical public purpose. At the same time, the effort needed to select and develop a landfill site is high, and the list of potential sites so short, that future landfill sites should be land-banked well in advance of their need. Land banking has the potential to reduce land use conflicts and minimize siting difficulties.

The Committee recommends that the City Council take steps to identify sites that address future landfill needs taking into consideration: the development of new technologies; the reduction in the waste stream that may result from such technologies and from current technologies; and the demand for landfill space. The Committee further recommends that land banking should be part of a process separate from the work of this Committee, and not limit the sites considered to those identified in this report.

6.2.3 Underground Injection Control Line and Groundwater Protection Zone

The evaluation done for the criterion related to groundwater illustrates a potential concern with the application of the UIC line and the Groundwater Protection Zone to the siting of landfills. These delineations are not precise enough to clearly identify areas that are appropriate or inappropriate for siting a landfill, nor were they intended to be used for this purpose when introduced. As previously noted, the City Council in 2003 by Resolution 03-09, applied these criteria to protect Oahu's groundwater, by precluding the siting of landfills in these areas. In this site evaluation, the Committee consultants relied on BWS staff expertise to accurately determine whether a potential site might be a problem with respect to current or future groundwater considerations.

The Committee expressed that there may be a need for the State and the City to revisit the protection that the UIC line and the Groundwater Protection Zone provide.

6.3 Continued Gathering of Information

The Committee recognized that the time allowed for gathering information was limited and that more information is needed for each site before a final decision is made. The Committee suggested direct contact with the landowners or facility operators. Those parties will have important information that needs to be considered in locating the landfill that will serve the City in the future. The Committee recommends that these parties be contacted and their input be considered.

7 OTHER ENTIRE COMMITTEE CONSIDERATIONS

The entire Committee spent considerable time and effort in its deliberations discussing the following issues.

7.1 Landfill Costs

The Committee noted that while landfill associated costs were a very important issue, and should be given significant attention in the siting process, the Committee focused on community related criteria. The Committee also noted that host community impacts were important. They recognized that the siting and EIS processes both involve a cost/benefit analysis. However, these processes do not always apply the same importance and depth of consideration to host community impacts.

After reviewing the Siting Criteria, the Committee noted that the economic costs had been weighted low compared to other factors. While the committee eventually agreed not to make any changes to the weighting factors, the Committee agreed that costs are a very significant factor and have a larger impact on the taxpayer. The Committee considered these issues in the brainstorming deliberations on the strengths and weaknesses of each site.

7.2 Alternative Technologies

The Committee strongly feels that the City Administration must pursue all viable alternative technologies, existing technologies, and landfill reduction strategies as expeditiously as possible to reduce the volume of material requiring landfill disposal. The Committee adds that as alternative technologies are identified and brought on-line, some of the factors that were considered key in the current landfill siting process might change. These factors included the anticipated annual volume of waste generated and its relationship to the amount of landfill space that will be needed in the future. The Committee urges the City Administration to regularly and diligently examine the need for municipal sanitary landfills in this light and to identify viable sites to preserve for future use.

7.3 Multiple Sites

Although the Committee's focus was on locating a single municipal solid waste landfill site, it is noted that advances in technology and reductions in the waste stream could have the potential for making smaller landfill sites economically viable. This could allow for the development of more than one site to handle the municipal waste disposal needs of the many communities on Oahu.

The Committee also notes that locating and permitting two municipal solid waste landfills is likely to result in significantly more controversy, require significantly more time, and cost more than following the process for just one landfill. Having two landfills, where one is adequate, would be counter to good stewardship of the land.

Attachment A – Planning Commission Recommendation and Land Use Commission Decision for State Special Use Permit for Waimanalo Gulch Sanitary Landfill Expansion

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In The Matter Of The Application Of The)	DOCKET NO. SP87-362
)	
DEPARTMENT OF ENVIRONMENTAL)	DECISION AND ORDER
SERVICES, CITY AND COUNTY OF)	APPROVING AMENDMENT
HONOLULU (FKA DEPARTMENT OF)	TO SPECIAL USE PERMIT
PUBLIC WORKS, CITY AND COUNTY OF)	
HONOLULU)	
)	
For An Amendment To The Special Use)	
Permit Which Established A Sanitary Landfill)	
On Approximately 86.5 Acres Of Land Within)	
The State Land Use Agricultural District At)	
Waimanalo Gulch, Honouliuli, 'Ewa, O'ahu,)	
Hawai'i, TMK No: 9-2-03: Portion 72 and)	
Portion 73 (fka TMK No: 9-2-03: Portion 2 and)	
Portion 13))	
_____)	

DECISION AND ORDER APPROVING AMENDMENT TO SPECIAL USE PERMIT

On January 17, 2003, the Department of Environmental Services, City and County of Honolulu ("Applicant"), formerly known as the Department of Public Works, City and County of Honolulu, filed an application to amend an existing special use permit ("Amendment") with the Department of Planning and Permitting, City and County of Honolulu ("DPP"), pursuant to section 205-6, Hawai'i Revised Statutes ("HRS"), and sections 15-15-95 and 15-15-96, Hawai'i Administrative Rules ("HAR"). The Applicant proposes to expand the existing Waimanalo Gulch Sanitary Landfill on approximately 21 acres of land within the State Land Use Agricultural District at

Waimanalo Gulch, Honouliuli, 'Ewa, O'ahu, Hawai'i, identified as TMK No: 9-2-03: portion 72 and portion 73 ("Property").¹ The Property is owned by the City and County of Honolulu and is under the jurisdiction of the Applicant.

On January 22, 2003, the DPP accepted the Amendment.

On March 5, 2003, the Planning Commission, City and County of Honolulu ("Planning Commission"), conducted a hearing on the Amendment, pursuant to a public notice published on January 31, 2003. After due deliberation, the Planning Commission recommended approval of the Amendment to the Land Use Commission ("LUC"), subject to the existing nine conditions and two additional conditions.

On March 13, 2003, the LUC received a copy of the decision and record of the Planning Commission's proceedings on the Amendment.

The LUC has jurisdiction over the Amendment. Section 205-6, HRS, and sections 15-15-95 and 15-15-96, HAR, authorize the LUC to approve special use permits and amendments thereto for areas greater than 15 acres where application for LUC approval is made within 60 days after the decision is rendered on the request to the Planning Commission.

On March 27, 2003, the LUC met in Waipahu, O'ahu, to consider the Amendment.² Frank Doyle and Maile R. Chun, Esq., appeared on behalf of the

¹ The actual landfill expansion is planned on approximately 14.9 acres. Accessory structures and uses, including, but not limited to berms and detention basins, are planned on the remaining acreage.

Applicant. David K. Tanoue, Esq.; Eric G. Crispin; Barbara Kim-Stanton; and Raymond Young appeared on behalf of the DPP. Russell Y. Tsuji, Esq., and Abe Mitsuda were also present on behalf of the Office of Planning. At the meeting, the Applicant presented a chart entitled "Mayor's Blue Ribbon Landfill Site Selection Committee, New Landfill Timeline, March 27, 2003," which the LUC accepted as Exhibit Number 33 to the record in this proceeding. The Applicant represented, among other things, that it would continue to seek alternate disposal sites and other technologies and waste recovery programs to reduce the amount of waste that is disposed of in landfills.

Conformance With Special Use Permit Criteria

Following discussion by the Commissioners, a motion was made and seconded to grant the Amendment, subject to the conditions as reflected in the minutes of the meeting, including, among other requirements, that if a new landfill site is not selected by December 31, 2003, the special use permit would immediately expire. An amendment clarifying this motion was then made and seconded to amend the date to December 1, 2003, by which the Blue Ribbon Landfill Site Selection Committee is to recommend a new landfill site and to further specify that if the City Council fails to select the new site by June 1, 2004, the special use permit would immediately expire. The LUC found that i) By Order dated April 20, 1987, the LUC approved a special use

² Pursuant to section 92-3, HRS, Ernest Adaniya, Greg Perry, Darrell Bussell, Paul B. Kekina, Lieutenant Commander Chuck Lewis, Richard Payne, Gail Butchart, Todd Apo, Cynthia K.L. Rezentes, and Kevin Mizuno presented oral testimony, and State Senator Brian Kanno and Councilmember Nestor Garcia submitted written testimony.

permit to establish the Waimanalo Gulch Sanitary Landfill on approximately 60.5 acres. By Order dated October 31, 1989, the LUC approved an amendment to the special use permit to expand the landfill by approximately 26 acres; ii) The current expansion is consistent with the solid waste handling and disposal policies of the 'Ewa Development Plan and will serve all of O'ahu's residents and visitors; iii) The Property is currently in open space and is located adjacent to the existing landfill; iv) No agricultural production occurs on the Property; v) There are no historic sites on the Property and there are no traditional cultural practices that have been identified that are specific to the Property; vi) There are no threatened or endangered species of flora and fauna nor are there any species of concern on the Property; vii) The expansion of the landfill will not adversely affect surrounding properties provided mitigation measures and all applicable government rules and requirements are followed; viii) The Applicant will comply with Federal and State regulations governing siting, design standards, operating requirements, groundwater monitoring and corrective action, closure, post-closure care, and financial assistance; ix) The Property will be restricted from handling or treating toxic hazardous waste material; x) Permanent and temporary fencing will be utilized to control litter in the expansion cells; xi) Vacuum equipment will be employed to clean the litter from the fences, and cleanup crews will be deployed when notice is received that litter has drifted offsite; xii) The Applicant will implement odor and gas emission control measures including a gas recovery and monitoring system, regular use

of odor misters, regular use of cover material, early onsite queuing of waste haulers, and diversion of sewage sludge offsite for drying and processing at the Sand Island Wastewater Treatment Plant; xiii) The expansion is not expected to result in noise levels greater than produced from current activities; xiv) Most of the short-term noise generated will be during operation and mobilization of heavy construction equipment; xv) The Applicant will comply with State noise regulations to mitigate short-term impacts; xvi) Longer term measures to ensure noise abatement include properly muffling equipment with noise attenuation devices, scheduling rock crushing during normal landfill operation hours, and landscaping with vegetation; xvii) Upon closure of the landfill, the Applicant and Waste Management of Hawaii, Inc., the operator of the landfill, will be responsible for capping the entire landfill, monitoring groundwater, methane gas, and leachates for 30 years; xviii) Exposed areas will be seeded or hydromulched, as appropriate, using plants similar to those found around the landfill; xix) Fabric to mimic rock outcrops will also be strategically placed to break up the homogenous appearance of the filled areas relative to the surrounding hillside; xx) The impact of the landfill on `Ewa and Nanakuli residential values was studied; xxi) Proximity to the landfill is not a consistent contributor to property values and does not adversely affect property values; xxii) The existing landfill has been in operation since 1989 and the relevant support infrastructure and services for the proposed expansion are adequate; xxiii) The approved capacity of the landfill is rapidly approaching its

maximum; xxiv) The landfill receives on a daily basis 600 tons of ash residue from the Honolulu Program on Waste Energy Recovery and 800 tons of municipal solid waste for a total of 1,400 tons per day; xxv) The Applicant evaluated alternative sites and technologies for the disposal of municipal solid waste; xxvi) The expansion of the landfill is the only feasible alternative that can be implemented in time to dispose of municipal solid waste after the approved landfill capacity is exhausted; and xxvii) The Property has extremely rocky soils and is not conducive to crop production, and the steep terrain is not appropriate for pasture use.

Following discussion by the Commissioners, a vote was taken on the amendment to the motion. There being a vote tally of 7 ayes, 1 nay, and 1 absent, the amendment carried. A vote was then taken on the main motion, as amended. There being a vote tally of 7 ayes, 1 nay, and 1 absent, the motion carried.

ORDER

Having duly considered the complete record of the Amendment and the oral arguments presented by the parties in the proceeding, and a motion and amendment thereto having been made at a meeting conducted on March 27, 2003, in Waipahu, O`ahu, and the motion and amendment having received the affirmative votes required by section 15-15-13, HAR, and there being good cause for the motion and amendment, the Commission hereby APPROVES the Amendment granted by the Planning Commission to expand the existing Waimanalo Gulch Sanitary Landfill on

approximately 21 acres of land within the State Land Use Agricultural District at Waimanalo Gulch, Honouliuli, `Ewa, O`ahu, Hawai`i, identified as TMK No: 9-2-03: portion 72 and portion 73, and approximately identified on Exhibit "A," attached hereto and incorporated by reference herein, subject to the following conditions:

1. The Blue Ribbon Site Selection Committee shall make its recommendation for a new landfill site to the City Council by December 1, 2003. The City Council shall select a new site by June 1, 2004. If a new site is not selected by June 1, 2004, this Special Use Permit shall immediately expire.

2. In the event that Condition No. 1 is satisfied, Condition No. 14 shall become effective.

3. That an earth berm shall be installed prior to the commencement of any waste disposal operations.

4. The landscaping plans which would include plant names, sizes, quantities and location shall be submitted to the Department of Planning and Permitting for approval and shall be implemented within 90 days of completion of the berm work.

5. The facility shall be operational between the hours of 7:00 a.m. and 4:30 p.m. daily.

6. The Applicant shall obtain all necessary approvals from the State Department of Health, Department of Transportation, Commission on Water Resource Management, and Board of Water Supply for all on-site and off-site improvements

involving access, storm drainage, leachate control, water, well construction, and wastewater disposal.

7. The Planning Commission or Director of the Department of Planning and Permitting may at any time impose additional conditions when it becomes apparent that a modification is necessary and appropriate.

8. The Applicant shall notify the Planning Commission of termination of use for appropriate Planning Commission action or disposition of the permit.

9. In accordance with Chapter 11-60, "Air Pollution Control," Hawai'i Administrative Rules, the Applicant shall be responsible for ensuring that effective dust control measures during all phases of development, construction, and operation of the landfill expansion are provided to minimize or prevent any visible dust emission from impacting surrounding areas. The Applicant shall develop a dust control management plan that identifies and addresses all activities that have a potential to generate fugitive dust.

10. That the City and County of Honolulu shall indemnify and hold harmless the State of Hawai'i and all of its agencies and/or employees for any lawsuit or legal action relating to any groundwater contamination and noise and odor pollution relative to the operation of the landfill.

11. The Applicant shall coordinate construction and operation of the landfill with the Hawaiian Electric Company.

12. Within 5 years from the date of this Special Use Permit Amendment approval or date of the Solid Waste Management Permit approval for this expansion, whichever occurs later but not beyond May 1, 2008, the 200-acre property shall be restricted from accepting any additional waste material and be closed in accordance with an approved closure plan.

13. Prior to commencing land filling in the 21-acre expansion area, the Applicant shall submit to the Director of the Department of Planning and Permitting for review and approval, a metes and bounds description and map of the approved landfill area as permitted by this Special Use Permit and amendments thereto. Any minor modifications to allow reasonable adjustments of the approved area due to engineering and/or health and safety requirements may be approved by the Director of the Department of Planning and Permitting; provided that there is no net increase to the approved area of 107.5 acres. A copy of the metes and bounds description and map shall be provided to the Land Use Commission.

14. The Applicant shall promptly provide, without any prior notice, annual reports to the Department of Planning and Permitting and the Land Use Commission in connection with the status of the landfill expansion and the Applicant's progress in complying with the conditions imposed herein. The annual report shall be submitted in a form prescribed by the Executive Officer of the Commission.

15. The City and County of Honolulu shall select a new landfill site. The recommendation for a new site shall be forwarded to the Planning Commission and City Council no later than December 1, 2003.

16. The City and County of Honolulu shall ensure that funding for design and planning is included in the FY05 budget to demonstrate the City's commitment to the new site and to ensure that no further extensions are necessary.

17. The City and County of Honolulu shall initiate the public comment and environmental review process for the new site no later than December 31, 2004.

18. The City and County of Honolulu shall, to the extent feasible, use alternative technologies to provide a comprehensive waste stream management program that includes H-Power, plasma arc, plasma gasification, and recycling technologies.

19. The City and County of Honolulu shall appropriately implement by executive order or ordinance the seven bullet points identified in the Applicant's Exhibit 3, Appendix H, page 1-3, regarding the third boiler at H-Power, wood recovery, metal recovery, gypsum recovery, enhanced enforcement of landfill bans, implementation of the bottle bill, and establishment of user fees.

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In The Matter Of The Application Of The)
)
DEPARTMENT OF ENVIRONMENTAL)
SERVICES, CITY AND COUNTY OF)
HONOLULU (FKA DEPARTMENT OF)
PUBLIC WORKS, CITY AND COUNTY OF)
HONOLULU)
)
For An Amendment To The Special Use)
Permit Which Established A Sanitary Landfill)
On Approximately 86.5 Acres Of Land Within)
The State Land Use Agricultural District At)
Waimanalo Gulch, Honouliuli, 'Ewa, O'ahu,)
Hawai'i, TMK No: 9-2-03: Portion 72 and)
Portion 73 (fka TMK No: 9-2-03: Portion 2 and)
Portion 13))
_____)

DOCKET NO. SP87-362
DECISION AND ORDER
APPROVING AMENDMENT
TO SPECIAL USE PERMIT

This is to certify that this is a true and correct copy of the document on file in the office of the State Land Use Commission, Honolulu, Hawaii.

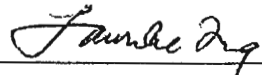
6/9/03 by 
Date Executive Officer

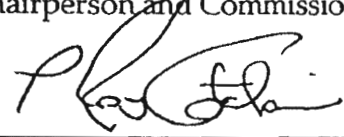
DECISION AND ORDER APPROVING AMENDMENT TO SPECIAL USE PERMIT

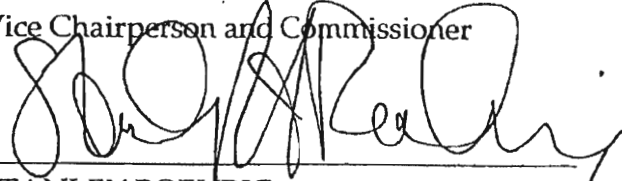
ADOPTION OF ORDER

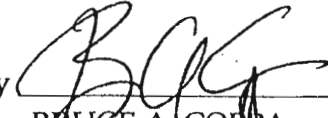
The undersigned Commissioners, being familiar with the record and the proceedings, hereby adopt and approve the foregoing ORDER this 5th day of June, 2003 The ORDER and its ADOPTION shall take effect upon the date this ORDER is certified and filed by this Commission.

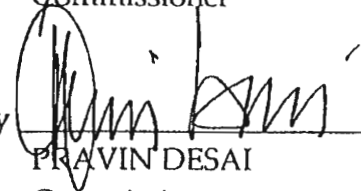
LAND USE COMMISSION
STATE OF HAWAII

By 
LAWRENCE N. C. ONG
Chairperson and Commissioner

By 
P. ROY CATALANI
Vice Chairperson and Commissioner

By 
STANLEY ROHRIG
Vice Chairperson and Commissioner

By 
BRUCE A. CORPA
Commissioner

By 
PRAVIN DESAI
Commissioner

By Isaac Fiesta
ISAAC FIESTA, JR.
Commissioner

By Steven Montgomery
STEVEN MONTGOMERY
Commissioner

By Randall Sakumoto
RANDALL SAKUMOTO
Commissioner

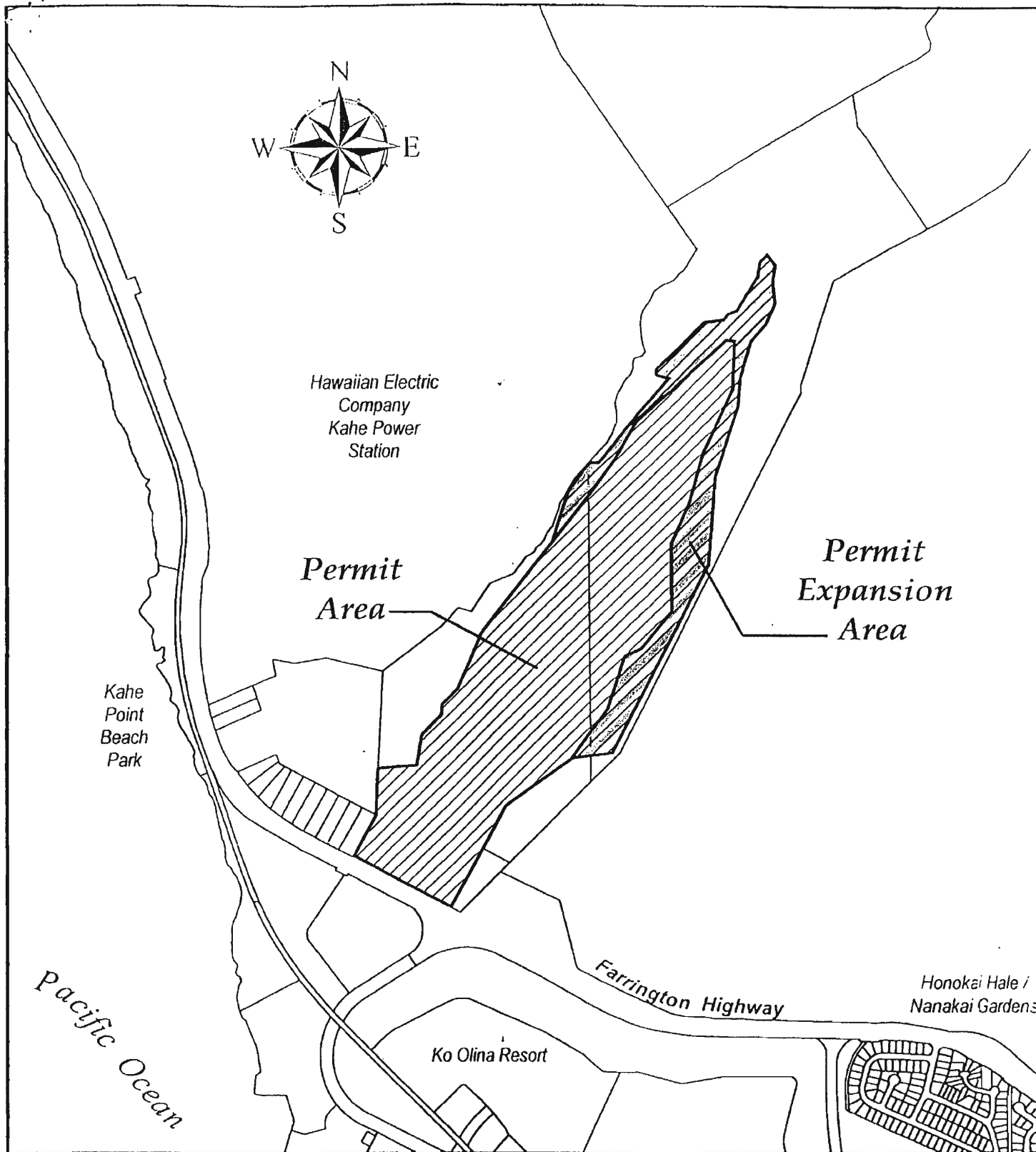
By OPPOSED
PETER YUKIMURA
Commissioner

APPROVED AS TO FORM:

Isaac Quisenberry
Deputy Attorney General

Filed and effective on
June 9, 2003

Certified by:
Anthony J. King
Executive Officer



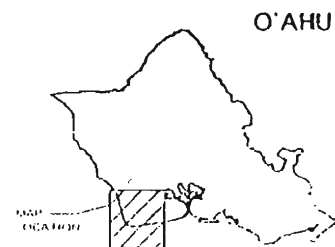
SP87-362 DEPARTMENT OF ENVIRONMENTAL SERVICES,
 CITY AND COUNTY OF HONOLULU
 (fka Department of Public Works, City and County of Honolulu)

LOCATION MAP

TMK No.: 9-2-3, portion 72 and portion 73
 Waimanalo Gulch, Honouliuli, 'Ewa, O'ahu, Hawaii

Scale 1" = 1,000 ft

EXHIBIT "A"



BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In The Matter Of The Application Of The) DOCKET NO. SP87-362
)
DEPARTMENT OF ENVIRONMENTAL) CERTIFICATE OF SERVICE
SERVICES, CITY AND COUNTY OF)
HONOLULU (FKA DEPARTMENT OF)
PUBLIC WORKS, CITY AND COUNTY OF)
HONOLULU)
)
For An Amendment To The Special Use)
Permit Which Established A Sanitary Landfill)
On Approximately 86.5 Acres Of Land Within)
The State Land Use Agricultural District At)
Waimanalo Gulch, Honouliuli, `Ewa, O`ahu,)
Hawaii`i, TMK No: 9-2-03: Portion 72 and)
Portion 73 (fka TMK No: 9-2-03: Portion 2 and)
Portion 13))
_____)

CERTIFICATE OF SERVICE

I hereby certify that a copy of the Decision and Order Approving Amendment to Special Use Permit was served upon the following by either hand delivery or depositing the same in the U.S. Postal Service by regular or certified mail as noted:

DEL. MARY LOU KOBAYASHI
Office of Planning
P.O. Box 2359
Honolulu, Hawaii 96804

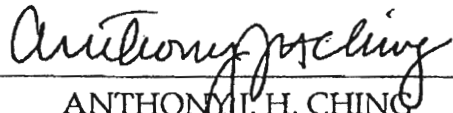
CERT. JOHN CHANG, ESQ.
Deputy Attorney General
Hale Auhau
425 Queen Street
Honolulu, Hawaii 96813

CERT. ERIC G. CRISPIN, DIRECTOR
Department of Planning and Permitting
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

CERT. FRANK DOYLE, DIRECTOR
Department of Environmental Services
1000 Uluohia Street, Suite 308
Kapolei, Hawaii 96707

CERT. DAVID ARAKAWA, ESQ.
Corporation Counsel
City & County of Honolulu
530 South King Street
Honolulu, Hawaii 96813

DATED: Honolulu, Hawaii, this 9th day of June, 2003.



ANTHONY J. H. CHING
Executive Officer