Volume 2 of 2

Draft Environmental Impact Statement
Prepared in Accordance with Chapter 343, Hawaii Revised Statutes and Title 11, Chapter 200, Hawaii Administrative Rules

Appendices Waimānalo Gulch Sanitary Landfill Lateral Expansion

Waimānalo Gulch, O'ahu, Hawai'i
TMKs: (1) 9-2-003: 072 and 073

May 2008

City & County of Honolulu
Department of Environmental Services
1000 Uluohia Street, 3rd Floor
Kapolei, Hawai'i 96707

R. M. TOWILL CORPORATION
SINCE 1930
2024 North King Street, Suite 200
Honolulu, Hawaii 96819-3494

1-21149-00

Volume 2 of 2

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Chapter 343, Hawai'i Revised Statutes, and
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Prepared for:
City & County of Honolulu
Department of Environmental Services
Kapolei, Hawai'i 96707

Prepared by:
R.M. Towill Corporation
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Honolulu, Hawai'i 96819-3494

Appendix A

Notice of Violation, January 31, 2006, and
Settlement Agreement, December 7, 2007,
State Department of Health

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EMD/SHWB

January 31, 2006

S0203JR

CERTIFIED MAIL NO. 7005 1160 0003 8275 9819
RETURN RECEIPT REQUESTED

Mr. Paul Burns, Vice President/General Manager
Waste Management of Hawaii, Inc.
92-460 Farrington Highway
Kapolei, Hawaii 96707

CERTIFIED MAIL NO. 7005 1160 0003 8275 9758
RETURN RECEIPT REQUESTED

Mr. Eric Takamura, Director
Department of Environmental Services
City and County of Honolulu
1000 Uluohia Street
Kapolei, Hawaii 96707

Dear Messrs. Burns and Takamura:

SUBJECT: NOTICE OF VIOLATION/ORDER

Under the authority of section 342H-7 of the Hawaii Revised Statutes, you are hereby notified that we are issuing a Notice of Violation (NOV) and Order for the implementation of corrective actions regarding state solid waste noncompliance issues. The documents are enclosed.

Pursuant to section 342H-7, any order issued shall become final, and the penalty imposed under this chapter shall become due and payable twenty (20) calendar days after the notice of penalty is served, unless the person or persons named therein request a hearing before the Director of Health. The request for a hearing must be made in writing, no later than twenty (20) calendar days after the NOV and Order are served. Furthermore, if the penalty is not paid to the Department of Health within thirty (30) calendar days after it becomes due and payable, the Director may institute a civil action in the name of the State to recover the civil penalty, which shall be a government realization.

Please direct all inquiries concerning this matter to Steven Y.K. Chang, P.E., Chief, Solid and Hazardous Waste Branch, Department of Health, 919 Ala Moana Boulevard, Room 212, Honolulu, Hawaii 96814.

Sincerely,

Linda Rosen

LAURENCE K. LAU
Deputy Director for Environmental Health

Enclosures

c: Kathleen Ho, Deputy Attorney General
Thomas P. Rack, Hearings Officer (NOV, Order)

IN THE DEPARTMENT OF HEALTH

STATE OF HAWAII

DEPARTMENT OF HEALTH, STATE OF HAWAII, COMPLAINANT, vs. WASTE MANAGEMENT OF HAWAII, INC. AND CITY and COUNTY OF HONOLULU; RESPONDENTS.	DOCKET NO. 05-SHW-SWS-004 NOTICE AND FINDING OF VIOLATION

NOTICE AND FINDING OF VIOLATION

A. INTRODUCTION

1. This is an administrative enforcement action instituted pursuant to §342H-7 of the Hawaii Revised Statutes ("HRS"), and the Department of Health's Solid Waste Management Control Rules, Chapter 11-58.1, Hawaii Administrative Rules ("HAR"). Complainant is the Department of Health ("DOH"), Solid Waste Section ("SWS"). RESPONDENTS are Waste Management of Hawaii, Inc. (WMH) and City and County of Honolulu ("RESPONDENTS").

2. At all times pertinent hereto, RESPONDENTS owned, operated, controlled, or managed a solid waste disposal facility at the Waimanalo Gulch Sanitary Landfill ("facility") located at 92-460 Farrington Highway, Kapolei, Hawaii.

3. On the basis of information obtained during the course of investigation, SWS has determined that RESPONDENTS have violated HRS 342H, HAR 11-58.1, and RESPONDENTS' solid waste management permit.

B. JURISDICTION

4. HRS §342H-7 authorizes DOH to issue orders assessing a penalty for any past or current violation of HRS chapter 342H, the rules adopted thereunder, or any term or condition of a permit issued pursuant to the chapter, and to require compliance

immediately or within a specified time.

5. RESPONDENTS are a "person" as defined in HRS §342H-1.

6. At all relevant times pertinent hereto, RESPONDENTS held a Solid Waste Management Permit ("permit"), Permit Number LF-0054-02, which was issued on May 15, 2003 and expires on April 30, 2008.

C. STATEMENT OF FACTS

COUNT I

(Exceedence of Permitted Grades)

7. Paragraphs 1 through 6 above are incorporated herein by this reference as if they were set forth here in their entirety.

8. On January 26, 2005, during a meeting between WMH and DOH, WMH stated that they overfilled areas in the ash monofill and MSW cells. WMH provided a drawing documenting the overfill areas to DOH. The drawing was based on an aerial survey conducted in January 7, 2005.

9. In a letter dated February 3, 2005, WMH states "approximately 100,000 tons of ash delivered from the H-Power facility has been placed above the current permitted grades of the ash monofill". The February 3, 2005 letter further states that the placement of ash occurred during 2004.

10. In WMH's Annual Operating Report (AOR) for 2004, dated February 20, 2005, WMH states that for the period between July 1, 2003 and June 30, 2004, the landfill received 96,239 tons of H-Power ash. The AOR further states that based on the January 15, 2004 topography, there is no remaining airspace in the ash monofill.

11. With a submission dated February 22, 2005, WMH provided DOH an isopach drawing dated February 2005, showing 2005 topography and master plan final grades. WMH noted that 139,485 cubic yards of ash and 129,240 cubic yards of MSW were placed beyond the permitted grades.

12. In a letter dated March 29, 2005, WMH stated, "Ash placement above the approved 2002 grades in the ash disposal cell was initially noted following the aerial flyover conducted in January 2004. Identification of an overfill condition in the MSW cell areas was noted following the flyover conducted in January 2005."

13. In a letter dated December 17, 2004 and during a meeting between WMH and DOH on January 26, 2005, DOH stated concern over the stability of the landfill for grades greater than the current design, as the factor of safety of the design grades is

1.5. During the January 26, 2005 meeting and in a February 7, 2005 letter, DOH requested that additional stability analysis be conducted to evaluate the overfill areas.

14. In a letter dated February 21, 2005, WMH's engineering consultant, GeoSyntec Consultants (GeoSyntec), states that the static stability analysis of the landfill with the overfill areas identified in their January 2005 survey, resulted in a factor of safety ranging between 1.3 and 1.8.

15. In a letter dated February 16, 2005, Waste Management proposed the construction of a stability berm along the downstream toe of the ash monofill. WMH stated "*This berm would be design to increase the factor of safety along Section 11 to a minimum of 1.5 and,* would *allow waste to be placed to grades approximately the same as those in the original 1989 design.*"

16. Solid Waste Management Permit Number LF-0054-02, Special Conditions III, Item 9 provides:

> *The waste fill height of this landfill shall not exceed 510 feet above mean sea level and shall be in accordance with the document entitled "14.9-Acre Master Plan Fill Grades" dated September 2002 by GeoSyntec Consultants submitted with the Lateral Expansion application dated September 27, 2002, or any other subsequent submission approved by the Department.*

17. Since the issuance of the solid waste permit, the Department did not approve any changes to the landfill grades.

18. Based on the tonnage estimate of placed ash exceeding design grades and WMH's statement that ash placement above the approved 2002 grades was noted after a January 2004 flyover, the RESPONDENTS placed at least one years' worth of ash over the permitted grades and exceeded design grades for over a year.

19. RESPONDENTS placed ash and MSW above grades presented in the 14.9-Acre master Plan Fill Grades, in violation of Solid Waste Management Permit Number LF-0054-02, Special Conditions III, Item 9.

COUNT II

(Failure to Submit Annual Operating Reports in a Timely Manner)

20. Paragraphs 1 through 19 above are incorporated herein by this reference as if they were set forth here in their entirety.

21. Solid Waste Management Permit Number LF-0054-02, Special Conditions III, Item 2 provides:

The permittee shall submit an Annual Operating Report (AOR), using July 1 to June 30 as the reporting period. The AOR shall be submitted by July 31 of each year unless otherwise specified under Item 3 of this section....

22. Solid Waste Management Permit Number LF-0054-02, Special Conditions III, Item 3 provides:

The Annual Operating Report shall include the following information...

a. *Quantities of filled airspace for the present year, past filled airspace and remaining airspace in both cubic yards and years shall be provided...*
b. *On or before July 31 of each year, the permittee shall submit an annual topographic survey of the site as prepared by a land surveyor registered in the State of Hawaii. This survey shall clearly show the horizontal and vertical dimensions of the landfilled area;*
c. *A Sequencing Plan, including a drawing, identifying the cell areas to be filled in the coming year including identification of the wet weather areas. The cell areas and wet weather area capacity shall be provided using an appropriate unit of measure; and*
d. *Final fill areas, intermediate fill areas, and future unused fill areas shall be identified for the projected year.*

23. On July 24, 2003, WMH submitted their 2003 AOR. The AOR did not contain the required information for filled airspace for that year, past filled airspace and remaining airspace in cubic yards and years. The 2003 AOR was also missing the annual topographic survey, a sequencing plan for the coming year and a summary plan identifying filled areas, intermediate fill areas that can still accept waste and future unused fill areas. These items are consistent with the requirements of Special Conditions III, Item 3.

24. On December 22, 2004, WMH requested a 30-day extension for the submission of their 2004 AOR, which was due July 31, 2004.

25. In February 7, 2005, DOH issued a warning letter stating the deficiencies of the 2003 AOR and the non-submission of the 2004 AOR.

26. On February 23, 2005, DOH received the missing documentation required of the 2003 AOR and the 2004 AOR from WMH dated February 22, 2005, which utilized aerial topographies dated March 24, 2003 and January 15, 2004, respectively. In the February 22, 2005 incident report, WMH states:

Second, under separate cover, we are providing you with a copy of the 2004 Annual Operating Report (AOR) as required in the permit. Oral notification was provided in July 2004 to Mr. Gary Siu of the DOH that this report would be delayed due to information required from the annual topographic survey.

Additionally written notification of the delay was provided to Mr. Siu in December 2004. These aerial flyovers of the landfill have been scheduled during January of each year for the benefit of reporting to the City and County of Honolulu. Steps will be taken to prevent recurrence by our commitment to reschedule all future aerial flyovers in June of each calendar year to coincide with the timing of the AOR.

Third, under separate cover, a completed 2003 AOR is being provided to you with the information that was required in the February 7 letter. This information was incomplete due to our misunderstanding of the new requirements in the permit, which was issued May 15, 2003.

27. By the late submission of the required information, RESPONDENTS were in violation of Solid Waste Management Permit Number LF-0054-02, Special Conditions III, Items 2 and/or 3.

COUNT III

(Failure to place daily cover on the active face of MSW landfill)

28. Paragraphs 1 through 27 above are incorporated herein by this reference as if they were set forth here in their entirety.

29. HAR 11-58 .1-15(b)(1) provides:

> *Cover Material requirements. The owners or operators of all MSWLF units must cover disposed solid waste with six inches of earthen material at the end of each operating day, or at more frequent intervals if necessary, to control disease vector, fires, odors, blowing litter, and scavenging.*

30. Solid Waste Management Permit Number LF-0054-02, Special Condition IIIA, 2 provides:

> ***Daily Cover Material*** *shall be a minimum of six inches of earthen material or an alternative in accordance to HAR 11-58.1-15(b). Request for the use of an alternative daily cover (ADC) as cover shall be submitted to the Director of the Department of Health at the address listed in Item 2 of Special Conditions III.*
>
> *Request for the use of an alternative daily cover (ADC) shall consist of a written request for the approval of a demonstration period whereby an evaluation and demonstration shall be made that the ADC and its thickness control disease vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the*

environment. The use of alternative cover materials is limited to daily cover use only. The written request shall evaluate the potential ADC as to its specific characteristics and its appropriate use at the facility. Demonstration period are to be in increments of six months. The demonstration period or the approved use of an ADC may be rescinded or cancelled by either the Department of Health or the Operator at anytime without cause.

31. Solid Waste Management Permit Number LF-0054-02, Special Condition III, Item 11 provides:

> *A revised written Operating Plan shall be prepared and filed with the Department, no later than 90 days after receipt of this permit. The permittee shall implement the plan upon submission to the Department; however, the Department may require revisions to the written plan as a condition of approval...*

32. The Facility's Operating Plan, dated July 2004, Section 5.8.1, Daily Cover states:

> *The active MSW disposal area is covered at the end of each day with a minimum of 6 inches of daily cover soil. In areas where additional waste will not be placed for a period of 30 days or more, intermediate cover consisting of a minimum of 12 inches of soil is placed over the waste, and graded to promote surface water drainage. When additional waste is to be placed over such areas, the upper part of the intermediate cover soil may be scraped off for subsequent reuse.*

33. On January 28, 2005, the DOH inspectors noticed inadequate soil cover adjacent to the workface area (previous day's workface) in Cell E-1, showing excessive flagging (less than 6 inch of cover with trash protrusion) and without the required six inches of soil cover. The dozers/compactor were working on the current day's workface and away from the area that was showing flagging and no attempt were made to cover the exposed flagging.

34. On February 8, 2005, due to the lack of soil cover, flagging was noticed again in an area away from the workface of Cell E-1. Mr. Cassulo, the facility manager was notified of the noncompliance issue.

35. On February 9, 2005, the DOH inspectors continued to notice flagging on the east side of MSW E-1 due to lack of soil cover.

36. On February 17, 2005, the DOH inspectors observed less than 6-inches of soil cover and exposed trash (flagging) on MSW Cell E-1, on an area of the cell that the facility had completed a week before.

37. On February 17, 2005, a large portion of MSW Cell E-1 top deck was observed with heavy flagging due to lack of soil cover.

38. On February 24, 2005, the DOH-inspectors observed a former cell area previously filled with solid waste from the week before with exposed trash (flagging). The front slope of the MSW Cell E-1 was also observed with heavy flagging again due to inadequate soil cover.

39. On March 11, 2005, a large area of the top deck was observed with heavy flagging and exposed MSW.

40. On March 15, 2005, stockpile of soil cover within the workface area was observed, however, some areas of the top deck of MSW Cell E-1 was observed with exposed MSW and flagging.

41. On March 22, 2005, the inspectors observed some flagging fronting the slope of MSW Cell E-1.

42. On March 30, 2005, the inspectors observed the front slope of MSW Cell E-1 with exposed MSW and heavy flagging due to inadequate soil cover.

43. On April 6, 2005, the east top deck of MSW Cell E-1 was noticed with exposed bags of MSW without soil cover, and the front slope of the cell not covered with soil for days as observed from previous inspections.

44. On April 6, 2005, the inspectors observed exposed MSW and flagging on an area located adjacent to the active workface area.

45. On April 11, 2005, the inspectors observed an entire cell from the day before located at the north area of MSW Cell E-1 not covered with soil. The dozer operator was noticed still trying to cover the large cell of exposed MSW with soil cover. Heavy flagging and plastic bags of MSW were also noted fronting the slopes of MSW Cell E-1.

46. On April 15, 2005, at 9:00 A.M. the DOH inspector observed a portion of MSW from the previous day was not properly covered. Due to gusty wind the litter fences were loaded with litter and some flagging was also noted due to inadequate soil cover.

47. On April 20, 2005, at 6:20 P.M. the facility has stopped accepting waste for the day and a few trucks were observed delivering soil to the workface area for daily cover. At 7:00 P.M. the DOH inspectors observed the operators haul in tarps onto the workface to be used to cover part of the workface due to lack of soil cover. The use of tarps was not approved by DOH to be used as alternative daily cover (ADC) for the facility. At 7:45 P.M. the operators had stopped working and left for the night without covering a major part of the workface area. Mr. David Fuiava of WMH was asked about

completing the cell with daily cover and he said "call it a day, will use another plan tomorrow."

48. On April 21, 2005, at 6:45 P.M. the operators had stopped work for the evening and the DOH inspectors noticed heavy flagging throughout the cell. The DOH inspectors also noted uncovered and partially covered MSW within the cell area. The unauthorized use of the tarp for alternative daily cover was still in place from the previous day.

49. On April 22, 2005, the DOH inspectors continued to observed heavy flagging on the front slopes and the northeast side of MSW Cell E-1. The workface center top deck area of MSW Cell E-1 had exposed MSW and heavy flagging due to inadequate soil cover. The inspectors noticed the ADC tarp was still in placed from previous days.

50. On April 25, 2005, at 4:40 P.M. the DOH inspectors observed the landfill equipment operators working the MSW at workface area. The workface area was observed with large amount of MSW not covered with soil at 6:42 P.M. At 6:49 P.M. the operators parked their equipment and left for the evening without covering the MSW for the day. The Environmental Compliance Officer was asked if the operators were done for the day and he said that he had no control of the operators. The DOH inspectors walked the top deck of MSW Cell E-1 and observed large amount of MSW not covered with soil, including the side slopes of the cell.

51. On April 26, 2005, at 5:20 P.M. the DOH inspectors noted a large MSW area on the northeast corner of MSW Cell E-1 from the night before that had not been covered with soil. Heavy flagging was also noted throughout the top deck of MSW Cell E-1 and along the east banks of the cell. The inspectors observed the operators trying to cover the workface area with soil until 7:30 P.M. and the operators had to stop work due to darkness. Inadequate soil was observed throughout the workface and with some exposed MSW.

52. On April 27, 2005, at 6:30 P.M. heavy flagging and exposed MSW was observed at the center portion of MSW Cell E-1 and the MSW was not covered with adequate soil at the end of the day. The northeast side of MSW Cell E-1 continues to be observed with heavy flagging due to inadequate amount of soil cover for the past two weeks.

53. On April 28, 2005 at 6:55 P.M. the DOH inspectors observed the northeast corner of the workface (an old workface from the previous day) with heavy flagging and exposed MSW. The south slopes of MSW Cell E-1 fronting Koolina Resort continues to be observed with exposed MSW and heavy flagging.

54. On May 1, 2005, the DOH inspectors observed an inactive area of MSW Cell E-1 fronting Koolina Resort with exposed MSW. At the end of the day (5:10 P.M.) the inspectors observed a large MSW drop off area of the active workface in MSW Cell E-1 & E-2 with large amounts of exposed MSW and without the required daily soil cover.

Soil cover was available at the MSW Cell-10 storage area, but the facility had insufficient personnel on Sunday to cover the cell at the end of the day. The northeast corner of MSW Cell E-1 and top deck has exposed MSW and has not been covered with soil for the past week. Heavy flagging and exposed MSW on the front slope fronting Koolina Resort continues to be uncovered with daily soil cover.

55. On May 3, 2005, the DOH inspector continued to observe the sloped area of MSW Cell E-1 fronting Koolina Resort with exposed MSW and heavy flagging. The workface area for MSW Cell E-2 was inadequately covered with soil and heavy flagging was noted. At the end of the day (6:30P.M.) the active workface area was inadequately covered with soil. The northeast corner of MSW Cell E-1 and top deck had exposed MSW and has not been covered with soil for the past few weeks.

56. On May 6, 2005, at 5:00P.M. the DOH inspectors observed facility operator park the equipment and drive away for the day. The inspectors observed heavy flagging and exposed MSW without adequate soil cover at the MSW Cell E-2 workface.

57. On May 9, 2005, at 6:20 P.M., DOH inspectors observed exposed MSW and heavy flagging on a large area of MSW Cell E-2 workface without adequate soil cover.

58. On May 19, 2005, the DOH inspectors continue to notice the bottom slope of MSW Cell E-1 fronting Koolina Resort with exposed MSW and heavy flagging.

59. The issue was reported to the Environmental Compliance Officer and Operation Manager on May 19, 2005; however, no action was taken to correct the problem.

60. On May 25, 2005, the DOH inspectors observed exposed MSW and heavy flagging on the recently completed northeast end of MSW Cell E-1, due to inadequate soil cover. Ms. Gordy, the Environmental Manager, was notified of the issue and was present during the inspection.

61. On June 3, 2005, the south slopes of MSW Cell E-1 fronting Koolina Resort continues to be observed with exposed MSW and heavy flagging. Mr. Cassulo said that WMH is leveling high spots within MSW Cell E-1 and once completed the area will be covered with intermediate soil.

62. On June 9, 2005, the inspectors observed large amounts of exposed MSW on a closed cell fronting MSW Cell E-2.

63. The RESPONDENTS failed to provide six inches of daily soil cover at the end of day on the aforementioned dates.

64. RESPONDENTS did not receive prior written approval from the Director of Health to use alternative daily cover.

65. RESPONDENTS violated HAR 11-58 .1-15(b)(1) and Solid Waste Management Permit Special Permit Condition IIIA, Item 2 on 27 separate occasions.

COUNT IV

(Failure to place intermediate cover material on the ash monofill)

66. Paragraphs 1 through 65 above are incorporated herein by this reference as if they were set forth here in their entirety.

66. Solid Waste Management Permit Number LF-0054-02, Special Condition IIIB, Item 2 provides:

> *Intermediate cover is required for the MSW ash monofill to control fugitive dust, if the ash is exposed for more than seven days. A minimum of 6 inches of earthen material shall be used for cover except where cover cannot be reasonable or safely applied. In those areas an alternative dust control cover shall be used with the approval of the Department.*

67. The Facility's Operating Plan, dated July 2004, Section 5.9.2. Cover provides:

> *Intermediate soil cover is placed over areas that are not being actively worked and are exposed for more than 7 days without receiving additional ash. Intermediate cover consists of soil compacted to a minimum thickness of six inches and graded to promote runoff of surface water.*

68. Aerial photographs of the landfill facility dated 1-3-00, 1-6-01, 3-24-03, 2-13-04, and 1-7-05, as reviewed by a DOH inspector at WMH's office, shows that the percentage of intermediate soil cover on the monofill varies from year to year.

69. On January 28, 2005, the DOH inspectors noticed large inactive cell areas of the ash monofill without intermediate soil cover. DOH inspectors voiced their concern to the facility manager Mr. Joe Hernandez, on the requirement for the ash monofill intermediate cover and were told that the facility plans to regrade the ash monofill sometime soon.

70. On February 9, 2005, DOH inspectors observed a WMH worker operating a grader and leveling/regrading the overfilled ash monofill on Ash Cells 5 & 6. The inspectors observed exposed ash monofill cells 5, 6, 7, & 8 without the required seven-day intermediate cover. Some soil stockpiles were noticed stored on the top deck of the ash monofill, but was not at that time being used as cover material. The re-grading of the ash monofill was observed to create significant fugitive dust without any mitigation controls.

71. On February 9, 2005, DOH inspectors noted the active ash disposal cell 3 area with large stockpiles of ash without the required seven day intermediate cover and DOH

voiced their concerns to Mr. Cassulo for the required intermediate cover. Mr. Cassulo said that they could not cover the ash because the ash is wet and takes a while to dry. He also mentioned that he does not interpret the permit condition requiring the ash to be covered every seven days. Mr. Cassulo also stated that they are cutting the ash piles to reduce the overfilled ash areas (cells 5 & 6) and WMH plans to have it completed by the following week.

72. On February 17, 2005, DOH inspectors observed the grader operator partially covering part of the top deck of ash monofill of cells 4 & 5 with intermediate soil cover.

73. On February 24, 2005, DOH inspectors observed the ash monofill top deck partially covered with intermediate soil cover, however, the side slope of the ash monofill had no intermediate cover. At the time of inspection, no equipment was observed working on the ash monofill area.

74. On February 24, 2005, the DOH inspectors observed two separate ash workface areas without soil cover. The entire side slope areas of the ash monofill landfill area are not covered with intermediate soil cover.

75. On March 11, 2005, a major part of the ash monofill landfill area continues to be without the required soil cover. Most of the side slope is not covered with soil.

76. On March 15, 2005, intermediate soil cover was noted on the top deck the ash monofill area, however, the side slopes have not been covered with soil. The entire ash monofill in Cell 5 has not yet been covered with intermediate soil.

77. On March 22, 2005, DOH inspectors noted that the side slopes of the ash monofill cells 6 & 7 were still not covered with intermediate soil.

78. On March 30, 2005, the DOH inspectors observed the side slopes of the ash monofill area without intermediate soil cover. The active ash monofill area was not being covered with the required soil cover every seven days.

79. On April 6, 2005, a former active ash monofill lift located on the northeast corner of ash cell 4 was observed without the required intermediate soil cover.

80. On April 11, 2005, the DOH inspectors continue to observe the side slopes of the ash monofill area without the required intermediate soil cover.

81. On April 15, 2005 to June 28, 2005, the DOH inspectors continue to observe the ash monofill side slopes and other areas of the ash monofill without the required intermediate soil cover.

82. On May 12, 2005, DOH continues to observe the active workface with stockpiles of ash from H-Power and without the required intermediate cover. H-Power facility was

closed for their annual maintenance on April 13, 2005 for about a month. WMH did not place the required soil cover on the active workface area during this entire period.

83. On June 29, 2005, DOH continued to observe ash monofill cell 3 areas without the required soil cover. The inspectors observed WMH equipment placing intermediate cover and grading the side slope of the ash monofill cells 6 & 7.

84. On July 27, 2005, the inspector observed the top deck and side slopes of the ash monofill landfill completely covered with intermediate soil and meeting regulatory requirements.

85. RESPONDENTS have failed to place intermediate cover on the ash monofill and have violated the facility's permit Special Conditions IIIB, Item 2 and facility's Operations Plan Section 4.9.2 for at least 153 days.

COUNT V

(Exceedance of leachate head on the liner in ash monofill)

86. Paragraphs 1 through 85 above are incorporated herein by this reference as if they were set forth here in their entirety.

87. HAR 11-58.1-14(b) provides:

> *The design shall either:*
> *(1) Ensure that the concentration values listed in Table 1, which is incorporated by reference, or Hawaii Administrative Rules, title 11, chapter 20, whichever is more stringent, will not be exceeded in the uppermost aquifer at the relevant point of compliance, as specified by the director under subsection (e); or*
> *(2) Include a composite liner as described in subsection (c) and a leachate collection system that is designed and constructed to maintain less than a thirty-centimeter depth of leachate over the liner.*

88. **RESPONDENTS** chose to meet HAR 11-58.1-14(b)(1). WMH submitted *Point of Compliance (POC)* documents dated, May 25, 1993 to demonstrate that the proposed `alternative liner and leachate collection system are designed to meet HAR 11-58.1-14(b)(1). The assumptions made in *POC* documents dated, May 25, 1993 was that leachate head on the liner will not exceed 30 centimeters.

89. The facility has three separate leachate collection systems that feed into three separate sumps. The ash monofill leachate sump is located at the south end of the ash monofill. The MSW leachate sump that services the primary section of the MSW landfill is located at the south end of MSW Cell 4B and is referred to Sump 4B. Leachate sump E-1 is located at the southern end of MSW Cell E-1, and services only the lateral

MSW expansion cells.

90. Based on as-built drawings contained in the Ash Cell 8 CQA report prepared by A-Mehr, Inc. and dated October 8, 1998, the depth of the ash monofill sump is approximately 6 feet deep. Therefore the maximum depth of leachate allowed in the sump as to provide no more than 12 inches (30 centimeters) of leachate on the liner system is approximately 7 feet. In a letter dated August 6, 1999, A-Mehr, Inc., further states that they recommend a maximum leachate level of 5 feet be maintained within the sump.

91. On March 11, 2005, the DOH inspectors requested a copy of the leachate log maintained at the facility for the three-leachate sumps that are located within the facility. Mr. Joe Hernandez of WMH provided the log to the inspectors and the log shows that the last time the ash monofill leachate sump was measure was back in October 28, 2003.

92. On March 11, 2005, the DOH inspectors located the ash monofill leachate sump at the south end of Ash Cell 8 and measured the leachate inside the sump. The leachate depth was measured with the facility's pre-marked six-foot solid rod attached to a rope and inserted into the vertical manhole sump. The homemade measuring device was lowered into the bottom of the manhole and next to the PVC pipeline used to pump the leachate out of the sump. Leachate measurements collected from the sump indicated 14 feet 2 inches of leachate inside the sump, or approximately 8.2 feet of leachate on the liner system.

93. On March 15, 2005, the DOH inspectors measured the leachate sump using the same six-foot solid rod and attached rope. Again, the homemade measurement device was lowered inside the sump. The device was removed, placed on the ground and measured with a tape measure. The rope was used because it showed a wet mark with an indication of the amount of liquid inside the sump. The inspectors recorded a measurement of 22 feet 8 inches of leachate inside the sump, or approximately 16 feet 8 inches of head on the liner system.

94. From March 16, 2005 to June 16, 2005 leachate was observed by DOH to be seeping and ponding at the bottom slopes outside of the lined cell areas fronting ash cell 8 and MSW cell E-1.

95. On March 22, 2005, the DOH inspectors visited the site and measured the leachate sump manhole utilizing the same pipe and rope. The inspectors recorded a measurement of 22 feet 3 inches of leachate inside the ash monofill sump, or approximately 16.3 feet of leachate head on the liner system. The water truck was parked near the sump and the fill pipe was connected to the water truck. No leachate was being pumped into the water truck at that time.

96. In a letter dated June 22, 2005, WMH provided leachate logs for the ash sump,

which indicated that leachate level of 22 feet was measured on February 9, 2005.

97. Sometime between July 15, 2005 and July 22, 2005, the leachate head on the liner system was lower to below the maximum head allowance of 30 centimeters.

98. RESPONDENTS have exceeded the maximum leachate head allowance of 12 inches or 30 centimeters on the ash monofill liner for at least 156 days, in conflict with their POC, dated May 25, 1993 and in violation of HAR 11-58.1-14(b)(1).

COUNT VI

(Exceedance of leachate head on liner in MSW Cell E-1 sump)

99. Paragraphs 1 through 98 above are incorporated herein by this reference as if they were set forth here in their entirety.

100. In WMH's letter dated June 22, 2005, they state that MSW Cell E-1 leachate sump was initially installed in November 2003.

101. Based on a design drawing of the E-1 sump, dated August 22, 2003, and provided by WMH, the depth of the sump is 3 feet. Therefore the maximum depth of leachate allowed in the sump as to provide no more than 12 inches (30 centimeters) of leachate on the liner system is 4 feet.

102. On March 11, 2005, the DOH inspectors requested a copy of the leachate log maintained at the facility for the three-leachate sumps that are located within the facility. Mr. Joe Hernandez of WMH could not produce a leachate log for MSW Cell E-1 sump.

103. On March 22, 2005, the DOH inspectors measured the hose attached to the pump leading to the bottom of MSW Cell E-1. The inspectors measured the hose and determine that the hose length is 80 feet long to the bottom of the sump. The inspectors pulled out 30 feet of hose from the lateral leachate line when the pump reached air and stopped pumping leachate. Based on the angle of the leachate riser (2:1) and the measured length of leachate in the pipe, DOH calculated that the vertical depth of the leachate in the sump is approximately 10.4 feet, or 7.4 feet on the liner.

104. On April 11, 2005, the inspectors observed a large puddle of leachate ponding at the bottom slope of MSW Cell 4-B. The leachate was seeping from the bottom slope of MSW Cell E-1.

105. On April 15, 2005, DOH inspector observed test holes at the bottom slope of MSW Cell E-1 filled with leachate. The test holes were about five foot in depth and contained approximately three feet of leachate.

106. In a letter dated June 22, 2005, WMH provided a leachate log for the E-1 Sump,

which lists 74 feet of leachate measured on April 29, 2005 and May 26, 2005.

107. Sometime between July 22, 2005 and August 1, 2005, WMH reported that leachate head no longer exceeds 30 centimeters on the liner system.

108. RESPONDENTS have exceeded the maximum leachate head allowance of 12 inches or 30 centimeters on the MSW E-cell liner for at least 123 days, in conflict with their POC, dated May 23, 1993 and in violation of HAR 11-58.1-14(b)(1).

COUNT VII

(Failure to Measure Leachate Levels and to Maintain Records on Leachate Levels in Cell 4B Sump)

109. Paragraphs 1 through 108 above are incorporated herein by this reference as if they were set forth here in their entirety.

110. Solid Waste Management Permit Number LF-0054-02, Special Condition III, Item 6 provides:

> *The permittee shall implement the final Groundwater and Leachate Monitoring Plan dated October 7, 1995, and revised in June 1997.*

111. The facility's Groundwater and Leachate Monitoring Plan dated October 7, 1995 and revised in June 1997, states in Section 4.2 *Leachate Monitoring:*

> *For the MSW landfill, the sump which is located in cell 4B, is checked monthly for any traces of liquids. Monitoring is done manually through the use of a steel tape which is lowered down the leachate extraction riser. If liquids are detected at any time during the monthly checks, monitoring frequency is increased to weekly until it is determined that liquid levels have stabilized or evacuation of liquids is required.*

112. Solid Waste Management Permit Number LF-0054-02, General Conditions I, Item 9b and 9c provides:

> a. *The permittee shall retain at the facility or other location designated by this permit, records of all monitoring information...copies of all reports required by this permit, and records of all data use to complete the application for this permit. The time period of retention shall be a minimum five (5) years unless otherwise specified by the Director. The groundwater, leachate, and air monitoring data must be maintained through the closure and post-closure periods.*
> b. *Records of monitoring information shall include:*

- *The dates, exact place, and time of sampling or measurements;*
- *The person responsible for performing the sampling or measurements;*
- *The date(s) analyses were performed;*
- *The person responsible for performing the analyses;*
- *Analytical techniques or methods used; and*
- *Results of such analyses.*

113. On March 11, 2005, the DOH inspectors requested a copy of the leachate log maintained at the facility for the three-leachate sumps that are located within the facility. Mr. Joe Hernandez provided the log to the inspectors and the log shows that the leachate sump in MSW Cell 4-B has not been measured since May 2003.

114. In a letter dated June 22, 2005, WMH provided another copy of the leachate log, which indicated that the leachate level in MSW Cell 4B could not be measured since June 2003, due to "lost measuring unit". The log continues to document the inability to measure until October 2003.

115. In the letter dated June 22, 2005, WMH stated that the 4-B sump has been inaccessible during the 2003-2005 time period due to a blockage of the riser by equipment used to take water level readings. The riser has recently been cleared of the obstruction, however, as of August 15, 2005, no leachate level measurements have been taken since May 2003.

116. RESPONDENTS have violated Solid Waste Management Permit Number LF-0054-02, Special Condition III, Item 6 and General Conditions I, Items 9b and 9c, and their Groundwater and Leachate Monitoring Plan, for not measuring leachate levels and/or maintaining records from at least June 2003 to July 2005.

COUNT VIII

(Failure to Measure Leachate Levels and to Maintain Records on Leachate Levels in the Ash Monofill Sump)

117. Paragraphs 1 through 116 above are incorporated herein by this reference as if they were set forth here in their entirety.

118. Solid Waste Management Permit Number LF-0054-02, Special Condition III, Item 6 provides:

> *The permittee shall implement the final Groundwater and Leachate Monitoring Plan dated October 7, 1995, and revised in June 1997.*

119. The facility's Groundwater and Leachate Monitoring Plan dated October 7, 2005

and revised in June 1997, states in Section 4.2 *Leachate Monitoring:*

> *For the ash landfill, the leachate monitoring and sump evacuation procedures are similar to MSW landfill. In the existing operating area of the ash landfill, a manhole serves as the leachate collection system sump (ash cell 1). This sump is also monitored monthly, as well as following significant rainfall events, by lowering a steel tape to the bottom and checking liquid level.*

120. On March 11, 2005, the DOH inspectors requested a copy of the leachate log maintained at the facility for the three-leachate sumps that are located within the facility. Mr. Joe Hernandez provided the log to the inspectors and the log shows that the leachate sump in the ash monofill has not been measured since October 2003.

121. In a letter dated June 22, 2005, WMH provided another copy of the leachate log, which indicated that the leachate level in the ash monofill was not measured between October 28, 2003 and February 9, 2005.

122. RESPONDENTS have violated Solid Waste Management Permit Number LF-0054-02, Special Condition III, Item 6 and General Conditions I, Items 9b and 9c, and their Groundwater and Leachate Monitoring Plan, for not measuring leachate levels and/or maintaining records from at least November 2003 to January 2005.

COUNT IX

(Failure to notify DOH of noncompliance on equipment blockage in MSW Cell 4-B leachate lateral line and inability to measure leachate levels)

123. Paragraphs 1 through 122 above are incorporated herein by this reference as if they were set forth here in their entirety.

124. On March 11, 2005, inspectors were told by Joe Hernandez and based on leachate logs provided that the leachate sump in MSW Cell 4-B has not been measured since May 2003. No written notification was submitted to the department.

125. The facility claims that a "Lizard" (a device with wheels used to lower measuring equipment inside the lateral pipe) was stuck inside the lateral leachate pipe and blocked the line, thus WMH was unable to properly measure or pump the leachate.

126. Solid Waste Management Permit Number LF-0054-02, General Conditions I, Item 5 provide:

> *If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in the permit, the permittee shall notify the Department orally within 24 hours followed by a written incident report within seven days of the oral notification. The written incident report shall contain the*

following information:

a. *A description of and the cause of noncompliance;*
b. *The period of noncompliance, including exact dates and times, or, if not corrected, the anticipated time the noncompliance is expected to continue; and*
c. *Steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.*

The permittee shall be responsible for any and all damages, which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

The use of an electronic facsimile device (FAX) for use in notifications is acceptable. Any data transmission or detailed explanations transmitted shall be accompanied by regular mail submissions. Failure to notify in accordance to this requirement may initiate enforcement action.

The reporting requirements of General Condition I, Condition 5 does not apply if the following conditions are met:

a. *Failure to comply will not create an immediate and significant risk to health, safety, or the environment;*
b. *The permittee is using its best efforts to comply; and*
c. *The permittee will be able to comply within 30 days.*
d. *With the exception that all incidents of fire or releases/spills over 25 gallons shall be reported.*

127. In the letter dated June 22, 2005, WMH stated that the 4-B sump has been inaccessible during the 2003-2005 time period due to a blockage of the riser by equipment used to take water level readings. The riser has recently been cleared of the obstruction, however, as of August 15, 2005, no leachate level measurements have been taken since June 2003.

128. On or about May 20, 2005, WMH was able to retrieve the "lizard" from the lateral leachate pipe. As of August 15, the facility has not measured leachate level and has not removed the leachate from the lateral sump.

129. RESPONDENTS have violated Solid Waste Management Permit Number LF-0054-02, *General Conditions I, Item 5 by* not notifying DOH of the problem and failure to provide a written notification.

COUNT X

(Failure to Notify DOH of Noncompliance in a Timely Manner on the Exceedences of Permit Grades and Submission of the AORs)

130. Paragraphs 1 through 129 above are incorporated herein by this reference as if they were set forth here in their entirety.

131. On January 26, 2005, during a meeting between DOH and WMH, WMH notified DOH of the exceedence of waste above permitted grades.

132. On February 7, 2005, DOH issued a warning letter stating oral notification on noncompliance issues (exceedence of permitted grades, and failure to submit AOR information) has not been provided in a timely manner, that an incident report has not been submitted, in violation of General Conditions I, Item 5.

133. Solid waste Management Permit Number LF-0054-02, General Conditions I, Item 5 provide:

> *If for any reasons, the permittee does not comply with or will be unable to comply with any condition or limitation specified in the permit, the permittee shall notify the Department orally within 24 hours followed by a written incident report within seven days of the oral notification. The written incident report shall contain the following information:*
>
> *a. A description of an the cause of noncompliance;*
> *b. The period of noncompliance, including exact dates and times, or, if not corrected, the anticipated time the noncompliance is expected to continue; and*
> *c. Steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.*
>
> *The permittee shall be responsible for any and all damages, which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.*
>
> *The use of an electronic facsimile device (FAX) for use in notification is acceptable. Any data transmission or detailed explanations transmitted shall be accompanied by regular mail submissions. Failure to notify in accordance to this requirement may initiate enforcement action.*
>
> *The reporting requirements of General Condition I, Condition 5 does not apply if the following conditions are met:*
> *a. Failure to comply will not create an immediate and significant risk to health, safety, or the environment;*
> *b. The permittee is using its best efforts to comply; and*
> *c. The permittee will be able to comply within 30 days.*
> *d. With the exception that all incidents of fire or releases/spills over 25 gallons*

shall be reported.

134. On February 3, 2005, WMH submitted a written incident report, notifying the DOH of the exceedences. The incident report did not include all of the requirements specified in General Condition I, Item 5.

135. On February 22, 2005, WMH submitted another incident report, reiterating the written notification on the exceedences on the permitted grades and providing additional information in an attempt to meet the requirements of General Condition I, Item 5.

136. In the February 22, 2005 incident report, WMH states:

Second, under separate cover, we are providing you with a copy of the 2004 Annual Operating Report (AOR) as required in the permit. Oral notification was provided in July 2004 to Mr. Gary Siu of the DOH that this report would be delayed due to information required from the annual topographic survey/ Additional written notification of the delay was provided to Mr. Siu in December 2004. These aerial flyovers of the landfill have been scheduled during January of each year for the benefit of reporting to the City and County of Honolulu. Steps will be taken to prevent recurrence by our commitment to reschedule all future aerial flyovers in June of each calendar year to coincide with the timing of the AOR.

Third, under separate cover, a completed 2003 AOR is being provided to you with the information that was required in the February 7 letter. This information was incomplete due to our misunderstanding of the new requirements in the permit, which was issued May 15, 2003.

137. On February 22, 2005, WMH submitted a revised 2003 AOR dated February 20, 2005 and the 2004 AOR dated February 20, 2005. The AORs utilized aerial topographies dated March 24, 2003 and January 15, 2004, respectively.

138. In a letter dated March 29, 2005, WMH states "Ash placement above the approved 2002 grades in the ash disposal cells was noted following the flyover conducted in January 2004."

139. RESPONDENTS were in violation of Solid Waste Management Permit Number LF-0054-02, General Conditions I, Item 5 for notifying the DOH over a year after WMH first noted permitted grade exceedences, and providing written notification on the delay of the 2004 AORs over 4 months after the date the document was due.

COUNT XI

(Unauthorized storage of material on the ash monofill)

140. Paragraphs 1 through 139 above are incorporated herein by this reference as if they were set forth here in their entirety.

141. Solid Waste Management Permit Number LF-0054-02, Special Condition IIIB, Item 5 provides:

> *No storage of material is allowed on the MSW ash landfill area.*

142. The Facility's Operating Plan, dated July 2004, Section 5.9.5. Use of Filled Areas provides:

> *Developed or filled areas of the ash monofill will not be used for other activities. Specifically, they will not be used for storage of green waste, tires, white goods or unacceptable wastes removed from the MSW landfill. The only use that may be made of ash monofill areas is for temporary soil stockpiling, provided the affected ash monofill area has received intermediate soil cover.*

143. On January 28, February 8, 9, 17 and 24, 2005, the inspectors noticed a large stockpile of rocks mixed with dirt located on portions of MSW ash Cell 4/5 and MSW Cell 5 and 4B.

144. From around March 2005, the rock stockpile started to be moved and used in the construction of the stability berm fronting the ash monofill.

145. In a letter dated March 29, 2005, WMH stated that the placement of the rock stockpile from the construction of MSW Cell E-1 occurred in July 2003.

146. RESPONDENTS stockpiled rocks mixed with soil on the MSW ash landfill area in violation of facility's permit Special Conditions IIIB, Item 5 and facility's Operations Plan Section 5.9.5.

COUNT XII

(Failure to manage and ban the acceptance of special waste)

147. Paragraphs 1 through 146 above are incorporated herein by this reference as if they were set forth here in their entirety.

148. Solid Waste Management Permit Number LF-0054-02, Special Condition IIIA, states that the items under Special Conditions IIIA, are to be included in the Operating Plan and implemented accordingly as specified in Special Condition III, Item 11.

149. Solid Waste Management Permit Number LF-0054-02, Special Condition IIIA,

Item 14 provides:

> ***Adequate Storage Procedures*** *for green waste, scrap vehicles, tires, and white goods shall be included in a written plan with record keeping to prevent vector and pollution problems. Bulk green waste, scrap vehicles, tires and white goods may not be disposed of at any solid waste facility in accordance with 11-58.1-65(b) and (c).*

150. HAR 11-58.1-65 Special solid waste controls. Subsection (c) provides:

> *Scrap automobiles, white goods, and tires. Scrap automobiles may not be accepted at disposal facilities permitted under these rules. White goods and motor vehicle tires may not be accepted at disposal facilities permitted under these rules after June 30, 1994. A plan must be developed by the operator of solid waste disposal facility and included in the facility operations plan to implement this ban.*

151. The Facility's Operating Plan, dated July 2004, Section 5.7, Storage and Disposition of Non-Disposable Waste states:

> *WGSLF does not accept for disposal the following categories of waste which are prohibited for disposal by Hawaii solid waste regulations:*
>
> •Tires
>
> *Tires are placed in a roll-off bin and stored until a full container is accumulated, at which time they are transported to an approved tire recycler. The bin is covered with a tarp to keep rain out and prevent vectors from using the tires.*

152. The inspectors at no time observed a roll-off bin to store the tires as stated in the facility's Operating Plan. As of July 27, 2005, the inspectors have not observed a roll-off bin for used tire storage on site.

153. During DOH's February 9, 2005 inspection, the inspectors witnessed the operator bury two whole tires at the workface of the facility. At no time did the dozer operator attempt to push the tires on the side for later recovery. The operator instead covered the tires with solid waste and continued to compact the trash at the workface. The observation of the tire burial was observed from the top of MSW Cell 1.

154. On February 17, 2005, DOH inspectors observed four whole tires on the side slopes of MSW Cell E-1. A few of the tires were partially buried with soil. The facility's Environmental Coordinator was notified of the noncompliance issue.

155. On March 11, 2005, the Inspectors noted that the tires observed on the side slope of MSW Cell-1 had not been removed from the February 17, 2005 visit.

156. On May 1, 2005, the inspectors observed the compactor operator at the workface bury a whole tire.

157. On May 1, 2005, an inactive area fronting MSW E-1 was observed by the inspectors with three whole tires partially buried with soil and MSW. The operator was alerted of the buried tires and said that he will remove the tires the next day.

158. On May 1, 2005, after the operators were done for the day, the inspectors walked the workface area and observed a whole tire buried in the soil.

159. On May 19, 2005, the inspectors observed a whole tire on the active workface of MSW Cell E-1 (northeast corner). A short time later, the inspectors observed the dozer operator cover the used tire with MSW.

160. On six separate occasions, the RESPONDENTS have improperly buried whole tires at the facility, in violation of HAR 11-58.1-65(c), Special Condition IIIA, Item 14, and facility's Operating Plan, Section 4.7.

COUNT XIII

(Failure to maintain records and record location of asbestos disposal at the landfill)

161. Paragraphs 1 through 160 above are incorporated herein by this reference as if they were set forth here in their entirety.

162. Solid Waste Management Permit Number LF-0054-02, Special Condition IIIA, Item 9 provides:

Asbestos Disposal, a written plan with recordkeeping shall be prepared to ensure that the disposal of asbestos waste is in accordance to current NESAHP (National Emission Standards for Hazardous Air Pollutants) regulations, 40 CFR 61.

163. The Facility's Operating Plan, dated July 2004, Section 5.6.2. Special Waste Procedures states:

> *Asbestos*
> *Special procedures applicable to asbestos waste are detailed in the Asbestos Disposal Plan. This plan contains measures to ensure that the requirements of 40 CFR 61.154 (National Emission Standards) are met at WGLF. After complying with all special waste acceptance procedures, asbestos waste transporters are allowed entry to the site at a pre-schedule time. After inspection of the load to ensure it meets all*

packaging requirements, the transporter proceeds to a prepared disposal trench, and discharges the load. All asbestos waste is covered with MSW and 6 inches of daily cover. Documentation of the date, time, names of the waste generator and transporter and location within the site where the waste was disposed are placed in the site's permanent operating records.

164. Facility's Operating Plan, dated July 2004, Section 8.13 Asbestos Disposal records states:

> *WGSLF is required by permit to maintain a record of each load of asbestos waste disposed at the site. Information to be recorded includes the type of waste, source and location, preferably by GPS or survey coordinates, of its disposal location in the landfill. Asbestos disposal records may be incorporated in the records of the hazardous waste exclusion or special waste screening programs.*

165. In a letter dated May 23, 2005, DOH requested WMH to provide special waste disposal logs, and disposal locations for the asbestos received at the facility for the past two years.

166. In a letter dated June 22, 2005, WMH provided copies of the daily logs on the disposal of accepted asbestos waste for the past two years. WMH claims that they have been unable to locate records on the disposal locations for asbestos waste at the landfill for the last two years.

167. As of July 27, 2005, WMH does not have records to provide to DOH showing disposal locations for the asbestos waste disposed at the landfill.

168. The RESPONDENTS failed to record and maintain records regarding the location of asbestos disposal in violation of Special Conditions III, Item 11 and the facility's operating plan.

COUNT XIV

(Failure to cover a dead animal)

169. Paragraphs 1 through 168 above are incorporated herein by this reference as if they were set forth here in their entirety.

170. Solid Waste Management Permit Number LF-0054-02, Special Condition IIIA, Item 10 provides:

> ***Dead Animals and Offal**, shall be addressed by a written plan requiring a minimum of two feet of soil, solid waste or other approved cover material*

and be compacted before the end of the workday.

171. The Facility's Operating Plan, dated July 2004, Section 5.6.2, provides:

- *Specialized procedures will be used to manage the categories of special waste described in this section:*

  Dead Animals and Offal
  Dead animals and offal (hides, intestines, and other waste from slaughtered animals) is not subject to special waste acceptance procedures, but will be identified by the transporter at the scale house. Loads known to contain dead animals or offal, and such wastes discovered incidental to other loads after dumping at the active face, will be placed in an area where they can be covered with additional solid waste immediately after being placed. Wherever possible, this will be accomplished by excavating it in the solid waste at the working face, placing the animal waste in it, and filling back in with MSW. Any areas that have received animal waste will be covered with daily cover soil at the end of the working day.

172. On February 17, 2005, the inspectors noticed along the bottom of MSW Cell E-1, a partially covered dead animal away from the landfill's workface area. The distance from the workface area to the dead animal was over 300 feet away.

173. On February 17, 2005, Mr. Hernandez was advised of the dead animal located at the bottom of MSW Cell E-1.

174. On March 15, 2005, Mr. David Fuiava informed the inspectors that the dead animal was discovered four days after acceptance and subsequently buried.

175. RESPONDENTS failed to properly handle a dead animal at the facility by not covering the dead animal with soil or waste immediately, which has resulted in violations of the facility's permit special conditions and facility's Operating Plan.

COUNT XV

(Failure to Submit Annual Surface Water Management Plan)

176. Paragraphs 1 through 175 above are incorporated herein by this reference as if they were set forth here in their entirety.

177. Solid Waste Management Permit Number LF-0054-02, Special Condition III, Item 11h provides:

The Surface Water Management Plan shall be updated annually and filed with

the Department by no later than September 1 of each year. It shall contain the following information:

(1) Report of an annual inspection of surface water management features and facilities, together with a description of required maintenance and changes;

(2) Updated drawings showing current topography of the landfill, surface water drainage system modifications planned for the next year in response to waste filling;

(3) Engineering calculations documenting the capability of the surface water management system to comply with the run-on and run-off requirements listed under 3 (a) above; and

(4) Any Storm Water Pollution Prevention Plan or Spill Prevention Control and Countermeasure Plan prepared pursuant to federal requirements under the Clean Water Act.

178. The Facility's Operating Plan, dated July 2004, Section 6.8.5 Annual Update of Surface water Management Plan, provides:

WGSL will prepare and submit to HDOH an annual update to the surface water management plan, by September 1 of each year. The annual surface water report will contain the following information:

- Results of an inspection of surface water management features and facilities, together with a description of recommended maintenance and changes;
- Updated drawings of the surface water management system;
- Engineering calculations confirming the capacity of the system;
- Any updates to the site's SPCC Plan

179. In a letter dated May 23, 2005, DOH requested the September 2003 and September 2004 annual updates as required by the permit.

180. In a letter dated June 22, 2005, WMH stated that they have not been able to locate the annual updates for 2003 and 2004.

181. To date, the DOH has not received the annual updates for 2003 and 2004. The facility has failed to comply with the facility's permit Special Conditions III, Item h Surface Water Management Plan and facility's Operations Plan Section 6.8.5, Annual Update of Surface Water Management Plan.

COUNT XVI

(Failure to control the generation of dust from vehicular traffic)

182. Paragraphs 1 through 181 above are incorporated herein by this reference as if

they were set forth here in their entirety.

183. Solid Waste Management Permit Number LF-0054-02, Special Condition III, Item 11 and 11m provides:

> *A revised written **Operating Plan** shall be prepared and filed with the Department, no later than 90 days after receipt of this permit. The permittee shall implement the plan upon submission to the Department; however, the Department may require revision to the written plan as a condition of approval. The revised **Operating Plan** shall include the following topics:*
>
> ***Mud and Dust Prevention Program,** a written plan for minimizing the tracking of mud onto public roads, or the generation of dust from vehicular traffic on site. The plan shall contain measures related to on-site road maintenance and cleaning, provision of a wet-weather disposal area, and an area for the wash-down of trucks or truck wheels prior to leaving the site. The possible methods include: rumble strips, drive-through tire wash, trash clean out pad, or wash pad.*

184. The Facility's Operating Plan, dated July 2004, Section 6.3 Mud and Dust states:

> *WGSLF personnel are responsible for preventing the emission of excessive dust from the facility. The site's water trucks are used during dry weather to spray water on access roads and other areas generating wind-blown dust. The volume of water and frequency of spraying is increased as needed during particularly dry and windy conditions.*

185. On February 9, 2005, DOH inspectors noticed the significant generation of dust from vehicular traffic ingress and egress down the road by MSW Cell 1 near the landfill's workface and surrounding area. DOH inspectors did not see a water truck being used to minimize the generation of fugitive dust during the two plus hours spent on site for the inspection. It takes approximately 15 minutes to fill the 5,000-gallon water truck and an additional 15 minutes to empty the truck of its contents. Inspectors outbriefed, Mr. Steve Cassulo, General Manager, of the noncompliance issues and said that the water truck was pumping leachate from manholes at the facility.

186. On February 17, 2005, DOH revisited the site and noticed heavy vehicular dust generation starting from the bottom road to the facility's workface area. The dirt areas near the workface and roads were observed to be very dry. The facility did not have a water truck in use at the site to spray for dust and to control dust problem.

187. On many site visits the DOH inspectors requested WMH to spray the main road leading into the landfill and near the workface area with water due to the heavy dust

generation from vehicular traffic or windy conditions at the site.

188. RESPONDENTS have violated Solid Waste Management Permit Special Condition III, Item 11 and Facility's Operating Plan Section Requirement 5.3 on at least two occasions.

COUNT XVII

(Failure to minimize free litter generation in the landfill)

189. Paragraphs 1 through 188 above are incorporated herein by this reference as if they were set forth here in their entirety.

190. Solid Waste Management Permit Number LF-0054-02, Special Condition IIIA, Item 8 provides:

> ***Litter Control,*** *a written plan with record keeping shall be prepared to provide measures to minimize free litter in the landfill and prevent its occurrence beyond the property line of the facility. The plan shall contain, at a minimum, the following information:*
>
> a. *Design of portable litter screens, the number of screens available on the site, and a description of how they are to be deployed under various operating conditions;*
> b. *Design and location of permanent or semi-permanent litter screen fences;*
> c. *Special procedures to be followed during the period when the H-Power waste-to-energy plant shuts down and the volume of municipal solid waste increases above quantities; and*
> d. *Procedures for litter prevention and cleanup in the event of a major windstorm or other incident in which litter escapes the normal litter containment systems.*

191. The Facility's Operating Plan, dated July 2004, Section 6.4, Litter states:

> *WGSLF uses permanent litter fences, portable screens, and routine site cleanup operations to prevent wind-blown litter from leaving the landfill premises and creating nuisance conditions in the area. These litter control program elements are described below:*
>
> • *Portable litter screens, typically 12 feet and 20 feet wide, are located in downwind locations near the active MSW disposal area as the first line of defense against litter. The screens are relocated frequently as the active area moves across the site.*

• Approximately 600 lineal feet of 30-foot tall permanent litter fence is installed between the ash monofill and the MSW fill area, as the second line of defense.

• The chain link fence surrounding the lower elevation areas of the WGSLF property provide a final level of physical containment of any litter that leaves the active working area.

• Routine site cleanup and litter collection are the final elements of the litter control program. WGSLF personnel remove litter from portable screens and permanent fences on a daily basis, clean haul roads weekly, and pick up litter anywhere on the site at any time. In the event of a major wind storm that creates excessive litter, temporary personnel are brought in on as as-needed basis to collect litter, both on and off the WGSLF property as needed. Additional personnel are also made available as needed during the period when the H-Power plant shuts down and MSW volume increases above normal levels.

• Information will be included in the site's daily operating log to document unusual litter problems or control activities, including instances when temporary personnel are used to collect or control litter on or off-site.

Daily records are kept of litter control activities, and maintained in the site's operating record.

192. The Facility's Operating Plan, dated July 2004, Section 8.12, Litter Control Records states:

> *A daily record will be kept of litter control activities, and maintained in the operating record. The log will contain information on the wind conditions each day, the number of litter control personnel on site, and the volume of litter collected.*

193. On February 17, 2005, DOH visited the facility and from the top of MSW Cell 1, a large accumulation of blown litter was observed on the permanent perimeter litter fence and portable screens. At the time of inspection the wind velocity was 15 to 18 MPH from a northeasterly direction.

194. The DOH inspectors also observed other areas of the landfill beyond the litter fences to include the front area of workface, side slopes of MSW Cell E-1 and the road leading to the top of the landfill with litter accumulation and wind blown litter. At no time did the inspectors observe anyone picking up litter at the facility. However, documents provided by the facility, shows that two temporary personnel were on site picking up

litter. One individual worked from 7:30 A.M. to 11:30 A.M. and the other litter picker worked from 7:00 A.M. to 3:30 P.M. The facility does not keep a log indicating the number of personnel utilized on a daily basis and the number of bags collected by the temporary help.

195. On February 24, 2005, DOH visited the site and observed litter downgradient of the workface and on an area by MSW Cell 1. The inspectors did observed a temporary litter picker collecting litter near the mobile fences. On the north side bottom slope of MSW Cell E-1, two temporary litter pickers were observed collecting litter. The amount of litter observed by the inspectors at the facility and the number of temporary litter pickers observed collecting the litter were not sufficient to collect the amount of litter for the day at the facility.

196. On March 15, 2005, the inspectors observed large amount of scattered litter accumulated along the east side of the perimeter property fence adjacent to MSW Cell E-1 and outside of the property boundaries. No litter pickers were observed in the immediate area.

197. The facility failed to deploy or relocate portable litter fences downwind as the active workface area moves on seventeen occasions from January 28 to May 1, 2005.

198. On April 15, 2005, wind conditions were between 18 to 25 mph. The inspectors observed large accumulation of litter on the primary and secondary litter fences down gradient of the workface area. Four litter pickers were observed along the primary litter fences collecting litter, but due to the large open area of the workface (pancake fill) the litter plan was ineffective.

199. On April 20 to 22, 2005, the inspectors observed large amount of litter throughout the landfill. The facility failed to implement the require litter control plan because of the amount of MSW present and uncovered at the landfill workface area.

200. On April 25 to 28, 2005, the inspectors observed the same situation as described above with the same results, lack of daily cover generating litter.

201. On May 1, 3, 6, and 8, 2005, the inspectors continue to observed large amounts of scattered litter throughout the MSW landfill area due to lack of soil cover.

202. On May 9, 12, 15, and 19, 2005, the inspectors continue to observed accumulation of litter throughout the MSW landfill areas due to lack of soil cover.

203. On June 9, 2005, the inspectors observed large accumulation of litter along primary and secondary litter fences at the southwest area of MSW Cell E-1.

204. On June 24, 2005, the inspectors observed the southeast end slope of MSW Cell E-1 with large accumulation of litter due to lack of soil cover. WMH was advised of

the problem and they acknowledge the litter/flagging problem and management plans to dressed-up the area soon.

205. RESPONDENTS failed to implement its litter control program effectively, due to either lack or improper placement of litter fences and documentation of litter control efforts, which has resulted in violations of the facility's permit special conditions.

COUNT XVIII

(Failure to monitor explosive gases and maintains monitoring records)

206. Paragraphs 1 through 205 above are incorporated herein by this reference as if they were set forth here in their entirety.

207. HAR Section 11-58.1-15(d)(1) and (2) provides:

> *(d) Explosive gases control.*
> *(1) Owners and operators of all MSWLF units must ensure that:*
> *(A) The concentration of methane gas generated by the facility does not exceed twenty-five per cent of the lower explosive limit for methane in facility structures (excluding gas control or recovery system components); and*
> *(B) The concentration of methane gas does not exceed the lower explosive limit for methane at the facility property boundary.*
> *(2) Owners or operators of all MSWLF units must implement a routine methane monitoring program to ensure that the standards of paragraph (1) are met.*
> *(A) The type and frequency of monitoring must be determined based on the following factors:*
> *(i) Soil conditions;*
> *(ii) The hydrogeologic conditions surrounding the facility;*
> *(iii) The hydraulic conditions surrounding the facility; and*
> *(iv) The location of facility structures and property boundaries.*
> (B) *The minimum frequency of monitoring shall be quarterly.*

208. Solid Waste Management Permit Number LF-0054-02, Special Condition IIIA, Item 7 provides:

> ***Explosive Gases Control**, which shall include a written plan with recordkeeping for a routine methane gas monitoring program in accordance to HAR 11-58.1-15(d). The plan shall include a minimum*

monitoring frequency of once per month.

209. The Facility's Operating Plan, dated July 2004, Section 6.6, Explosives Gas states:

> *Methane gas is produced by anaerobic decomposition of organic components of solid waste. WGSLF implements a Site Specific Gas Monitoring Plan to ensure that methane gas does not cause safety or environmental problems. Specifically, the program must demonstrate with the requirements of HAR 11-58.1-18(d) that concentrations of methane do not exceed 25% of the lower explosive limits in facility structures, or 100% of the lower explosives limits at the property boundary. The lower explosive limit for methane is 5% by volume (50,000 ppm)*
>
> *Methane monitors are installed in the landfill office building and in the maintenance to measure explosive gas levels continuously and provide an alarm if levels reach 10,000 ppm (20% of the lower explosive limit). This program ensures that explosives gas levels in building are below the 25% limits set forth in HAR 11-58.1-18(d).*
>
> *Monitoring is conducted on a monthly basis to ensure compliance with HAR 11-58.1-18(d)(1)(B), which specifies that the concentration of methane gas at the property boundary shall not exceed the lower explosive limit. Under this program, barhole monitoring is conducted along the perimeter of the site, measuring methane concentrations to depths of about 3 feet.*
>
> *A monthly summary of gas monitoring results is placed in the operating record.*
>
> *To date, minimal methane has been detected at WGSLF. Should this change in the future, a landfill gas collection and treatment system will be developed to minimize potential gas migration problems.*

210. In a letter dated May 23, 2005, DOH requested all reports on all explosive gas monitoring data collected in accordance with explosive gas requirements in permit, LF0054-02 and HAR 11-58.1 from 2003.

211. In a letter dated June 22, 2005, WMH provided explosive gas monitoring data for 2005, but could not find data collected for prior years.

212. RESPONDENTS failed to monitor for explosive gases in 2003 and 2004, in violation 11-58.1-15(d), Special Conditions III Item 11 and Special Conditions IIIA Item 7, General Conditions I Item 9, and the facility's Operating Plan.

D. FINDINGS

On the basis of the provisions of Jurisdiction and Statement of Facts cited above, it is hereby found and determined that:

213. RESPONDENTS are therefore subject to the provisions of sections 342H-7 *Enforcement*, 342H-9 *Penalties*, 342H-10 *Administrative Penalties*, and 342H-11 *Injunctive Relief*, HRS, including penalties not to exceed $10,000 for each day of each violation.

DATED: Honolulu, Hawaii JAN 3 1 2006.

DEPARTMENT OF HEALTH
STATE OF HAWAII

LAURENCE K. LAU
Deputy Director for Environmental Health

APPROVED AS TO FORM:

KATHLEEN S.Y. HO
Deputy Attorney General

IN THE DEPARTMENT OF HEALTH

STATE OF HAWAII

DEPARTMENT OF HEALTH, STATE OF HAWAII, COMPLAINANT, vs. WASTE MANAGEMENT OF HAWAII, INC. AND CITY AND COUNTY OF HONOLULU RESPONDENTS	)	DOCKET NO.05-SHW-SWS-004 Waimanalo Gulch Sanitary Landfill (Solid waste management rules and Permit Conditions) ORDER

ORDER

Pursuant to chapter 342H, Hawaii Revised Statutes, the Department of Health's Solid Waste Management Control rules, and the attached Notice and Finding of Violation made this day in Docket No. 05-SHW-SWS-004, Waste Management of Hawaii, Inc. and City and County of Honolulu, Department of Environmental Services, hereinafter "RESPONDENTS," are hereby ordered to:

1. Immediately implement a full-time spotter for the hazardous waste and special waste-screening program as defined in the facility permit conditions. The spotter shall stop any unauthorized solid waste disposal

such as, whole tires, white goods, and lead acid batteries. Spotter and equipment operators shall be considered separate positions.

2. Continue to develop, revise and implement a revised groundwater monitoring plan that was developed to expand monitoring coverage for the entire landfill, and seepage areas, as requested in our letter dated July 27, 2005 to Mr. Paul Burns of Waste Management of Hawaii, Inc. The development, revision and implementation of a revised groundwater monitoring plan shall follow the proposed timeline presented with your Tidal Study Results and Groundwater Monitoring Well Network, prepared by EarthTech and dated December 15, 2005.

3. Remove the storage of all materials from the ash monofill and MSW landfill area with the exception of cover material. All stockpiled soil materials, except continuously operated stockpiles of less than one-week capacity, shall have stormwater/erosion controls and shall not exceed permit grades. Stockpiled soil materials shall not impede surface water drainage paths to conveyance channels. Only stockpiled soil materials for use as daily or intermediate cover are allowed on the active portion of the landfill, with a maximum capacity of 3 months and in not more than two stockpiles.

4. Place daily cover on the active MSW workface at the end of each workday. Submit daily-cover-verification photographs of the active MSW work area at noon and at the end of the workday. The photographs shall be identified with date and time of photograph, cell number, and name of responsible person taking the photo. The photographs taken on the same day shall be taken from the same perspective.

5. Operate only one workface in the ash monofill at any given time. In accordance with Solid Waste Management Permit Number LF-0054-02, Special Conditions IIIB, Item 1e, fresh MSW ash material may be used as daily cover material for the ash monofill provided that Special Conditions IIIB, Items 1a, b, c and d are met and such usage is limited to the active area where MSW ash is being placed on a daily basis. If this condition cannot be met, then fresh MSW ash may not be used and daily soil cover shall be place. If fresh MSW ash is used as daily cover, intermediate cover shall be placed over the MSW ash at least every 7 days to control fugitive dust. Submit daily/intermediate cover verification photographs of the active MSW ash workface at noon and at the end of the workday. The photographs shall be identified with the date and time of photograph, cell number and name of responsible person taking the photo. The

photographs taken on each workface and cell shall be taken from the same perspective.

6. Within thirty (30) days of this order becoming final, complete or submit the following items to the department for review and approval:

   a. A plan and time schedule for the construction of the MSW leachate manhole in MSW Cell 4B. The RESPONDENTS shall implement the plan in accordance with the approved time schedule. The leachate manhole shall be constructed to allow for automated and manual measurements of leachate head on the liner system, and automated pumping of leachate. The overflow of leachate generated in the MSW cell into the ash cell is not acceptable.

      Upon the completion of the leachate manhole construction in MSW Cell 4B, revise the "Groundwater and Leachate Monitoring Plan," dated October 7, 1997, to reflect depths and locations of all leachate sumps to include present and all new or future leachate sumps within the site including E cell lateral expansion and ash monofill leachate drain line in the ash buttress. The revised plan should include diagrams (blueprints) for any new or future leachate sumps location and provide validation of all diagrams.

   b. Install and maintain grade survey control markers to delineate the boundaries and elevations of the ash monofill and MSW landfill areas, including the delineation of overfilled areas. Submit updated drawings with grades, and height of the control markers on a quarterly basis.

   c. A plan and time schedule for the correction of the overfill areas of the ash monofill and MSW landfill to meet permit grades. The plan shall address waste capacity needs for the county until the expiration date of the landfill permit.

   d. A plan and time schedule for the management of county waste after the expiration date of the landfill. Should the City and County of Honolulu decide to continue operations at the Waimanalo Gulch Sanitary Landfill or at a different location, a <u>complete</u> solid waste management permit application shall be submitted at least one year prior to the current expiration date of Solid Waste Management Permit (LF-0054-02) for the Waimanalo Gulch Sanitary Landfill.

d. Monthly methane gas monitoring data collected from perimeter and enclosed structures. Results that exceed regulatory limits or show increasing trend should be accompanied with an explanation and type of corrective actions to mitigate the problem. The RESPONDENTS shall mitigate the situation to ensure concentrations below regulatory levels.

e. Inspect and maintain the surface water management systems, and maintain records of the inspection and any repairs. The surface water run-on controls shall maintain paths to the surface water basin and eliminate water ponding against landfill edges. The run-off controls shall direct surface water away from active workface, maintain paths including on-site silt control to surface water collection system and siltation basin, and eliminate stormwater ponding within the landfill. These records do not need to automatically be submitted to the department, however, the records and copies of the records shall be made available to the department upon request

9. Within ninety (90) days of the order becoming final, RESPONDENTS shall submit the following plans to the Department of Health for review and approval. The plans shall be implemented in accordance with the approved time schedule.

a. A plan and time schedule to repair the top decks and side slopes of the ash monofill and MSW landfill areas to ensure an appropriate cover thickness (12-inch intermediate cover).

b. A plan and time schedule on how the facility will manage the disposal of asbestos and maintain disposal location information to ensure that present and future asbestos material can be located/avoided in the future. Provide 30-day advance written notification to DOH on any future drilling/excavation through waste, including any future installation of gas collection wells. The notification shall include excavation/drilling plans and locations.

c. A plan and time schedule describing how the facility will keep litter to a minimum by minimizing cell geometry, the placement of primary and secondary litter fences, wind influencing barriers and litter pickers. Records documenting litter collection such as, amount of litter collected, number of litter pickers utilized each day,

wind velocity, and speed shall be maintained and made available for department review. In addition, the workface area and litter fences shall be free of litter at the end of the workday.

d. A plan to manage waste in an event of a natural disaster (i.e. seismic event) such that the Waimanalo Gulch Sanitary landfill and ash monofill are not able to accept waste. The alternative shall provide for MSW and ash disposal, with a minimum five-year capacity, to allow for repairs / new site developments. The alternate site must be approved in accordance with Hawaii Administrative Rules Chapter 11-58.1 and meet DOH Solid Waste Management Permit requirements.

10. The duration of the activities specified in this order shall be continued as applicable until the issuance of a modified or renewed solid waste permit that would otherwise supercede Solid Waste Management Permit LF-0054-02.

11. Send to the Director of Health, within ten (10) days after this order becomes final, a certified check payable to the State of Hawaii in the amount of two million seven hundred sixty nine thousand six hundred sixteen dollars ($2,769,616).

Paragraphs 1 to 11 of this Order and the Notice and Finding of Violation shall become final and effective twenty (20) days after receipt, unless the RESPONDENTS submit a written request to the Director for a hearing pursuant to section 342H-7, H.R.S. before the twenty (20) days are up. If a hearing on paragraphs 1 to 10 of this Order and the Notice and Finding of Violation is requested, it will be held in conjunction with the hearing on the penalty imposed by paragraph 11 of this Order.

If a hearing is requested, it will be held on a date, time, and place to be specified later. The hearing will be conducted in accordance with Chapter 91, H.R.S. and the Rules of Practice and Procedure of the Department of Health; the hearing will address the issues raised by the Notice and Finding of Violation and Order in this case. If a hearing is requested, RESPONDENTS must attend a pre-hearing conference scheduled for March 7, 2006, at 10:00am in Room 200, 1250 Punchbowl Street, Honolulu, Hawaii. At the pre-hearing conference, the date(s) of the hearing as well as other pertinent deadlines will be determined.

If you have special needs due to a disability that will aid you in participating in the hearing or pre-hearing conference, please contact the Hearings Officer at (808)

wind velocity, and speed shall be maintained and made available for department review. In addition, the workface area and litter fences shall be free of litter at the end of the workday.

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If you have special needs due to a disability that will aid you in participating in the hearing or pre-hearing conference, please contact the Hearings Officer at (808)

586-4409 (voice) or through the Telecommunications Relay Service (711), at least ten (10) working days before the hearing or pre-hearing conference date.

Parties may present evidence and argument on any issue raised by any paragraph in the Notice and Finding of Violation or Order or otherwise raised by this case. Parties may examine and cross-examine witnesses and present exhibits.

Parties may be represented by legal counsel at their own expense. An individual may appear on his own behalf, or a member of a partnership may represent the partnership, or an officer or authorized employee of a corporation or trust or association may represent the corporation, trust, or association.

After such hearing, this Order shall be affirmed, modified, or rescinded by the Director.

Please direct the written request for a hearing, if any, and all inquiries concerning this case to:

Steven Y.K. Chang, P.E., Chief
Solid and Hazardous Waste Branch
State Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801
Telephone: (808)586-4226

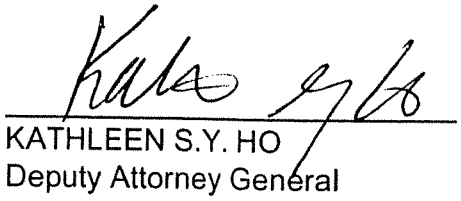
Failure to comply with this Order may subject the RESPONDENTS to additional penalties of $1,000 a day and measures under chapter 342H, H.R.S. and the rules adopted thereunder.

DATED: Honolulu, Hawaii JAN 3 1 2006

DEPARTMENT OF HEALTH
STATE OF HAWAII

LAURENCE K. LAU
Deputy Director for Environmental Health

APPROVED AS TO FORM:



KATHLEEN S.Y. HO
Deputy Attorney General

IN THE DEPARTMENT OF HEALTH

STATE OF HAWAII

Department of Health, State of Hawaii, Complainant, vs. Waste Management of Hawaii, Inc. And City and County of Honolulu, Respondents.	))))))))))))	DOCKET NO. 05-SHW-SWS-004 **SETTLEMENT AGREEMENT**

SETTLEMENT AGREEMENT

This is a Settlement Agreement ("Agreement") between the Solid Waste Section, Department of Health, State of Hawaii ("DOH"), and Waste Management of Hawaii, Inc. ("WMH") and the City and County of Honolulu, hereinafter referred to as "RESPONDENTS", to set forth RESPONDENTS' responsibilities relating to the payment of penalties and injunctive relief.

I. PRELIMINARY STATEMENT

1. On or about January 31, 2006, COMPLAINANT DOH, filed an eighteen count, Notice and Finding of Violation and Order in Docket No. 05-SHS-SWS-004 ("NFV") for certain permit violations concerning the operations and management of the Waimanalo Gulch Sanitary Landfill (the "Landfill") which is owned, operated and/or controlled by RESPONDENTS. The NFV is incorporated by reference and made a part of the settlement of this case.

2. Pursuant to HRS sections 342H-9 and 342H-10, the DOH NFV assessed a total penalty of $ 2,769,616.00 against RESPONDENTS. Shortly thereafter, to correct an error in calculating the penalty amount, DOH reduced the assessed penalty to $2,445,130.00.

3. The DOH and RESPONDENTS have agreed to conclude this enforcement action by entering into this Agreement.

II. WAIVER OF RIGHTS

4. RESPONDENTS hereby agree to waive any rights RESPONDENTS may have to a hearing on any issue relating to the factual allegations or legal conclusions set forth in the NFV.

5. RESPONDENTS admit and agree that the DOH has jurisdiction to enter into this Agreement and to enforce its terms. Further, RESPONDENTS agree that the DOH has jurisdiction and authority to compel compliance with the terms and conditions of this Agreement in an enforcement proceeding and be bound by the laws and rules of the State of Hawai'i.

III. PARTIES BOUND

6. This Agreement shall apply to and be binding upon the DOH and RESPONDENTS. RESPONDENTS agree to carry out all actions required of RESPONDENTS by this Agreement. The signatories to this Agreement certify that they are authorized to execute and legally bind the parties they represent to this Agreement. RESPONDENTS shall give notice of this Agreement to any successors in interest prior to transfer of ownership of the Landfill or of the contractor operating the Landfill. No change in ownership or corporate status of RESPONDENTS or of the Landfill shall alter RESPONDENTS' responsibilities under this Agreement without written consent by the DOH.

IV. CORRECTIVE ACTIONS AND COMPLIANCE REQUIREMENTS

7. RESPONDENTS agree to act in accordance with the Hawaii Revised Statutes, the Hawaii Administrative Rules, the conditions of their solid waste management permit and this Agreement.

7.1. RESPONDENTS shall make every practicable effort to screen waste and prevent disposal of any unacceptable waste, including but not limited to, whole tires, white goods, and lead-acid batteries, from entering and being disposed at the Landfill.

7.2. RESPONDENTS shall implement the Groundwater and Leachate Monitoring Plan dated August 2007, and any approved subsequent submissions. Groundwater and leachate samples from each monitoring well and leachate sump shall be collected and analyzed on a quarterly basis, or as required or otherwise approved by the DOH.

a. Groundwater samples shall be analyzed for constituents listed in 40 CFR 258, Appendix I, major cations and anions (Mg, Na, Ca, K, Cl, CO3, SO4, HCO3), major leachate indicators (TDS, TOC, total alkalinity, nitrogen-ammonia, Cl, and Fe), COD, nitrate-N, bromide, and field measurements (electrical conductance, pH, temperature, turbidity, and groundwater surface elevation), or as required or otherwise approved by the DOH.

b. Groundwater samples from newly installed wells shall also be analyzed for the following constituents in the first quarterly monitoring event: constituents listed in 40 CFR 258, Appendix II, major cations and anions (Mg, Na, Ca, K, Cl, CO3, SO4, HCO3), major leachate indicators (TDS, TOC, total alkalinity, nitrogen-ammonia, Cl, Fe), COD, nitrate-N, bromide, and field measurements (electrical conductance, pH, temperature, turbidity, and groundwater surface elevation), or as required or otherwise approved by the DOH.

c. Leachate samples shall be analyzed for constituents listed in 40 CFR 258, Appendix II, major cations and anions (Mg, Na, Ca, K, Cl, CO3, SO4, HCO3), major leachate indicators (TDS, TOC, total alkalinity, nitrogen-ammonia, Cl, Fe), COD, nitrate-N, bromide, and field measurements (electrical conductance, pH, temperature, and turbidity), or as required or otherwise approved by the DOH.

7.3. RESPONDENTS shall place a minimum of 6-inches of daily cover on the active MSW workface at the end of each workday, and shall leave no exposed waste. RESPONDENTS shall implement a Daily Cover Monitoring Verification Program as follows:

a. RESPONDENTS shall take digital photos of the active workface at the middle and end of each weekday (Monday through Friday), from the same perspective, to document the placement and thickness of daily cover. Digital photo records shall be maintained at the facility and submitted to the DOH via email by 12:00 noon on the next business day, with cell location information. RESPONDENTS and DOH will work cooperatively to determine the best perspective for the photos.

b. RESPONDENTS shall record the following quantitative items on a daily basis:
   i. Volume of waste disposed,
   ii. Cell geometry, and
   iii. Volume and type of daily cover used.

7.4. RESPONDENTS shall apply at least six inches of soil cover over exposed ash (not inclusive of alternative daily cover of fresh ash) every seven (7) days, or more frequently as required by the DOH. RESPONDENTS shall implement a Weekly Cover Monitoring Verification Program as follows:

a. RESPONDENTS shall take digital photos of the active ash workface on a weekly basis, prior to the placement of the weekly cover and after the weekly cover has been placed. Digital photo records shall be maintained at the facility and submitted to the DOH via email by 12:00 noon on the next business day following the day on which weekly cover was placed, with cell location information. RESPONDENTS and DOH will work cooperatively to determine the best perspective for the photos.

b. RESPONDENTS shall record the following quantitative items on a weekly basis:
   i. Volume of waste ash disposed,
   ii. Cell geometry, and
   iii. Volume of soil cover used.

7.5. RESPONDENTS shall cover all inactive ash and MSW areas with intermediate cover. Inactive areas are areas that do not receive waste (ash or MSW) within a 30-day period. RESPONDENTS shall also cover any area receiving vehicular traffic with intermediate cover, regardless of the time period since last receiving waste. Intermediate cover shall be a minimum of 12 inches of earthen material (may include six inches of soil daily cover). Particle size shall be adequate to minimize infiltration and direct stormwater to collection systems.

7.6. RESPONDENTS shall submit an application to the DOH for a permit modification to increase the maximum final grades of the ash monofill.

7.7. RESPONDENTS shall maintain the MSW leachate collection sump (4B-cell sump) leachate discharge riser and associated pumps and instrumentation. The sump leachate discharge riser shall be constructed in accordance with design drawing titled, *Sump 4B Riser* Replacement, by Sanborn, Head and Associates, Inc., dated July 26, 2007, and approved subsequent submissions. RESPONDENTS shall submit a written report, within 30 days of the Effective Date or receipt of a revised solid waste permit, whichever is earlier, documenting installation of the 4-B cell sump leachate discharge riser and associated equipment. The report shall be prepared by or approved by a professional engineer licensed in the State of Hawaii, and at a minimum, shall include the following:

a. Description of procedures for the installation of the 4-B cell sump leachate discharge riser and associated equipment,

b. Identification of any deviations from the written installation instructions, the reason for the deviations, and assessment of any effects on the usability of the sump or human health and the environment.

c. Discussion of observations (visual, meter readings, etc.) noted during installation of the leachate discharge riser system, including the presence of charred waste and observations related to the sump location, gravel depth, and liner system. Photo documentation shall also be provided.

d. Survey and as-built drawings documenting the location and construction details of the newly installed 4B-cell sump leachate discharge system.

e. Description of associated appurtenances associated with the sump leachate discharge riser. A copy of the manufacturer's specifications for any pumps and control and measuring devices shall also be provided.

f. Specify the sump depth, top of riser and compliance levels associated with the sump in feet above mean sea level (msl).

g. Certification that the sump leachate discharge riser, and associated appurtenances, were installed in accordance with the design and shall provide adequate means of complying with the leachate management provisions of HAR 11-58.1, the operations plan, and the revised solid waste permit.

7.8. Leachate Monitoring and Recordkeeping.

a. RESPONDENTS shall use automated monitoring systems to monitor leachate levels in all sumps and storage tanks. The automated systems shall include an alarm system to alert RESPONDENTS to anomalous conditions in the sumps or storage tanks.

b. RESPONDENTS shall maintain a log of the status of the leachate collection systems, and record in the log at least three times per week the date, level of leachate in each sump, volume of leachate in each tank, and associated pump rates.

c. RESPONDENTS shall take manual measurements of leachate levels in the ash sump and 4B sump, at least once per month. RESPONDENTS shall take manual measurements of leachate levels in the E1 sump on an annual basis. If manual measurements are inconsistent with automated readings or other problems are identified with the system, the DOH may increase the frequency of manual measurements.

7.9. RESPONDENTS shall remove leachate from the Landfill via each of the leachate sumps, in a manner that maintains a maximum depth of 30 centimeters (12 inches) of leachate above any part of the liner in the cell, outside the sump area.

7.10. Within thirty (30) days of the Effective Date, RESPONDENTS shall install and maintain grade survey control markers to delineate the boundaries and elevations of the ash monofill and MSW landfill areas in sufficient number to ensure compliance with permitted grades.

7.11. RESPONDENTS shall implement the Asbestos Management and Disposal Plan, as provided in the Site Operations Manual. Compliance with the plan does not preclude compliance with other applicable statutes, regulations, and rules. RESPONDENTS shall document the quantity, type, and location of asbestos disposed of in the MSW landfill. Disposal locations shall be recorded with GPS coordinates. RESPONDENTS shall maintain records on the amount and location of asbestos disposal.

7.12 RESPONDENTS shall implement the Interim Perimeter Gas Monitoring Plan dated December 2006, and approved subsequent submissions, until

implementation of the permanent Perimeter Gas Monitoring Plan required by Section 7.13. The gas monitoring program shall also be conducted in accordance with HAR 11-58.1-15(d) and these conditions.

a. RESPONDENTS shall monitor the concentration at depths that will minimize the infiltration of and dilution from atmospheric air.

b. RESPONDENTS shall minimize the amount of time that the probe is open prior to recording the gas concentrations.

c. The interim plan results shall all include the duration of time that the probe was open prior to recording the concentration, length of PVC piping extending above ground surface, and length of tubing inserted at each well.

7.13 RESPONDENTS shall implement the Perimeter Gas Monitoring Plan dated October 2007, and approved subsequent submissions, within six (6) months of the Effective Date or receipt of a revised solid waste permit, whichever is earlier. The gas monitoring program shall also be conducted in accordance with HAR 11-58.1-15(d) and these conditions.

a. The well shall not be vented, or opened prior to measuring the gas concentration.

b. RESPONDENTS shall install permanent gas monitoring probes within four (4) months of the Effective Date, or receipt of a modified solid waste permit, whichever is earlier, and provide documentation of installation within sixty (60) days of completion. Documentation shall include, but is not limited to, geologic logs of each probe location, surveyed locations and elevations of probes, and as-built drawings of each monitoring probe.

7.14 RESPONDENTS shall monitor the concentration of gases, including oxygen, methane, carbon dioxide, and hydrogen. RESPONDENTS shall monitor the concentration of gases in facility structures, including temporary structures, and at the property boundary on a monthly basis, or other frequency as approved by the DOH. If an exceedance is identified, RESPONDENTS may conduct a verification monitoring event, provided that the verification monitoring is conducted within one (1) hour of the initially detected exceedance. If exceedances or other anomalous conditions are identified, the DOH may increase the frequency of monitoring events.

a. The concentration of methane gas shall not exceed 25% of the lower explosive limit (LEL) for methane in facility structures.

b. The concentration of methane gas shall not exceed the LEL for methane at the facility property boundary.

c. The concentration of hydrogen gas shall not exceed 25% of the LEL for hydrogen in facility structures.

d. The concentration of hydrogen gas shall not exceed the LEL for hydrogen at the facility property boundary.

7.15 RESPONDENTS shall submit a report with results within 45 days of each monitoring event. The results shall include the date and time, gas concentrations by volume, barometric pressure, site conditions, name of personnel conducting the monitoring, description of equipment and calibration results, description of monitoring procedure, and identification of any procedures or observations outside of normal conditions.

If verification monitoring performed within one (1) hour of the initial exceedance shows concentrations below the limits in Section 7.14, RESPONDENTS shall place results in the operating record and send written notification of the exceedance and verification monitoring results to the DOH within seven (7) days.

7.16 If combustible gas concentrations exceed the limits in Section 7.14, and verification monitoring is not performed within one (1) hour of the initial exceedance or verification monitoring confirms the initial exceedance, RESPONDENTS shall perform the following.

a. Immediately take all necessary steps to ensure protection of human health;

b. Immediately notify the DOH of the exceedance;

c. Within three (3) days of detection, place in the operating record and submit to the DOH, the type of gas, gas levels detected and a description of the steps taken to protect human health; and

d. Within sixty (60) days of detection, prepare and implement a remediation plan for the combustible gas releases, place a copy of the plan in the operating record, provide a copy of the plan to the DOH, and notify the DOH that the plan has been implemented.

e. Within thirty (30) days after the remediation plan has been completed, submit a report to the DOH documenting the actions taken, additional monitoring results, and plans to prevent future recurrences.

f. The DOH may modify the reporting and implementation schedule, as necessary to protect human health and the environment.

7.17 This Article IV and its compliance requirements shall be effective until issuance of a revised solid waste permit for continued operations, if such a

permit is issued, or until closure for the Landfill, if such a permit is not issued. Thereafter, these requirements shall terminate except for the compliance date set forth in Section 7.13(b) and the Landfill shall be subject to the requirements set forth any revised solid waste permit, or in any permits, statutes, rules, or regulations governing closure.

V. PAYMENTS AND CONSIDERATION FOR SETTLEMENT

8. Civil Penalty Amount. RESPONDENTS shall pay a civil penalty in the amount of ONE MILLION FIVE HUNDRED THOUSAND DOLLARS ($1,500,000). RESPONDENTS may, in their discretion, satisfy this civil penalty through either of the following two options:

8.1. Cash Payment. Within THIRTY (30) days after the Effective Date of this Agreement, RESPONDENTS shall deliver payment in the amount of ONE MILLION FIVE HUNDRED THOUSAND DOLLARS ($1,500,000) to the DOH at the following address:

Solid and Hazardous Waste Branch
Environmental Management Division
Hawaii State Department of Health
919 Ala Moana Blvd., Room 212
Honolulu, Hawaii 96814

8.2. Cash Payment and Supplemental Projects. Within THIRTY (30) days after the Effective Date of this Agreement, RESPONDENTS shall notify the DOH of RESPONDENTS' election to satisfy the civil penalty through a combination of a cash payment to the DOH and Supplemental Environmental Projects, as described below. If RESPONDENTS elect this option, RESPONDENTS shall satisfy a, b and c as indicated below:

a. Within THIRTY (30) days after the Effective Date of this Agreement, RESPONDENTS shall deliver payment in the amount of FIVE HUNDRED TWENTY THOUSAND DOLLARS ($520,000) to the DOH at the address set forth in Section 8.1 above;

b. RESPONDENTS shall pay the amount of SIX HUNDRED THIRTY-SEVEN THOUSAND FIVE HUNDRED DOLLARS ($637,500) in the following manner;

(1) to the DOH, for deposit into a fund be established by order of the Hearings Officer in Docket No. 05-SHW-SWS-004 in an account established within the State of Hawaii Department of Accounting and General Services ("DAGS"). This fund shall be known as a Supplemental Environmental Project ("SEP") Fund and the amounts in the SEP Fund shall be used to fund environmentally beneficial projects to benefit Leeward communities located near the

landfill, or other communities or residents of Oahu, as selected by the DOH or any other State agency designated by the DOH after consultation with the Leeward communities located near the Landfill. RESPONDENTS shall deliver the funds to the DOH at the address stated in Section 8.1 above within THIRTY (30) days after receiving notice from the DOH that the SEP Fund has been established by DAGS, and that such funds are to be deposited. RESPONDENTS shall not participate in the selection of projects funded by the SEP Fund. If the DOH elects to hire a Supplemental Environmental Coordinator, the sum of $ 100,000.00, or such lesser amount as DOH may designated, from the SEP fund shall be used by the DOH to hire a Supplemental Environmental Coordinator to oversee the SEPs that will be selected by the DOH; or

(2) to environmentally beneficial projects selected by the DOH within 30 days of notification;

(3) or to a combination of (1) and (2), as determined by DOH.

If any funds paid in accordance with Section 8.2(b), remain unexpended for environmentally beneficial projects, those monies shall be paid to the DOH at the address listed in Section 8.1 at the discretion of DOH;

c. RESPONDENTS shall satisfy the balance of the penalty amount ($342,500) by designing, engineering, permitting, and constructing at an estimated cost of at least FOUR HUNDRED FIFTY THOUSAND DOLLARS ($450,000) a community drop off center (the "Drop-Off Center") to be located at the Landfill for use by local residents to drop-off solid waste and recyclables in the vicinity of the current scalehouse and administrative building. The design of the Drop-Off Center shall be approved by the DOH. The purpose of the Drop-Off Center is to allow members of the public to conveniently and safely deliver solid waste and/or recyclables to the Landfill for disposal and/or recycling without entering areas of the Landfill with active landfilling operations. If the actual cost to design, engineer, permit, and construct the Drop-Off Center does not exceed $450,000, then RESPONDENTS shall pay the difference to the DOH at the address set forth in Section 8.1 above.

Notwithstanding any other provision in this Agreement, if RESPONDENTS elect to satisfy the civil penalty amount through this option, RESPONDENTS shall be obligated to design, engineer, permit, and construct the Drop-Off Center only when the Landfill is issued all final permits and approvals required for the expansion of the Landfill and continuation of Landfill disposal operations. If RESPONDENTS are not

able to permit or construct the Drop-Off Center consistent with this Agreement and in spite of their reasonable efforts, then in lieu thereof, RESPONDENTS shall pay to the DOH the amount of FOUR HUNDRED THOUSAND DOLLARS ($400,000) at the address set forth in Section 8.1 above.

VI. RELEASES

9. Upon payment of the amounts set forth in Section V (PAYMENTS AND CONSIDERATION FOR SETTLEMENT), any and all violations and claims alleged or which could have been alleged by the DOH in the NFV shall be discharged, dismissed, waived and released as against RESPONDENTS, their respective directors, officers, employees, servants, agents, (former directors, officers, employees, servants and agents), assigns, attorneys, administrators, insurers, subsidiaries, affiliates and/or related entities.

VII. STIPULATED PENALTIES AND ENFORCEMENT

10. Failure by RESPONDENTS to pay the amounts in Section V (PAYMENTS AND CONSIDERATION FOR SETTLEMENT), shall obligate RESPONDENTS to pay a stipulated penalty of $1,000 per day for each day that such failure continues.

11. RESPONDENTS shall pay any stipulated penalties within seven (7) days of demand as set forth in Section VIII (Form of Payment).

12. If RESPONDENTS breach the terms of Section IV (CORRECTIVE ACTION AND COMPLIANCE REQUIREMENTS) prior to the termination of those requirements, RESPONDENTS agree to be subject to the penalties set forth in section 342H-9(a), Hawaii Revised Statutes for such breaches. RESPONDENTS reserve their rights to argue all legal and factual defenses under the law, except for any argument that penalties for such breaches may not be imposed pursuant to that section, any such arguments being contractually waived herein, in consideration of and for this Settlement Agreement. Further RESPONDENTS agree that for the purposes of said section 342H-9(a), any breach of the terms of Section IV (CORRECTIVE ACTION AND COMPLIANCE REQUIREMENTS) shall be considered breaches of a permit and/or variance issued pursuant to Chapter 342H, Hawaii Revised Statutes.

13. The provisions of this section shall not be construed to limit any other remedies, including but not limited to institution of proceedings for civil or criminal liability, available to DOH for violations of this Agreement future violations of the permit, or for violations of any other provision of law.

VIII. FORM OF PAYMENT

14. The amounts payable under Sections V (PAYMENTS AND CONSIDERATION FOR SETTLEMENT and VII (STIPULATED PENALTIES AND ENFORCEMENT) shall

be paid by cashier's check, payable to the State of Hawaii, and shall be delivered to the DOH as set forth in Section XI (NOTIFICATION).

IX. DELAYS OR IMPEDIMENTS TO COMPLIANCE

15. RESPONDENTS shall notify the DOH orally, as soon as feasible, and in writing within ten (10) calendar days of any delay or anticipated delay which does or may affect compliance with this Agreement. The notice shall describe in detail the anticipated length of the delay, the precise cause(s) of the delay, the measures taken and to be taken by RESPONDENTS to prevent or minimize the delay, the timetable by which those measures will be implemented, and the expected effect on the environment of the delay. RESPONDENTS shall take all reasonable measures to avoid or minimize any such delay.

16. The burden of proving that any delay is caused by circumstances entirely beyond the control of RESPONDENTS shall rest with RESPONDENTS.

X. ENTRY AND INSPECTION

17. Any authorized representative of the DOH, upon presentation of credentials, may enter upon the Landfill premises and/or inspect the Landfill records of RESPONDENTS at any time for the purpose of monitoring compliance with the provisions of this Agreement. This provision shall not be deemed to limit any authority the DOH otherwise has to enter and inspect.

XI. NOTIFICATION

18. Whenever, under the terms of this Agreement, a notice, report, or payment is required to be given by one party to another, such notice, report, or payment shall be directed to the individuals specified below, at the addresses given, unless a party gives notice in writing to the other parties that another individual has been designated to receive such communications:

Steven Y.K. Chang, P.E., Chief
Solid and Hazardous Waste Branch
Environmental Management Division
Hawaii State Department of Health
919 Ala Moana Blvd., Room 212
Honolulu, Hawaii 96814
Telephone: (808) 586-4226
Telefax: (808) 586-7509

Department of Environmental Services
City and County of Honolulu
1000 Uluohia Street, Suite 308
Kapolei, Hawaii 96707
Telephone: (808) 768-3486
Telefax: (808) 768-3487

Director of Operations
Waste Management of Hawaii, Inc.
Waimanalo Gulch Landfill
92-460 Farrington Hwy.
Kapolei, HI 96707
Telephone: (808) 668-2985
Telefax: (808) 668-1366

General Counsel, Western Group
Western Group Legal Department
7025 North Scottsdale Road, Suite 200
Scottsdale, AZ 85253
Telephone: (480) 624-8400
Telefax: (480) 951-5280

XII. AUTHORITY OF SIGNATORIES

19. Each undersigned representative or a party to this Agreement certifies that he or she has full authority to enter into the terms of this Agreement and legally to bind the party which he or she represents.

20. Compliance with this Agreement does not relieve RESPONDENTS' responsibility to comply with all other applicable laws and regulations.

XIII. NO ADMISSION OF LIABILITY

21.The parties acknowledge that neither this Agreement, nor the fact of settlement, nor the civil penalty and settlement payments, nor the settlement proceeds are, may be construed as, may be deemed evidence of, or may be used at any time as an admission, concession, presumption, or inference of fault, wrongdoing or liability of any party. The Agreement is to be construed strictly as a compromise and settlement of all the alleged violations in NFV for the purpose of ending past and present controversies, litigation of the contested case, and expenses.

XIV. ENTIRE AGREEMENT

22. This Agreement sets forth the entire agreement between the parties with respect to this matter.

XV. EFFECTIVE DATE

23. This Agreement shall become effective as soon as it has been signed by all the parties (the "Effective Date").

XVI. MODIFICATIONS

24. This Agreement shall not be modified except in writing, signed by all the parties.

XVII. TERMINATION

25. RESPONDENTS must demonstrate to the DOH's satisfaction that RESPONDENTS have made the payment required by Sections 8.1 or 8.2 (as appropriate) of this Agreement, and implemented the corrective actions and compliance requirements of Section IV (until those requirements are governed by a revised solid waste permit, as provided for in Section 7.17 of this Agreement. Within thirty (30) working days after such a showing by RESPONDENTS, the DOH shall issue a letter to RESPONDENTS certifying satisfactory compliance, which shall terminate this Agreement.

XVIII. EFFECT

26. This Agreement constitutes the final agreement between the parties and the settlement of Docket No. 05-SHW-SWS-004; and concludes the contested case proceedings which shall be dismissed with prejudice upon execution of this Agreement.

XIX. FEES AND COSTS

27. Each party shall bear its own costs and attorneys' fees.

XX. GOVERNING LAW

28. This Agreement shall be enforceable under, and interpreted according to the laws of the State of Hawaii.

XXI. SEVERABILITY OF UNLAWFUL PROVISIONS

29. Should any provision of this Agreement be declared or be determined by any court to be illegal or invalid, the validity of the remaining parts, terms, or provisions shall not be affected thereby and said illegal or invalid part, term, or provision shall be deemed not to be a part of this Agreement.

XXII. COUNTERPART/FACSIMILE SIGNATURES

30. This Agreement may be executed in two or more counterparts or by facsimile, and any set of the counterparts or facsimile that are collectively executed by the Parties hereto shall be sufficient proof of this Agreement.

Dated: Honolulu, Hawaii DEC - 7 2007

DEPARTMENT OF HEALTH
STATE OF HAWAII

LAURENCE K. LAU
Deputy Director for Environmental Health

APPROVED AS TO FORM:

KATHLEEN S.Y. HO
Deputy Attorney General

WASTE MANAGEMENT OF HAWAII, INC,

ANDREW M. KENEFICK
Senior Legal Counsel
per Corporate Resolution (Dec. 6, 2007)

APPROVED AS TO FORM:

LORRAINE H. AKIBA
Attorney for Waste Management of Hawaii, Inc.

CITY AND COUNTY OF HONOLULU

DIRECTOR, DEPARTMENT OF
ENVIRONMENTAL SERVICES

APPROVED AS TO FORM:
AND LEGALITY:

Deputy Corporation Counsel

Department of Health, State of Hawaii vs. Waste Management, Inc. and City and County of Honolulu; Docket No. 05-SHW-SWS-004; Settlement Agreement

Appendix B

Finding and Notice of Violation, Docket No. R6-06-06
Environmental Protection Agency, April 5, 2006

United States
Environmental Protection
Agency

Regional Administrator
75 Hawthorne Street
San Francisco, CA 94105-3901

Region 9, Arizona, California
Hawaii, Nevada, Guam
American Samoa,
Northern Marianas Islands

EPA Environmental News

For Immediate Release: April 5, 2006
Contact: Dean Higuchi, 808-541-2711, higuchi.dean@epa.gov

EPA cites two Hawai'i landfills for clean air violations

Waimanalo Gulch on Oahu and West Hawai'i on the Big Island

HONOLULU – The U.S. Environmental Protection Agency recently announced that Waste Management of Hawaii, Inc., and island governments on Oahu and Hawai'i have violated the Clean Air Act at the Waimanalo Gulch landfill at Kapolei and West Hawai'i landfill at Waikaloa.

The violations pertain to the Waimanalo Gulch landfill at Kapolei on Oahu and West Hawai'i landfill at Waikaloa on the Big Island. The Waimanalo Gulch landfill is owned by the City and County of Honolulu, and the West Hawai'i landfill is owned by the County of Hawai'i. Both landfills are run and operated for the counties by Waste Management of Hawaii, Inc.

"Landfill owners and operators need to meet the planning, permitting and control requirements to comply with clean air rules," said Deborah Jordan, director for the EPA Pacific Southwest Region's Air Division. "The goal of our action is to ensure that Waste Management and the counties effectively control emissions from both landfills."

At the Waimanalo Gulch landfill, EPA inspectors found that the gas collection and control system was installed seven years late in August 2005, and does not meet requirements. At the West Hawaii landfill, Waste Management and the County of Hawai'i violated several reporting requirements. Both landfills have been required to comply with the clean air rules since March 1996.

The EPA is requiring Waste Management and the counties to get both landfills into compliance with clean air rules. Under the Clean Air Act, they could face fines of up to $32,500 per day, per violation. Staff from the Hawai'i Department of Health's Clean Air Branch provided assistance to the EPA's investigators.

Nonmethane landfill gas contains volatile organic compounds and hazardous air pollutants that can result in adverse effects to the respiratory system, cancer, and damage to the nervous system. Methane emissions contribute to global climate change and can result in fires or explosions when they accumulate in structures on or off the landfill site.

# # #

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

CERTIFIED MAIL NO. 7003 3110 0006 2000 8182
RETURN RECEIPT REQUESTED

Paul Burns
General Manager
Waste Management of Hawaii, Inc.
92-460 Farrington Highway
Kapolei, HI 96707

CERTIFIED MAIL NO. 7003 3110 0006 2000 8175
RETURN RECEIPT REQUESTED

Eric S. Takamura, P.E.
Director
Department of Environmental Services
City and County of Honolulu
1000 Uluohia St., Suite 308
Kapolei, HI 96707

In Reply: AIR-5
Refer To: Docket No. R9-2006-06

Dear Messrs. Burns and Takamura:

Enclosed is a copy of a Finding and Notice of Violation ("NOV") that the United States Environmental Protection Agency ("EPA") is issuing to Waste Management of Hawaii ("WMH") and the City and County of Honolulu ("CCH") pursuant to Section 113 (a) of the Clean Air Act (the "Act"), 42 U.S.C. § 7413 (a). The NOV is intended to notify WMH and CCH of EPA's finding that Waimanalo Gulch Solid Waste Landfill at Kapolei on Oahu (the "Landfill") has been and is in violation of the Act.

You should be aware that Section 113(a) of the Act provides that EPA may issue an Order requiring compliance, issue an Order assessing a civil administrative penalty, or commence a civil action seeking an injunction and/or a civil penalty. Furthermore, Section 113(c) of the Act provides for criminal penalties in certain cases.

Upon a finding of adequate evidence of a continuing violation, EPA may place the Landfill on the List of Violating Facilities. See Section 306 of the Act and the regulations promulgated in 40 C.F.R. Part 32. Such facility would be declared ineligible for participation in any federal contract, grant, loan, or subagreement thereunder.

If you wish to discuss the NOV, you may request a conference with EPA. The conference will afford WMH and CCH an opportunity to present information bearing on the finding of violation, the nature of the violation, any efforts you have taken to achieve compliance, and the steps you propose to take to achieve compliance.

Please contact Brian Riedel, Office of Regional Counsel, at (415) 972-3924, to request a conference. Such request should be made as soon as possible, but in any event no later than 10 business days after receipt of this letter. Thank you for your cooperation in this matter.

Sincerely,

Deborah Jordan
Director, Air Division

Enclosures

cc: Wilfred Nagamine, CAB, HSDOH

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

CERTIFIED MAIL NO. 7004 1160 0004 3168 5961
RETURN RECEIPT REQUESTED

Paul Burns
General Manager
Waste Management of Hawaii, Inc.
92-460 Farrington Highway
Kapolei, HI 96707

CERTIFIED MAIL NO. 7004 1160 0004 3168 5978
RETURN RECEIPT REQUESTED

Michael Dworsky
Division Head
Solid Waste
Department of Environmental Management
County of Hawaii
25 Aupuni Street, Room 214
Hilo, HI 96720

In Reply: AIR-5
Refer To: Docket No. R9-2006-07

Dear Messrs. Burns and Dworsky:

Enclosed is a copy of a Finding and Notice of Violation ("NOV") that the United States Environmental Protection Agency ("EPA") is issuing to Waste Management of Hawaii ("WMH") and the County of Hawaii ("CH") pursuant to Section 113 (a) of the Clean Air Act (the "Act"), 42 U.S.C. § 7413 (a). The NOV is intended to notify WMH and CH of EPA's finding that West Hawaii landfill at Waikaloa on the Big Island (the "Landfill") has been and is in violation of the Act.

You should be aware that Section 113(a) of the Act provides that EPA may issue an Order requiring compliance, issue an Order assessing a civil administrative penalty, or commence a civil action seeking an injunction and/or a civil penalty. Furthermore, Section 113(c) of the Act provides for criminal penalties in certain cases.

Upon a finding of adequate evidence of a continuing violation, EPA may place the Landfill on the List of Violating Facilities. See Section 306 of the Act and the regulations promulgated in 40 C.F.R. Part 32. Such facility would be declared ineligible for participation in any federal contract, grant, loan, or subagreement thereunder.

If you wish to discuss the NOV, you may request a conference with EPA. The conference will afford WMH and CH an opportunity to present information bearing on the finding of violation, the nature of the violation, any efforts you have taken to achieve compliance, and the steps you propose to take to achieve compliance.

Please contact Brian Riedel, Office of Regional Counsel, at (415) 972-3924, to request a conference. Such request should be made as soon as possible, but in any event no later than 10 business days after receipt of this letter. Thank you for your cooperation in this matter.

Sincerely,

Deborah Jordan
Director, Air Division

Enclosures

cc: Wilfred Nagamine, CAB, HSDOH

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

In the Matter of: Waste Management of Hawaii, Inc. 92-460 Farrington Highway Kapolei, Oahu, Hawaii 96707 County of Hawaii 25 Aupuni Street Hilo, Hawaii 96720 Proceeding under Section 113 of the Clean Air Act, 42 U.S.C. § 7413	Docket No. R9-06-07 Finding and Notice of Violation

This Finding and Notice of Violation ("NOV") is issued pursuant to the authority of Section 113 of the Clean Air Act, 42 U.S.C. §§ 7401-7671q (the "Act") to Waste Management of Hawaii, Inc. ("WMH") and the County of Hawaii ("CH") for violations of the Act at West Hawaii Sanitary Landfill ("West Hawaii Landfill" or "Landfill") located at 71-1111 Queen Kahumanu Hwy., Waikoloa, Hawaii. The authority of the Administrator of the United States Environmental Protection Agency ("EPA") to issue an NOV pursuant to Section 113(a) of the Act, 42 U.S.C. § 7413(a), has been delegated to the Regional Administrator, EPA Region IX, and redelegated to the Director, Air Division, EPA Region IX.

STATUTORY AND REGULATORY AUTHORITY

1. Section 111(b)(1)(A) of the Act, 42 U.S.C. § 7411(b)(1)(A), requires EPA to publish a list of

categories of stationary sources that emit or may emit any air pollutant. The list must include any categories of sources which are determined to cause, or significantly contribute to, air pollution which may be reasonably anticipated to endanger public health or welfare. "New source[s]" are defined as stationary sources, the construction or modification of which is commenced after the publication of the regulations or proposed regulations prescribing a standard of performance applicable to such source. 42 U.S.C. § 7411(a). These standards are known as New Source Performance Standards ("NSPS").

2. Section 111(e) of the Act, 42 U.S.C. § 7411(e), prohibits an owner or operator of a new source from operating that source in violation of an NSPS.

3. Pursuant to Section 111(b)(1)(A) of the Act, 42 U.S.C. § 7411(b)(1)(A), and at 40 C.F.R. § 60.16, EPA has identified municipal solid waste landfills as one category of stationary sources that cause, or contribute significantly to, air pollution that may reasonably be anticipated to endanger public health or welfare. EPA also promulgated the Standards of Performance for Municipal Solid Waste Landfills ("NSPS Subpart WWW" or "Subpart WWW"), at 40 C.F.R. Part 60, Subpart WWW, §§ 60.750 - 60.759, effective March 12, 1996.

4. NSPS Subpart WWW applies to each municipal solid waste landfill ("MSW landfill" or "landfill") that commenced

construction, reconstruction or modification on or after May 30, 1991.

5. Pursuant to NSPS Subpart WWW, each owner or operator of an MSW landfill having a design capacity $\geq$ 2.5 million megagrams ("Mg") and 2.5 million cubic meters ("m^3") must calculate its nonmethane organic compounds ("NMOC") emissions potential using procedures specified in 40 C.F.R. § 60.754 and report the results to EPA on an annual basis. *See* 40 C.F.R. §§ 60.752(b) and 60.757(b)(1).

6. The annual NMOC emission rate emission rate report must include all the data, calculations, sample reports and measurements used to estimate annual emissions. 40 C.F.R. § 60.757(b)(2).

7. If the calculated NMOC emissions $\geq$ 50 Mg/yr, the owner or operator must submit a gas collection and control design plan ("design plan") within 1 year, and install a gas collection and control system ("GCCS") within 30 months of the first report indicating emissions $\geq$ 50 Mg NMOC/yr, unless the landfill performs Tier 2 or 3 measurements that show NMOC emissions < 50 Mg/yr. *See* 40 C.F.R. §§ 60.752(b) and 60.757(c).

8. If the calculated NMOC emissions > 50 Mg/yr and the owner or operator elects to perform Tier 2 NMOC sampling and analysis pursuant to 40 C.F.R. § 60.754(a)(3), a revised NMOC emission rate report, with the recalculated emission rate, based on Tier 2 sampling and analysis, must be submitted to EPA within

180 days of the first calculated exceedance of 50 Mg/yr. *See* 40 C.F.R. § 60.757(c)(1).

9. On January 30, 2006, EPA delegated authority to implement and enforce NSPS Subpart WWW to the State of Hawaii, Department of Health.

10. Pursuant to Section 502(a) of the Act, sources subject to regulation under Section 111 of the Act (NSPS) must obtain an operating permit under Title V of the CAA, unless the source category is exempted by EPA.

11. Pursuant to 40 C.F.R. § 60.752(b), the owner or operator of an MSW landfill that is subject to NSPS Subpart WWW with a design capacity $\geq$ 2.5 million Mg and 2.5 million m^3 is subject to part 70 or 71 permitting requirements. *See also* 40 C.F.R. § 60.752(c).

12. Forty C.F.R. § 70.5(a)(1) requires a source applying for a part 70 permit for the first time to submit an application within 12 months after the source becomes subject to the part 70 permit program.

FINDING OF VIOLATION

13. The West Hawaii Landfill commenced construction on or after May 30, 1991.

14. Beginning March 12, 1996, the Landfill became subject to NSPS Subpart WWW.

15. On March 12, 1996, the Landfill had a design capacity that exceeded 2.5 million Mg and 2.5 million m^3.

16. On June 9, 1996, WMH submitted an Initial Design Capacity Report and Initial NMOC Emission Rate Report

(collectively, "Initial Report") for the Landfill to EPA pursuant to 40 C.F.R. §§ 60.757(a)(1), 60.757(a)(2) and 60.757(b).

17. In the Initial Report for the Landfill, submitted by WMH to EPA on June 9, 1996, Tier 1 calculations indicated that the NMOC emission rate < 50 Mg/yr.

18. WMH or CH was required to submit Annual NMOC Emission Rate Reports for 2001, 2002, 2003, 2004 and 2005 to EPA on an annual basis.

19. WMH and CH failed to submit Annual NMOC Emission Rate Reports for 2001, 2002, 2003, 2004 and 2005 to EPA on an annual basis.

20. The failure of WMH and CH to submit Annual NMOC Emission Rate Reports for 2001, 2002, 2003, 2004 and 2005 to EPA on an annual basis constitutes five (5) violations of Section 111 of the Act and 40 C.F.R. § 60.757(b).

21. On August 8, 2005, WMH completed Tier 1 calculations for the Landfill that revealed an NMOC emission rate ≥ 50 Mg/yr in 2002.

22. WMH has elected to recalculate the NMOC emission rate for the Landfill pursuant to Tier 2 sampling and analysis, but, to date, has not submitted a revised NMOC emission rate report to EPA.

23. WMH and CH failed to submit a revised NMOC emission rate report based on Tier 2 sampling and analysis for the Landfill within 180 days of June 9, 2002, or by December 9, 2002.

24. WMH and CH also failed to submit a design plan for the Landfill to EPA with one year of June 9, 2002 or by June 9, 2003, and failed to install a GCCS within 30 months of June 9, 2002 or by December 9, 2004.

25. The failures of WMH and CH described in the preceding two paragraphs constitute a violation of Section 111 of the Act and 40 C.F.R. § 60.757(c).

26. Pursuant to 40 C.F.R. § 70.5(a)(1), WMH or CH was required to submit an application for a part 70 permit for the Landfill within 1 year of March 12, 1996, or by March 12, 1997.

27. On June 19, 2001, CH submitted its first part 70 permit application for the Landfill.

28. WMH and CH violated 40 C.F.R. § 70.5 by failing to submit the first part 70 permit application for the Landfill by March 12, 1997.

ENFORCEMENT

29. Section 113(a)(3) of the Act provides that whenever EPA finds that any person has violated, or is in violation of, any requirement or prohibition of, *inter alia*, subchapter I or V of the Act, including, but not limited to, any requirement or prohibition of any rule promulgated under Sections 111 or 502 of the Act, EPA may,

- issue an administrative penalty order pursuant to Section 113(d) for civil administrative penalties of up to $ 32,500 per day of violation, or

- issue an order requiring such person to comply with such requirement or prohibition, or
- bring a civil action pursuant to Section 113(b) for injunctive relief and/or civil penalties of not more than $ 32,500 per day for each violation.

42 U.S.C. § 7413(a)(3), as amended by Pub. L. 104-134. Furthermore, for any person who knowingly violates a requirement or prohibition of Sections 111 or 502 of the Act, Section 113(c) provides for criminal penalties or imprisonment, or both. In addition, under Section 306(a), the regulations promulgated thereunder (40 C.F.R. Part 32), and Executive Order 11738, facilities to be used in federal contracts, grants, and loans must be in full compliance with the Act and all regulations promulgated pursuant to it. Violation of the Act may result in the subject facility being declared ineligible for participation in any federal contract, grant, or loan.

PENALTY ASSESSMENT CRITERIA

Section 113(e)(1) of the Act states that the Administrator or a court, as appropriate, shall, in determining the amount of any penalty to be assessed, take into consideration (in addition to such other factors as justice may require) the size of the business, the economic impact of the penalty on the business, the violator's full compliance history and good faith efforts to comply, the duration of the violation as established by any credible evidence (including evidence other than the applicable test

method), payment by the violator of penalties previously assessed for the same violation, the economic benefit of noncompliance, and the seriousness of the violation. Section 113(e)(2) of the Act allows the Administrator or a court to assess a penalty for each day of violation.

OPPORTUNITY FOR CONFERENCE

WMH and/or CH may, upon request, confer with EPA. The conference will enable WMH and/or CH to present evidence bearing on the finding of violation, the nature of the violation, and any efforts it may have taken or proposes to take to achieve compliance. WMH and/or CH may be represented by counsel. A request for a conference must be made within ten (10) working days of receipt of this NOV. The request for a conference or other inquiries concerning the NOV should be made in writing to:

Brian P. Riedel (ORC-2)
Office of Regional Counsel
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3924
facsimile (415) 947-3570

4-4-06
Date

Deborah Jordan
Director, Air Division

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

In the Matter of: Waste Management of Hawaii, Inc. 92-460 Farrington Highway Kapolei, Hawaii 96707 City and County of Honolulu 1000 Uluohia Street, Suite 308 Kapolei, Hawaii 96707 Proceeding under Section 113 of the Clean Air Act, 42 U.S.C. § 7413	Docket No. R9-06-06 Finding and Notice of Violation

This Finding and Notice of Violation ("NOV") is issued pursuant to the authority of Section 113 of the Clean Air Act, 42 U.S.C. §§ 7401-7671q (the "Act") to Waste Management of Hawaii, Inc. ("WMH") and the City and County of Honolulu ("CCH") for violations of the Act at Waimanalo Gulch Municipal Solid Waste Landfill ("Waimanalo Gulch Landfill" or "Landfill") located at 92-460 Farrington Highway, Kapolei, Oahu, Hawaii. The authority of the Administrator of the United States Environmental Protection Agency ("EPA") to issue an NOV pursuant to Section 113(a) of the Act, 42 U.S.C. § 7413(a), has been delegated to the Regional Administrator, EPA Region IX, and redelegated to the Director, Air Division, EPA Region IX.

STATUTORY AND REGULATORY AUTHORITY

1. Section 111(b)(1)(A) of the Act, 42 U.S.C.

§ 7411(b)(1)(A), requires EPA to publish a list of categories of stationary sources that emit or may emit any air pollutant. The list must include any categories of sources which are determined to cause, or significantly contribute to, air pollution which may be reasonably anticipated to endanger public health or welfare. "New source[s]" are defined as stationary sources, the construction or modification of which is commenced after the publication of the regulations or proposed regulations prescribing a standard of performance applicable to such source. 42 U.S.C. § 7411(a). These standards are known as New Source Performance Standards ("NSPS").

2. Section 111(e) of the Act, 42 U.S.C. § 7411(e), prohibits an owner or operator of a new source from operating that source in violation of an NSPS.

3. Pursuant to Section 111(b)(1)(A) of the Act, 42 U.S.C. § 7411(b)(1)(A), and at 40 C.F.R. § 60.16, EPA has identified municipal solid waste ("MSW") landfills as one category of stationary sources that cause, or contribute significantly to, air pollution that may reasonably be anticipated to endanger public health or welfare. EPA also promulgated the Standards of Performance for Municipal Solid Waste Landfills ("NSPS Subpart WWW" or "Subpart WWW"), at 40 C.F.R. Part 60, Subpart WWW, §§ 60.750 - 60.759, effective March 12, 1996.

4. NSPS Subpart WWW applies to each MSW landfill that

commenced construction, reconstruction or modification on or after May 30, 1991.

5. Pursuant to NSPS Subpart WWW, each owner or operator of an MSW landfill having a design capacity $\geq$ 2.5 million megagrams ("Mg") and 2.5 million cubic meters ("m^3") must calculate its nonmethane organic compounds ("NMOC") emissions potential using the Tier 1 calculations at 40 C.F.R. § 60.754 and report the results to EPA. If this report indicates NMOC emissions $\geq$ 50 Mg/yr, the owner or operator must submit a collection and control design plan ("design plan"), prepared by a professional engineer, to EPA within 1 year, and install a gas collection and control system ("GCCS") within 30 months of the first report indicating emissions $\geq$ 50 Mg NMOC/yr, unless the landfill performs Tier 2 or 3 measurements that show NMOC emissions < 50 Mg/yr. *See* 40 C.F.R. §§ 60.752(b) and 60.757(c).

6. A GCCS installed in accordance with 40 C.F.R. § 60.752(b)(2) must meet the design and operation requirements of 40 C.F.R. §§ 60.752(b)(2)(ii) and 60.752(b)(2)(iii).

7. On January 30, 2006, EPA delegated authority to implement and enforce NSPS Subpart WWW to the State of Hawaii, Department of Health.

FINDING OF VIOLATION

8. The Waimanalo Gulch Landfill is owned by CCH and operated by WMH.

9. The Waimanalo Gulch Landfill commenced modification after May 30, 1991.

10. Beginning March 12, 1996, the Landfill became subject to NSPS Subpart WWW.

11. On March 12, 1996, the Landfill had a design capacity $\geq$ 2.5 million Mg and 2.5 million m^3.

12. On June 9, 1996, WMH submitted an Initial Design Capacity Report and Initial NMOC Emission Rate Report (collectively, "Initial Report") for the Landfill to EPA pursuant to 40 C.F.R. §§ 60.757(a)(1), 60.757(a)(2) and 60.757(b).

13. The Initial Report for the Landfill, submitted by WMH to EPA on June 9, 1996, is the first report in which the Landfill had an NMOC emission rate $\geq$ 50 Mg/yr.

14. WMH or CCH was required to either submit a design plan to EPA within 1 year of June 9, 1996, or by June 9, 1997, or perform Tier 2 measurements that show NMOC emissions < 50 Mg/yr and report such results to EPA by December 9, 1996.

15. WMH and CCH failed to submit a design plan to EPA by June 9, 1997.

16. WMH and CCH failed to submit Tier 2 results to EPA by December 9, 1996.

17. WMH and CCH violated Section 111 of the Act, 40 C.F.R. §§ 60.752(b)(2)(i) and 60.757(c) by failing to submit a design plan to EPA by June 9, 1997 or submit Tier 2 recalculations to EPA by December 9, 1996.

18. WMH or CCH was required to install a GCCS for the

Landfill within 30 months of June 9, 1996, or by December 9, 1998.

19. WMH and CCH failed to install a GCCS for the Landfill by December 9, 1998.

20. WMH and CCH violated Section 111 of the Act and 40 C.F.R. § 60.752(b)(2)(ii) by failing to install a GCCS for the Landfill by December 9, 1998.

21. On August 1, 2005, full operation of a GCCS for the Landfill began. However, the GCCS has not complied with, and does not comply with, the design and operation requirements of 40 C.F.R. § 60.752(b)(2). Therefore, WMH and CCH have been in violation, and are considered to be in violation, until WMH and/or CCH establishes continuous compliance with 40 C.F.R. § 60.752(b)(2).

ENFORCEMENT

22. Section 113(a)(3) of the Act provides that whenever EPA finds that any person has violated, or is in violation of, any requirement or prohibition of, *inter alia*, subchapter I or V of the Act, including, but not limited to, any requirement or prohibition of any rule promulgated under Sections 111 or 502 of the Act, EPA may,

- issue an administrative penalty order pursuant to Section 113(d) for civil administrative penalties of up to $ 32,500 per day of violation, or
- issue an order requiring such person to comply with such requirement or prohibition, or

- bring a civil action pursuant to Section 113(b) for injunctive relief and/or civil penalties of not more than $ 32,500 per day for each violation.

42 U.S.C. § 7413(a)(3), as amended by Pub. L. 104-134. Furthermore, for any person who knowingly violates a requirement or prohibition of Sections 111 or 502 of the Act, Section 113(c) provides for criminal penalties or imprisonment, or both. In addition, under Section 306(a), the regulations promulgated thereunder (40 C.F.R. Part 32), and Executive Order 11738, facilities to be used in federal contracts, grants, and loans must be in full compliance with the Act and all regulations promulgated pursuant to it. Violation of the Act may result in the subject facility being declared ineligible for participation in any federal contract, grant, or loan.

PENALTY ASSESSMENT CRITERIA

Section 113(e)(1) of the Act states that the Administrator or a court, as appropriate, shall, in determining the amount of any penalty to be assessed, take into consideration (in addition to such other factors as justice may require) the size of the business, the economic impact of the penalty on the business, the violator's full compliance history and good faith efforts to comply, the duration of the violation as established by any credible evidence (including evidence other than the applicable test method), payment by the violator of penalties previously assessed for the same violation, the economic benefit of

noncompliance, and the seriousness of the violation. Section 113(e)(2) of the Act allows the Administrator or a court to assess a penalty for each day of violation. For purposes of determining the number of days of violation, where EPA makes a prima facie showing that the conduct or events giving rise to this violation are likely to have continued or recurred past the date of this NOV, the days of violation shall be presumed to include the date of this NOV and each and every day thereafter until the defendant or respondent establishes that continuous compliance has been achieved, except to the extent that the defendant or respondent can prove by the preponderance of the evidence that there were intervening days during which no violation occurred or that the violation was not continuing in nature.

OPPORTUNITY FOR CONFERENCE

WMH and/or CCH may, upon request, confer with EPA. The conference will enable WMH and/or CCH to present evidence bearing on the finding of violation, the nature of the violation, and any efforts it may have taken or proposes to take to achieve compliance. WMH and/or CCH may be represented by counsel. A request for a conference must be made within ten (10) working days of receipt of this NOV. The request for a conference or other inquiries

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concerning the NOV should be made in writing to:

Brian P. Riedel (ORC-2)
Office of Regional Counsel
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3924
facsimile (415) 947-3570

4-4-06
Date

Deborah Jordan
Director, Air Division

Appendix C

EIS Public Scoping Conducted for the Proposed Expansion of the Waimānalo Gulch Sanitary Landfill, October 2006

Appendix C
EIS Public Scoping

Waimānalo Gulch Sanitary Landfill Lateral Expansion
Waimānalo Gulch, Oahu, Hawaii

October 2006

City & County of Honolulu
Department of Environmental Services
1000 Uluohia Street, 3rd Floor
Kapolei, Hawai'i 96707

R. M. TOWILL CORPORATION
SINCE 1930
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

1-19777-01

Appendix C

EIS Public Scoping

Waimanalo Gulch Sanitary Landfill Lateral Expansion EIS
Waimānalo Gulch, O'ahu, Hawai'i
TMKs: (1) 9-2-003: 072 and 073

October 2006

Prepared for:
City & County of Honolulu
Department of Environmental Services
Kapolei, Hawaii 96707

Prepared by:
R.M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawai'i 96817

Environmental Impact Statement (EIS)
Public Scoping Summary

1. Background

The Department of Environmental Services (ENV) held a series of four EIS Community Scoping Meetings between July 10 and August 10, 2006 to obtain input on issues that islandwide communities feel should be addressed in the preparation of the EIS for the expansion of the Waimanalo Gulch Sanitary Landfill. Waimanalo Gulch is located close to the boundaries of the Nanakuli and Ewa regions of Oahu but is used islandwide by all Oahu communities for the disposal of municipal refuse. The series of public scoping meetings were therefore convened to obtain input from the communities closest to the landfill, as well as other communities that are important users of the facility. The meetings were held on the following dates and at the following locations:

Mtg. No. 1	July 10, 2006	Nanakuli High and Intermediate School 98-980 Nanakuli Avenue Waianae, Hawaii 96792
Mtg. No. 2	July 11, 2006	Benjamin Parker Elementary School 45-259 Waikalua Road Kaneohe, Hawaii 96744
Mtg. No. 3	July 27, 2006	Mission Memorial Auditorium 550 South King Street Honolulu, Hawaii 96813
Mtg. No. 4	August 10, 2006[1]	Kapolei Hale 1000 Uluohia Street Kapolei, Hawaii 96707

[1]The date for this meeting was changed from a previous date on July 26th that conflicted with the scheduling of Neighborhood Board No. 34, Makakilo/Kapolei.

2. EIS Public Scoping Meeting Agenda

Each of the four public scoping sessions was conducted by a meeting facilitator who explained that the purpose of the meetings are to obtain community input on environmental issues that the public feels should be addressed in the preparation of the project EIS. The agenda used for the meetings included:

A. An overview of the purpose of the meeting;
B. Remarks by the Department of Environmental Services (ENV) concerning the need for the project and important events that have transpired since the last EIS for the expansion of Waimanalo Gulch was approved in 2003;
C. A session during the meeting when the community provides comments on issues or subject areas that they feel should be addressed in the EIS;
D. A session summarizing the input provided by the community during the last 15-30 minutes of the meeting; and
E. Adjournment and "Thank You" to audience for attendance.

3. List of Participants and Summary of Issues and Concerns Raised

A record of each of the four meetings is attached and includes the date of the meeting, the sign-in list of meeting attendees, and written comments that were received by the close of the EIS Public Scoping comment period on August 30, 2006.

4. Summary of Issues by Topic Area

A combined summary list incorporating comments received from the four meetings are attached. Bulleted comments that are in bold are those received in writing that do not duplicate what was already provided by the community.

Meeting No. 1

Nanakuli High and Intermediate School

Monday, July 10, 2006

Public Scoping Meeting for Preparation of EIS
Waimanalo Gulch Sanitary Landfill Expansion
July 10, 11, 2006
Nanakuli High and Intermediate School/Benjamin Parker Elementary School

	NAME	Address	Phone No.	E-mail Address
1	Bud Ebel EBEL	84-854 Freight St	696-8[illegible]	bud96792@[illegible].com
2	Lee Munson	Ko Olina	924-2345	lmunsonusa@aol.
3	Mary Josue	89-407 Mokiawe St.	668-1423	[illegible]
4	Romeo Moncus	Ko Olina Kai	671-2890	romeo@royalhawaiianresort.com
5	Harry Basso	89-246 Dunnage	668 5417	
6	Nina Fisher	89-639 Nanakuli		
7	Uma Kinilau	"		
8	Hanalei Aipoalani	89-308 Mokiawe St	351-3989	haipoalani@yahoo.com
9	Clara Batongbacal	87-140 Helekuna St #2		cbatongbac01@hawaiiantel.net
10	Ralph F. Harris	92-1527-H Aliinui Dr	440-7999	Ralph.Harris@Kolina
11	Todd Apo	92-1184 Olani St	680-7660	TAPO@HONOLULU.GOV
12	Cynthia K.L. Rezentes	87-149 Maipala St.	696-0131	rezentesc@aol.com
13	Kamaki Kanahele	89-237 Kanaali	696-1515	
14	Agnes Cope	" "	" "	
15	Ken Williams	92-1480 Aliinui	6712512	ken@kolina.com
16	Carolyn Holway	84-192 Kapua	695 5069	Carolyn@wisconsultingllc.com
17	Mapuana Tector	85-832 Old Gov Rd	696 7812	Mapuana@Hawaii.edu
18	Kahikaina, Naomi	89-416 Nanakuli Ave	668-1039	
19	Kahikaina, Michael P.	"	"	"
20	Terrie Spottkaeff	PO Box 1888 Waianae 96792	3064164	tspottkaeff@AOL.com

Public Scoping Meeting for Preparation of EIS
Waimanalo Gulch Sanitary Landfill Expansion
July 10-11, 2006
Nanakuli High and Intermediate School/Benjamin Parker Elementary School

	NAME	Address	Phone No.	E-mail Address
1	Johnnie-Mae L. Perry	Waianae	—	—
2	Herb. Henlen	86-313 [illegible]	Waianae	
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COMMENT FORM

Waimanalo Gulch Sanitary Landfill Expansion
Public Scoping Meeting for Environmental Impact Statement (EIS)
July 10-11, 2006

Your comments are important and appreciated. Please use this form to make your comments regarding issues or concerns pertinent to the preparation of the EIS for this project. All comments should be received by **August 10, 2006. Please send to:**

Department of Environmental Services, Refuse Division
City & County of Honolulu
1000 Uluohia Street, Suite 212, Kapolei, Hawaii 96707

It is very frustrating to have been involved in mtgs. w/ city council hearings & testimony for several years now and then to gear up for battle again ??
The community has said "No More Landfill!" When will the City get the message - No Landfill - Yes JDI Plasma Arc Gasification!! Stop thinking about the money - think & look at our community, our families health & safety - How about designating landfills for East/Windward & Central areas - We always take everybody's opala - Seriously, JDI can eliminate alot of this "opala mea" plus renewable energy for who? Us, the people - Address our health, safety concerns stop looking at ~~to~~ money, give us a chance - look at "JDI plasma arc gasification!
People take time to voice their concern - Are you all hearing them?? STOP Landfills!!

Name: Naomi Kahikena

Address: 89-416 Nanakuli Ave

Telephone: 668-1033 Fax:

COMMENT FORM

Waimanalo Gulch Sanitary Landfill Expansion
Public Scoping Meeting for Environmental Impact Statement (EIS)
July 10-11, 2006

Your comments are important and appreciated. Please use this form to make your comments regarding issues or concerns pertinent to the preparation of the EIS for this project. All comments should be received by **August 10, 2006. Please send to**:

Department of Environmental Services, Refuse Division
City & County of Honolulu
1000 Uluohia Street, Suite 212, Kapolei, Hawaii 96707

Waimanalo Gulch Issues:

o Health concerns

1. Unknown effects to the land, water + air
2. Who is liable is people get sick or hurt? City? Private?
3. Community has right to sue?

o Community Benefits:

1. What community benefits? Who defines?
2. Who and how selection to committee is done?
3. Not living up to agreement with community in closure.

o Alternative Processing:

1. Plasma Arc Gasification
   Jacoby Inc.

Name: Representative Michael P. Kahiking

Address: 89-416 Nanakuli Ave.

Telephone: 668-1033 Fax: 586-8469

Meeting No. 2

Benjamin Parker Elementary School

Tuesday, July 11, 2006

Public Scoping Meeting for Preparation of EIS
Waimanalo Gulch Sanitary Landfill Expansion
July 10-11, 2006
Nanakuli High and Intermediate School/Benjamin Parker Elementary School

	NAME	Address	Phone No.	E-mail Address
1	Shirley Foley	3926 Ala Kanaka St.	780-7774	foleyhawaii@aol.com
2	Sonia W. Yick	email - jsonigwy@aol.com		
3	Bill Sager	bsager@lavanet		
4	Ron Boyle	47-128 Pulama Rd Kaneohe 96744	239 5621	boyler@rr.hawaii
5	Ken Williams	92-1480 Aliinui	6712512	ken@koolina.com
6	STANN REIZISS	KAILUA PO Box 1517	230-8199	REIZISS@CCHMO.com
7	Lucy Gay	86-088 Farrington Hwy	696-6378	lucy@hawaii.edu
8	SUSAN BACA	47459 HUI IWA	3921416	SUEBACA@HOTMAIL
9	Andrew Malahoff	503 S. King St.	527-5813	amalahoff@honolulu.gov
10	Wane Kinilau	85-639 Nanakuli Ave		
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COMMENT FORM

Waimanalo Gulch Sanitary Landfill Expansion
Public Scoping Meeting for Environmental Impact Statement (EIS)
July 10-11, 2006

Your comments are important and appreciated. Please use this form to make your comments regarding issues or concerns pertinent to the preparation of the EIS for this project. All comments should be received by **August 10, 2006. Please send to:**

Department of Environmental Services, Refuse Division
City & County of Honolulu
1000 Uluohia Street, Suite 212, Kapolei, Hawaii 96707

I support the full use of ~~of~~ the Waimanalo Site before any other site is considered. Any thing else would be a terrible waste of money & resources.

Incorporate a comprehensive waste management program to minimize waste stream which needs to be land filled. Include analysis in EIS.

Address problem of fire burning deep into land fill & being impossible to put out.

Address issue of vegetation to be used when land fill is closed. Impact of hydromulch

Name: Bill Sager

Address: 44-211 Mikida Dr, Kaneohe, HI 96744

Telephone: 235-0757 Fax: bsager@lava.net

Meeting No. 3

Mission Memorial Auditorium

Thursday, July 27, 2006

Public Scoping Meeting for Preparation of EIS
Waimanalo Gulch Sanitary Landfill Expansion
July 27 - August 10, 2006
Mission Memorial Auditorium/Kapolei Hale

	NAME	Address	Phone No.	E-mail Address
1	Paul Herran	1301 Lusitana St. #611	383-8829	pherran@honolulu.gov
2	Jim Corcoran	1171 Luna'ikani Pl.	263-3093	corcoran@lava.net
3	Roy Sato	39 Makaweli St.	396-7613	
4	Rod Ohira	Honolulu Advertiser		
5	Todd Apo	530 S. King	5477001	
6	Robert Kaialau III	565 Koko St. D-7 Ho 96817	3069787	—
7	Randy Ching	1560 Kanuau St #818	942-0145	oahurandy@yahoo.com
8	Cynthia K.L. Rezentes	87-149 Maipela St. 96792	696-0131	rezentesc@aol.com
9	Uhane Kimlau	89-639 Nanakuli Ave.		
10	Kyle Kajihiro	2426 Oahu Ave	988 6266	KKajihiro@afsc.org
11				
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Meeting No. 4

Kapolei Hale

Thursday, August 10, 2006

Public Scoping Meeting for Preparation of EIS
Waimanalo Gulch Sanitary Landfill Expansion
July 27 - August 10, 2006
Mission Memorial Auditorium/Kapolei Hale

	NAME	Address	Phone No.	E-mail Address
1	BOB EBEL	84-854 FRICKE ST.	696-8160	bud96792@hotmail.com
2	James Kasushi	89-796 Ilimaparpa	668-9912	
3	Cameron Nekota	1917 Colburn St.	358-2792	cameron@hawaii.edu
4	Mike Fuentes	92-1489 Hoalii	391-3707	MIKEFALOHA@YAHOO.COM
5	Ralph Harris	92-1527-1 Aliinui	679-0085	Ralph.Harris@Koolina.Com
6	Ken Williams	92-1480 Aliinui	671 2512	Ken@koolina.com
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Public Scoping Meeting for Preparation of EIS
Waimanalo Gulch Sanitary Landfill Expansion
July 27 - August 10, 2006
Mission Memorial Auditorium/Kapolei Hale

	NAME	Address	Phone No.	E-mail Address
1	ROBERT H. KAIALAU	565 KOKOA ST. Hon Hi 96817	808-306-9767	—
2	DAVID LEONG	1338 Kawelokaa St P.C.	351-6714	
3	ROBERT STRATTON	87-207 WAIOLI	265-2784	
4	BRYAN HA'O		732-9751	
5	CHUCK & JENNIFER BENEKE	92-958 PANANA ST #27	672-8087	nobene8@aol.com
6	Michael Kalukiwa	89-416 Varakali Ave Waianae, HI 96792	668-1033	mkalukiwa@bgch.com
7	GREGORY FUJITA	92-608 MALAHINA LP KAPOLEI, HI 96707	682-4889	fujitag@usn.com
8	Beverly Munson	590 Farrington Hwy Kapolei, HI 96707	674-3241	
9	Lee Munson	"	"	
10	Kunlei Jolonina	92-769 Packoi St. Kapolei 96707	682-3002 (h) 542-0628 (c)	Kunlei@aol.com
11	STEVE KELLY	1001 KAMOKILA #255 KAPOLEI 96707	674-3289	stevek@kapolei.com
12	Cynthia K. L. Rezentes	87-149 Maipela St. Waianae HI 96792	696-0131	rezentesc@aol.com
13	~~PAT CHARDON~~	~~92-918 KAIOLI ST~~ KAPOLEI	~~693-6020~~	
14	~~LORRAINE MARTINEZ~~			
15	TODD APO	530 S. King St Hon 96813	547-7001	TAPO@HONOLULU.GOV

Public Scoping Meeting for Preparation of EIS
Waimanalo Gulch Sanitary Landfill Expansion
July 27 - August 10, 2006
Mission Memorial Auditorium/Kapolei Hale

	NAME	Address	Phone No.	E-mail Address
1	Maeda Timson	Kapolei Neighborhood Board		
2	C Manu DeLaCruz	Villages of Kapolei Board		
3	Michael & Pam Anderson	Nanakuli AF		
4	Robert Webster	91-174 Hanua St. Kapolei	682-0201	
5	Lehua Kinilau	89-639 Nanakuli		
6	Colleen Hanabusa	[illegible]		
7	Hanale Aipualani	Nanakuli, HI		
8	Nalani Aipualani-Tiaki-Tiafia	Heleiua		
9	Todd Upton	91-1067 Makakuia	561-3802	
10	Kelli Upton	↓	↓	
11				
12				
13				
14				
15				

Bud Ebel Republican Candidate For The 45th District House Representatives

The Landfill ! - Just a short time ago the C&C of Honolulu was under the threat of huge fines (perhaps millions of dollars) for the operation and illegal continued use of the Waimanalo Gulch landfill by the EPA, State of Hawaii and some private watchdog groups threatening legal action.

First lets get it straight ! The government will never pay a dime in fines ! Only the tax payers have that privilege.

The latest proposal is an offer by the Waste Management Co. to take over operation of the gulch from the C&C of Honolulu which has by some miracle found room for 15 years of trash storage at the site.

Needless to say the residents of the west coast are a bit perturbed.

I am fully cognizant of the fact that trash removal services are the responsibility of the county.

However as a candidate for the 45th district State House the questions about the landfill are unavoidable and must be addressed.

My Solution

Legislation being 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 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. They could be used to offset property taxes, utility charges or many other lawful use as provided by law.
The most important safeguard would be strict accounting and keeping these monies out of the hands of any but the legal beneficiaries.

Respectfully submitted for discussion. Bud Ebel republican candidate 45th house district

Robert H Kaialau III
565 Kokea Street, Suite D7 ❖ Honolulu, HI 96817
(808) 306-9787 ❖ robert@fightdrugs.us

10 August 2006

City and County of Honolulu
Department of Environmental Services – Refuse Division
1000 Uluohia Street, Suite 212
Kapolei, HI 96707

RE: Waimanalo Gulch Sanitary Landfill Expansion – EIS Public Scoping Meeting

I am Robert H Kaialau III, and I am testifying in opposition to the proposed expansion and permit extension for the Waimanalo Gulch Sanitary Landfill.

On Friday, February 3, 2006 the Honolulu Star Bulletin reported on the $2.8 million dollar fine imposed by the State Department of Health on the City and County of Honolulu and its landfill operator Waste Management, Inc. for permit violations at the Waimanalo Gulch Sanitary Landfill. To date, the public has yet to be advised of the final disposition of those fines. Have they been paid? How have the violations cited in the order been addressed?

The information provided in the Star Bulletin article validated long-held concerns by the community. In addition to the multiple environmental, health and safety threats attributable to the existing landfill – the management company contracted to operate the landfill, is unable to properly and consistently adhere to the requirements of the state issued DOH Solid Waste and LUC Special Use permits.

Mayor Hannemann's veto of Bill 37, CD 2 presented a list of "indisputable facts". Of these, the assertion that 1) the City cannot have a new landfill in operation by May 1, 2008 and 2) for the *foreseeable* future, the City "needs" a landfill on island are both inaccurate and misleading.

Before any approval of the requested permits are considered, the City and County of Honolulu's administration must be required to demonstrate the following:

1. The timely completion of the long delayed Integrated Solid Waste Management Plan, which was to have been completed and submitted to the Honolulu City Council for review and approval in 2003.
2. The issuance of a "Request for Proposals" 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 on July 27, 2006 .
3. 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.
4. A detailed, comprehensive closure plan for the existing Waimanalo Gulch landfill site irrespective of the proposed closure date. The plan must include details on required permits for closure, the identification of the authorizing government agencies and the listing of required monitoring activities after the closure process is complete.

In closing, it is my desire to provide the decision making body reviewing the proposed application with an additional perspective and a few requirement considerations regarding the existing landfill.

Thank you for this opportunity to provide my testimony.

Sincerely,

Robert H. Kaialau III

Robert H Kaialau, III

Additional Letters Received

Wm. Anderson and Sara Barnes
92-1001 Aliinui Drive
Kapolei, HI 96707

City & County of Honolulu
Department of Environmental Services, Refuse Division
1000 Uluohia Street, Suite 212
Kapolei, Hawaii 96707

Re: Waimanalo Gulch Landfill Hearing

Dear City and County Leaders:

As residents of Kai Lani at Ko Olina, we are writing to urge that you not expand the landfill at Waimanalo Gulch either temporarily or permanently. Indeed, we urge you to close the landfill as you originally promised.

We are subject to excessive dust, blowing plastic bags and garbage, increased truck traffic and noise on the highway, and at times, sickening smells due to the landfills current location and activities.

We understand the need to have landfills. As a Texas friend of mine said recently: "Everyone wants to have their trash picked up, but nobody wants to have it put down." And so, on a positive note, we think that there are three things that need to be done to address the trash/garbage problem.

1. Immediately start easy-to-use, comprehensive recycling programs 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.
2. Start innovative programs to encourage us all to use less and re-use what we have. Get the business community involved in this effort. (For example: How many shoppers throw out their plastic grocery store bags? How many return them for recycling? How reuse them several times before they do any of the above? How many use cloth bags instead? Couldn't Safeway do some inexpensive consciousness raising about this?) The city and county of Honolulu and its business community could and should become a national and international leader in this area.
3. 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 Wai'anae Coast that you value this area and do not see it - or its people - as a place of garbage.

Wm. Anderson and Sara Barnes
92-1001 Aliinui Drive
Kapolei, HI 96707

We urge you to honor your previous commitment to close the landfill. We urge you not to expand it, either temporarily or permanently. We urge you to exert your leadership in being good stewards of the land and give us easy-to-accomplish incentives to re-use and recycle.

In order to remain economically viable, Honolulu must grow, but it must grow in a sustainable way. Thank you for your service to us all and for considering these comments.

Sincerely,

Wm. Anderson and Sara Barnes

DEPARTMENT OF ENVIRONMENTAL SERVICES

CITY AND COUNTY OF HONOLULU

1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
TELELPHONE: (808) 692-5159 • FAX: (808) 692-5113 • WEBSITE: http://www.co.honolulu.gov

MUFI HANNEMANN
MAYOR

ERIC S. TAKAMURA, Ph.D., P.E.
DIRECTOR

KENNETH A. SHIMIZU
DEPUTY DIRECTOR

IN REPLY REFER TO:
RA 06-046

August 16, 2006

Mr. William Anderson and Ms. Sara Barnes
92-1001 Aliinui Drive
Kapolei, Hawaii 96707

Dear Mr. Anderson and Ms. Barnes:

Thank you for your letter regarding the Waimanalo Gulch Sanitary Landfill.

We appreciate your understanding of the need for landfills as part of our integrated solid waste management program. Our goal is to significantly reduce the volume of waste going to landfill. Over the past years our H-POWER facility has been the primary operation to meet this goal. We intend to further expand our waste-to-energy capability.

The collection of residential and commercial separated green waste for delivery and recycling to compost is another major diversion from landfill undertaking. Our sludge composting program will soon become operational. This material will also be diverted. Other materials under consideration for diversion include e-waste, mattresses, and carpet, which may better be recycled on the mainland.

As you know, we are preparing the EIS for the Waimanalo Gulch Sanitary Landfill. The community scoping meetings are part of the process and your letter will be forwarded for inclusion in the comments. We also have initiated a landfill oversight advisory committee to assist us in assuring that Waste Management Inc. continues to improve their operations.

We are proceeding in a deliberate and professional manner to manage our solid waste. Your input is again appreciated.

Sincerely,

Dr. Eric S. Takamura, P.E.
Director

cc: RM Towill w/attachment

MAKAIWA HILLS LLC

James Campbell Building, Suite 250
1001 Kamokila Boulevard
Kapolei, Hawaii 96707
Tel 808 674-3541 / Fax 808 674-3111

August 29, 2006

City & County of Honolulu
Department of Environmental Services, Refuse Division
1000 Uluohia Street, Suite 212
Kapolei, Hawaii 96707.

To Whom It May Concern:

Subject: Comments on Proposed Waimanalo Gulch Landfill Expansion EIS

Makaiwa Hills, LLC is the fee owner of approximately 1,700 acres of property located on the eastern boundary of the Waimanalo Gulch Sanitary Landfill ("Waimanalo Gulch"). It has come to our attention that certain blasting and grading activity has been occurring, and is planned as part of the proposed expansion, along the shared property line between Waimanalo Gulch and Makaiwa Hills. We are concerned that this type of activity could threaten the structural integrity of Makaiwa Hills, LLC property. Based on the foregoing, we request the Environmental Impact Statement ("EIS") address the following issues:

- Structural integrity of the slope along the shared property line.
- Appropriate blasting and grading setbacks from the shared property line.
- Proposed operations near the shared property line and line of sight to these operations.
- Proposed access points for any expansion of Waimanalo Gulch near the shared property line.
- The eventual height of Waimanalo Gulch along the shared property line.
- The distance from the top of slope that is being manufactured as part of the landfill to the shared property line.

Thank you for the opportunity to comment on the proposed EIS.

Sincerely,

Steve Kelly, AICP
Manager
Entitlements and Infrastructure

26034500\K10005

DEPARTMENT OF ENVIRONMENTAL SERVICES

CITY AND COUNTY OF HONOLULU

1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
TELELPHONE: (808) 692-5159 • FAX: (808) 692-5113 • WEBSITE: http://www.co.honolulu.gov

MUFI HANNEMANN
MAYOR

ERIC S. TAKAMURA, Ph.D., P.E.
DIRECTOR

KENNETH A. SHIMIZU
DEPUTY DIRECTOR

IN REPLY REFER TO:
RA 06-068

October 16, 2006

Mr. Steve Kelly, AICP
Manager
Entitlements and Infrastructure
Makaiwa Hills LLC
James Campbell Building, Suite 250
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Kelly:

Thank you. We received your written comments. We will incorporate the issues determined to be relevant within the environmental impact statement process.

Sincerely,

Eric S. Takamura

Dr. Eric S. Takamura, P.E.
Director

cc: Brian Takeda- RM Towill
Paul Herran-COR

COMMENT FORM

Waimanalo Gulch Sanitary Landfill Expansion
Public Scoping Meeting for Environmental Impact Statement (EIS)
July 27 - August 10, 2006

Your comments are important and appreciated. Please use this form to make your comments regarding issues or concerns pertinent to the preparation of the EIS for this project. All comments should be received by **August 30, 2006. Please send to:**

Department of Environmental Services, Refuse Division
City & County of Honolulu
1000 Uluohia Street, Suite 212, Kapolei, Hawaii 96707

Name: Cynthia K L Rezentes

Address: 87-149 Maipala St, Waianae 96792

Telephone: 696-0131 Fax: 696-0131
497-1432 (c)

Cynthia K.L. Rezentes
87-149 Maipela Street
Wai`anae, HI 96792-3154
(808) 696-0131
Email: Rezentesc@aol.com

August 29, 2006

Eric Takamura, Director
Department of Environmental Services, Refuse Division
City & County of Honolulu
1000 Uluohia Street, Suite 212
Kapolei, Hawaii 96707

RE: Comments Submitted for Environmental Impact Statement Public Scoping for the Proposed Waimanalo Gulch Sanitary Landfill Expansion

Dear Director Takamura:

Thank you for the opportunity to submit public scoping comments regarding the proposed Waimanalo Gulch Sanitary Landfill Expansion Environmental Impact Statement.

I continue to oppose the continuing operation of Waimanalo Gulch Sanitary Landfill beyond the agreed upon date of closure by the City and County of Honolulu in 2003 and as ordered by the State Land Use Commission. This should be the primary position of all concerned with actions taken to fulfill those commitments.

As many of us are aware, the City and County of Honolulu is at a critical point in time in making decisions as to how our municipal solid waste should be managed for future generations. It is imperative that we, as an island community, pursue the best solution for the long-term health and well being of all of the residents of O`ahu. It is with this in mind that I submit the following comments for consideration of inclusion in the proposed Draft Environmental Impact Statement (EIS) for the Waimanalo Gulch Sanitary Landfill (WGSL) to be released in the near future.

1. The EIS needs to address the State Land Use Commission Decision and Order which calls for the closure of the WGSL in May 2008 (which implies no further waste will be accepted at WGSL). This was the date presented by the previous City and County of Honolulu administration.

2. All previous violations as identified in "Department of Health, State of Hawaii v. Waste Management of Hawaii, Inc. and City and County of Honolulu" should be resolved and all challenges concluded prior to the drafting of an EIS for the expansion of WGSL. (In fact, no new permits or permit modifications should be allowed until the violations are addressed and resolved.) Each of the eighteen counts brought against Waste Management of Hawaii, Inc. (WMI) and the City and County of Honolulu (C&C) should be identified and a current status provided within the proposed EIS. Each of the following counts (Taken directly from the Notice and Finding of Violation – Docket No. 05-SHW-SWS-004) should be addressed:
    a. Exceedence of Permitted Grades
    b. Failure to Submit Annual Operating Reports in a Timely Manner
    c. Failure to place daily cover on the active faces of MSW landfill
    d. Failure to place intermediate cover material on the ash monofill
    e. Exceedance of leachate head on the liner in the ash monofill

f. Exceedance of leachate head on the liner in MSW Cell E-1 sump
g. Failure to Measure Leachate and to Maintain Records on Leachate Levels in Cell 4B Sump
h. Failure to Measure Leachate Levels and to Maintain Records on Leachate Levels in the Ash Monofill Sump
i. Failure to notify DOH of noncompliance on equipment blockage in MSW Cell 4-B leachate lateral line and inability to measure leachate levels
j. Failure to Notify DOH of Noncompliance in a Timely Manner on the Exceedences of Permit Grades and Submission of the AORs
k. Unauthorized storage of material on the ash monofill
l. Failure to manage and ban the acceptance of special waste
m. Failure to maintain records and record location of asbestos disposal at the landfill
n. Failure to cover a dead animal
o. Failure to Submit Annual Surface Water Management Plan
p. Failure to control the generation of dust from vehicular traffic
q. Failure to minimize free litter generation at the landfill
r. Failure to monitor explosive gases and maintains monitoring records

3. The EIS should clearly define the current state of the WGSL footprint and airspace occupied. This information should include the fact that the permit modification to allow the expansion for the 14.9 acres (to keep the landfill open until 2008) actually redesigned fill slopes and caused portions of the landfill to exceed the fills limits for the ash monofill. The information will provide the baseline of the actual dimensions of the landfill from which the expansion may be measured.

4. The current permitted WGSL footprint and airspace allowances should be completed and a closure plan (including stabilization of the structure) for the current permitted footprint and airspace allowances should be part of the EIS. This closure should include 30-year monitoring as part of the closure plan. This will act to separate the current landfill and any future expansion. This separation of the landfill into two separate permitted footprints with independent safety and monitoring issues effectively should build in a factor of safety thereby not compounding and confusing any future issues or problems that may arise from continued filling contiguous to the current landfill which has received numerous counts of violations in the Notice and Finding of Violation, Docket No. 05-SHW-SWS-004.

5. An explanation needs to be provided as to the conflicting position of the 1984/1985 EIS which stated that only 57+/- of the 200 or so acres owned were feasible for utilization as a landfill due to the slope angles of the hillsides. What conditions have changed to allow additional expansion? Is the quarrying of the mountain the reason for additional volume being available for MSW and monofill ash waste deposits? Has the quarrying effects on the remaining mountain range been analyzed to assure stability of not only the landfill but also the surrounding area? Those calculations should be included in the EIS. Also to be included in the EIS is the design and analysis of material removed and it's impacts on the landfill design (primarily safety issues of stability), if quarrying is the manner in which additional volume is freed up for MSW and monofill waste receipt.

6. Considering the extensive list of violations the current WGSL has received, the EIS needs to clearly identify who is to enforce the conditions of the Planning Commission Approval, LUC Decision and Order, DOH permit and as importantly, who is responsible for adherence to conditions placed on any expansion of the landfill? There needs to be a section on what

guarantees the public have that violations will not occur in the future and what role the public has in providing information regarding violations observed.

7. One of the conditions of the permit was to allow for ridgeline and site views being maintained. Currently, the landfill exceeds the view plains with the approach from Wai`anae to Honolulu. What will be done to rectify that situation and guarantee that this will not happen in the future?

8. There should be clearly identified, separate (physically divided) municipal solid waste (MSW) and ash monofill cells for the expansion

9. There should be a clearly identified location for the disposal of asbestos that is not contained within a MSW or monofill cell. This is required considering the location of the asbestos that has been disposed of in the past cannot be identified with any level of confidence.

10. Considering the violation identifying not having enough or not providing time to complete soil cover as required on a daily basis, the EIS should reflect from where the soil cover will be procured. There should be records kept on when soil cover is received and when it is used via a daily tracking system. In addition, the hours of operation should reflect the time of last disposal versus completion of the day's activities to allow for the soil cover to be done daily.

11. With the new expansion area, there should be separate stormwater retention basins, leachate systems, and methane gas monitoring and collection systems to preclude confusion with current systems and recognized violations assigned to these systems. This would be consistent with closure of the current landfill and the establishment of a new landfill with separate construction analyses, stormwater retention basins, leachate systems, gas monitoring and collection systems, and any other requirements that would need to be followed for a separate landfill.

12. The chemical composition of the ash monofill should be identified and specific issues addressed, i.e. detection of heavy metals, dioxins, furans, etc. and the information should be shared with the public. There should be established an independent testing and recording system.

13. The EIS needs to clearly identify how fugitive trash (e.g. flying plastic bags) will end. This includes fugitive trash that settles on the land or in the near shore waters. What extra measures will be taken when HPOWER (a waste-to-energy generation facility) is down for maintenance and all MSW is diverted to WGSL? As you go further back into the gulch you approach known high wind areas. That information should be included as a factor in the plans provided for fugitive trash control.

14. The EIS needs to define how dust control will be handled. During high wind days not only is fugitive trash a problem but high quantities of dust can be observed swirling above the site. This could create health problems with individuals downwind from the site and should be addressed as a plan on how this will be prevented and controlled in the future.

15. The EIS needs to provide data regarding how the current WGSL is affecting the near shore waters. This needs to include not just during arid times but also when there are significant rain events and what the stormwater runoff contains or how it will all be contained on the property.

16. The EIS needs to address traffic concerns:
    a. No trucks should be parked on Farrington Highway waiting for entrance into the facility
    b. Farrington Highway should not have mud and dirt dropped from exiting trucks (trucks should leave the facility clean)

c. Farrington Highway, fronting the facility, should be regularly cleaned of mud and dirt

17. There needs to be a commitment to maintain the route to WGSL in a clean condition (i.e. no roadside litter).

18. There should be identification of how the WGSL will be maintained facing Farrington Highway, landscaped to reflect surrounding areas, park-like upkeep, greenbelt, set backs, etc. What will this buffer look like to preclude visual impacts?

19. What specific controls will be put into place to address the odors emanating from the site? Will sewage sludge continue to be accepted, thereby adding to the odor concerns expressed in the past? Will it be pretreated or treated once received? A commitment should be made that if sewage sludge is received it will be given a high priority for immediate coverage to minimize the odor problems associated with this type of waste deposit and not wait until the end of the day final soil cover to be applied. The EIS should identify what will be contained in the odor plan and an outline should be listed.

20. There should be a section to specifically address the stability of the expansion. Static stability should discuss the safety factor with which the new expansion will be built and take into consideration and show the calculations used to provide the safety factor for construction (i.e. stability berm). What will be the safety factor (minimum is required to be 1.5 but should be greater, preferably 1.75-2.0).

    Deformation characteristics caused by an earthquake need to be discussed including potential liquefaction of the fill and subsequent consequences. Considering the August 28, 2006 earthquake experienced off the east coast of O`ahu at a magnitude between 3 and 4 on the Richter scale and the USGS position that we are in a seismically active region, this is no longer remote theory but a distinct possibility. How will that affect the overall safety factor applied to the structure's construction? There should be a higher safety factor applied to the proposed landfill expansion due to this seismic instability and not the minimum of 1.5 allowed by EPA. What are the alternatives to receiving MSW, monofill or other debris after an earthquake, if an analysis of the integrity of the liner system needs to be investigated? What are the alternatives if the liner system is compromised?

21. There has been a lack of urgency on the part of WMI to provide timely reports, how will that be addressed and how will the reports be made available to the public? I request that they be placed on the C&C webpage for the Environmental Services Division (www.opala.org) since they are public documents. There should be photos with a high resolution (perhaps 5M per photo) at the beginning, middle and end of the day to record the progress made during the depositing of MSW and monofill ash. These photos should be a part of the information made available to the public on the webpage. The C&C should also consider the potential of having a webcam on the operations of the site for recordation of the daily activities.

22. What are the impacts if leachate removal is required again in the future? In the past leachate was removed from WGSL and sent to the Wai`anae Wastewater Treatment Plant which discharges secondary treated water into the offshore waters. What kinds of affects could be expected on the offshore waters, flora or fauna considering leachate, at times contain heavy metals or other undesirable chemicals?

23. A full discussion on alternative methodologies for managing MSW and monofill ash needs to be included in this EIS. Currently, there are two for-profit projects being proposed in the Wai`anae

area to do composting on the organic portion of the MSW collected. The C&C needs to answer why if these projects are profitable for private enterprises, is the C&C not pursing these and other alternative technologies which have been presented, e.g. plasma arc/torch/gasification/vitrification?

24. What is the C&C's plans for recycling and reduction of the waste stream going into WGSL? Curbside recycling, green waste recycling, adding a third boiler to HPOWER, etc?

25. What role does this expansion play in the C&C's Solid Waste Management Plan and what does the plan state as to how the C&C will address landfills in the future considering a very limited number of sites which can qualify for receipt of MSW?

The items identified need to be addressed in addition to the standard requirements as an EIS is prepared. Some of the other standard requirements may include but are not limited to: archaeological impacts, cultural impacts, social impacts, traffic concerns, noise, odor, etc.

The proposed EIS for this expansion of WGSL needs to be as comprehensive as today's knowledge base allows us to have considering the consequences of the action proposed will continue to have effects on our residents for many years to come.

Sincerely,

Cynthia K.L. Rezentes

DEPARTMENT OF ENVIRONMENTAL SERVICES

CITY AND COUNTY OF HONOLULU

1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
TELELPHONE: (808) 692-5159 • FAX: (808) 692-5113 • WEBSITE: http://www.co.honolulu.gov

MUFI HANNEMANN
MAYOR

ERIC S. TAKAMURA, Ph.D., P.E.
DIRECTOR

KENNETH A. SHIMIZU
DEPUTY DIRECTOR

IN REPLY REFER TO:
RA 06-068

October 16, 2006

Ms. Cynthia K.L. Rezentes
87-149 Maipela Street
Waianae, Hawaii 96792

Dear Ms. Rezentes:

Thank you. We received your written comments. We will incorporate the issues determined to be relevant within the environmental impact statement process.

Sincerely,

Dr. Eric S. Takamura, P.E.
Director

cc: Brian Takeda- RM Towill
Paul Herran-COR

State Capitol
415 S. Beretania Street
Honolulu, HI 96813

Hawaii State Senate

Fax

To:	Wilma Namumnart	**From:**	Senator Colleen Hanabusa
Fax:	692-5402	**Pages:**	9, including cover
Phone:	692-5410	**Date:**	08/30/06
Re:	Comments for EIS preparation on expansion of WGSL	**CC:**	

- **Comments:** Submittal via fax.

This message is intended only for the use of the individual or entity to which it is addressed and may contain information that is privileged or confidential. If the reader of this message is not the intended recipient, or the employee or agent responsible for delivering the message to the intended recipient, you are hereby notified that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone. Thank you.

ROBERT BUNDA
PRESIDENT
DONNA MERCADO KIM
VICE PRESIDENT
COLLEEN HANABUSA
MAJORITY LEADER
CLAYTON HEE
MAJORITY FLOOR LEADER
SHAN S. TSUTSUI
MAJORITY CAUCUS LEADER
FRED HEMMINGS
MINORITY LEADER
BOB HOGUE
MINORITY FLOOR LEADER
GORDON TRIMBLE
MINORITY POLICY LEADER

FIRST DISTRICT
LORRAINE R. INOUYE
SECOND DISTRICT
RUSSELL S. KOKUBUN
THIRD DISTRICT
PAUL WHALEN
FOURTH DISTRICT
SHAN S. TSUTSUI
FIFTH DISTRICT
ROSALYN H. BAKER
SIXTH DISTRICT
J. KALANI ENGLISH
SEVENTH DISTRICT
GARY L. HOOSER
EIGHTH DISTRICT
SAM SLOM
NINTH DISTRICT
LES IHARA, JR.
TENTH DISTRICT
BRIAN T. TANIGUCHI
ELEVENTH DISTRICT
CARDI FUKUNAGA
TWELFTH DISTRICT
GORDON TRIMBLE
THIRTEENTH DISTRICT
SUZANNE CHUN OAKLAND
FOURTEENTH DISTRICT
DONNA MERCADO KIM
FIFTEENTH DISTRICT
NORMAN SAKAMOTO
SIXTEENTH DISTRICT
DAVID Y. IGE
SEVENTEENTH DISTRICT
RON MIZUNO
EIGHTEENTH DISTRICT
CLARENCE K. NISHIHARA
NINETEENTH DISTRICT
BRIAN KANNO
TWENTIETH DISTRICT
WILL ESPERO
TWENTY-FIRST DISTRICT
COLLEEN HANABUSA
TWENTY-SECOND DISTRICT
ROBERT BUNDA
TWENTY-THIRD DISTRICT
CLAYTON HEE
TWENTY-FOURTH DISTRICT
BOB HOGUE
TWENTY-FIFTH DISTRICT
FRED HEMMINGS
CHIEF CLERK
PAUL T. KAWAGUCHI

The Senate
The Twenty-Third Legislature
of the
State of Hawaii

STATE CAPITOL
HONOLULU, HAWAII 96813

August 30, 2006

Department of Environmental Services, Refuse Division
City & County of Honolulu
1000 Uluohia Street, Suite 212
Kapolei, HI 96707

RE: Comments for EIS preparation on the Expansion of Waimanalo Gulch Sanitary Landfill

To the Department of Environmental Services, Refuse Division:

The following are my comments which will set forth issues and concerns pertinent to the preparation of an EIS for this project.

Standard To Be Met.

The EIS process is governed by HRS §343. An EIS is:

§343-2 Definitions. As used in this chapter unless the context otherwise requires: . . .

"Environmental impact statement" or "statement" means an informational document prepared in compliance with the rules adopted under section 343-6 and which discloses the environmental effects of a proposed action, effects of a proposed action on the economic welfare, social welfare, and cultural practices of the community and State, effects of the economic activities arising out of the proposed action, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects.

The statute also sets forth what the Rules must contain, at minimum. HRS §343-6. The legal effect of administrative rules are well settled in this jurisdiction. Administrative Rules are to be followed and given the full effect of law. ***Williams v. Hawaii Medical Service Association,*** 71 Haw. 545, 549, 7984 P.2d 442, 444 (1990). The Supreme Court has clearly stated that arbitrary and

capricious application of the Rules will not be tolerated. ***Windward Marine Resorts v. Sullivan,*** 86 Haw. 171, 948 P.2d 592 (ICA 1997).

HAR §11-200-14 through 23 are the requirements in the preparation of Draft and Final Environmental Impact Statements. The "General Provisions" highlight the expectation of the EIS process.

I have grave concerns that you will comply with what is required of an EIS.

The following standard set in ***Life of the Land v. Ariyoshi,*** 59 Haw. 156, 164-165, 577 P.2d 1116 (1978) for a court to determine the sufficiency of an EIS:

> In making such a determination the court is guided by the "rule of reason," under which an EIS need not be exhaustive to the point of discussing all possible details bearing on the proposed action but will be upheld as adequate if it has been compiled in good faith and sets forth sufficient information to enable the decision-maker to consider fully the environmental factors involved and to make a reasoned decision after balancing the risks of harm to the environment against the benefits to be derived from the proposed action, as well as to make a reasoned choice between alternatives. County of Suffolk v. Secretary of Interior, 562 F.2d 1368, 1375 (2d Cir. 1977), cert. den., 434 U.S. 1064, 98 S. Ct. 1238, 55 L. Ed. 2d 764 (1978). [Emphasis added.]

The condition precedent to all EISs is that it be compiled in "good faith" and sets forth sufficient information. The past practice of the City has shown that EISs have not been compiled in good faith and nor does it provide sufficient information.

At the very minimum the City must take its past EISs and explain the discrepancies that have now been found and set forth whatever information it now relies upon to justify its change in position.

The best place to begin is with the discussion as to why we in the community have no rights to rely upon the representation of government that the WGSL will close. This is the position of the community that the WGSL should close.

What Was Represented As To The Closure.

At the outset, the City must explain why it has changed its position from an expansion of only 5 years to now an additional 15 years. I have heard comments from the City that there was never a "promise" to close the WGSL in 5 years; however, this is contrary to the statements made under oath to the Land Use Commission during their hearings on the conditional use permit as well as statements made in the Final Supplemental Environmental Impact Statement (FSEIS) for the 5 year expansion. The LUC was very clear in its questioning as to what the City intended to do. How does the City explain its statement under oath and the change in the FSEIS. A discussion should be had as to whether the City can be bound by its statements under oath like a person.

The EIS must address the following.

1. Waste Management's Contract

An EIS is "meaningless" if it is self-serving and rationalizes an outcome. The contract between Waste Management, Inc. and the City for the operation of WGSL was entered into in 1999 for 15 years. This was two years before the first Draft EIS in 2000; and three years before the FSEIS. At the very minimum, this shows the decision to expand WGSL was a done deal in 1999. Explain this contract and why the City entered into it in 1999. Also explain what was done after the City said the expansion would be for only 5 years. Was the contract amended?

2. Alternatives.

HRS §343-2 defines an EIS as one that discloses, among other items, the "alternatives to the action and their environmental effects."

HAR §11-200-17 addresses the requirement as to alternatives as follows:

> F. The draft EIS shall describe in a separate and distinct section alternatives which could attain the objectives of the action, regardless of cost, in sufficient detail to explain why they were rejected. The section shall include a rigorous exploration and objective evaluation of the environmental impacts of all such alternative actions. Particular attention shall be given to alternatives that might enhance environmental quality or avoid, reduce, or minimize some or all of the adverse environmental effects, costs, and risks. Examples of alternatives include: . . . (Emphasis added.)

Money is not the paramount criteria in arriving at a decision which is environmentally sound.

HAR §11-200-17 F. 5 states that "For any agency actions, the discussion of alternatives shall include, where relevant, those alternatives not within the existing authority of the agency." In ***Westlands Water District v. U.S. Dept. of Interior,*** 376 F.3d 853, 866 (9th Cir. 2004), the Ninth Circuit recently reaffirmed that alternatives must be rigorously explored and that "reasonable alternatives" include those not within the jurisdiction of the lead agency. ***Westlands, supra,*** at 868. The Ninth Circuit went on to say that "[t]he existence of a viable but unexamined alternative renders an environmental impact statement inadequate." ***Id.***, citing to ***Morongo Band of Mission Indians v. FAA,*** 161 F.3d 569, 575 (9th Cir. 1998).

3. Failure to Comply with the City's Ordinance.

Ordinance 9-1/1(a)(6)(b)(1) states that by the year 2000, at least 75 percent of the solid waste generated shall be recycled, reused, composted, or otherwise diverted from incineration or placement in the landfill. What is the status and what is the consequence of this non-compliance?

4. Sludge

A major source of "odor" for the landfill is sludge. What is the City's treatment of sludge and for what period of time will it continue to be dumped in the landfill.

5. Purpose and Need.

HAR §11-200-17 D requires the Draft SEIS to "contain a separate and distinct section that includes a statement of purpose and need for a proposed action." It is a similar provision under NEPA, which is looked upon to guide the discussion on alternatives. ***Westlands, supra,*** at 866. In ***Westlands,*** the Ninth Circuit looked to whether the preparers had "arbitrarily and capriciously" narrowed the scope of the statement, thereby affecting the discussion on the alternative.

There is an application for a private landfill pending and also the fact that the Department of Agriculture will now permit the transshipment of MSW. These points must be addressed in discussing any need of the expansion, especially in light of the prior statements that there will be no need for landfills in 5 years.

6. Excavation

The City must address the discrepancies in all the draft EISs along with the reports provided by RM Towill to the Blue Ribbon Commission which was tasked with siting the new landfill. The criteria was no excavation. RM Towill determined that WGSL had a life of 20 more years with the criteria. This is in direct conflict with other EISs also prepared by RM Towill. What does the City intend to do about this obvious misrepresentation? How does the City explain this discrepancy.

The extreme slope of WGSL for the proposed expansion and the newly constructed rock berm are related. What is the stability of the expansion? How much native soil will have to be removed? Where will it be removed to? Will the excavated materials be sold?

7. Stability of the Slope

In light of the concern over the stability of slope as evidenced by the construction of the rock berm wall, how will the community be assured about its stability? How is the integrity of the liner tested? Will the rock berm wall act as the retaining wall to justify and increase in the slope?

8. The Violations of the Existing Permit

The Notice and Finding of Violation ("Notice and Finding") and Order dated January 31, 2006, of the Department of Health ("DOH") as to the operations of WGSL must be addressed. The first point of discussion is why the City had no oversight and permitted these activities to go unchecked. These violations resulted in the largest fine in the history of the State of Hawai'i.

The following violations are the most critical and must be addressed, though all violations should be addressed:

1. Since 2003, the City has placed ash above the 2002 grades and exceeded the design grades for over a year from discovery in January 2004.
2. The control of leachate and the monitoring was discovered. The DOH found 16.3 feet of leachate on the liner and 22 feet and 3 inches in the sump area. More troubling is no monitoring has been conducted since October 26, 2003. This was attributed to the ash monofill landfill.
3. As for the MSW landfill, in April 2005 and May 2005, 74 feet of leachate was measured. This was in an area where the sump was installed in November, 2003 (MSW Cell E-1). There was a gross failure to monitor the leachate
4. The leachate level in the area of 4B was unavailable because no monitoring had taken place since May.
5. The removal of soil and its impact on stability. DOH has found that in January of 2005, they were notified of the fact that grades were exceeded. The City knew that the ash had exceeded the approved grades by January, 2004 as to the ash landfill

6. Disposal of asbestos is a major concern. DOH found that the City and its operator accepted asbestos at the landfill but do not have any logs as to where it has been buried.
7. Surface Water Management. There are no surface water management plans as required by the permit for the years 2003-2004.
8. DOH found a failure to control dust.
9. DOH found a failure to control litter.
10. DOH found that there has been no monitoring of methane gas at the landfill.

The DOH Order entered in this action demonstrates the seriousness of the violations and its agency's (including County's) responsibility to monitor. There are also additional violations that were not included in the DOH Order, such as the applicant's failure to submit a revised Closure and Post-Closure Plan no later than May 1, 2005, which was finally submitted on February 22, 2006 and the operators unauthorized night work preparing a new cell for receiving waste.

9. How the Public Trust Is Being Met

The recent Hokulia case makes clear the State's public trust for the waters of our State. How has this trust obligation been met?

10. Cumulative Effects

This EIS cannot merely address the proposed expansion. It must address the cumulative effects of the operation of WGSL since the 1980s in addition to the proposed expansion on the Coast, including the disposal of leachate off site at the Waianae Wastewater Treatment plant.

11. Environmental Justice

The EIS must address the concept of environmental justice and how the City's use of this landfill and others in the Waianae Coast affect the community.

These are concerns and issues which must be addressed in the EIS. It continues to remain my position that WGSL must close. I continue to be perplexed as to how the City can change its position without any sense of obligation of keeping its word to its people.

Sincerely,

Colleen Hanabusa
Senator, Twenty-First District

DEPARTMENT OF ENVIRONMENTAL SERVICES

CITY AND COUNTY OF HONOLULU

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MUFI HANNEMANN
MAYOR

ERIC S. TAKAMURA, Ph.D., P.E.
DIRECTOR

KENNETH A. SHIMIZU
DEPUTY DIRECTOR

IN REPLY REFER TO:
RA 06-068

October 16, 2006

The Honorable Colleen Hanabusa
State Senate
State Capitol
Honolulu, Hawaii 96813

Dear Senator Hanabusa:

Thank you. We received your written comments. We will incorporate the issues determined to be relevant within the environmental impact statement process.

Sincerely,

Eric S. Takamura

Dr. Eric S. Takamura, P.E.
Director

cc: Brian Takeda- RM Towill
Paul Herran-COR

Summary of Issues by Topic Area

Combined Issues by Topic Area for Consideration:
Developed At EIS Scoping Meetings In Waianae, Kaneohe, Downtown Honolulu, and Kapolei Regarding The Expansion Of Waimanalo Gulch Sanitary Landfill

October 31, 2006

Note: Issues that are in **bold** are those that were received in writing by August 30, 2006, and are not duplicative of what was already stated by the community during the course of the meetings.

General

- The 2001 EIS should not be used as the basis for this EIS
- EIS needs to clearly illustrate what expansion is taking place
- Need to provide number of years of continuing operation as well as the number of acres the expansion will take
- Need to clarify the location, size of the area and what the current zoning is. Documents need to be very clear and specify the boundaries
- Need to look at mainland sewage sludge studies
- New ash area that is covered in EIS needs to be specified where and size
- Impact of other new proposed private sites such as Nanakuli B – do not need both
- Need to identify impacts to RFP process
- Need to consider federal draft rules for shipping of waste
- Need to look seriously at all sites available around the island
- Need to discuss worst case scenario contingencies including earthquake etc.
- Need to determine how the DEIS will tie-in to the City's comprehensive, Solid Waste Integrated Management Plan (SWIMP) update that the city is supposed to prepare
- There is a need to be aware that other areas of the island have hosted landfill sites in the past until their capacity was reached i.e. Aikahi, Kawaianui Marsh, Kapa`a Quarry etc. – they have not all been on the Leeward side
- The EIS needs to reflect the current status at the landfill not the preferred status
- There was a concern expressed about the ability of a local planning firm to be neutral on this issue with all the political pressure
- Need to include all Federal, state and local laws that affect landfill operations
- Need to address Waste Management's 1999 contract with Mayor Harris
- Need clarity between airspace and landfill
- Need to explain why the community should believe the City at this point and why promises have not been kept
- HPOWER has never failed an EPA test on its ash – need to know why DOH has not approved reuse for concrete etc.
- Need to deal with the reality that because of our tourist economy or per person generation of waste is 7 pounds per day instead of the national average of 4 pounds

- Need to consult the County of Hawai`i who has just completed review of 61 alternatives and chosen 3 proven technologies to address this same issue
- **EIS needs to comply with all EIS rules and statutes – including those that require "good faith"**
- **Must not just address expansion but cumulative impacts since the 1980s**

Closure of Landfill

- EIS needs to focus on closing of Waimanalo Gulch now or as soon as possible – should not just go for life of area but should have a plan to reduce waste stream as quickly as possible to provide for closing sooner rather than later
- Review all alternatives available to reduce the waste stream with the intent of closing the landfill as soon as possible
- Need to consider the fact that many landowners and developers were fully aware of the landfill's existence pre-development of their current homes and projects and moved in anyway
- Landowners in the area maintain that they were told the landfill would close in '08 when they bought and had depended on these representations in making their decisions
- Need for active recycling program that would cut down the need for a landfill; need for a sensible plan that would allow for the earliest possible closure of the landfill
- Need for finite planning – Hawai`i should be at the cutting edge and shouldn't worry about costs to keep it a paradise
- City must explain why we are here – other meetings have been held in the past which promised closure of the landfill by 08 and it is still open
- EIS needs to provide factual/historic information for the issue of the promised closure in 2008 and the issuance of an operating permit that required closure in '08
- **Need a comprehensive closure plan for the existing Waimanalo Gulch landfill site irrespective of the proposed closure date**
- **Need to address the State Land Use Commission Decision and Order calling for closure in 2008**
- **Need to address the conflicting position of the 1984/1985 EIS which stated that only 57+/- of the 200 or so acres owned were feasible for utilization as a landfill due to the slop angles of the hillsides.**
- **Close it and put it somewhere else on the island**

Environmental

- Need to explain what the relationship will be between the newly created topography of the expanded landfill, and the prevailing wind patterns of the area including any impact on ocean currents and near shore water temperatures as well as any impacts the new topography may have on adjacent landowners (including the slope integrity along shared property lines, and heights and distances along these lines)
- Need to review Hawaiian Electric Company's wind study and explain the logic of the increase in height of the landfill in light of the wind energy study

- Need an assessment of the static stability of the landfill both ash and solid waste areas including consideration of past history as well as the dynamic stability of the landfill recognizing the fact that we live in a seismically active area
- Need to address how much of the mountain land space is being shaved for the landfill and discuss blasting or grading setbacks that are necessary
- Need to address environmental impacts of potential hazards
- Need to understand how 20 years of further capacity will be provided without excavation as previously stated – if there is excavation need to address where the soil will go
- Need to review recent State of Hawai`i Supreme Court case (Hokulia) regarding State DOH responsibility for water quality in relation to how it is being affected by the landfill e.g. ocean run off
- If expansion moves forward, storm water retention basins, leachate and gas monitoring systems are needed
- Address future ash monofills
- Need to know chemical composition of ash
- The location of potential hazards such as asbestos within the landfill need to be identified
- **Address unknown effects to the land, water, and air**
- **Need to address odor issues – will the expansion take sludge and if so for how long**
- **How is the liner tested and how secure is it needs to be addressed**
- **The ability of the rock berm to handle the expansion needs to be discussed**
- **Needs to address the need for a surface water management plan**
- **Need fugitive trash plan designed to end this problem**

Infrastructure

- Impact to landfill when H-POWER is down is an issue
- Impact on highway; road blockages, etc.
- Maintenance issues along Farrington Highway with heavy truck use – standards for adequate maintenance of this highway
- Any new access points and their impacts on adjacent property owners

Economic Issues

- Economic impacts
- Costs of closing landfill
- Need a solution to address lost revenues to the city should the solid waste go to a private landfill – tipping fees

Explore Alternatives

- Need to look at all alternatives that are appearing (i.e., Plasma ARC gasification, etc.) and determine how these alternatives fit in with everything else that the City is doing – including how they can reduce the waste stream to allow for the earliest closing possible of the landfill
- Need to explore all viable alternatives

- Need to look at other places, especially Europe, and how they dispose of their waste, the kinds of incentives/taxes/sanctions they use to reshape people's attitudes at the curbside
- Expansion should be limited to a specific time and coupled with a plan to reduce the waste stream
- Need to address things that can be done to reduce the amount of waste that goes to the landfill – curbside recycling, alternative technologies, partnerships with the business community to promote recycling and reuse, etc. Need to get innovative and creative.
- Need to increase HPOWER and explore reuse of ash – HPOWER type facilities could be decentralized and built anywhere
- Need to address trans-shipping of waste
- Need to address providing a funding stream to address alternatives
- Need to speed up action on alternatives
- **Plasma Arc Gasification – Jacoby Inc.**
- **Need to address the implementation of the comprehensive and mandatory island-wide recycling program (proposed to be done by December 2006)**
- **Alternatives looked at must be explained including why they are rejected – the exploration must be rigorous**

Facilities Management

- Need to look at as a facilities management problem and apply technologies correctly (especially as pertains to smells and debris)
- The EIS should address the status of all violations and what has been done regarding violations – need to close violations prior to new EIS and permit
- Hours of operation need to be clear and adhered to – the community recently expressed concerns about night operations taking place and the impact of the lighting on houses and neighborhoods
- Need to address overfilling of landfill site
- Need to look at rubbish control and sludge issues
- Need a specific operational plan for soil cover
- **Explain the contracts between the city and Waste Management Inc and the timing of these contracts.**
- **There should be a clearly identified, separate (physically divided) MSW and ash monofill cells for the expansion**
- **A separate area should be identified for asbestos disposal**
- **A full discussion of all management techniques must be included**
- **Impact of expanded operations on adjacent property owners including line of sight issues**

Monitoring and Enforcement

- Need to provide for air quality monitoring, testing as it corresponds to traffic at the site, and along the route to/from the site
- Need to examine enforcement capability and capacity of DOH – including the lack of resources required for monitoring, enforcement, reporting, and accountability

- Major dirt and dust issues; monitoring doesn't work – need for more data collection
- Need to consider past problems with the landfill (i.e., EPA violations, leachate collection system) and be sure the DEIS identifies ways to assure that they do not happen again
- Need to address and explain the $2.8 million fine that has been imposed on the landfill by the Department of Health and assure that these types of practices/violations do not continue in the expansion
- Need to assure that a system is in place to hold the operator accountable
- Monitoring should be adequate so that after the fact permit modification should not happen – example the permit modification needed for the leachate sump pump system
- Need to monitor methane gas levels
- Need to have rigid standards and adequate monitoring to ensure the health and safety of the community
- Need regular monitoring by the Department of Environmental Services
- Need to address who will be responsible for enforcement of things in the EIS and what guarantees will be made in the EIS
- Need to include status of compliance with current permit – by modifying the permit, are we negating prior violations which should not be allowed
- **Need to assure timely reporting by the operator and public access to these reports – consider webcam on site for monitoring purposes**

Leachates

- Need to also address leachate and its impact to groundwater, runoff to ocean, subsidence and slippage resulting from seismic activity, methane fires, and EPA violations relating to gas collection systems
- Need to look back and forward – what has been/will be done to take care of leachate problems and make sure these do not reoccur in the future
- Need to address leachate pumped out to the sewer treatment plant and what happens to it and what is its effect on the final outflow water quality from the sewer treatment plant
- Need to discuss comprehensively the leachate management system – including possible failure of the geo-membrane lining system and how it will be taken care of

Environmental Justice

- Need to address "environmental justice" along the Leeward Coast and as it pertains to this landfill, including the multitude of existing private and proposed sites in the area

Health impacts

- Need to include discussion of potential health hazards
- Who is liable for the health costs to residents should the landfill cause health problems
- When considering expansion, need to discuss EPA finding regarding gas collection system issues
- Compensation to neighbors for health impacts
- Impact of multiple landfills, both public and private, on air quality needs to be addressed
- Higher standards are needed for dust and debris and possible impacts to health

Community issues

- The DEIS needs to deal with the lack of sensitivity to cultural sites and issues
- What communities will benefit - who will be selected and how will the compensation benefits committees be set up also needs to be addressed
- Need to include impact of non-closure of Waimanalo Gulch on for-profit businesses in the area or planning to locate in the area
- Smells, trash escape, floating dust, truck traffic and speeding, trash on road, visual blight all need to be addressed
- Landfill should not be going above the ridge lines, which can be seen from Waianae
- **One of the conditions of the permit was to allow for ridgeline and site views being maintained**
- **No trucks should be parked on Farrington Highway waiting for entrance to the facility**
- **Trucks should be cleaned when leaving facility so the there is no mud or dirt dropped on the highway**
- **Route along Farrington Highway should be kept clean of rubbish or dirt generated by the facility**
- **There should be identification of how the Waimanalo Gulch Sanitary Landfill will be maintained facing Farrington Highway, landscaped to reflect surrounding areas, park-like upkeep, greenbelt, setbacks, etc.**

Appendix D

Hydrologic Setting and Groundwater Monitoring
Waimānalo Gulch Sanitary Landfill, 2006

Hydrologic Setting and Groundwater Monitoring
Waimānalo Gulch Sanitary Landfill
Kahe Valley, Island of O‘ahu, Hawai‘i

Waste Management, Inc./Geosyntec Consultants, Inc.
December 2006

1. HYDROGEOLOGIC SETTING
1.1 Climate and Topography

WGSL is located in a region of Oahu that is relatively arid when compared to the rest of the island due to the “rain-shadow” effect of the Waianae Mountain Range. The average annual rainfall in the area is approximately 20 inches, while gauge stations in the nearby mountains experience significantly higher rainfall averages (Hokuloa gauge, elevation 2,200 feet above mean sea level, average annual rainfall 42 inches).

The regional topography near the WGSL is dominated by the moderate to steep Waianae Range, a northerly trending volcanic mountain complex that is characterized by narrow valleys separated by steeply sloping hills and ridges. The range extends northward from the site approximately 20 miles and is up to approximately 4 miles in width. The WGSL is located at the southern toe of this range in a typically steep and narrow valley (gulch). Elevations along the main mountain ridgeline range from about 1,000 to 3,600 feet msl. Elevations drop dramatically away from the main ridgeline. Lateral slopes along the Waianae Range are asymmetrical, with steeper slopes to the west. Typical slopes on the sides of the range drop some 2,600 feet over distances of two miles or less. Near the WGSL, the mountains of the Waianae Range transition to the low-lying coastal plains. Elevations abruptly diminish from 2,300 feet msl (Puu Manawahua) to sea level in a lateral distance of two miles in the WGSL vicinity (RUST, September 1993).

The WGSL is located in a relatively narrow gulch with a steeply sloping valley floor and sides. At the mouth of the gulch, the elevation of the valley floor is

approximately 50 feet msl and rises to 450 feet msl over a distance of 4,800 feet (up to an 18% slope). Relative elevations between the valley floor and the tops of the adjacent ridges range from about 60 feet to 240 feet. Waimanalo Gulch is approximately 1,000 feet wide from ridge to ridge at its widest point, and is about 500 feet wide at its narrowest point (near the confluence of the upstream tributaries). Site elevations vary from a low of about 70 feet msl in the southeast corner to a high of about 940 feet msl in the northern portion of the property.

1.2 Regional Geology

The island of Oahu represents the eroded remnants of two shield volcanoes, Waianae and Koolau. The Koolau volcano was active after the Waianae volcano became dormant, and its flows backed against the Waianae volcano shield to form the Schofield Plateau. After a long quiescent period during which erosion cut canyons several thousand feet deep, another series of lava flows, the Honolulu Volcanic Series, formed cinder and cones primarily along the southeastern portion of the island.

The Waianae Volcanic Series was formed during the Tertiary period and forms the majority of the Waianae Range. This series is divided into lower, middle and upper members. The lower member consists of sequenced lava flows and associated pyroclastic material up to 2,000 feet thick, which makes up the majority of the Waianae shield volcano. The rocks of this member are mostly thin-bedded pahoehoe that are locally intruded by dikes in the southwestern portion of the island (Takasaki, 1971).

The middle member of the Waianae Volcanic Series is in unconformable contact with the lower member and consists of rocks that accumulated in the caldera and, as such, are thick (on the order of 2,000 feet) and generally horizontally bedded (Macdonald, 1940). This member resembles the lower member but contains more a'a flows than in the lower member. The middle member also is

locally intruded by dikes in the southwestern portion of the island (Takasaki, 1971).

The upper member is about 2,300 feet thick, and is mostly massive a'a flows that issued from large cinder cones (Takasaki, 1971). Dikes also locally intrude the upper member in the southwestern portion of the island, but fewer dikes are present in the upper member than in the lower two members. The valleys of the Waianae Range typically contain moderately thick deposits of alluvium[1] and colluvium[2].

Erosion has removed most of the western slope of the Waianae shield and exposed the internal structure of the volcano. The shield was built by eruptions that took place along three rift zones. The two principal rift zones trended northwestward and southeastward from the summit, while a lesser one trends northeastward (Takasaki, 1971). A rift zone of an active volcano is characterized by parallel to subparallel fissures and a line of cinder and spatter cones. These features are absent in older, dormant volcanoes such as the Waianae volcano where rift zones are identified by erosion-exposed dike complexes (Takasaki, 1971). The dikes are generally basalts and diabases and are aphanitic or have only a small content of phenocrysts. The dikes typically have glassy chilled margins and show a gradual steady increase in grain size from rim to center. Near surface lava in Hawaii typically contains high numbers of cooling joints, vesicle partings, flow-unit boundaries, rubble layers and other planes of weakness (Walker, 1987). Dikes cutting near surface flows can be highly irregular in shape. Dikes are common in the western and southwestern Waianae Range. They are sparse in the less permeable, massive, thick-bedded flows of

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[1] Sediments deposited by erosional processes, usually by streams, www.weather.gov/glossary/glossary.php.

[2] Rock and soil accumulated at the foot of a slope from gravitational forces, www.blm.gov/nhp/Commercial/SolidMineral/3809/deis/glossary.html.

the upper member and more numerous in the highly permeable, thin-bedded flows of the lower member of the Waianae Volcanic Series (Takasaki, 1971).

"Caprock", which consists primarily of alluvium, terrigenous and marine clays, and fossilized coral reef with associated calcareous detritus, overlies the volcanic sequences along much of the Oahu coastline. Portions of the caprock are important local coastal aquifers, such as in the Ewa Plain. However, much of caprock is less permeable than the sequences of volcanic rocks so it acts a confining unit above the volcanic aquifer sequence (Hufen et al, 1980; RUST, September 1993).

1.3 Regional Hydrogeology

On a regional scale, fresh groundwater in aquifers on Oahu is similar to other islands, and occurs as a lens floating above and displacing saline groundwater. Generally, the fresh water lens is thickest at the center of the island and thins toward the edges of the island at sea level (e.g. Hufen and others, 1980).

In the southeastern portion of the Waianae Range, the principal groundwater aquifer system is the middle and lower members of the Waianae Volcanic Series. The volcanic aquifers are recharged by infiltration of rainfall and surface runoff originating in the Waianae and Koolau Ranges. Flows of the upper member are largely above the water table and contain only a small perennial supply. Permeability of a volcanic aquifer is generally high due to presence of pahoehoe lava tubes and loose clinker zones and rubble between lava flows. However, permeability is highly variable on a local scale and the low-permeability dense interiors of a'a lava flows and cross-cutting near-vertical volcanic dikes can function as hydraulic barriers that locally partition groundwater both vertically and horizontally. Groundwater gradients in portions of the southern Waianae Range have been shown to be step-like rather than smooth due to the presence of dikes that act as barriers to groundwater flow (Takasaki, 1971; Hufen and others, 1980).

Groundwater generally flows from inland areas outward toward the coast. However, locally, discharge of groundwater to the sea is limited by low permeability “cap rock” that overlies the volcanics along much of the coast of Oahu. Locally, the caprock prevents the free discharge of groundwater to the ocean, and diverts groundwater flow parallel to the coastline toward areas without confining cap rock where the groundwater discharge to the sea is unimpeded.

Waimanalo Gulch is located in the Makaiwa Aquifer System as defined by the Commission on Water Resource Management (CWRM) Water Resource Protection Plan Volume II (George A. L. Yuen & Assoc., 1990). This aquifer has not been assigned a sustainable yield by CWRM, though it is adjacent to the Ewa-Kunia Aquifer System to the east and the Nanakuli Aquifer System to the northwest. The estimated sustainable yield of the Ewa-Kunia Aquifer System is 16 million gallons per day (mgd); while the Nanakuli Aquifer System is assigned one (1) mgd for sustainable yield.

Although no groundwater is developed in the Makaiwa Aquifer System and near Waimanalo Gulch, several monitoring wells and test holes have been drilled in the lower part of the valley and the neighboring Kahe Point area.

Present water levels encountered in the Ewa-Kunia Aquifer System, east of Waimanalo Gulch, are greater than 13 feet above msl. Near Makaiwa Gulch, just east of Waimanalo Gulch, a hydrologic discontinuity occurs where water levels drop to less than 6 feet above msl (see Stearns, 1940, p.36). U. S. Geological Survey test holes T-4 (2006-12) in the Ewa-Kunia Aquifer System and T-5 (2007-01) in the Makaiwa Aquifer System are only a mile apart and reflect the discontinuity (CWRM well database). **Figure 1, Well Location Map**, is a well location map that also depicts the approximate location of wells T-4 and T-5 and the boundary between the Ewa-Kunia and Makaiwa Aquifer systems. When originally drilled in 1938, the water levels for T-4 and T-5 were 17.0 feet and 6.5

feet above msl, respectively (Stearns, 1940). The last water level measurement for T-4 was 13.73 ft above msl (December 6, 2001, Honolulu Board of Water Supply measurement). Well T-5 was previously abandoned and sealed.

The Nanakuli Aquifer System, to the west of the Makaiwa Aquifer System, has only a few wells and test holes. One observation well of note was test hole T-15 (2307-01) described by Stearns (1940) and Mink (1978). This hole was drilled at an elevation of 479.6 ft above amsl. It penetrated 100 feet of talus and old alluvium before entering basalt. It was drilled to -9.0 feet above msl and had an initial water level of 2.6 feet above msl. According to Mink (1978), T-15 was used as an observation well until 1969. Regular monthly water levels were measured from 1940-1953 and ranged from 1.60 feet to 3.14 ft above msl. The average water level for the period of record was 2.0 feet above msl. Chlorides varied from 86 to 119 milligrams per liter (mg/L).

Hydraulic conductivities in dike-free basaltic lavas on Oahu typically range between 1,000 and 2,000 feet per day (ft/d). A value of 1,500 to 2,000 ft/d is commonly used in analytical and numerical groundwater models (Mink, 1980; Oki, 1997). The hydraulic gradient for dike-free lava flows is typically 1-foot per mile, which is the value found in the adjoining Ewa-Kunia Aquifer System.

For dike-impounded aquifers, the hydraulic conductivity depends upon dike spacing, their distribution and continuity, and depth of penetration into the aquifer. In an aquifer where there are more than 100 dikes per linear mile, or as used by Takasaki and others (1969) as constituting 5 percent or more of the country rock, the hydraulic conductivity is generally low (<1 percent), typically ranging between 1 and 100 ft/d. While in the marginal dike zone where dike occurrence is much less, the conductivity values typically range between 100 and 1,000 ft/d (Takasaki and Mink, 1982; Takasaki and Mink, 1985).

Wells, test holes, and monitoring observation wells were drilled in the lower valley as part of a regular monitoring program and for the proposed expansion plan.

Wells are sampled regularly and used to determine groundwater gradients. The wells listed below in **Table 1** are located near Makaiwa Gulch, Waimanalo Gulch, and Kahe Valley. Well data are from the CWRM database and data for the monitoring wells are provided by Waste Management of Hawaii, Inc.

Table 1: Wells in the Kahe Point/Waimānalo Gulch Sanitary Landfill Area

(Source: CWRM Well Database and Waste Management, Inc.)

Well No.	Old Name	Init. WL (ft amsl)	Init. Cl (mg/L)	Grnd El. (ft amsl)	Bot. Hole Elevation (ft. bmsl)	Casing Diameter (in.)	Length Screen Interval (ft)
2007-01*	T-5	5.5	484	80	-20	6	15
2107-01*	T-51	3.2	492	203	-7	4	11
2107-02	T-128	2.1	N/A	22	-182	N/A	N/A
2107-03	T-129	1.7	6750	28	-176	N/A	N/A
2107-04	T-130	5.8	362	62	-65	N/A	N/A
2107-05	T-131	1.9	3300	40	-51	N/A	N/A
2107-06	T-68	2.1	2410	58	-67	N/A	N/A
2107-07 (MW07)[a]		3.82	890	202.4**	-14.6	2	30
MW02 [a]		3.88	1400	73.82**	-8.8	2	15
MW03 [a]		3.84	1100	77.14**	-7.5	2	18
MW10		N/A	N/A			2	
MW11		N/A	N/A			2	

*sealed and/or lost

**top well head

a – data from Quarterly Monitoring Report for January –March 2006 at the WGSL

The wells shown in **Table 1** are located in lava flows defined by Stearns (1940) as “Lower and Middle Members” of the Waianae Volcanic Series. **Figure 1, Well Location Map** identifies the location of wells and also depicts the location of T-15.

The quality of groundwater in the volcanic aquifers is generally good, except where proximity to the ocean results in elevated salinity (Takasaki, 1971). Other sources of lower quality groundwater include leaching of hydrothermally altered volcanic rocks in the central vent area and of carbonate rocks above or adjacent to the volcanic aquifer (i.e., caprock; Takasaki, 1971). Total dissolved solids concentrations in wells to the northwest of the WGSL range from about 200 to about 2,000 mg/l. Chloride concentrations in these same wells range from about 10 to greater than 10,000 mg/l.

1.4 Site Geology

This section summarizes the results of studies related to site geology, hydrogeology, and geochemistry that have been performed at the WGSL since the early to mid 1990s.

The sequence of volcanic rocks encountered in borings and exposed on slopes at the WGSL is the lower member of the Waianae Volcanic Series (e.g. TNWRE, August 7, 1993). The lava flows include both a'a and pahoehoe flows ranging from aphanitic to porphyritic. Coloring of the rock material varies from grey to reddish grey to red, and the texture varies widely from highly vesicular to dense and fine-grained.

Based on observations made during drilling and down-hole video logs of borings drilled in October 2006 for monitoring wells MW-10 and MW-11, lava flows range in thickness from 3 to 20 feet thick, and loose clinker zones between flows comprise approximately 20 percent of the volcanic sequence (Geosyntec, December 7, 2006).

U. S. Geological Survey (USGS) personnel identified a near-vertical dike striking between about 15 and 20 degrees west of north, located at the approximate midpoint of the WGSL property. Furthermore, dikes have been documented to exist through visual observation from site personnel during excavation activities.

Two dikes were documented during the construction of Cell E1 (A-Mehr Inc, 2003). In addition, recent geologic reconnaissance has confirmed the presence of dikes to the north of the site (Mink & Yuen and Knight Enterprises, 2006). The trends of the dikes are predominantly north/northwest, and when projected to the southwest, intersect portions of the northern and northeastern cells of the existing landfill. The approximate location of near vertical dikes in the vicinity of the WGSL that cross-cut the sequence of basaltic lava flows are shown on **Figure 2**.

1.5 Site Hydrogeology

Groundwater under the WGSL is present within the lower and middle members of the Waianae Volcanic Series that dips slightly towards the coast (southwest). In the vicinity of the lower portion of the WGSL, the water table occurs at an elevation of approximately 4 feet above msl and is very flat. As a consequence of the topographic relief, depth to groundwater at the five monitoring wells ranges from 55 to 200 feet. **Table 2** provides depths and screened interval information for the five monitoring wells.

Table 2: Monitoring Wells at WGSL

	Northing (feet)	Easting (feet)	MP Elevation (ft above MSL)	approximate casing stickup (ft above gs)	-------- screen -------- top (ft bgs)	bottom (ft bgs)	10/20/2006 depth to gw (ft below MP)	10/20/2006 gw elevation (ft above MSL)	11/20/2006 depth to gw (ft btoc**)	11/20/2006 gw elevation (ft above MSL)
MW-2	66,879.36	456,496.80	73.85	1.9	82.6	82.6	69.62	4.25	69.66	4.19
MW-3	67,383.32	456,311.18	77.18	1	84.6	84.6	72.94	4.26	73	4.18
MW-7	68,092.04	456,724.17	202.42	2.3	217	217	198.31	4.13	198.28	4.14
MW-10	67,186.53	457,050.04	123.48	0	135	135	119.11	4.37	119.14	4.34
MW-11	66,570.31	456,821.29	61.13	3.5	67	67	56.68	4.45	56.775	4.36

Notes:

All five monitoring wells are Schedule 40 PVC casing.

All five monitoring wells surveyed by Park Engineering 24 October 2006.

Surveyed MP (measuring point) is top of PVC casing (TOC).

Oct 20, 2006 depth to water at MW-2, MW-3, and MW-7 was measured from top of cap for pump assembly, which is 3/16 inch (0.0156 ft) above top TOC

**** Pump assemblies at MW-2, MW_3 & MW-7 were removed prior to 11/20/2006 measurments so depth to water was measured from TOC for all wells.**

Water levels in monitoring wells are tidally influenced. Water levels reported here do not include averaging or compensation for tidal influence.

The marine sediments of the Ewa Plain to the south and east form a low permeability caprock that inhibits groundwater discharge to the ocean south and east of the WGSL. However, the caprock is reported to be generally absent along the coast to the west and northwest of Waimanalo Gulch, in the area of the Kahe Park. The distribution of confining caprock is interpreted to control the westward flow of groundwater and unimpeded discharge to the sea west to northwest of the WGSL. Salinity measurements of ocean water along this stretch of coastline performed by the USGS and TNWRE in 1991 are consistent with major discharge of fresh groundwater in this area (RUST, September 1993, 1997; Earth Tech, 2006). **Figure 3** shows an aerial photo of the general vicinity of the WGSL with approximate groundwater elevations at wells. This data supports a general northwest direction of groundwater flow toward the Kahe Beach coastline.

In the upper portion of the WGSL, a few near-vertical, north-northwest trending basaltic dikes have been mapped that cross cut the sequence of lava flows. Additional investigation is in progress to evaluate the potential influence of the dikes on groundwater flow in the upper portion of the WGSL. However, as stated earlier, all the dikes are up-canyon from the existing leachate collection sumps, so even if the dikes are barriers to groundwater flow they do not influence monitoring of groundwater for detection of potential leaks from the existing leachate collection sumps within the existing landfill footprint.

1.5.1 Hydrogeochemistry

The inorganic geochemistry of groundwater beneath the WGSL is fairly complex, reflecting both the facility's coastal location and its proximity to the coastal cap rock. Groundwater monitoring wells at the WGSL are screened within a transitional groundwater zone in which there is mixing between freshwater and seawater. Groundwater from each of the WGSL monitoring wells is a sodium-magnesium-calcium-chloride (Na-Mg-Ca-Cl) type water which generally reflects this mixing of freshwater and seawater. Total dissolved solid (TDS) concentrations in Monitoring Wells 03M and 07 are consistently lower than TDS

concentrations in Monitoring Well 02M, a condition that is also consistent with the facility's position within the coastal transition zone. The relative percentage of dissolved calcium in groundwater from Monitoring Well 02M is slightly higher than that in groundwater from Monitoring Wells 07 and 03M. This is likely related to the fact that Monitoring Well 02M is located nearer the cap rock (primarily calcium carbonate) than are Monitoring Wells 07 and 03M.

The most comprehensive study of groundwater chemistry was conducted in 1992 (by the former Waste Management Environmental Monitoring Laboratory in Geneva, Illinois). The purpose of that study was to establish the degree of hydraulic continuity across the WGSL and to further establish if the groundwater on either side of the dikes was hydraulically connected. The results of the geochemical study were consistent with little to no barrier to lateral groundwater flow between the downgradient edge of the landfill and the ocean west of the WGSL. This is further corroborated through the results of the tidal study described above which show hydraulic continuity between all monitoring wells at the WGSL with the sea. This also is consistent with the concept of transition-zone groundwater (RUST, 1997).

2. GROUNDWATER MONITORING

2.1 Groundwater Monitoring Network

Detection monitoring wells installed for the WGSL were located using previous flow direction information to better target the primary points of leachate accumulation (leachate sumps). An appropriate groundwater detection monitoring network can be designed based on flow direction and velocity information.

Water levels in monitoring wells at the WGSL are tidally influenced. The results of a tidal study conducted in November 2006 (Geosyntec, 2006) indicate groundwater flow to the northwest in the immediate vicinity of the WGSL. Historical elevations in the HECO wells indicate a water table elevation

approximately 2-3 feet lower than the WGSL wells, suggesting a westerly groundwater flow direction on a local-regional scale.

The gradient calculated using the groundwater elevation data collected during the November 2006 tidal study is about 0.0003 foot/foot (approximately 1.5 feet/mile) to the northwest. This value is consistent with the hydraulic gradient for dike-free lava flows, typically about 1 foot per mile, and indicates that groundwater flow in the lower part of the WGSL is not significantly affected by dikes. Groundwater velocity is calculated using the equation V= Ki/n, where K = hydraulic conductivity, i = hydraulic gradient, and n = effective porosity. Hydraulic conductivities in basaltic lavas on Oahu typically range between 1,000 and 2,000 ft/d for dike-free lavas with a value of 1,500 to 2,000 ft/d commonly used in analytical and numerical groundwater models (Mink, 1980; Oki, 1997). Using a K value of 1,500 ft/day, a gradient of 0.0003 ft/ft, and an effective porosity of 0.20, the groundwater velocity is calculated to be approximately 2.3 ft/day.

The current groundwater monitoring network includes five monitoring wells around the toe of the WGSL (02M, 03M, 07, MW-10, and MW-11). Locations of the five monitoring wells are shown on **Figure 2**. Based on the calculated groundwater flow directions and velocity, the existing monitoring wells are sufficient for monitoring potential impacts to groundwater downgradient of the toe of the WGSL, and the ash monofill sump in cell 8. Monitoring well 07 is located west of the MSW Cell E-1 Sump and the MSW Cell 4B Sump. Based on a westerly flow direction, this well is downgradient of the sumps. Based on a northwesterly flow direction, this well is cross-gradient to down-gradient of the sumps. As discussed above in Section 1.5.1, Hydrogeochemistry, above, the apparent northwestward flow toward monitoring well 07 may be a consequence of local recharge associated with the surface water detention pond elevating water levels in monitoring wells 02M and 03M.

Results of the long-term monitoring of the WGSL monitoring wells (currently equipped with pressure transducers and data loggers) will be used to continue

assessment of fluctuations in groundwater flow direction and gradient to further evaluate if the current monitoring network is sufficient for long-term detection monitoring.

2.2 Groundwater Monitoring Parameters

Chapter 11-58.1, HAR, (1) requires that MSW landfills routinely monitor groundwater for the 15 metals and 47 volatile organic compounds (VOC) listed in Appendix I of Chapter 11-58.1. This is the same list of monitoring parameters contained in the Federal Subtitle D regulations (40 CFR Part 258, Appendix I) and, in addition to containing an excessively large number of parameters, also contains several parameters (i.e., the 15 metals) which are generally viewed as ineffective monitoring parameters because of their limited mobility in most subsurface environments. The EPA intended the Appendix I analytes to be default parameters for use in those states which have not yet obtained Subtitle D authorization. Through 40 CFR Part 258.54 (a)(1) and (2), the EPA has provided authorized states, such as Hawaii, the flexibility to approve alternative lists of site-specific monitoring parameters. This flexibility, specifically outlined in Chapter 11-58.1 subsections (1)(A) and (B), HAR, has been reflected in the development of previous groundwater monitoring programs for the WGSL (e.g., RUST, 1997).

Accordingly, the groundwater monitoring program describes the approach for selecting an updated alternative list of site-specific groundwater monitoring parameters for use during detection monitoring at the WGSL, and incorporates the approximate 10 years of additional monitoring data collected since the preparation of the previous WGSL groundwater monitoring program (RUST, 1997).

2.2.1 Site-Specific Detection Monitoring Selection Strategy

It is widely accepted that a combination of volatile organic compounds (VOCs) plus selected general water quality parameters will typically provide the most reliable monitoring parameters for most MSW landfills. VOCs in particular can be highly effective parameters for providing an early indication of a potential release from a landfill because they are: (1) rarely detected in background groundwater samples; (2) detected more frequently than any other class of organic compounds in solid waste landfill leachate (Cravy et al., 1990; Plumb, 1991); and (3) are analytically sensitive (i.e., they can be detected at extremely low concentrations); and (4) are relatively mobile in the groundwater system. Although commonly present in MSW landfill leachate, semi-volatile organic compounds (SVOCs), as a group, are significantly less mobile than VOCs in most subsurface environments and do not typically provide for substantial additional monitoring benefits.

The above strategy (i.e., VOCs in conjunction with a short list of water quality parameters) has been implemented as a part of previous WGSL groundwater monitoring programs (e.g., RUST, 1997) and is consistent with the monitoring parameter selection strategy outlined in the Guidance Document. This groundwater monitoring program for WGSL reaffirms this strategy but provides a re-evaluation of water quality monitoring parameters using updated groundwater and leachate monitoring data.

The VOCs listed in Appendix I of Subtitle D, which have been monitored in accordance with the previous WGSL monitoring program (RUST, 1997) will continue to be routinely monitored.

2.2.2 Water Quality Monitoring Parameters

Water quality monitoring parameters are those parameters that occur naturally in groundwater and for which a background concentration must be established in

order to provide an indication of a possible leachate release. For detection monitoring purposes, the use of the minimum number of effective water quality monitoring parameters is always the most effective approach over utilization of a very long list of monitoring parameters, such as the list of metals in Appendix I or a generic list of cations, anions, and other common parameters such as TDS. This is true because of the direct relationship between the number of statistical comparisons performed during each sampling event and the resulting false positive error rates. For example, if a given detection monitoring program consists of 5 wells each of which is sampled for 20 parameters (i.e., 100 statistical decisions per monitoring event), even using a very low error rate (e.g., 0.01, or 1%), it would yield one false positive result every sampling event. The larger the number of statistical decisions that are performed each sampling event, the higher (i.e., less conservative) the associated statistical limit must be in order to avoid excessively high false positive results.

The selection of a list of alternative monitoring parameters for the WGSL is based on actual site conditions and involves a detailed evaluation of available site-specific groundwater and leachate data which, at the WGSL, now contains extensive long-term data Geosyntec 2006). Using the strategies outlined in the State of Hawaii Guidance Document, the first step is to identify those water quality parameters whose concentration in leachate are significantly higher than in groundwater, in order to account for dilution and attenuation processes. The resulting list of potential monitoring parameters is then refined further by identifying and removing parameters that provide substantially redundant coverage (e.g., monitoring for both electrical conductivity and TDS). From the remaining parameters, those anticipated to provide the earliest and most reliable indication of a release are selected as detection monitoring parameters for statistical evaluation purposes. This determination is based on the relative mobility of the constituents, the detectability of each parameter using existing analytical methods, the likelihood of false positive results associated with each parameter, as well as any changes in the parameter that might be expected

during its migration through the unsaturated and saturated zones beneath the facility (e.g., due to changes in pH or redox conditions).

The Guidance Document suggests that potential detection monitoring parameters first be screened by calculating the concentration contrast between leachate and groundwater. As noted in the Guidance Document, a potentially effective monitoring parameter would exhibit a concentration in leachate at least 5 times greater than the upper background limit in groundwater. Note that a leachate-groundwater contrast of 5 times is considered highly conservative based on EPA guidance, which identifies typical useful leachate-groundwater contrast for potentially useful indicator parameters of at least 10 to 20 times (EPA, 1996). If insufficient contrast exists for a specific parameter (i.e., the leachate concentration is consistently at or below the background groundwater limit), then that parameter is eliminated from further consideration for detection monitoring.

Table 3 summarizes the leachate-groundwater concentration contrast values for various inorganic and water quality parameters for the WGSL. These values were calculated by dividing the background concentrations using statistical prediction limits for pooled data from groundwater monitoring wells 02M, 03M, and 07 into maximum leachate values in the WGSL database (through the first half of 2005). The groundwater data was pooled in order to provide sufficient data for statistical calculations and it is assumed that the data is representative of background conditions (i.e., no leachate impact). This is a reasonable assumption given that no inorganic leachate impact is indicated in the WGSL monitoring wells, as described in the routine monitoring reports. Furthermore, numerous monitoring parameters are viable due to the large contrast between concentrations of chemicals in leachate and groundwater at the WGSL facilitates.

Table 3: Leachate - Groundwater Concentrations Contrasts
Waimānalo Gulch Sanitary Landfill

Analyte of Interest	Leachate Pt. Exhibiting Max. Concentration of Analyte of Interest[1]	Date of Max. Leachate Concentration[1]	Maximum Leachate Concentration	Groundwater Background Concentration[2]	Units	Leachate/ Groundwater Ratio
Sulfide	All	5/6/2005	ND[3]	0.05	mg/L	NM[4]
Cyanide, total	ASHMH	12/15/1998	0.022	0.02	mg/L	1.1
Iron*	MSWLS2	12/20/2004	780	636	ug/L	1.2
Sulfate	ASHMH	5/6/2005	890	514	mg/L	1.7
Arsenic*	MSWLS2	12/20/2004	37	10.0	ug/L	3.7
Magnesium*	ASHMH	12/15/1998	3390	793.9048	mg/L	4.3
Beryllium*	MSWLS2	12/20/2004	26	5.0	ug/L	5.2
Alkalinity (as caco3)	MSW-LSE1	5/6/2005	1800	288	mg/L	6.3
Specific conductance field	ASHMH	12/15/2002	91000	13047.5	umhos/cm	7.0
Cobalt*	MSWLS2	12/20/2004	420	50.0	ug/L	8.4
Thallium*	ASHMH	12/29/1999	146	10.0	ug/L	15
Vanadium*	MSWLS2	12/20/2004	1000	50.0	ug/L	20
Chloride	ASHMH	12/26/2000	100000	4510	mg/L	22
Solids, total dissolved	ASHMH	12/14/2001	185000	7891.257	mg/L	23
Calcium*	ASHMH	12/26/2000	21400	816.558	mg/L	26
Nickel*	MSWLS2	12/20/2004	1700	51.2	ug/L	33
Selenium-dissolved	ASHMH	5/6/2005	180	5.0	ug/L	36
Chemical oxygen demand	ASHMH	12/20/2004	5900	160.4427	mg/L	37
Mercury*	ASHMH	12/20/2004	8.7	0.20	ug/L	44
Sodium*	ASHMH	12/20/2004	51000	1108.4675	mg/L	46
Barium*	ASHMH	12/15/1998	11700	200	ug/L	59
Nitrogen, total kjeldahl	ASHMH	4/3/1996	84.4	1.0	mg/L	84
Chromium*	MSWLS2	12/20/2004	1000	10.0	ug/L	100
Bromide	ASHMH	12/26/2000	2270	22.1772	mg/L	102
Lead*	ASHMH	12/20/2004	630	5.0	ug/L	126
Zinc*	MSWLS2	12/20/2004	2700	20.0	ug/L	135
Copper*	ASHMH	12/20/2004	4900	25.0	ug/L	196
Total organic carbon	ASHMH	12/20/2004	2300	7.3	mg/L	315
Potassium*	ASHMH	12/29/1999	17800	38.3028	mg/L	465
Cadmium*	ASHMH	12/20/2004	2400	5.0	ug/L	480
Manganese*	DET-POND	5/20/2005	31	0.0522	mg/L	594
Nitrogen, nitrate	DET-POND	4/27/2005	5880	7.52	mg/L	782
Nitrogen, ammonia	DET-POND	4/27/2005	646	0.24	mg/L	2692

Notes:

[1] based on data through the first half of 2005

[2] based on statistical prediction limit of background data set through the first half of 2005

[3] ND = analyte not detected in any leachate samples

[4] NM = ratio not meaningful because leachate data sets contain no detections of this parameter

* Note that contrast evaluation compares the "total" concentration of a metal in leachate to the "dissolved" concentration in groundwater

The contrast values shown on **Table 3** range over several orders of magnitude and can be categorized as follows:

Leachate/Groundwater = <10:

- Arsenic
- Beryllium
- Cyanide, total
- Magnesium
- Sulfate
- Barium
- Chloride
- Mercury
- Selenium
- Sodium
- Thallium
- Alkalinity
- Cobalt
- Iron
- Specific conductance field
- Leachate/Groundwater = 10 to 99:
- Calcium
- Chemical oxygen demand
- Nickel
- Nitrogen, total Kjeldahl
- Solids, total dissolved
- Vanadium

Leachate/Groundwater = 100 to 999:

- Bromide
- Chromium
- Lead
- Nitrogen, nitrate
- Zinc
- Cadmium
- Copper
- Manganese
- Potassium
- Total organic carbon

Leachate/Groundwater = >1000

- Nitrogen, ammonia

Because of groundwater flow conditions at the WGSL, the latter two groups with leachate-groundwater concentration contrasts on the order of 100 to 1,000 are of particular interest in the process of identifying potentially useful site detection monitoring parameters and are further evaluated below.

In the group with contrast values between 100 and 999, the trace metals cadmium, chromium, copper, lead, manganese, and zinc are eliminated from consideration due to mobility considerations. Several processes interact to influence the transport of metals in the leachate-soil-groundwater system,

including complexation reactions, oxidation/reduction processes, and reactions that result in the removal of metal ions from liquid such as adsorption and precipitation. It is widely recognized that, due to the positive charge of metal ion species, adsorption of metals onto negatively charged clay mineral or organic matter is an important limiting process with respect to metals mobility in this environment. A cation with greater valence state is adsorbed more strongly that a cation with a lower valence state and, for a given valence state, the cation with the smallest radius is adsorbed more strongly than a cation with a large radius. Trace metals, therefore, can be expected to be adsorbed more strongly than the major metals, such as sodium, potassium, calcium, and magnesium, all of which possess relatively large atomic radii and relatively low valence states. Based on these factors, cadmium, chromium, copper, lead, manganese, and zinc are unlikely to provide effective indication of a release from the waste management.

Additionally, bromide is excluded from further consideration due to its association with seawater, which is known to influence site groundwater chemistry (**Section 1.3**). Therefore, Total organic carbon (TOC), potassium, and nitrate as nitrogen are considered potentially effective indicators of site leachate. However, for detection monitoring purposes at the WGSL, chemical oxygen demand (COD) is selected as a replacement for TOC, in spite of its lower concentration contrast. Both COD and TOC are gross-scale measures of the organic carbon content of water and a strong positive statistical correlation between TOC and COD is evident in site leachate. The WGSL's previous monitoring program incorporated COD as a detection monitoring parameter. Therefore, significantly more recent background data exist for COD in the WGSL database, thereby facilitating statistical analysis.

Ammonia-nitrogen exhibits a relatively large leachate-groundwater concentration contrast (approximately 2,700). Clearly, this parameter is highly concentrated in site leachate relative to groundwater. However, ammonia-nitrogen is most mobile under relatively strongly reducing and/or acidic conditions. Groundwater

conditions at WGSL are such that rapid oxidation and rapid neutral pH buffering can be expected. These effects would serve to limit the mobility of ammonia-nitrogen upon release to the groundwater system. Therefore, ammonia-nitrogen, in spite of its large contrast value, would be expected to be a less effective detection monitoring parameters than COD, potassium, and nitrate.

2.2.3 Supplemental Geochemical Parameters

In addition to the use of VOCs, COD, potassium, and nitrate as detection monitoring parameters, the WGSL also incorporates analysis of supplemental geochemical parameters into the routine monitoring program. These supplemental geochemical parameters augment the site-specific detection monitoring parameters such that the general chemical nature of groundwater can be further characterized and potential mechanisms affecting water quality (both natural and man-made) can be better understood and evaluated. The supplemental parameters will not be evaluated statistically. However, they can, on an as-needed basis, provide critical data for evaluating data reliability and potential changes in groundwater quality without affecting the site-wide false-positive statistical error rate. The following supplemental geochemical parameters are to be analyzed in conjunction with routine detection monitoring parameters during each monitoring event:

- Total Alkalinity (reported as bicarbonate and carbonate)
- Bromide
- Chloride
- Sulfate
- Dissolved Calcium, Magnesium, Potassium, Sodium
- Total Dissolved Solids

2.2.4 Summary of Site-specific Detection Monitoring and Supplemental Parameters

The updated detection monitoring parameters for use in detection monitoring at the WGSL are summarized in **Table 4**. Concentration limits using both statistical and non-statistical methods, as appropriate, will be established for each of the detection monitoring parameters (as described in Section 4.0). In addition to routine analysis of the detection monitoring parameters, the supplemental geochemical parameters listed in **Table 4** will also be analyzed during each routine monitoring event. These supplemental monitoring parameters are collected for geochemical informational purposes and are not subject to statistical analysis or other compliance-related evaluation.

As additional leachate data is generated throughout the course of landfill operations, the detection monitoring parameter list will be re-evaluated and updated as required. If parameters are added to the routine detection-monitoring list, background concentrations will be determined using appropriate statistical methods and added to the long-term monitoring program after the changes are approved by the DOH.

2.3 Groundwater Monitoring Schedule

Groundwater monitoring will be performed each quarter for recently installed wells MW-10 and MW-11 until a minimum of 8 background data sets are obtained to facilitate statistical evaluation (i.e., quarterly for a minimum of two years). Quarterly monitoring will continue at monitoring wells 02M, 03M, and 07 for two years. If appropriate and approved by DOH, and following statistical evaluation of two years of quarterly data from the five monitoring wells, the monitoring frequency will decrease from quarterly to semiannually.

Table 4: Detection Monitoring Parameters
Waimānalo Gulch Sanitary Landfill

Constituents	Frequency	Locations
GROUNDWATER Detection Monitoring Parameters Volatile Organic Compounds (VOCs) -- EPA 8260B Parameters Chemical Oxy. Demand; Potassium, dissolved; Nitrate-N	Quarterly	Wells: 02M, 03M, 07, MW-10 and MW-11
Supplemental Monitoring Parameters Total Alkalinity (reported as bicarbonate and carbonate) Bromide; Chloride; Sulfate; Dissolved Calcium; Dissolv. Magnesium; Dissolv. Sodium; Total Dissolv. Solids	Quarterly	Wells: 02M, 03M, 07, MW-10 and MW-11
Groundwater Characterization Parameters (1) detection monitoring parameters, above (2) supplemental geochemical parameters, above (3) Subtitle D Appendix II parameters, below 17 "dissolved" trace metals: Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Tl, Sn, V, Zn Cyanide, total; Total Sulfide; Semivolatile Organic Compounds; Pesticides; Herbicides; PCBs	Once, upon installation	MW-10 and MW-11 first event; any newly installed wells
LEACHATE Routine Leachate Monitoring Parameters Total Alkalinity (reported as bicarbonate and carbonate); Bromide; Chloride; Sulfate; Calcium, total; Magnesium, total; Potassium, total; Sodium, total; Total Dissolved Solids; Chemical Oxygen Demand; Nitrate-N; VOCs (EPA Method 8260B analytes)	Annually	Ash monofill (Cell 8 Sump), MSW Cell E-1 Sump, MW Cell 4B Sump
Non-Routine Leachate Characterization Parameters 17 "total" trace metals: Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Tl, Sn, V, Zn Cyanide, total; Total Sulfide; Semivolatile Organic Compounds; Pesticides; Herbicides; PCBs Major cations and anions (covered by routine monitoring, above) – (Mg, Na, Ca, K, Cl, carbonate, sulfate, and bicarbonate) Major leachate indicators (partially covered by routine monitoring, above) – (TDS, TOC, Total Alkalinity, Nitrogen–Ammonia, Cl, Fe) Field measurements (performed in accordance with Sampling and Analysis procedures in Section 5.0) – (electrical conductance, pH, temperature, and turbidity)	Biennially	Ash monofill (Cell 8 Sump), MSW Cell E-1 Sump, MW Cell 4B Sump, plus any newly sampled leachate locations

3. LEACHATE MONITORING

Leachate monitoring has been performed on a routine basis at the WGSL in accordance with the WGSL solid waste operating permit and with previous site monitoring programs (e.g., RUST 1997). Currently, monitoring is conducted pursuant to the Monitoring Plan, the *Groundwater, Surface Water, and Leachate Sampling Guide* (WMI 2000), and the DOH letter request (DOH 2005). Monitoring is conducted quarterly and reported along with groundwater monitoring (e.g. Earth Tech, 2006).

3.1 Leachate Monitoring System

Leachate samples will be routinely collected to augment the database of potential source information and to evaluate the suitability of site monitoring parameters. Sampling of the following leachate monitoring locations (see **Figure 1**) is proposed on an annual basis:

- Ash monofill (Cell 8 Sump)
- MSW Cell E-1 Sump
- MW Cell 4B Sump (pending DOH approval and installation)

3.2 Leachate Monitoring Parameters

Routine leachate monitoring parameters will consist of the same parameters used for groundwater detection monitoring and the supplemental geochemical parameters including:

- Total Alkalinity (reported as bicarbonate and carbonate)
- Bromide; Chloride; Sulfate
- Calcium, total
- Magnesium, total
- Potassium, total
- Sodium, total
- Total Dissolved Solids

- Chemical Oxygen Demand
- Nitrate-N
- VOCs (EPA Method 8260B analytes)

Note that leachate samples are not filtered and, therefore, the major cations are shown as “total” for leachate (as opposed to “dissolved” for groundwater).
In addition to the above routine parameters, leachate samples collected from new leachate locations, and leachate samples collected from existing locations every two years (biennial characterization) will be analyzed for the following Subtitle D Appendix I parameters and “leachate indicators”, per the Guidance Document:

- 17 trace metals (Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Tl, Sn, V, Zn) plus cyanide and sulfide
- Semivolatile Organic Compounds
- Pesticides
- Herbicides
- PCBs
- Major cations and anions (covered by routine monitoring, above) – (Mg, Na, Ca, K, Cl, CO3, SO4, HCO3)
- Major leachate indicators (partially covered by routine monitoring, above) – (TDS, TOC, Total Alkalinity, Nitrogen–Ammonia, Cl, Fe)
- Field measurements (performed in accordance with Sampling and Analysis procedures in Section 5.0) – (electrical conductivity, pH, temperature, and turbidity)

4. DATA EVALUATION METHODS

The following subsections describe the criteria by which groundwater data will be evaluated at the WGSL for detection monitoring purposes. These criteria represent a conservative approach to groundwater analysis and incorporate

state–of–the–practice statistical and other evaluation methodologies consistent with the Guidance Document.

4.1 Statistical Methodology for Evaluation of Inorganic Parameters

Consistent with the existing groundwater monitoring program at the WGSL, an intra-well monitoring strategy using Shewhart-CUSUM control charts will be used for routine detection monitoring. Shewhart-CUSUM control charts (Gibbons, 1992; Gibbons 1994) are particularly effective in this capacity because they are capable of detecting both sudden and gradual changes in groundwater chemistry. Combined Shewhart–CUSUM control charts will be constructed for each well where intra-well monitoring is performed to provide a statistical and visual tool for detecting trends and abrupt changes in inorganic groundwater chemistry. The combined Shewhart–CUSUM procedure assumes that the data are independent and normally distributed. The most important assumption is independence (Gibbons, 1994). Therefore, care should be taken to never sample wells more frequently than sample independence can be demonstrated based on site–specific hydrogeological factors. The assumption of normality is somewhat less of a concern because the data can usually be adequately transformed for most applications. Non-detects (NDs) can be replaced by one–half of the PQL without serious consequence, although this procedure should be applied only to constituents that are detected in at least 25% of all samples. For data sets with less than 25% detected values in the background data set, non-parametric prediction limits will be used in lieu of Shewhart-CUSUM control charts.

Intra-well monitoring is always the preferred approach for wells not already impacted by inorganic waste constituents because it eliminates the spatial component of chemistry variability from the statistical evaluation. No impact from inorganic waste constituents has been identified to date in WGSL groundwater. A statistically significant trend in sodium concentrations exhibited by well 03M, as reported in 2004 was demonstrated to be unrelated to impact from the facility (A-Mehr, 2004).

For intrawell comparisons, a minimum of eight background samples (i.e., from each well in the monitoring program) is required for parametric (i.e., Shewhart-CUSUM) tests and 13 background samples for nonparametric (i.e., Prediction Limit) tests. Additional discussion of intrawell monitoring can be found in Gibbons (1987a, 1987b, 1990, and 1994). Statistical evaluation of groundwater monitoring data will be performed using DUMPStat™ statistical modeling software, developed consistent with USEPA and ASTM guidance on groundwater monitoring at Subtitle D and Subtitle C facilities (Gibbons and Discerning Systems, 1994; www.discerningsystems.com).

4.2 Non-Statistical Methodology for Evaluation of VOCs

VOCs have been demonstrated to be effective indicators of a release from MSW landfills. However, because these compounds are rarely naturally detected in background groundwater samples, establishing monitor well–specific limits for VOCs is generally not an option. Therefore, a detection monitoring decision rule based on laboratory–specific practical quantitation limits (PQL) will be used to identify a statistically significant monitoring result with respect to VOCs.

It is generally accepted that when a landfill facility actually produces a leachate release to groundwater, multiple constituents contained in the leachate are associated with the source fluids and are subsequently detected by the groundwater monitoring program. A single constituent at very low concentration (i.e. below the PQL) typically is not the signature that is produced from an actual release. The calculation of laboratory–specific PQLs (Gibbons, et al., 1992) already incorporates a measure of the statistical uncertainty that is associated with the measurement process. Therefore, any VOC detected and verified at a concentration above the PQL would be statistically significant, and would therefore trigger assessment monitoring (or an alternative source demonstration if the detection is unrelated to a release from the landfill). This decision rule only

applies in cases where the constituent has rarely, or never, been detected in background samples.

PQLs assure that the quantitative value of the analyte is close to the measured value. Method detection limits (MDLs), on the other hand, indicate that the analyte is present in the sample with a specified degree of confidence (Gibbons et al., 1991). For analytes with estimated concentrations greater than the MDL but not the PQL, it can only be concluded that the true concentration is greater than zero; the actual concentration cannot be determined. The actual concentration of an analysis result between the PQL and the MDL (often referred to as a “trace” result or a “J-flagged” result) may actually be less than the MDL. Therefore, comparison of a detected concentration to a maximum contaminant level (MCL), or any other concentration limit, is not meaningful unless the concentration is greater than the PQL.

Although the use of VOC results reported between the MDL and PQL is not appropriate for use in the decision rule, such trace/J-flagged results can be used to guide further investigation in the event that long-term, repeatable trace/J-flagged results are observed, such as the recent case with WGSL well 07; in that case, repeatable trace detections of VOCs were the basis for initiating further study that resulted in the identification of a probable non-landfill source (GeoChem Applications, 2005).

4.3 Detection Verification Procedure

If groundwater analysis results have been collected, checked for quality assurance and quality control (QA/QC) consistency and are determined to be above the appropriate statistical level (i.e., the Shewhart-CUSUM control chart limit or non-parametric prediction limit for inorganic monitoring parameters, or the PQL for one or more VOCs), the results should be verified in accordance with the objectives of 40 CFR Part 258.53 and HAR Chapter 11-58.1.

Verification resampling is an integral part of the statistical methodology described by the USEPA's *Addendum to Interim Final Guidance Document – Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* (July 1992). Without verification resampling, much larger statistical limits would be required to achieve site–wide false positive rates of 5% or less. Furthermore, the resulting false negative rate would be greatly increased. For the WGSL groundwater detection monitoring program, the following procedure will be performed for each compound determined to initially be above its statistical limit. Note that only those compounds that initially exceed their statistical limit should be sampled for verification purposes; otherwise, an unacceptably high false-positive error rate can be expected (e.g., if PCE is the only compound detected during an EPA Method 8260B scan, then only PCE is targeted and reported by the laboratory during the retest).

Volatile Organic Compounds

If one or more VOCs is/are detected above statistical limit(s) (i.e., PQL), one immediate resample and analysis should be conducted. A statistical exceedance will be recorded and assessment monitoring initiated if any single VOC is measured above the PQL in the verification resample, or an alternative source demonstration may be performed if the exceedance is not anticipated to be associated with a release from the facility.

Inorganic Constituents

If one or more of the inorganic parameters are detected above their statistical limit (i.e., Shewhart–CUSUM control chart limit or non-parametric Prediction Limit), one verification resample will be collected at the next scheduled sampling event. A statistical exceedance will be recorded and assessment monitoring initiated if verification of an elevated parameter is confirmed for one discrete verification resample, or an alternative source demonstration performed if the exceedance is not a result of a release from the facility

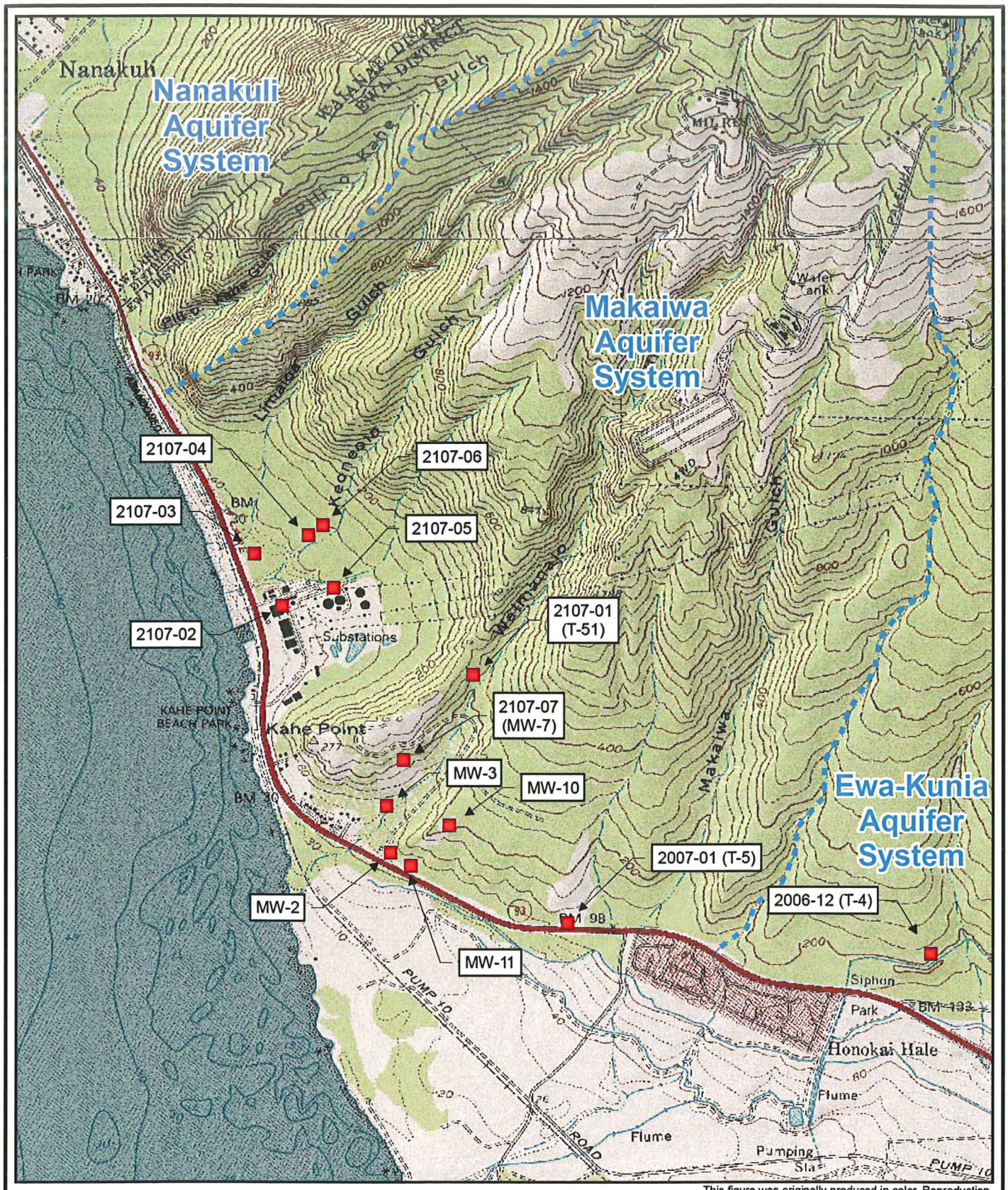
5. FIGURES

See attached figures referenced in this document:

Figure 1 - Well Location Map

Figure 2 - Near Vertical Dikes in the Vicinity of Waimānalo Gulch Sanitary Landfill

Figure 3 - Approximate Water Table Elevation, WGSL and Vicinity



This figure was originally produced in color. Reproduction in black and white may result in a loss of information.

LEGEND

- Monitoring Well Locations
- Major Aquifer Approximate Boundary

0 2000
Scale in Feet

Map Projection: GCS NAD 1983

Source: USGS

N

DRAFT

FIGURE 1
AREA AQUIFERS AND MONITORING WELLS
WAIMANALO GULCH SANITARY LANDILL

0637105805F02R01.mxd 11/14/07 | KBD

LEGEND

- EXISTING GROUND 10-FT CONTOUR (MSL)
- CELL BOUNDARY
- PROPERTY LINE
- 03M MONITORING WELLS (LOCATIONS APPROXIMATE)
- LEACHATE SUMP
- APPROXIMATE LOCATIONS OF REPORTED DIKES

400 200 0 400 800

SCALE IN FEET

NOTES:

1. EXISTING TOPOGRAPHY BASED ON 30 DECEMBER 2005 AND 29 DECEMBER 2001 AERIAL SURVEY PROVIDED BY OWNER USING LOCAL COORDINATE SYSTEM.

2. LOCATIONS OF DIKES D1, D2, AND D3 ARE BASED ON HISTORICAL REPORTS (E.G. RUST, 1993, 1997; EARTH TECH, 2006A) BUT NO EVIDENCE OF REPORTED DIKES D1, D2, AND D3 IS VISIBLE IN THE SLIDE SLOPES OF WAIMANALO GULCH. LOCATIONS OF DIKES D3, D4, AND D5 ARE BASED ON RECENT GEOLOGIC RECONNAISSANCE MAPPING AND GPS COORDINATES (MINK & YUEN AND KNIGHT ENTERPRISES, 2006).

GEOSYNTEC CONSULTANTS

SITE PLAN

WAIMANALO GULCH LANDFILL
OAHU, HAWAII

FIGURE NO.	2
PROJECT NO.	WR0935
DATE:	DECEMBER 2006

P:\GIS\Waimanalo\AI\August2007\Figure 2 Site Plan with MWs.ai

Notes:
1. MSL - Mean Sea Level
2. Posted values are general water levels elevations (ft above MSL)

N

0 2000 ft
Scale Approximate

GeoSyntec Consultants

Aerial Photo with Approximate Water Table Elevations

DRAFT

Figure 3

WR0935

December 2006

P:\GIS\Waimanalo\AI/Figure 5 Site Aerial.ai

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Appendix E

Botanical Resources Report for Alternative Municipal Refuse Disposal Sites on the Island of O'ahu, 2007

Botanical resources report for alternative municipal refuse disposal sites on the Island of O'ahu[1]

February 20, 2007 *AECOS* Consultants No. 065

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INTRODUCTION

Although solid waste generated by the populace on the Island of O'ahu is increasingly diverted to various other forms of disposal, there remains today a need to landfill a portion of the waste stream. The need for a solid waste disposal site will likely be reduced in the future, but not eliminated. This report considers botanical resources extant at potential landfill sites as presented by the City & County of Honolulu. The purpose of this report is to establish which, if any of the proposed locations, support plants of special concern: either species that are listed by the state and federal governments under an endangered species program, or plant assemblages that are substantially native in their composition, and therefore represent intact or partially intact native communities capable of supporting biological resources unique to the Hawaiian Islands.

Five (5) potential landfill sites are investigated: Mā'ile Quarry, Nānākuli B, Waimanalo Gulch (lateral expansion), Makaīwa Gulch, and Kapa'a (Fig. 1). All but the last site are located on leeward O'ahu; Kapa'a is the Ameron quarry site on windward O'ahu (located between Kāne'ohe and Kailua).

With respect to the potential for any of the sites to support an assemblage of plants with significant native species representation, it must be realized that selection of potential sites was limited to those parts of the island *makai* (seaward) of the Underground Injection Control (UIC) and *makai* of the Groundwater Protection Zone (GPZ). The boundaries defining these two

[1] This report was prepared for R. M. Towill for inclusion in the EIS titled "Waimanalo Gulch Sanitary Landill Lateral Expansion EIS."

zones closely approximate each other and the zones occupy most of the interior of the Island of O'ahu. This requirement for placement of a waste landfill restricts such development to a rather narrow coastal belt around the Island. This coastal belt is mostly populated or otherwise developed and disturbed; with few exceptions, most disturbed by human activities, including those of the ancient Hawaiian population. Further, from an initial larger set of potential sites, some that were in more pristine areas (such as 'Ohikilolo Valley) were eliminated from consideration for both environmental and accessibility reasons. Thus the selection process has already moved significantly in a direction driven in part by factors that minimize adverse impacts on special botanical resources.

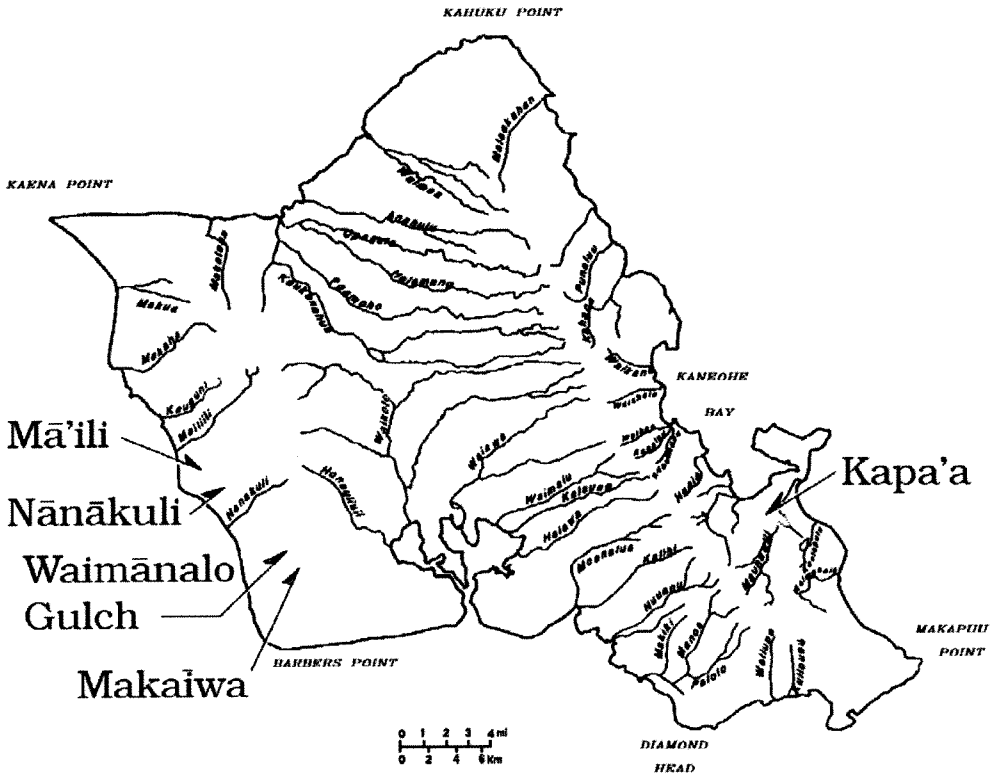

Figure 1. Map of O'ahu showing location of the five sites considered for solid waste landfills on the island.

METHODS

For various reasons, it was not possible to conduct surveys of the botanical resources found on each of the proposed landfill sites. Permission was granted, and a site survey conducted, in the Waimanalo Gulch Expansion Area, representing the alternative of expanding the present-day solid waste landfill site further back up into Waimanalo Gulch. For the other locations, botanical resources were assessed by means of consulting past reports, reviewing the Hawaii Natural Heritage Program (HNHP) data base, and visiting the area to establish the nature of the extant vegetation and the likelihood that valuable botanical resources would be present. Results of these approaches to establishing actual more likely botanical resources present are presented under the individual site descriptions that follow.

The botanical survey for the Waimanalo Gulch expansion area followed a standard protocol utilized for discovery-type surveys called a wandering pedestrian transect. In more basic terms, this amounts to a botanist hiking around the property in a manner that allows a visual survey of all of the various types of habitats present on the property. During the transect, each plant species is noted as it is encountered, material is collected where a field identification proves difficult, photographs are taken, and a sense of the relative abundance of each species on the property is developed.

As the survey progressed, 15 waypoints (intermittent position locations) were entered into a hand-held GPS unit (Garmin *eTrex* "Vista"®). These 15 positions were later downloaded into a computer mapping program (TOPO!®) and a map produced showing the general route of the survey.

The survey of the Waimanalo Gulch was conducted during the wet season (January 2007). Consequently, most of the plants encountered (including annuals) were growing well and were in flower, making positive field identifications relatively straight forward. Nonetheless, a one time survey cannot expect to list every plant species growing on a subject property. Some species are seasonal or opportunistic, while others might be present, but in such low numbers that they are simply not encountered. Every square foot of the land cannot reasonably be covered, and some areas—in this case dangerously steep portions of the gulch margins and high cliff faces—will not be accessed. The botanist attempts to reach all physiographic types characteristic of the property and reach plants appearing from a distance to be "unique". Steep but traversable portions of the gulch margins and smaller cliff faces serve as representative of the inaccessible habitats on the property.

SITE DESCRIPTIONS

This section of the report provides known information on the botanical resources of the five sites considered as potential landfill sites. The discussion of sites is arranged from west to east as shown in Fig.1.

MĀ'ILI

The Mā'ili Site (TMK: 8-7-10:003) is located in the Wai'anae District on leeward O'ahu. The approximately 200 ac (80+ ha) site presently supports an active limestone quarrying operation (Fig. 2). Although most of the site is clearly disturbed as quarry pits, material sorting and storage areas, access roads, or other ancillary operations as needed to support the quarry, some portions of the property do appear to retain a remnant *kiawe* forest. At least three separate quarry sites are present. The active quarry is the large central pit in Fig. 3. This pit has been expanded to the northwest through the buffel grass field seen in the satellite image since the image was obtained. Another pit, largely overgrown, appears in the satellite photo to the southeast. The original quarry pit is directly south, seen as an area of white soil with kiawe trees. Slurry lagoons lie along one side of this quarry pit.

The vegetation is largely ruderal in nature: consisting of plants adapted to disturbed ground. The assemblage would be mostly non-native in composition, although indigenous *'uhaloa* (*Waltheria indica*) and *'ilima* (*Sida fallax*) may be present as both respond well to land clearing. Less recently disturbed or undisturbed areas support either buffel grass (*Cenchrus ciliaris*) grassland or a *kiawe* forest with a buffel grass groundcover.

The adjacent Naval Radio Transmitting Facility (NRTF) was previously surveyed by Funk (Botanical Associates, 1984; Traverse Group, 1987) and more recently, Guinther and David (2003) surveyed the highly disturbed (by regular mowing) environment of the central part of NRTF across Pa'akea Road from Mā'ili Quarry. In general, there are a number of rare and/or listed species of plants found at much higher elevations of the Naval Reservation which extends to Kolekole Pass on the Wai'anae ridgeline, but few species of interest or concern have been found on the lowlands. Exceptions are a semi-aquatic fern called *'ili'ihi* (*Marsilea villosa*) and scattered occurrences of an endemic hibiscus, *ko`oloa ula* (*Abutilon menziesii*). The fern is discussed further on page 31; the hibiscus was noted in Guinther & David (2002) and later confirmed by Navy biologists (Julie Rivers, pers. comm.) This hibiscus, a listed species, is not expected to be present on the Mā'ili Site, although its presence cannot be ruled out

entirely, as the only reason it would not be present is the long-standing disturbance of most of the property.

No surveys of botanical resources at the Mā'ili Limestone Quarry are known to this author. The plant assemblages present is certainly dominated by non-natives. Native plants of interest or concern (for example, listed species) would be rare if present at all.

Figure 2. Pacific Aggregate (Mā'ili) Limestone Quarry. Quarry operations are mining an ancient limestone (reef) deposit, slowly removing the *kiawe* forest (background) on the northwest end of the property.

NĀNĀKULI

The Nānākuli (or "Nānākuli B" Site in some records of the site selection process; TMK: 8-7-9:001 & 8-7-21:026) is located in the Wai'anae District on leeward O'ahu. The site is presently undeveloped, but is adjacent to (and the land owned by) a private entity (PVT Land Co.) operating a landfill that accepts mostly construction debris. The PVT Landfill is located on the west side of Lualualei Naval Road across from the proposed Nānākuli Site,

which extends along the east side of that road to the vicinity of an old cement plant (Fig. 4 and 6).

Figure 3. Mā'ili Site (outlined in orange) is mostly a disturbed area supporting a limestone quarry operation. A *kiawe* forest is present in the southwest and northwest portions of the parcel. All of the upper corner in this satellite image is NRTF Lualualei where the grounds are regularly mowed to reduce fire hazard.

Figure 4. Much of the Nānākuli Site is low sloping grassland, here looking across the site towards the old cement plant and Lualualei Valley. The PVT Landfill is the hill across the Lualualei Naval Road (left of center).

The Nānākuli Site consists of gradually rising ground that becomes steeper to the east, eventually reaching a peak at 1890 ft (576 m) known as Pu'u Heleakalā. The lower, moderately sloped areas are colluvium: eroded material of basaltic origin moved by gravity and water flow downslope from the ridge. Above the colluvial slope (generally above 400 to 500 ft (120-150 m) the layers of basalt representing ancient lava flows form a characteristic cliff and ledge formation (Fig. 5).

The proposed landfill site was surveyed for botanical resources by *AECOS* Inc. in 1991 (Guinther & Miranda, 1992). Nearby lower slopes of Pu'u Heleakalā have also been surveyed for a proposed golf course just north of the Nānākuli site (Char, 1990a).

The vegetation of the site is mostly grassland. The dry conditions and occasional fires tend to favor exotic grasses over native grasses, shrubs, and trees. Scrutiny of the satellite image (Fig. 3) reveals a complex of fire roads cut into the steeper slopes to control the spread of fires that can

occur with unfortunate regularity on leeward O'ahu between about May and September of most years. Buffel grass dominates, and becomes self-preserving by increasing the intensity of fires that occur, itself capable of regrowing from basal stems when rains return (Hughes, Vitousek, and Tunison, 1991; Tix, undated, Latz, 1991). Native Hawaiian plants are not adapted to fire, and are gradually eliminated from areas subjected to repeated fires (Mueller-Dombois, 1981).

Figure 5. Alluvial pasture land (foreground), colluvial slope (middle ground with boulders and *kiawe* trees) and cliff and ledge habitats on Pu'u Heleakalā at and above the Nānākuli Site.

Table 1 is modified from Guinther & Miranda (1992) to reflect plants observed in a survey of the lands east of Lualualei Naval Road comprising the proposed Nānākuli Site (the complete survey report covered lands on both sides of the road as well as along Ulehawa Stream). The species list (flora) is fairly typical for this part of the Wai`anae coast. The only species of interest is *'ihiahialo'e* or coast sandalwood (*Santalum ellipticum*), an endemic species that does persist in areas invaded by exotics (Wagner, Herbst, and Sohmers, 1990) and Hawaiian cotton or *ma'o* (*Gossypium*

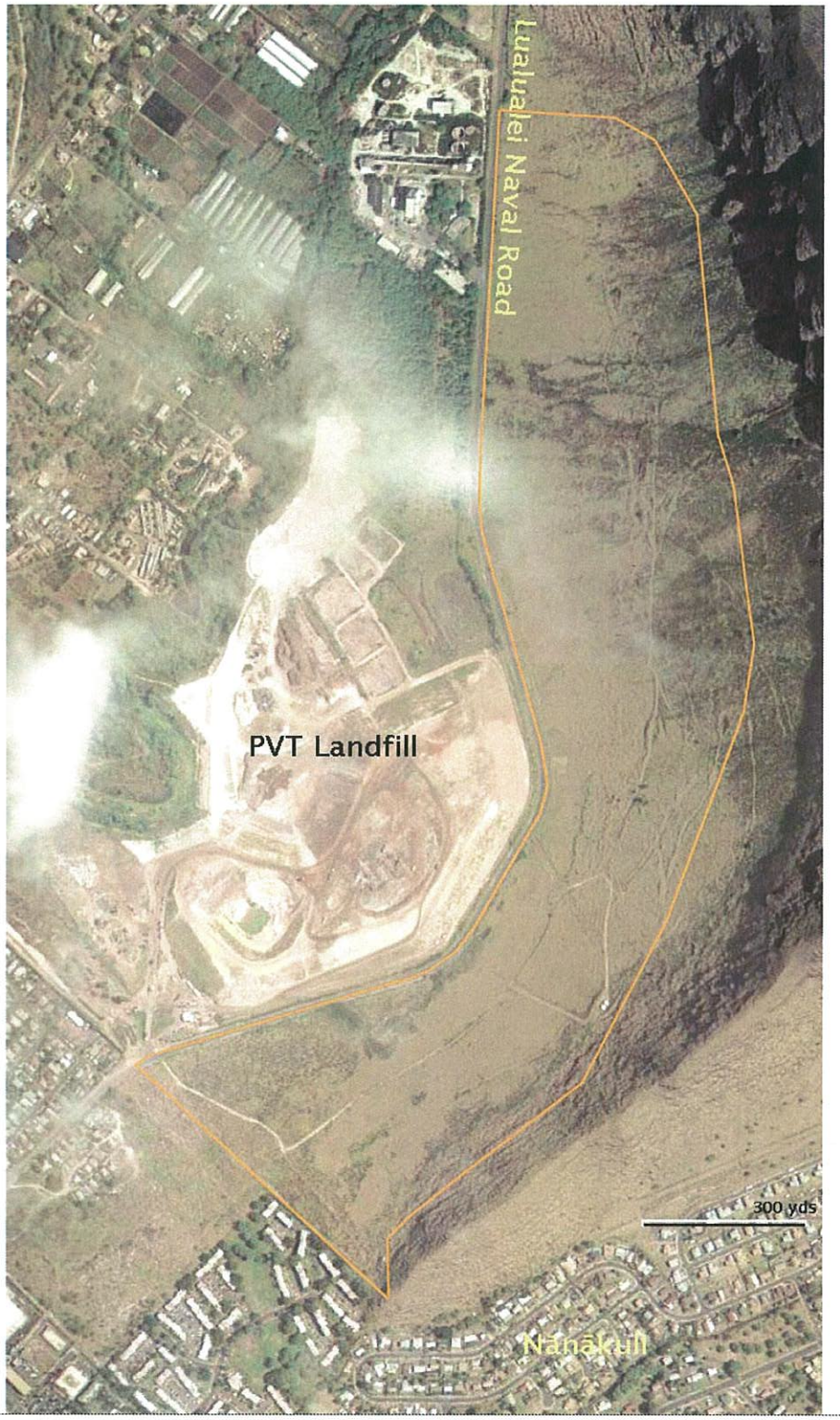

Figure 6. The Nānākuli Site (outlined in orange) lies on the east side of Lualualei Naval Road against a ridge of Pu'u Heleakalā (far right).

Table 1. Listing of plants (flora) for the Nānākuli Site, west O'ahu, Hawai'i from a survey conducted October and December, 1991 (Guinther & Miranda, 1992)

Species listed by family	Common name	Status	Abundance LOW	Abundance UPL	Notes
	FERNS				
POLYPODIACEAE					
indet.	---	Nat.		R	(2)
PTERIDACEAE					
Pteris sp.	?cliff brake	Nat.		R	
	FLOWERING PLANTS				
	DICOTYLEDONES				
AMARANTHACEAE					
Amaranthus spinosus L.	spiny amaranth	Nat.		R	
ASTERACEAE (COMPOSITAE)					
Bidens sp.	---	Nat.		U	
Emilia fosbergii Nicolson	*pualele*	Nat.		O	
Pluchia carolinensis (Jacq.) G. Don	sourbush	Nat.		U	
Sonchus oleraceus L.	sow thistle	Nat.		U	
Synedrella nodiflora (L.) Gaertn.	nodeweed	Nat.		R	
Verbesina enceliodes (Cav.) Benth. & Hook.	golden crown-beard	Nat.		U	
CACTACEAE					
Opuntia ficus-indica (L.) Mill.	*pānini*	Nat.		U	
CONVOLVULACEAE					
Ipomoea cairica (L.) Sweet	*koali 'ai*	**Ind.**		C	
Merremia aegyptia (L.) Urb.	hairy merremia	Nat.		C	
EUPHORBIACEAE					
Chamaesyce hypericifolia (L.) Millsp.	graceful spurge	Nat.		U	
FABACEAE					
Acacia farnesiana (L.) Willd.	*klu*	Nat.	U	O	
Desmanthus virgatus (L.) Willd.	virgate mimosa	Nat.	C		
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat.	A	A	
Indigofera suffruticosa Mill.	indigo	Nat.	R	U	
Macroptilium lathyroides (L.) Urb.	cow pea	Nat.		O	
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*kiawe*	Nat.		O	
LAMIACEAE					
Hyptis pectinata (L.) Poit.	comb hyptis	Nat.		U	
MALVACEAE					
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	Nat.		R	
Abutilon incanum (Link) Sweet	*ma'o*	**Ind.**		O	(1)
Gossypium tomentosum Nutt. ex Seem.	*ma'o*	**End.**	U		
Malvastrum coromandelianum (L.) Garck	false mallow	Nat.		O	(1)

Table 1 (continued).

Species listed by family	Common name	Status	Abundance LOW	Abundance UPL	Notes
MALVACEAE (continued)					
Sida fallax Walp.	*`ilima*	**Ind.**	C	C	(1)
PASSIFLORACEAE					
Passiflora foetida L.	love-in-a-mist	Nat.		R	
PORTULACACEAE					
Portulaca oleracea L.	pigweed	Nat.		O	
Portulaca pilosa L.				O	
SANTALACEAE					
Santalum ellipticum Gaud.	*'iliahialo'e*	**End.**		R	
STERCULIACEAE					
Waltheria indica L.	*`uhaloa*	Nat..	A	A	(1)
VERBINACEAE					
Stachytarpheta jamaicensis (L.) Vahl.	Jamaican vervain	Nat.		U	
MONOCOTYLEDONES					
COMMELINACEAE					
Commelina benghalensis L.	hairy *honohono*	Nat.		O	
POACEAE					
Cenchrus ciliaris L.	buffelgrass	Nat.	AA	A	
Chloris barbata (L.) Sw.	swollen fingergrass	Nat.	P	R	
Melinus repens (Willd.) Zizka	Natal redtop	Nat.	R		
Panicum maximum Jacq.	Guinea grass	Nat.		C	

STATUS = distributional status for the Hawaiian Islands:
- **end.** = endemic; native to Hawaii and found naturally nowhere else.
- **Ind.** = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- nat. = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.

ABUNDANCE AREAS:
- LOW – Grassland, to moderate slopes on colluvium.
- UPL – Rocky tallus and cliffed areas

ABUNDANCE CODES:
Abundance codes used in 1991 have been modified here to fit more recent practice as reflected in Table 2, below.

NOTES:
- (1) – locally abundant in disturbed areas (road and fire trail cuts).
- (2) – only dried fronds presnt.

tomentosum). Neither one is a listed species, but both are increasingly uncommon on O'ahu due to steady development of dry, lowland environments for housing. In 1991, *ma'o* was far more abundant in this area on the west side of Lualualei Naval Road; being rather rare in the proposed landfill site. Char (1990a) reported a very similar flora for the adjacent property to the north, although with only one endemic plant present, the *wiliwili* (*Erythrina sandwicensis*) tree.

Although no part of the property is included in a designated critical habitat for an endangered species, the eastern property boundary lies west some 200 and 300 ft (60 to 90 m) of the O'ahu critical habitat Unit 15 boundary (USFWS, 2003). Unit 15 in this area incorporates the steepest parts of Pu'u Heleakalā; on the western slope incorporating elevations above 400 to 600 ft (120 to 180 m). This part of Unit 15 includes critical habitat for an endangered species of *'akoko* (*Chamaesyce kuwaleana*; see page 33).

WAIMĀNALO GULCH EXPANSION AREA

Waimānalo Gulch (TMK: 9-2-3:072 & 073) is located along the southern slopes of the Wai'anae Mountain. It is the last gulch above the 'Ewa Plain, traveling westward, before the Wai'anae coast, lying between Kahe Gulch on the west and an unnamed gulch (part of Makaīwa watershed) on the east. The Expansion Area comprises about 60.5 acres (24 ha) of the property above the existing municipal landfill (Fig. 7).

The v-shaped gulch is narrow and incised on the order of 200 ft (60 m) into the Wai'anae mountain. The gulch margins vary from steep to very steep (Fig. 8) and show the same alternating cliff and ledge structure so apparent on the dry, leeward parts of the island. Along the bottom of the gulch is an intermittent stream.

The Waimānalo Gulch Expansion Area was surveyed for this report. The general route taken by the biological team is indicated in Fig. 9 from the recorded waypoints as described under Methods, above, in this case transferred onto a satellite image after plotting on a topographic map. The actual route taken by the team was more convoluted than is shown on the map. The results of the floristic survey are summarized in Table 2: a listing of species observed and their relative abundances as recorded by the survey team.

The vegetation of the expansion area is fairly homogeneous, consisting of grassed slopes with scattered *kiawe* trees. In places, especially along the

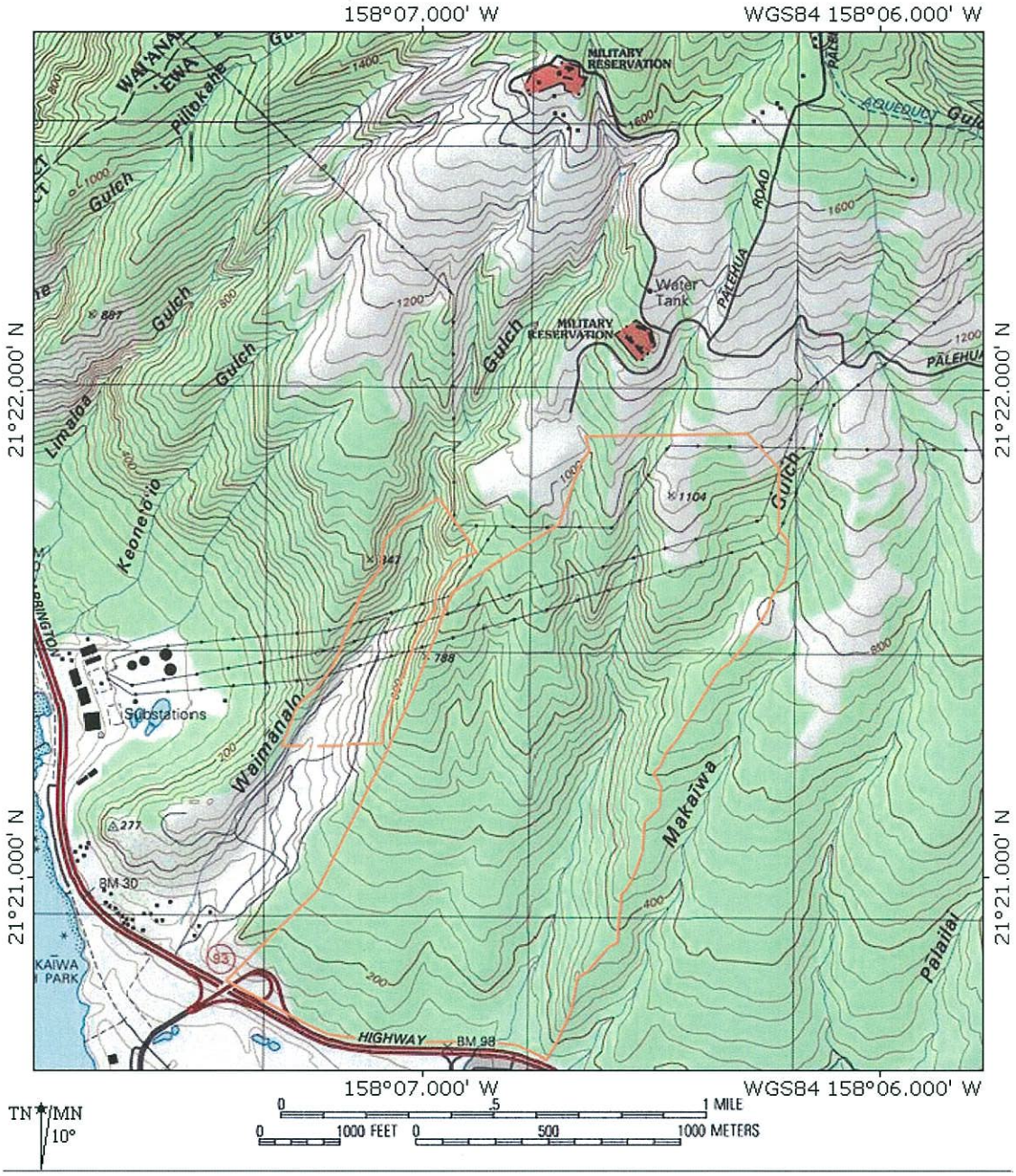

Figure 7. Topographic map showing the Waimānalo Gulch expansion area and Makaīwa Gulch parcel.

bottom and eastern slope of the gulch, the trees form an open forest grading to savannah. The grass is predominantly Guinea grass (*Panicum maximum*),although near the ridgelines, buffel grass (*Cenchrus ciliaris*) becomes the dominant species, and in one area along the top of the western

ridge, native pili grass (*Heteropogon contortus*) is abundant in large patches. *Kiawe*, *klu* (*Acacia farnesiana*), and *koa-haole* dominate the scrub-shrub and tree components of the vegetation, which are relatively sparse on the upper slopes particularly, and made more so by recent fires that have burned across portions of the property and destroyed many of the *kiawe* trees. Crude roads have been bulldozed into the gulch, and these are marked by a diverse assemblage of weedy plants (see Note 1 in Table 2).

Figure 8. Steep, rocky terrain typifies most of the Waimānalo Gulch Expansion Area. In the background (down slope) can be seen the upper end of grading operations at the existing municipal landfill

A total of 50 species were recorded from the proposed Expansion Area. Of these, only 6 species (12%) are indigenous species (plants native to Hawai`i, but found elsewhere as natives as well). Lowland sites on O'ahu typically have between 6 and 12% of the species present as natives. Thus, the percentage of natives in lower Waimānalo Gulch is better than might be expected, although not special. All of the species are widely encountered on leeward O'ahu; none is considered rare or threatened. The only unusual botanical resource encountered was several large patches of *pili* grass across a broad shoulder of the ridge between Waimānalo Gulch and Kahe

Gulch at the 600 ft (180 m) elevation. *Pili* grass may be locally abundant because there is no longer any grazing of cattle in this particular area.

Table 2. Listing of plants (flora) for the Waimanalo Gulch expansion area, west O'ahu, Hawai'i

Species listed by family	Common name	Status	Abundance	Notes
FLOWERING PLANTS				
DICOTYLEDONES				
AMARANTHACEAE				
Amaranthus spinosus L.	Spiny amaranth	Nat.	U	(1)
Amaranthus virdis L.	slender amaranth	Nat.	R	
ASCLEPIADACEAE				
Stapelia gigantea N.E. Brown	giant toad plant	Nat.	U	
ASTERACEAE (COMPOSITAE)				
Agerarum conyzoides L.	*maile honohono*	Nat.	U2	(1)
Bidens cynapiifolia Kunth	---	Nat.	R	
Emilia fosbergii Nicolson	*pualele*	Nat.	O2	(1)
Pluchia carolinensis (Jacq.) G. Don	sourbush	Nat.	U	
Sonchus oleraceus L.	sow thistle	Nat.	O2	
Tridax procumbens L.	coat buttons	Nat.	U3	(1)
Verbesina enceliodes (Cav.) Benth. & Hook.	golden crown-beard	Nat.	R	
CACTACEAE				
Opuntia ficus-indica (L.) Mill.	*pänini*	Nat.	R	
CHENOPODIACEAE				
Atriplex cf. *suberects* Verd.	saltbush	Nat.	R	
CONVOLVULACEAE				
Ipomoea obscura (L.) Ker-Gawl.	---	Nat.	U	
Merremia aegyptia (L.) Urb.	hairy merremia	Nat.	C	
CUCURBITACEAE				
Momordica charantia L.	balsam pear	Nat.	U	
EUPHORBIACEAE				
Chamaesyce hirta (L.) Millsp.	garden spurge	Nat.	O2	
Ricinus communis L.	castor bean	Nat.	U	
FABACEAE				
Acacia farnesiana (L.) Willd.	*klu*	Nat.	C	
Crotalaria incana L.	fuzzy rattlepod	Nat.	U	
Crotalaria pallida Aiton	smooth rattlepod	Nat.	O3	(1)
Desmanthus virgatus (L.) Willd.	virgate mimosa	Nat.	C	
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat.	C	
Indigofera suffruticosa Mill.	indigo	Nat.	U	
Macroptilium atropurpureum (DC) urb.	---	Nat.	C	(1)

Table 2 (continued).

Species listed by family	Common name	Status	Abundance	Notes
FABACEAE (continued)				
Macroptilium lathyroides (L.) Urb.	cow pea	Nat.	U	
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*kiawe*	Nat.	O	(2)
LAMIACEAE				
Hyptis pectinata (L.) Poit.	comb hyptis	Nat.	R	(1)
Leonotis nepetifolia (L.) R. Br.	lion's ear	Nat.	A	(1)
MALVACEAE				
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	Nat.	O	
Abutilon incanum (Link) Sweet	*ma'o*	**Ind.**	C	
Malvastrum coromandelianum (L.) Garck	false mallow	Nat.	U	(1)
Sida fallax Walp.	*`ilima*	**Ind.**	O	
NYCTAGINACEAE				
Boerhavia acutifolia (Choisy) J.W. Moore	*alena*	**Ind.**	U	
PLUMBAGINACEAE				
Plumbago zeylanica Lam.	*'ilie'e*	**Ind.**	U	
PAPAVERACEAE				
Argemone sp.	prickly poppy	???	R	(3)
PASSIFLORACEAE				
Passiflora foetida L.	love-in-a-mist	Nat.	R	
PORTULACACEAE				
Portulaca oleracea L.	Pigweed	Nat.	U	
SOLANACEAE				
Nicandra physalodes (L.) Gaertn.	apple of Peru	Nat.	R	
Nicotiana glauca R.C. Graham	tree tobacco	Nat.	C	(1)
Solanum americanum Mill.	*pöpolo*	**Ind.**	R	
Solanum lycopersicum var. *cerasiforme* (Dunal) Spooner, G. Anderson,& Jansen	wild cherry tomato	Nat.	R	
STERCULIACEAE				
Waltheria indica L.	*`uhaloa*	Nat..	C	
VERBINACEAE				
Stachytarpheta jamaicensis (L.) Vahl.	Jamaican vervain	Nat.	R	
MONOCOTYLEDONES				
COMMELINACEAE				
Commelina benghalensis L.	hairy *honohono*	Nat.	R	
POACEAE				
Cenchrus ciliaris L.	buffelgrass	Nat.	AA	
Chloris barbata (L.) Sw.	swollen fingergrass	Nat.	U2	

Table 2 (continued).

Species listed by family	Common name	Status	Abundance	Notes
POACEAE (continued)				
Heteropogon contortus (L.) P. Beauv, ex Roem. & Schult.	*pili* grass	**Ind.**	U3	
Melinus repens (Willd.) Zizka	Natal redtop	Nat.	O2	
Panicum maximum Jacq.	Guinea grass	Nat.	AA	
Paspalum sp.			R1	(1)

STATUS = distributional status for the Hawaiian Islands:
end. = endemic; native to Hawaii and found naturally nowhere else.
Ind. = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
nat. = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.

ABUNDANCE AREAS:
Expansion Area is treated as one plant assemblage or association.

ABUNDANCE CODES:
R – Rare; seen in only one or perhaps two locations.
U – Uncommon; seen at most in several locations
O – Occasional; seen with some regularity
C – Common; observed numerous times during the survey
A – Abundant; found in large numbers; may be locally dominant.
AA - Very abundant; abundant and dominant; defining vegetation type.

Numbers following an occurrence rating indicate clusters within the survey area. The ratings above provide an estimate of the likelihood of encountering a species within the specified survey area; numbers modify this where abundance, as encountered, tends to be greater than the occurrence rating:
1 – several plants present
2 - many plants present
3 – locally abundant

NOTES:
(1) – Especially abundant in disturbed areas as along rough graded road into valley.
(2) – Previously more common, but many burned trunks now present.
(3) – Plant lacking flowers or fruit.

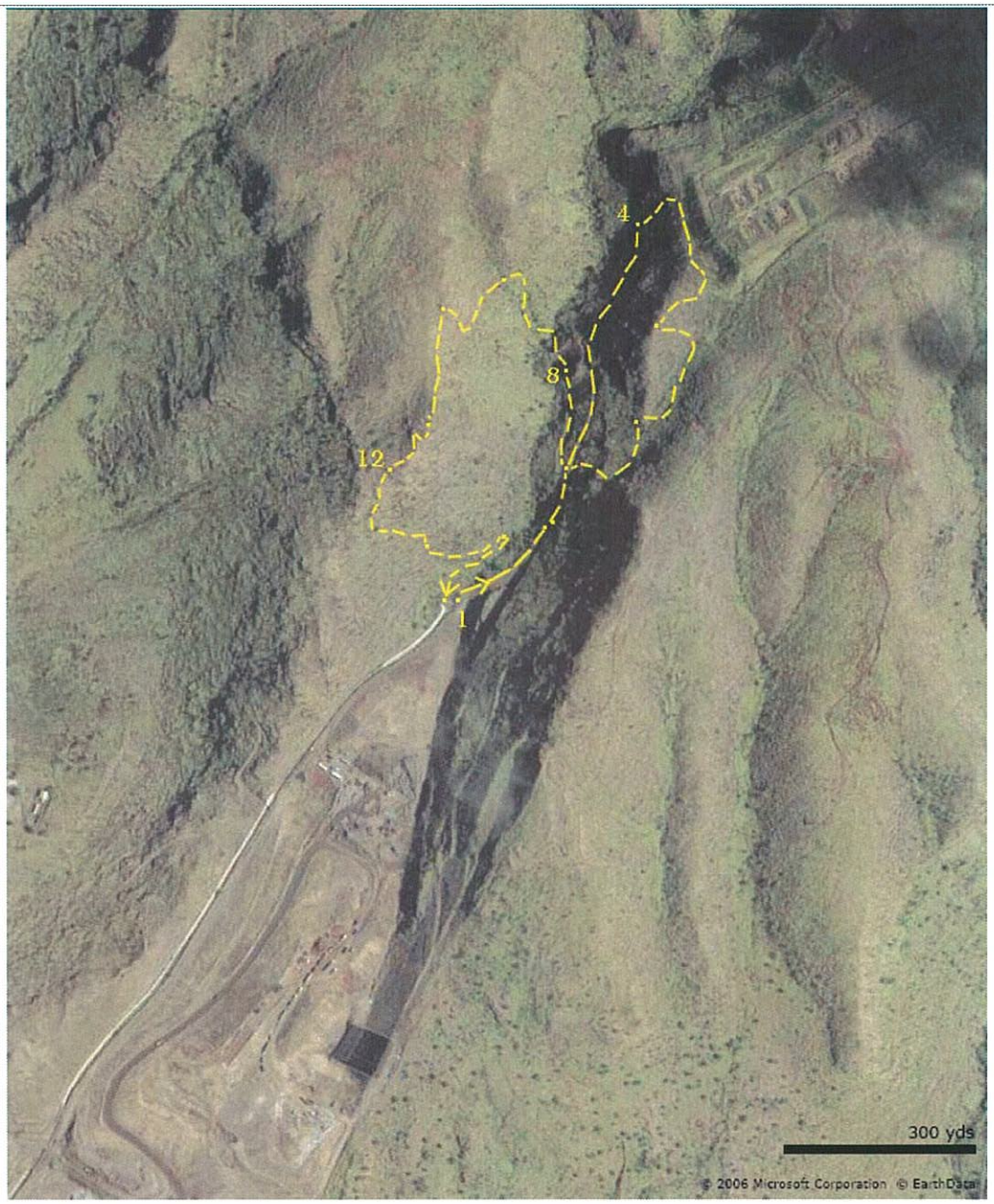

Figure 9. Satellite image of the Waimanalo Gulch landfill and proposed expansion area further upslope, showing general route taken during the botanical survey. Selected waypoints are numbered.

MAKAĪWA GULCH

Makaīwa Gulch (TMK: 9-2-3) is located along the southern slopes of the Wai'anae Mountain directly east of Waimanalo Gulch. The proposed site actually is a parcel encompassing two unnamed gulches between Makaīwa Gulch on the west and Waimanalo Gulch on the east (Fig. 7), within which a 338 ac (137 ha) area (essentially the eastern of the two unnamed gulches) was selected as an optional location for a municipal landfill. This gulch has generally less severe side slopes than nearby Waimānalo Gulch (Fig. 10).

Figure 10. The unnamed gulch (proposed landfill site) immediately west of Makaīwa Gulch photographed in the early morning.

Because this land is part of the land-owners long-range plans for expansion of the Makakilo residential area (to be called Makaīwa Hills), various surveys have been undertaken on the property, including botanical surveys in 1990 (Char, 1990b) and 2005 (David and Guinther, 2006b). A flora listing from the latter survey (and including plants observed only in 1990) is provided herein as Table 3.

Table 3. Listing of plants (flora) for the Makaīwa Gulch Site on west O'ahu, Hawai'i (after David & Guinther, 2006 and Char, 1990b).

Species listed by family	Common name	Status	Abundance	Notes
FERNS				
PTERIDACEAE				
Doryopteris decipiens (Hook.) J. Sm.	*kumuniu*	**End.**	--	(1)
FLOWERING PLANTS				
DICOTYLEDONES				
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat.	U	
AIZOACEAE				
Trianthema portulacastrum L.	---	Nat.	O	
AMARANTHACEAE				
Achyranthes aspera L.	---	Nat.	--	(1)
Amaranthus spinosus L.	spiny amaranth	Nat.	--	(1)
Amaranthus viridis L.	slender amaranth	Nat.	U	
ANACARDIACEAE				
Schinus terebinthefolius Raddi	Christmasberry	Nat.	R	
ARALIACEAE				
Schefflera actinophylla (Endl.) Harms.	octopus tree	Nat.	--	(1)
ASCLEPIADACEAE				
Crypyostegia grandiflora (Roxb.) R.Br.	Indian rubber vine	Nat.	--	(1)
Stapelia gigantea N.E. Brown	carrion flower	Nat.	O	
ASTERACEAE (COMPOSITAE)				
Acanthospermum australe (Loefl.) Ktze.	spiny-bur	Nat.	--	(1)
Ageratum conyzoides L.	*maile hohono*	Nat.	R	
Ambrosia artemisiifolia L.	common ragweed	Nat.	--	(1)
Bidens cynapiifolia Kunth	---	Nat.	O	
Bidens pilosa L.	---	Nat.	--	(1)
Calyptocarpus vialis Less.	---	Nat.	O	
Conyza bonariensis (L.) Cronq.	horseweed	Nat.	R	
Eclipta prostrata (L.) L.	---	Nat.	R	
Emilia fosbergii Nicolson	*pualele*	Nat.	U	
Lactuca serriola L.	prickly lettuce	Nat.	--	(1)
Lipochaeta lobata (Gaud.) DC	*nehe*	**End.**	--	(1)
Pluchia carolinensis (Jacq.) G. Don	sourbush	Nat.	U	
Pluchea indica (L.) Less.	Indian fleabane	Nat.	--	(1)
Sonchus oleraceus L.	sow thistle	Nat.	R	
Tridax procumbens L.	coat buttons	Nat.	U	
Verbesina enceliodes (Cav.) Benth. & Hook.	golden crown-beard	Nat.	U	

Table 3 (continued).

Species listed by family	Common name	Status	Abundance	Notes
ASTERACEAE (continued)				
Vernonia cinerea var. *parviflora* (Reinw.) DC	little ironweed	Nat.	--	(1)
Xanthium strumarium L.	*kikiana,* cockleburr	Nat.	R	
BRASSICACEAE				
Lepidium virginicum L.	peppergrass	Nat.	--	(1)
CACTACEAE				
Opuntia ficus-indica (L.) Mill.	*panini*	Nat.	R	
CAPPARACEAE				
Cleome gynandra L.	wild spider flower	Nat.	R	
CHENOPODIACEAE				
Atriplex semibaccata R. Br.	Australian saltbush	Nat.	--	(1)
Atriplex suberecta Verd.	---	Nat.	O	
Chenopodium carinatum R. Br.	---	Nat.	U	
Chenopodium murale L.	*`aheahea*	Nat.	--	(1)
CLUSIACEAE				
Clusia rosea Jacq.	copey	Nat.	--	(1)
CONVOLVULACEAE				
Ipomoea cairica (L.) Sweet	*koali `ai*	**Ind.**	U	
Ipomoea obscura (L.) Ker-Gawl.	---	Nat.	O	
Merremia aegyptia (L.) Urb.	hairy merremia	Nat.	O	
CUCURBITACEAE				
Coccinia grandis (L.) Voigt.	scarlet-fruited gourd	Nat.	R	
Cucumis dipsaceus Ehrenb. ex Spach	teasel gourd	Nat.	--	(1)
Momordica charantia L.	balsam pear	Nat.	U	
EUPHORBIACEAE				
Chamaesyce hirta (L.) Millsp.	garden spurge	Nat.	U	
Chamaesyce hypericifolia (L.) Millsp.	graceful spurge	Nat.	--	(1)
Euphorbia heterophylla L.	*kaliko*	Nat.	U	
Phyllanthus debilis Klein ex Willd.	niruri	Nat.	--	(1)
Ricinus communis L.	castor bean	Nat.	U	
FABACEAE				
Acacia confusa Merr.	Formosan koa	Nat.	--	(1)
Acacia farnesiana (L.) Willd.	*klu*	Nat.	A	
Chamaecrista nictitans (L.) Moench.	*lauki*	Nat.	U	
Crotalaria incana L.	fuzzy rattlepod	Nat.	--	(1)
Crotalaria pallida Aiton	smooth rattlepod	Nat.	O	
Desmanthus pernambucanus (L.) Thellung	virgate mimosa	Nat.	U	
Desmodium tortuosum (Sw.) DC	Florida beggarweed	Nat.	--	(1)

Table 3 (continued).

Species listed by family	Common name	Status	Abundance	Notes
FABACEAE (continued)				
Indigofera suffruticosa Mill.	indigo	Nat.	--	(1)
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat.	C	
Macroptilium atropurpureum (DC) Urb.	---	Nat.	R	
Macroptilium lathyroides (L.) Urb.	cow pea	Nat.	U	
Mimosa pudica L.	sensitive plant	Nat.	--	(1)
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*kiawe*	Nat.	A	
Senna surattensis (N.L. Burm.) H. Irwin & Barneby	*kolomana*	Nat.	R	
GENTIANACEAE				
Centaurium erythraea Raf.	bitter herb	Nat.	--	(1)
LAMIACEAE				
Hyptis pectinata (L.) Poit.	comb hyptis	Nat.	O	
Hyptis suaveolens (L.) Poit.	---	Nat.	--	(1)
Leonotis nepetifolia (L.) R. Br.	lion's ear	Nat.	U	
Ocimum basilicum L.	wild basal	Nat.	O	
MALVACEAE				
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	Nat.	R	
Abutilon incanum (Link) Sweet	hoary abutilon	**Ind.**	O	
Malva parviflora L.	cheese weed	Nat.	R	
Malvastrum coromandelianum (L.) Garck	false mallow	Nat.	U	
Sida ciliaris L.	---	Nat.	O	
Sida fallax Walp.	*`ilima*	**Ind.**	AA	
Sida rhombifolia L.	Cuba jute	Nat.	U	
Sida spinosa L.	prickly sida	Nat.	R	
MORACEAE				
Ficus microcarpa L. f.	Chinese banyan	Nat.	--	(1)
MYRTACEAE				
Eucalyptus sp.	gum tree	Nat.	--	(1)
Syzygium cumini (L.) Skeels	Java plum	Nat.	R	
NYCTAGINACEAE				
Boerhavia acutifolia (Choisy) J.W. Moore	*alena*	**Ind.**	O	
PAPAVERACEAE				
Argemone glauca (Nutt. ex Prain) Pope	*pua kala*	**End.**	--	(1)
PASSIFLORACEAE				
Passiflora foetida L.	running pop	Nat.	U	
Passiflora suberosa L.	*huehue-haole*	Nat.	--	(1)
PLUMBAGINACEAE				
Plumbago zeylanica L.	*'ilie'e*	**Ind.**	R	

Table 3 (continued).

Species listed by family	Common name	Status	Abundance	Notes
PORTULACACEAE				
Portulaca oleracea L.	pigweed	Nat.	U	
PROTEACEAE				
Grevillea robusta A. Cunn. ex R.Br.	silk oak	Nat.	R	
RUBIACEAE				
Hedyotis corymbosa (L.) Lam.	---	Nat.	R2	
Spermacoce assurgens Ruiz & Pav..	buttonweed	Nat.	R	
SAPINDACEAE				
Dodonaea viscosa Jacq.	*a'ali'i*	**Ind.**	--	(1)
SOLANACEAE				
Solanum lycopersicum var. *cerasiforme* (Dunal) Spooner, G. Anderson,& Jansen	wild cherry tomato	Nat.	--	(1)
Nicandra physalodes (L.) Gaertn.	apple of Peru	Nat.	--	(1)
Solanum americanum Mill.	*popolo*	**Ind.**	--	(1)
Solanum linnaeanum Hepper & P. Jaeger	apple-of-Sodom	Nat.	--	(1)
STERCULIACEAE				
Waltheria indica L.	*'uhaloa*	Nat..	C	
VERBENACEAE				
Lantana camara L.	lantana	Nat.	R	
Stachytarpheta australis Moldenke		Nat.	O	
Stachytarpheta cayennensis (Rich.) Vahl.	nettle-leaved vervain	Nat.	--	(1)
Stachytarpheta jamaicensis (L.) Vahl.	smooth vervain	Nat.	R	
Verbena littoralis Kunth	*oi*	Nat.	--	(1)
MONOCOTYLEDONES				
AGAVACEAE				
Agave sisalana Perrine	sisal	Nat.	R	
CYPERACEAE				
Cyperus rotundus L.	nutgrass	Nat.	--	(1)
COMMELINACEAE				
Commelina benghalensis L.	hairy honohono	Nat.	U	
POACEAE				
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	Nat.	A	
Brachiaria mutica (Forssk.) Stapf	California grass	Nat.	--	(1)
Cenchrus ciliaris L.	buffelgrass	Nat.	AA	
Chloris barbata (L.) Sw.	swollen fingergrass	Nat.	C	
Chloris radiata (L.) Sw.	radiate fingergrass	Nat.	--	(1)
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat.	--	(1)
Digitaria ciliaris (Retz.) Koeler	crabgrass	Nat.	--	(1)

Table 3 (continued).

Species listed by family	Common name	Status	Abundance	Notes
POACEAE (continued)				
Digitaria insularis (L.) Mez. ex Ekman	sourgrass	Nat.	--	(1)
Digitaria setigera Roth	*kukaipua'a*	**Ind.**	--	(1)
Echinochloa colona (L.) Link	jungle-rice	Nat.	R	
Eleusine indica (L.) Gaertn.	beach wiregrass	Nat.		
Eragrostis cf. *tenella* (L.) R & S	lovegrass	Nat.	O	
Eragrostis sp.			U	
Heteropogon contortus (L.) P. Beauv. ex Roem. & Schult.	*pili*, pili grass	**Ind.**	--	(1)
Melinus repens (Willd.) Zizka	Natal redtop	Nat.	O	
Panicum maximum Jacq.	Guinea grass	Nat.	AA	
Panicum maximum var. *trichoglume* Eyles ex Robyns	Guinea grass	Nat.	--	(1)
Paspalum sp.		Nat.	R	
Setaria verticillata (L.) P. Beauv.	bristly foxtail	Nat.	--	(1)
Sporobolus sp.	---	Nat.	U	

STATUS = distributional status for the Hawaiian Islands:
- **end.** = endemic; native to Hawaii and found naturally nowhere else.
- **Ind.** = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- nat. = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.

ABUNDANCE AREAS:
Expansion Area is treated as one plant assemblage.

ABUNDANCE CODES:
- R – Rare; seen in only one or perhaps two locations.
- U – Uncommon; seen at most in several locations
- O – Occasional; seen with some regularity
- C – Common; observed numerous times during the survey
- A – Abundant; found in large numbers; may be locally dominant.
- AA - Very abundant; abundant and dominant; defining vegetation type.

NOTES:
- (1) – Especially abundant in disturbed areas as along unpaved road into valley.
- (2) – Prev iously more common, but many burned trunks now present.
- (3) – Plant lacking flowers or fruit.

Char (1990b) divided the vegetation on the hillside (her survey covered a wider area) into two vegetation types: (1) Grassland/Shrubland and (2) Kiawe Forest. These vegetation types were somewhat reinterpreted by David & Guinther (2006). The higher elevation slopes of the parcel are dominated by a Grassland/Shrubland of mostly Guinea grass, but several other

prominent grass species are present as well: buffelgrass, pitted beardgrasss (*Bothriochloa pertusa*), and *Chloris* spp. (not in flower at the time of the survey). Common shrubs and large herbs include *klu* (*Acacia farnesiana*), *'ilima* (*Sida fallax*), wild basal (*Ocimum basilicum*), and *'uhaloa* (*Waltheria indica*). Near the upper boundary at Pālehua Road, several tree species (e.g., Christmasberry or *Schinus terebinthifolius*) are present that increase in abundance upslope, but are not present much below the road. *Kiawe* abundance, on the other hand, increases downslope, the trees forming copses scattered around the hills and open to closed forest stands along gulch bottoms. Further downslope is an open *kiawe* forest dominated by an understory of buffelgrass, characteristic of the natural vegetation of lower slopes on leeward O'ahu.

No ferns or fern allies were observed during the 2005 plant survey, although Char (1990) earlier reported *kumuniu* (*Doryopteris decipiens*), a native species. The vegetation is comprised of flowering plants which are overwhelmingly dominated by alien plant species, especially grasses. Of the total of 72 species of plants identified as present in 2006 by David & Guinther (2006), only five (6.9%) are known from the Hawaiian Islands before the arrival of James Cook in 1778. None of these five species is considered an endemic (that is, a species unique to the Hawaiian Islands). All five are indigenous species, and therefore not likely to be of concern for future listing as threatened or endangered under either Federal or State of Hawai'i endangered species statutes. One species, hoary abutilon (*Abutilon incanum*), common in the mid-to-lower elevations on the property, is considered to be somewhat rare on O'ahu. If we consider the abundance estimates for these six native species, all but three (*'Ilima* or *Sida fallax*, hoary abutilon or *Abutilon incanum*, and *'alena* or *Boerhavia acutifolia*) are rare or uncommon in the survey area. Thus, in terms of biomass, as well as number of species, native plants are a relatively minor component of the vegetation found on the site.

Where access by cattle is restricted (and perhaps moisture regime enhanced) in the steep gulch margins, Guinea grass is especially dense and grows to a large stature. On more gentle slopes accessed by grazing cattle, the grasses tend to be cropped and erosion can be a problem, although areas of dense buffelgrass are present where cattle have not recently grazed.

Of particular interest in considering the results of the two surveys conducted in and around the proposed landfill site at Makaīwa are three endemics recorded in 1990, but not seen in 2005. These are *kumuniu* (fern; *Doryopteris decipiens*), *nehe* (*Lipochaeta lobata*), and *pua kala* (*Argemone glauca*), none of which was observed in 2005. These species were noted

mostly from the upper part of the property (near Pālehua Road, presumably). *Kumuniu* is described as a relatively common fern in dry shrublands, grasslands, and forests (Palmer, 2003). A variety of *nehe* (*L. lobata* var. *leptophylla* is a listed species (Federal Register, 1991) and known only from a few locations between Kolekole Pass and Kānehoa (Lualaulei) on the Wai`anae Mountain. This plant grows on dry to mesic cliffs, ridges, and slopes between 840 and 3208 ft (256 to 978 m) elevations (Federal Register, 2003). The more common variety—*L. l.* var. *lobata*, presumably the variety observed by Char—is found near the coast from 0 to 1300 ft (0 to 400 m) on Ni'ihau, O'ahu, and West Maui (Wagner, Herbst, and Sohmer, 1990). *Pua kala* is common in leeward parts of all the islands.

Figure 11. A significant determinant of natural vegetation at the Makaīwa Gulch, Waimānalo Gulch, and Nānākuli proposed landfill sites are frequent fires. This view looking downslope into Makaīwa Gulch was taken on August 24, 2005 from Pālehua Road at the 1500 ft (460 m) elevation.

A significant factor in determining the nature of the flora at the Nānākuli, Waimanalo Gulch, and Makaīwa Gulch sites are dry season fires that sweep over grass-covered hillsides (Fig. 11, above). The origin of many fires in these areas in recent years has been arson, although an accident caused the smaller Makaīwa Mauka fire that burned lower Pālailai Gulch in 2005

and power line electrical arching was suspected in the Nānākuli fire of 2005 (Fujimori, 2005a,b). Modern landfills, such as the existing one in Waimanalo Gulch, do not burn garbage and are not a source of accidental wildfires.

KAPA'A GULCH

Kapa'a Gulch (TMK: 4-2-015:001) is located in the District of Ko'olaupoko on the windward side of O'ahu. The proposed landfill site is a presently active basalt rock quarry operated by Ameron International Inc encompassing 391 acres (158 ha). Neither maps of the site provided showing the property nor recent USGS topographic sheets (Kaneohe and Koko Head quadrangles dated 1998) reflect the true contours of this site, which today presents a deep pit with sheer walls cut back towards Mahinui Ridge (Fig. 12).

Figure 12. In this aerial photo of the Ameron Quarry at Kapa'a, north is roughly to the left and Mahinui Ridge runs along the bottom. The large road passing left to right near the top of the photograph is the H-3 Interstate (photo by Brian Daniel, September 20, 2002).

The proposed landfill would utilize the existing quarry, shown in Fig. 13. The quarry pit is massive, certainly the largest on O'ahu. Although plants are present along the ledges above each vertical step, these ledges are planted and maintained by Ameron. Given that a municipal landfill operation in Kapa'a Valley would likely utilize the existing pit without the need to expand over undisturbed ground, and soil cover would come from existing, adjacent overburden stock piles, impacts to vegetation would be minimal.

Figure 13. Ameron International quarry pit at Kapa'a. Only minimal vegetation grows in the pit area, proposed as landfill site.

Botanical resources within Kapa'a Valley were surveyed in 2002 (Oceanit, 2002; see also Guinther, undated). In general, where undisturbed, the valley is inhabited by a mesic forest dominated by *koa haole* on the upper slopes, grading into a more diverse forest of Java plum (*Syzigium cumini*) and monkeypod (*Samanea saman*) near the valley floor. The somewhat scrubby growth of *koa haole* on the higher slopes is increasingly invaded by fiddlewood (*Citharexylum caudatum*) all along the Oneawa Hills (Mahinui Ridge). The lower half of the valley is highly disturbed, although once contained an extension of Kawai Nui marsh on the valley floor. While some wetland still remains here, much of this area is now fill land.

Plant surveys along the ridgelines of Ulumawao, the upland forming the east side of Kapa'a Valley, have revealed several native species as present: 'ūlei (*Osteomeles anthyllidifolia*), 'ākia (*Wikstroemia oahuensis*), and 'ōhi'a lehua (*Metrosideros polymorpha*; Guinther and Montgomery, pers. comm.). The latter species is particularly interesting as this species occurs as a small copse of stunted shrubs (Fig. 14) on the northern side of the highest part of Ulumawao where the peak rises to 980 ft (m). These native species might also occur on the Mahinui ridgeline above the quarry.

Figure 14. Dr. S. Montgomery inspecting *'ōhi'a lehua* blossoms for insects near the top of Ulumawao in Kailua.

PLANT RESOURCES DISCUSSION

This section of the report covers various jurisdictional issues and data bases containing information relative to special botanical resources at or near the proposed landfill sites. In addition, plant species of interest or concern are discussed in more detail as each species is brought in from a record of interest.

USFWS CRITICAL HABITAT DESIGNATIONS

Critical habitat under the Endangered Species Act of 1973 (ESA) refers to specifically bounded areas thought to be important to the conservation and recovery process of species listed under the ESA. Although federal actions within a designated critical habitat area require consultation under Section 7 of the ESA, actions by other entities also come under this requirement if the action is funded or authorized by a federal agency. All entities are subject to provisions of the ESA when it comes to actions impacting on a listed species; critical habit involves actions occurring within a designated area, whether the listed species is present or not.

A total of 22,274 ha (55,040 ac) of land on O'ahu have been designated as critical habitat for 99 species of plants. The total number of separate areas (known as "units") on O'ahu representing designated habitats for these 99 species of plants is 36.

There are no critical habitat units in the vicinity of Waimanalo Gulch, Makaīwa Gulch, or Kapa'a Valley. Closest to any of these three sites is Unit 16, encompassing much of the south slopes of Nānākuli Valley between about 400 and 1500 ft (120 to 460 m), designated as critical habitat for *Isodendrion pyrifolium.*, a species last seen on O'ahu in 1870 (Wagner, Herbst, & Sohmer, 1990). The ridgeline representing the southernmost extent of Unit 16 is just over 1 mi (1.8 km) from the northwest ridgeline bounding the Waimanalo Gulch parcel. No part of any proposed site overlaps into a critical habitat unit (Federal Register, 2003). However, critical habitat units are close to the proposed Mā'ili and Nānākuli sites.

The proposed Mā'ili site is near Units 12, 13, and 14. Unit 12 encompasses Pāhe'ehe'e Ridge and Mauna Kūwale as designated for *Chamaesyce kuwaleana*. This unit is about 2 mi (3.2 km) north of the quarry at Mā'ili. Unit 13 is located at the westernmost corner of the Naval Radio Transmitting Facility (NRTF) at Lualualei near Ma'ili'ili Stream, only a short distance west of the Mā'ili site property boundary. Both Unit 13 and nearby Unit 14 are designated for the fern, *Marsilea villosa*. Unit 14 is

located just inside the southern boundary of the NRTF Lualualei approximately 0.5 mi (0.8 km) southeast of the Mā'ili quarry site.

The proposed Nānākuli Site is near Critical Habitat Units 14 and 15. As described above, Unit 14 is located just inside the southern boundary of the NRTF Lualualei—0.75 mi (1.2 km) northwest of the closest part of the proposed Nānākuli Site. Unit 15 covers an extensive area of the uplands surrounding Lualualei Valley above 500 ft (150 m). A portion of this designated unit is directly upslope of the Nānākuli Site, encompassing the upper slopes of Pu'u Heleakalā. Although 39 species of listed plants have some part of Unit 15 designated as critical habitat, only *Chamaesyce kuwaleana*, has critical habitat on Pu'u Heleakalā. The area proposed for the landfill lies mostly at the base of the western face of Pu'u Heleakalā between 60 and 120 ft (18 – 37 m) elevations (the 611 ac parcel extends up to about the 360 ft or 110 m elevation).

ENDANGERED SPECIES ACT LISTED SPECIES

The previous subsection described relationships between designated critical habitat areas on O'ahu and the five proposed landfill sites. Although no site is within any of the 36 designated critical habitat units on the Island, this fact does not preclude their being ESA listed species present on one or more of the sites. In the absence of recent site surveys for four of the five sites, endangered species presence or absence must be inferred from what is known about the sites and the distribution of those species likely to be present based upon historical data. Presumably, once a site is selected and before it is developed, a botanical survey would be undertaken, and the finding of a listed species would then subject the site development process to provisions of the Act.

A number of species are known from individual specimens or populations growing near to some of the proposed municipal landfill sites and these are discussed here.

Marsilea villosa or *'ili'ihi* is a small aquatic or semi-aquatic fern resembling a clover (Fig. 15). The fern requires periodic flooding and drying of the ground to complete its short life cycle, and thus is confined to shallow basins subjected to brief periods of flooding during the wet season. The following description is from the Recovery Plan for the *Marsilea villosa* as given by USFWS (undated):

> This fern requires periodic flooding for spore release and fertilization, then a decrease in water levels for the young plants to establish. It typically occurs in

shallow depressions in clay soil, or lithified sand dunes overlaid with alluvial clay. All reported populations occur at or below 500 feet (150 meters) elevation. While *M. villosa* can withstand minimal shading, it appears most vigorous growing in open areas.

Figure 15. The fern, *Marsilea villosa* or *'ili'ihi*, is an endangered species, here growing among grasses at O'ahu critical habitat Unit 15 on Naval Transmitting Facility property at Lualualei.

Five populations are known from three locations on O'ahu at Koko Head (2), Lualualei Naval Reservation (2), and Kealakipapa (near Makapu'u) (Palmer, 2003), although a USFWS website confusingly lists 6 locations to account for "three currently occur[ing populations] on O`ahu... (USFWS, undated).

It is possible that *'ili'ihi* could occur on the Mā'ili Site given the close proximity of known populations of this fern. Both populations are located

at topographically low points on the Base, and were perhaps more extensive before off base areas were developed. On the Base, periodic mowing of the areas appears to help maintain the populations against overgrowth by aggressive introduced species, thus extensive disturbance of the Mā'ili Site by quarrying operations cannot be cited as a reason to rule out the ferns presence there. Exclusion of grazing may be a factor in the preservation of the fern populations where they are presently found.

The author surveyed both the Nānākuli A and B sites in 1991 before the PVT landfill occupied most of the Nānākuli A site (Guinther & Miranda, 1992). *Marsilea villosa* was not recorded and no habitat suitable for this fern was observed on the Nānākuli A or B sites, the latter being mostly a sloped hillside (Fig. 5). Similarly, suitable habitat is not present at Waimanalo Gulch, Makaīwa Gulch, or Kapa'a sites.

Chamaesyce kuwaleana, is a species of *'akoko* listed as endangered (Federal Register, 1991). Critical habitat for this species has been designated in seven units. Unit 15 encompasses 454 ac (184 ha) of Pu'u Heleakalā and is thought to presently harbor 300 individual plants (USFWS, 2003). Unit 15 lies upslope of the Nānākuli site. The plant is a small shrub between 0.2 and 0.9 m (8 to 35 in) high, known only from "arid volcanic cliffs, 250 m [820 ft high], Wai'anae Mountains, and also known from one specimen from Mokumanu, Kāne'ohe, O'ahu" (Wagner, Herbst, and Sohmer, 1990).

HAWAII NATURAL HERITAGE DATABASE

The Hawaii Natural Heritage Program (HNHP) was accessed and maps showing data entries were reviewed covering the lands for at least 1 mile around each proposed site. The data base has no rare or listed species of native plants at or close to any of the five proposed landfill sites. Within a distance of 1.25 mile (2 km), the data base yields entries for some of the sites.

For the proposed Mā'ili Quarry Site, the *'ili'ihi* fern is shown occupying an area on NRTF Lualualei close to Mā'ili Stream. This is the same area designated as critical habitat for this species, and is something less than 0.5 mile from the closest edge of the quarry property. However, given the special habitat requirement of this species (see p. 31, above), more than proximity would be required for the species to be established on the Mā'ili Site.

Schiedea ligustrina is indicated as having been reported from near the peak (northeast slope) of Pu'u Heleakalā approximately 0.7 mi (1.2 km) from the Nānākuli Site. At nearly the same distance away, at Ulehawa Beach Park, two rare plant records are in the data base: *maiapilo* (*Capparis sandwichiana*) and *nehe* (*Lipochaeta lobata* var. *lobata*).

Schiedea ligustrina is an endemic shrub that grows "[s]cattered in dry forest to diverse mesic forest, often on cliffs, usually in shaded sites, (305)-640-730(-830) m, Pālehua to Pu'ulaua and Keawapilau Gulch, and Mokulē'ia, Wai'anae Mountains, O'ahu" (Wagner, Herbst, and Sohmer, 1990). *Schiedea ligustrina* is not a listed species. *Maiapilo* is uncommon on O'ahu, but also not a listed species.

Nehe (*Lipochaeta lobata*) is presently considered to be found in the wild as two distinguishable varieties (Wagner, erbst, and Sohmer, 1990). *Lipochaeta lobata* var. *leptophylla* is a listed variety (Federal Register, 1991); The few remaining plants of *L. l.* var. *leptophylla* are located above Lualualei Valley but the known elevation range of this variety is well above the properties proposed for landfill use. The lowland or coastal variety, *L. l.* var. *lobata* is not listed and not presently regarded for listing consideration.

Within roughly 1 mi (1.6 km) of the Waimānalo Gulch and Makaīwa Gulch properties, the data base indicates the now extirpated populations of *'Ewa 'akoko* (*Chamaesyce skottsbergii* var. *skottsbergii*) that once occupied land that is Barbers Point Deep Draft Harbor and associated dredge tailings. This endangered variety is no longer present in this area (David and Guinther, 2006), but is being maintained at several sites in Kalaeloa (former Barbers Point Naval Air Station).

CONCLUSIONS

The results of all botanical surveys and searches of pertinent sources of information indicate that there are no special concerns or legal constraints related to botanical resources on any of the proposed sites. Non-native or introduced species of plants clearly dominate the natural vegetation in all areas proposed for landfill use, and the remnants of native vegetation extant on or near these sites consists of generally sparse growth of a limited number of species that remain relatively common in all undeveloped lowlands around O'ahu. Although some rare native plants, and in a couple of cases, endangered species or varieties of plants, can be found within 2 km (1.2 mi) of a proposed landfill site, there is no reason to believe that the operation of a landfill at these sites would have any adverse impacts on such species.

Figure 16. Composite photo of the eastern side of Waimānalo Gulch showing the upper end of the permitted landfill area (right) with reshaping of the site underway.

The operation of a municipal solid waste landfill, by its very nature and in compliance with the most modern environmental requirements designed to minimize and contain offsite movement of pollutants, will require removal of the vegetation from the selected site. Figure 16 (above) shows the Waimānalo Gulch (existing City & County landfill) operation at the very beginning of setting up the cells into which refuse is permanently stored. Although for each site this may differ to some degree, this initial phase entails making cuts into hillsides to create room and obtain inert material for use as cover. Whatever botanical resources are present at the selected site will likely be completely removed, the only possible exceptions being

areas around the margins of a site where the terrain becomes too steep to alter. Following grading and use of the site for land-filling, surface stabilization practices will eventually include replacing the vegetation. An emphasis on utilizing appropriate native species could be followed.

It is generally the case that many rare native plants of interest (an exception is the fern, *'ili'ihi*) growing in the lowlands of O'ahu will be confined to steep gulch slopes and cliffs. In most cases, these habitats would tend not to be developed, although as Fig. 16 shows, steep gulch slopes could be incorporated into the overall reshaping of the site to a greater degree than might be the case for most other kinds of land development. At two of the proposed sites (Mā'ili Quarry and Kapa'a Quarry), the landfill would utilize existing, highly disturbed, quarry pits. The conclusion cannot be drawn that because steep, rocky gulch margins and cliff faces and ledges provide habitat for rare native plants, the two existing quarry sites (Mā'ili and Kapa'a) might then harbor special species. Rare plants occur in nearly inaccessible places because these places are not accessed by grazing cattle and, certainly in some cases, are protected from fires spreading over the landscape. The special plants hang on in these locations because the common sources of disturbance are minimized. Quarry walls and ledges are highly disturbed sites and not ideal habitat for rare native plants. These plants—in the absence of the many disturbances (including aggressive introduced species)—would populate areas today used for housing, recreation, and grazing.

This report provides information from the recent investigation of the Waimānalo Gulch site and data associated with prior investigations of the Nānākuli, Mā'ili, Makaīwa, and Kapa'a sites. There is no guarantee that some small number of specimens of a listed species might be present at one or another of the proposed sites that have not been subjected to a recent survey. Should one or more of these sites be selected for landfill use, additional botanical surveys should be conducted as deemed practical to better establish the conclusion of no adverse impacts on listed species. The desirability of doing such a future survey or surveys will depend upon habitat present at the site, proximity of the site to known populations of endangered species, and how recently and completely past botanical surveys covered the site. For assessment purposes, this report should suffice to cover any such concerns involving investigation of the Waimānalo Gulch site.

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Appendix F

Survey of the Avifaunal and Feral Mammals for the Proposed Waimānalo Gulch Landfill Expansion Project, O'ahu, 2007

SURVEY OF THE AVIFAUNA AND FERAL MAMMALS FOR THE PROPOSED WAIMANALO GULCH LANDFILL EXPANSION PROJECT, OAHU

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INTRODUCTION

The purpose of this report is to present the findings of a bird and mammal field survey, conducted on 26 September 2006 at Waimanalo Gulch, Leeward Oahu. This same area was previously surveyed (Bruner 1999). Data from the earlier study is also given in this report for comparison purposes, along with references to pertinent literature and unpublished reports since 1999.

The objectives of the field survey were to:

1- Document what bird and mammal species currently occur on the property.

2- Provide comparative data on the relative abundance of each species.

3- Determine the presence or likely occurrence of native or migratory birds, those that are listed as endangered or threatened.

4- Determine if the habitats on this site are comparable with that seen in 1999.

SITE DESCRIPTION

The proposed expansion area is located in a narrow "V" shaped valley with a dry stream bed that only contains water during flash flood events. Introduced vegetation continues to dominate the plant communities at this site. Many of the trees that were present in 1999 were burned in the August 2005 fire that ravaged this region. Most of the surviving trees are along the stream bed. Dry grass covers most of the site.

Weather during the survey was clear and warm. Winds were from the east at 10-15mph.

STUDY METHODS

The site was walked using the same access road as in 1999. I also continued on mauka from the end of the road to an old fence that crossed the valley. Field observations were made with the aid of binoculars and by listening for vocalizations.

All birds seen or heard were tallied. These data provide the basis for the relative abundance estimates given in Table One. Data from the 1999 survey are also given for comparison. Observations of feral mammals were limited to visual sightings. No attempts were made to trap mammals in order to obtain data on their relative abundance and distribution.

Scientific names of birds and mammals used in this report follow those given in Checklist of the Birds of Hawaii (Pyle 2002) and Mammal Species of the World (Honacki et al. 1982). These sources use names cited in the most current scientific literature.

RESULTS AND DISCUSSION

Resident Endemic (Native) Birds:

As was the case in 1999 no native land birds were recorded on the survey. The Hawaiian Owl or Pueo (*Asio flammeus sandwichensis*) is listed as endangered by the State of Hawaii on the island of Oahu. This species was not recorded on the survey but may forage in this area. Since 1999 I have observed Pueo in Leeward Oahu at locations only a few miles on either side of this property. Pueo hunt over grasslands as well as forests and nest on the ground in tall grass (Pratt et al. 1987, Hawaii Audubon Society 2005).

Migratory Indigenous (Native) Birds:

No migratory shorebirds were recorded on the survey. This area lacks suitable habitat for these species.

Resident Indigenous (Native) Seabirds:

No seabirds were observed. The White-tailed Tropicbird (*Phaethon lepturus*) can be seen soaring above valleys and over ridges on Oahu. This species is not endangered or threatened.

Resident (Native) Waterbirds:

The stream only contains water during flash floods. No waterbirds would be expected at this site.

Exotic (Introduced) Birds:

Only nine species of exotic birds were recorded during the course of the field survey compared with 13 species in 1999. The array of species was comparable to that observed on other surveys in similar habitat (Bruner 1989, 1990a, 1990b, 1992, 1993, 1996, 1999, 2000, 2001a, 2001b, 2002, 2003). Table One gives the relative abundance of each species recorded on the 1999 and 2006 survey. None of these species are listed as endangered or threatened.

Feral Mammals:

The only feral mammal observed was the Small Indian Mongoose (*Herpestes auropunctatus*). Two were seen in the stream bed. Rats (*rattus sp.*) and Mice (*Mus musculus*) were not seen but probably occur on this site. The endemic and endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) is rarely seen on Oahu (Tomich 1986, Kepler and Scott 1990). No bats were observed on the survey. This species is known to roost solitarily in trees and forages for flying insects (Jacobs 1993). They use a variety of habitats including native forests, ranchlands, ponds and bays as well as urban areas (Jacobs 1991, Reynolds et al. 1998).

CONCLUSIONS

The absence of native and migratory birds on this property is not unexpected given the elevation and available habitats. The Pueo (Hawaiian Owl) might forage on occasion in this region. All of the birds recorded in 1999 and on this survey were alien (non-native, introduced) species. The fact that there were fewer alien species and lower relative abundance on this 2006 survey may be due to the August 2005 fire which had a major impact on this habitat. Other factors may also account for the differences in bird populations between 1999 and 2006 (Williams 1987, Moulton 1990). In conclusion this site is not remarkable in either the array or number of birds and mammals. There are no unique habitats. Similar areas occur all along the leeward side of Oahu.

TABLE 1

Alien (introduced) species of birds recorded on and near the site of the proposed Waimanalo Gulch Landfill Expansion, Oahu during the 1999 and 2006 field surveys. Relative abundance estimates are based on total numbers of birds recorded:
A = abundant (30-50); C = common (15-29); R = rare (1-4).
Species not recorded are indicated by a (-).

Common Name	**Scientific Name**	**Relative Abundance**	
		1999	**2006**
Cattle Egret	*Bubulcus ibis*	U	R
Erckel Francolin	*Francolinus erckelii*	R	-
Rock Dove	*Columba livia*	C	-
Spotted Dove	*Streptopelia chinensis*	A	C
Zebra Dove	*Geopelia striata*	C	U
Red-vented Bulbul	*Pycnonotus cafer*	A	R
Common Myna	*Acridotheres tristis*	A	U
Japanese White-eye	*Zosterops japonicus*	R	C
Northern Cardinal	*Cardinalis cardinalis*	R	R
House Finch	*Carpodacus mexicanus*	U	-
Common Waxbill	*Estrilda astrild*	A	C
Red Avadavat	*Amandava amandava*	-	R
Nutmeg Mannikin	*Lonchura punctulata*	U	-
Java Sparrow	*Padda oryzivora*	R	-

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REPORT OF POTENTIAL BIRDS AND MAMMALS AT FOUR PROPOSED ALTERNATIVE LANDFILL SITES ON OAHU

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INTRODUCTION

The purpose of this report is to provide a guideline of the potential birds and mammals that might be found on a field survey of each of the four proposed alternative landfill sites on Oahu. In addition, any potential problems associated with a landfill and native or migratory birds on or nearby the sites is noted.

MAILI SITE

Native Birds:

None would be expected on this site due to its location, lack of appropriate habitats and current land use.

Migratory Birds:

The potential species that might forage at this site, provided there is open habitat is the Pacific Golden-Plover or Kolea (*Pluvialis fulva*). This species often forages on lawns and fallow agricultural lands. It is not endangered or threatened. They spend the non-breeding season (August – April) in Hawaii and nest in western Alaska during June – July.

Alien (Non-native, Introduced) Birds:

Without actually surveying the site it is impossible to provide a complete and accurate accounting of alien birds on this site. Nevertheless some of the more common species likely to be found on or near this area include:

Spotted Dove (*Streptopelia chinensis)*

Zebra Dove (*Geopelia striata*)

Red-vented Bulbul (*Pycnonotus cafer*)

Common Myna (*Acridotheres tristis*)

House Finch (*Carpodacus mexicanus*)

Common Waxbill (*Estrilda astrild*)

NANAKULI B SITE

Native Birds:

The only native bird that might forage on or around this site is the Hawaiian Owl or Pueo (*Asio flammeus sandwichensis*). The Oahu population of this species is listed as endangered by the state of Hawaii. They forage over a variety of habitats included lands such as the Nanakuli B site and area up slope of this property. I have seen Pueo as

recently as three years ago in the general area of this proposed alternative landfill site. Pueo forage in a wide variety of natural and disturbed habitats.

Migratory Birds:

The only migrant that might be expected in large open spaces free of brush and high grass is the Pacific Golden-Plover or Kolea (*Pluvialis fulva*).

Alien (Non-native, Introduced) Birds:

The most likely common species are:

Spotted Dove (*Streptopelia chinensis*)

Zebra Dove (*Geopelia striata*)

Red-vented Bulbul (*Pycnonotus cafer*)

Common Myna (*Acridotheres tristis*)

Japanese White-eye (*Zosterops japonicus*)

House Finch (*carpodacus mexicanus*)

Common Waxbill (*Estrilda astrild*)

Game Birds such as Erckel Francolin (*Francollinus erckelii*) and Gray Francolin (*Francolinus pondicerianus*) may also occur in the steeper areas above the site.

MAKAIWA GULCH SITE

Native Birds:

Aside from the Pueo (Hawiian Owl) no native birds likely would be found at this site.

Migratory Birds:

The only migratory bird that could occur on the property is the Pacific Golden-Plover.

Alien (Non-native, Introduced) Birds:

This site is so similar in habitat, topography and elevation to the Waimanalo Gulch site that the list of alien species that probably occur on or near this area would coincide with that obtained in the 1999 and the current 2006 faunal field surveys of Waimanalo Gulch. The relative abundance of these species might vary a little between the two sites.

AMERON QUARRY SITE

Native Birds:

Native birds would not be expected to frequent the actual quarry site but several species of native, endangered waterbirds do occur at the nearby Kawainui Marsh. Of the four alternative landfill sites, Ameron Quarry poses the greatest potential threat to native birds through groundwater or flood water contamination of Kawainui Marsh.

Migratory Birds:

The Pacific Golden-Plover occurs in open habitats around the quarry.

Alien (Non-native, Introduced) Birds:

Common alien species in this area include but are not limited to:

Cattle Egret (*Bubulcus ibis*)

Spotted Dove (*Streptopelia chinensis*)

Zebra Dove (*Geopelia striata*)

Red-vented Bulbul (*Pycnonotus cafer*)

Common Myna (*Acridotheres tristis*)

Japanese White-eye (*Zosterops japonicus*)

Northern Cardinal (*Cardinalis cardinalis*)

Red-crested Cardinal (*Paroaris coranata*0

House Finch (*Carpodacus mexicanus*)

Common Waxbill (*Estrilda astrild*)

FERAL MAMMALS

All four sites likely have some or all of the following feral mammals: cats, dogs, rats, mice and the Small Indian Mongoose.

CONCLUSIONS

This report is only intended to provide a general overview of the more common species of birds and mammals that might be expected at the alternative landfill sites. An actual field survey would obviously yield a more complete assessment of faunal use of these areas. The only alternative site with potentially serious impact is the Ameron Quarry property. Its proximity to a wetland with endangered species could spell trouble in the form of water contamination from flooding or through groundwater drainage.

Appendix G

Archaeological Inventory Survey
Waimānalo Gulch Landfill Expansion Project, 2008

Archaeological Inventory Survey for the Waimānalo Gulch Sanitary Landfill Expansion Project Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu (TMK: [1] 9-2-003: por. 072 and 073)

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Management Summary

Reference	Archaeological Inventory Survey for the Waimānalo Gulch Sanitary Landfill Expansion Project, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu (TMK: [1] 9-2-003: por. 072 and 073) (Dalton and Hammatt 2008)
Date	April 2008
Project Number	Cultural Surveys Hawaii, Inc. (CSH) Job Code: HONOU 6
Investigation Permit Number	The fieldwork for this investigation was carried out under archaeological permit number 07-19, issued by the Hawai'i State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR), per Hawai'i Administrative Rules (HAR) Chapter 13-282.
Project Location	The proposed landfill expansion area is located immediately *mauka* (northeast) of the existing Waimānalo Gulch Sanitary Landfill. Waimānalo Gulch is generally located immediately inland of Farrington highway, roughly between the Honokai Hale residential subdivision and Ko Olina Resort to the southeast, and the Hawaiian Electric Co.'s (HECO) Kahe Power Plant to the northwest. This area is depicted on the 1998 'Ewa USGS 7.5 minute topographic quadrangle.
Project Funding and Land Jurisdiction	City and County of Honolulu (City)
Agencies	City Department of Environmental Services, SHPD
Project Description	The proposed landfill expansion area comprises approximately 90 acres of undeveloped land within the overall 200-acre Waimānalo Gulch Landfill property (TMK: [1] 9-2-003: 072 and 073). The proposed landfill expansion area is to be used for the disposal of municipal refuse, H-POWER associated ash and residue, and operational activities associated with running the landfill. The landfill expansion is meant to increase the capacity and lifespan of the existing Waimānalo Gulch Sanitary Landfill. Minimally, land disturbing activities associated with the landfill expansion project would include: major grading, including blasting of exposed rock surfaces, and excavation of the base and walls of Waimānalo Gulch to prepare the expansion area for landfill use; grading for a perimeter road around the expansion area; excavations for stockpiling of sediment for use as cover material; excavations for associated landfill infrastructure; excavation for the installation of a storm water runoff control channel along the west side of the gulch; and filling of the expansion area with refuse material.

Area of Potential Effect (APE)	The project's APE is defined as the entire approximately 90-acre proposed expansion area.
Definition of the Current Study Area.	Background research confirmed that the approximately 90-acre landfill expansion project area had been previously surveyed by CSH as part of an earlier archaeological inventory survey (AIS) of the entire 200-acre Waimānalo Gulch Landfill property (Hammatt and Shideler 1999). In early 2007, at the request of the project proponents, CSH completed additional AIS investigation, including systematic pedestrian inspection and limited subsurface testing, of a 36-acre portion of the overall 90-acre APE that represents the core of the expansion area (located within TMK: [1] 9-2-003: 073). This 36-acre portion of the overall 90-acre APE is defined as the study area for the current AIS investigation.
Historic Preservation Regulatory Context	As a City-funded project on City-owned land, the proposed landfill expansion is a project requiring compliance with State of Hawaii historic preservation review legislation. This investigation was performed to fulfill Hawaii State archaeological inventory survey standards (Hawaii Administrative Rules [HAR] Chapter 13-276) and support the project's historic preservation review under Hawaii Revised Statutes [HRS] Chapter 6E-8 and HAR Chapter 13-275. It also is intended to support the project's environmental review under HRS Chapter 343.
Fieldwork Effort	Fieldwork for the current AIS investigation of the study area was accomplished over a one-week period from January 25, 2007 to February 2, 2007. The CSH field crew consisted of Matt Bell, B.A., Amy Hammermiester, B.A., and Kevin Dalton, B.A., under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). The field effort required 13 person-days to complete.
Results	Through the combined effort of the earlier AIS investigation of the entire 200-acre Waimanalo Gulch Landfill property (Hammatt and Shideler 1999) and the current AIS investigation of the 36-acre study area, all of the expansion area APE was subjected to systematic pedestrian inspection, with limited subsurface testing where appropriate. This effort located a single historic property: SIHP # 50-80-12-6903, three rock uprights, which are recommended eligible to the Hawai'i Register of Historic Places (Hawaii Register) under significance Criteria D (for information content) and E (for traditional-cultural significance to Native Hawaiians).

Consultation Effort Related to SIHP # 50-80-12-6903	For the project's AIS consultation effort, CSH worked with the Office of Hawaiian Affairs, SHPD, and knowledgeable cultural consultants. This effort was dove-tailed with the cultural consultation effort for the project's cultural impact assessment, which CSH prepared pursuant to HRS Chapter 343 and the Office of Environmental Quality Control's guidelines for assessing cultural impacts. This consultation effort included several on-site, at the SIHP # 50-80-12-6903 location, meetings that included SHPD personnel (Mr. Adam Johnson, Ms. Teresa Davan, Ms. Linda Kaleo Paik, and Ms. Lauren Morawski), as well as knowledgeable cultural consultants, including Mr. McD Philpotts, Mr. Alika Silva, Mr. Glen Kila, Mr. Shad Kane, Mr. William Ailā, and Mr. Eric Enos. Through this consultation CSH sought the opinions of cultural consultants regarding the age, function, cultural affiliation, and significance of the three stone uprights. All cultural consultants felt the stones were significant Native Hawaiian cultural resources that were used in the past by traditional Hawaiian cultural practitioners. There is no clear consensus, however, regarding the specific function of the upright stones. Potential functions discussed included trail markers, markers for observation points for celestial observation and/or navigation, or markers used to calculate the location of specific coastal and/or off-shore resources. Potential mitigation measures for the stones, including preservation in place and relocation, were discussed with the cultural consultants.
Effect Recommendation	After weighing the options, the project proponents have determined that the three stones that make up SIHP # 50-80-12-6903 cannot be preserved in place in a safe and appropriate manner. Accordingly, a project effect determination of "effect with agreed upon mitigation commitments" is warranted.
Mitigation Recommendation	The project proponents propose the relocation of the three SIHP # 50-80-12-6903 stones to Battery Arizona, located in the southwestern portion of the Waimānalo Gulch Landfill property. The proposed relocation would ensure the safety of the stones during the landfill's expansion and would make them much more accessible to interested parties. There is the option of returning the stones to near their original resting places. This relocation could only take place after that portion of the landfill had been filled, most likely in approximately 15 years. The specifics of the proposed stone relocation would be the subject of the project's archaeological mitigation plan for SIHP # 50-80-12-6903.

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Section 1 Introduction

1.1 Project Background

The City and County of Honolulu (City) intends to expand the active landfill operations within the 200-acre Waimānalo Gulch Sanitary Landfill property, located in Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu (TMK: [1] 9-2-003: 072 and 073). Waimanalo Gulch is generally located immediately inland of Farrington highway, roughly between the Honokai Hale residential subdivision and Ko Olina Resort to the southeast, and the Hawaiian Electric Co.'s (HECO) Kahe Power Plant to the northwest. This area is depicted on the 1998 'Ewa USGS 7.5 minute topographic quadrangle. The proposed expansion area includes approximately 90 acres of the overall property that is located generally *mauka* (northeast) of the existing and in-use landfill operations (Figure 1, Figure 2, & Figure 3).

The Waimānalo Gulch Sanitary Landfill was established in 1989; is owned by the City and County of Honolulu (C&C) under the jurisdiction of the Department of Environmental Services/Refuse Division, and operated by Waste Management of Hawai'i. The landfill currently takes in roughly 500,000 tons per year.

The proposed landfill expansion area of potential effect (APE) comprises approximately 90 acres of undeveloped land within the overall 200-acre Waimānalo Gulch Landfill property (TMK: [1] 9-2-003: 072 and 073). The proposed landfill expansion area is to be used for the disposal of municipal refuse, H-POWER associated ash and residue, and operational activities associated with running the landfill. The landfill expansion is meant to increase the capacity and lifespan of the existing Waimānalo Gulch Sanitary Landfill. Minimally, land disturbing activities associated with the landfill expansion project would include: major grading, including blasting of exposed rock surfaces, and excavation of the base and walls of Waimānalo Gulch to prepare the expansion area for landfill use; grading for a perimeter road around the expansion area; excavations for stockpiling of sediment for use as cover material; excavations for associated landfill infrastructure; excavation for the installation of a storm water runoff control channel along the west side of the gulch; and filling of the expansion area with refuse material.

As a City-funded project on City-owned land, the proposed landfill expansion is by definition a project requiring compliance with Hawaii State environmental (Hawaii Revised Statutes [HRS] Chapter 343) and historic preservation [HRS Chapter 6E-8 and Hawaii Administrative Rules (HAR) Chapter 13-275] review legislation. Accordingly, at the request of R.M. Towill Corporation, on behalf of the City, Cultural Surveys Hawai'i Inc. (CSH) conducted an archaeological inventory survey (AIS) to support the project's environmental and historic preservation review. This investigation was performed to fulfill Hawaii State archaeological inventory survey standards (HAR Chapter 13-276) and support the project's environmental and historic preservation review.

Background research confirmed that the approximately 90-acre landfill expansion project area had been previously surveyed by CSH as part of an earlier archaeological inventory survey (AIS) of the entire 200-acre Waimānalo Gulch Landfill property (Hammatt and Shideler 1999). In early 2007, at the request of the project proponents, CSH completed additional AIS investigation,

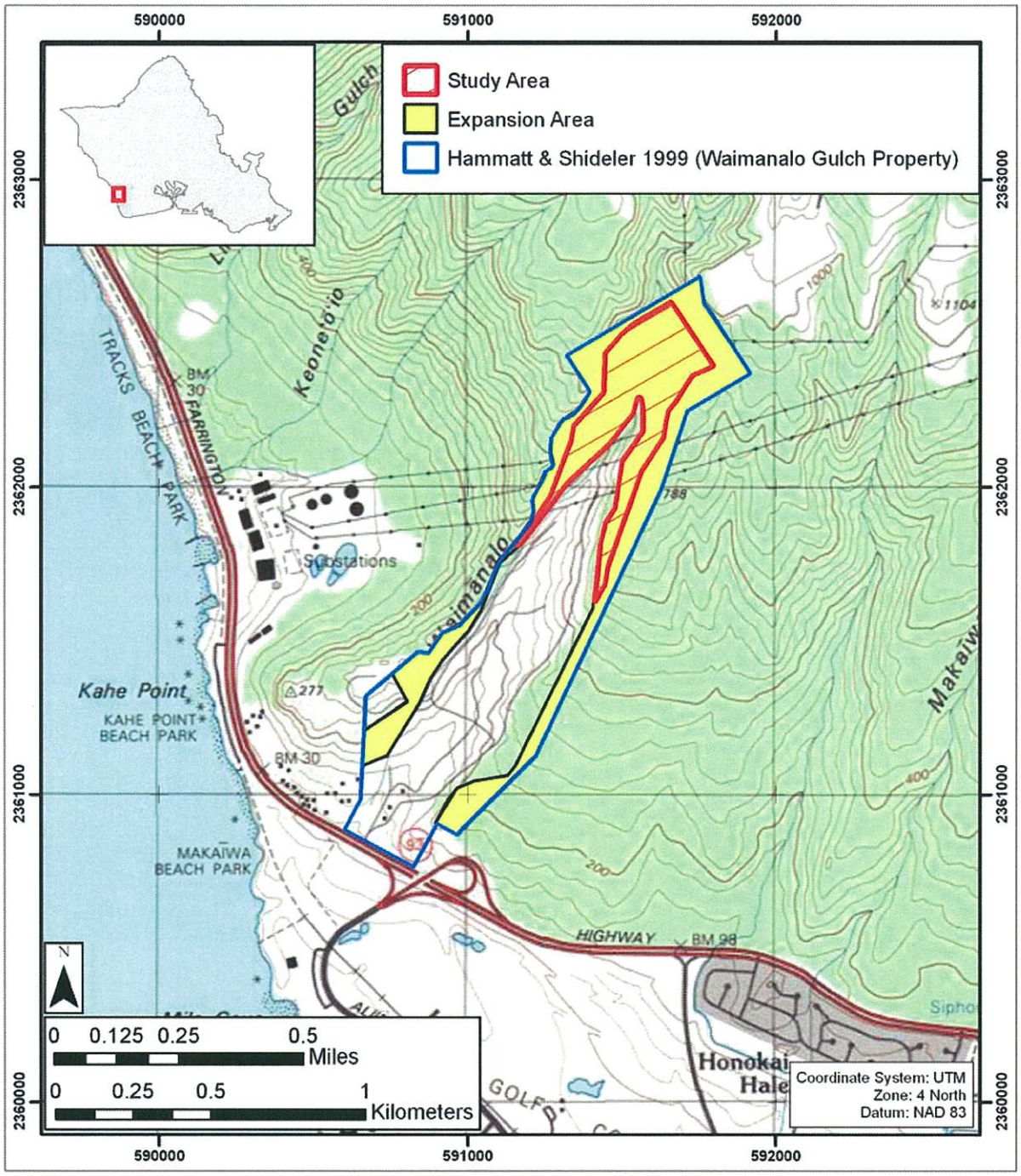

Figure 1. USGS 7.5 Minute Series Topographic Map, Ewa Quadrangle (1998), showing the location of the Hammatt & Shideler (1999) study area, the Waimānalo Gulch Sanitary Landfill proposed expansion area, and the current study area

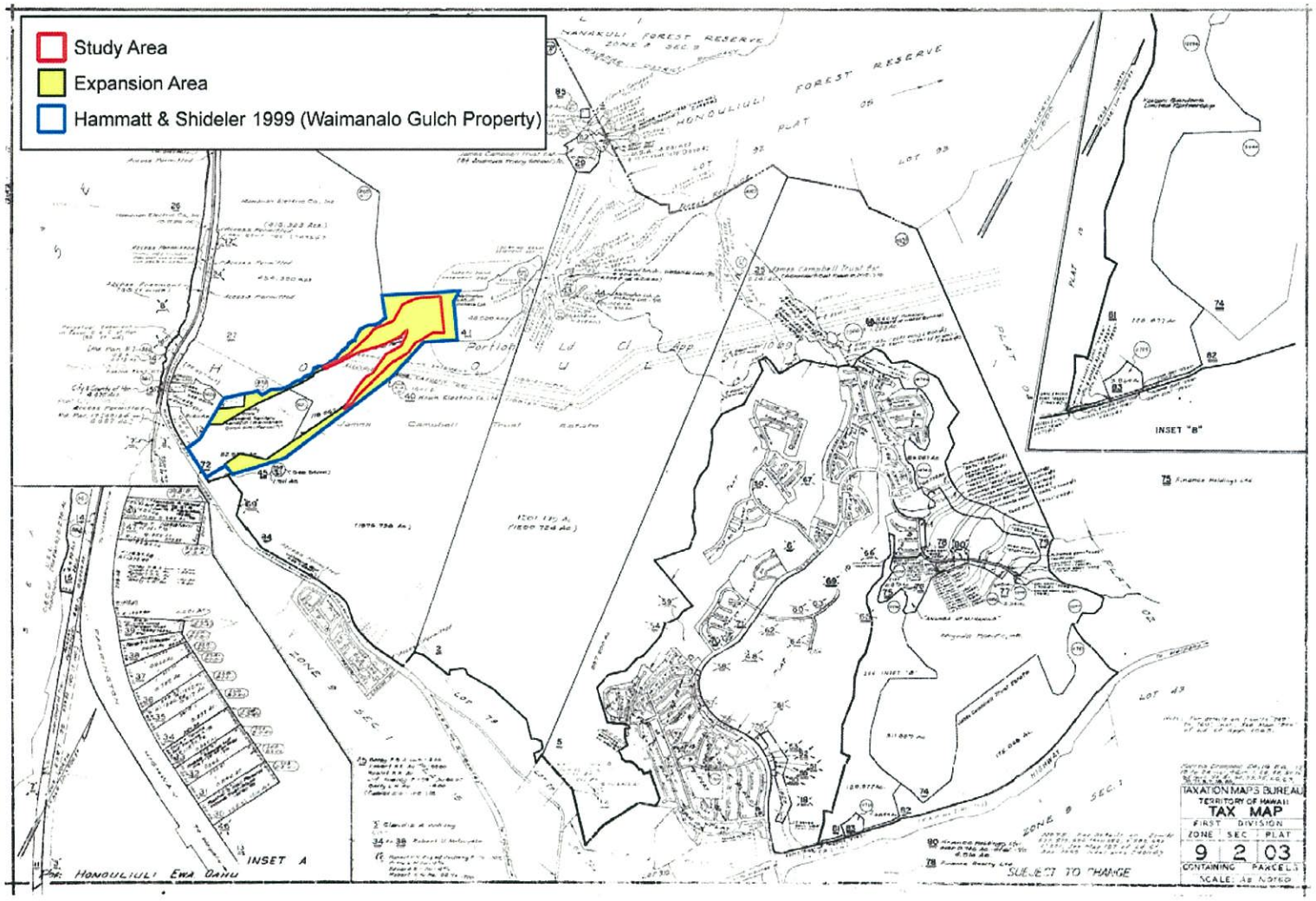

Figure 2. TMK [1] 9-2-03 showing the location of the Hammatt & Shideler (1999) study area, the Waimānalo Gulch Sanitary Landfill proposed expansion area, and the current study area

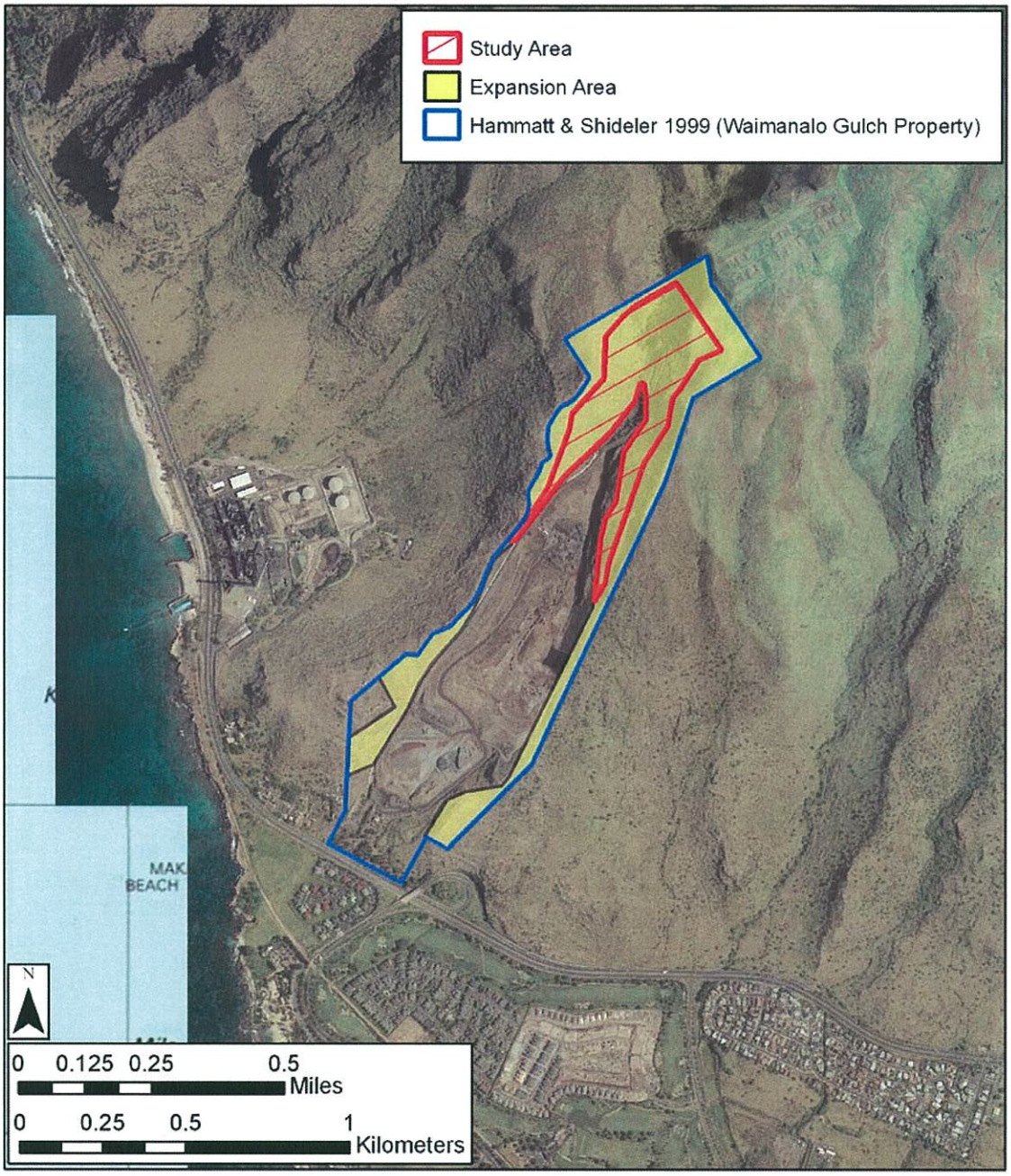

Figure 3. Aerial photograph showing the location of the Hammatt & Shideler (1999) study area, the Waimānalo Gulch Sanitary Landfill proposed expansion area, and the current study area (source: USGS Orthoimagery 2005)

including systematic pedestrian inspection and limited subsurface testing, of a 36-acre portion of the overall approximately 90-acre landfill expansion APE (see Figure 1, Figure 2, & Figure 3). This 36-acre area represents the core of the expansion area (located within TMK: [1] 9-2-003: 073, refer to Figure 1). This 36-acre portion of the overall approximately 90-acre APE is defined as the study area for the current AIS investigation. Through the combined effort of the earlier AIS investigation of entire 200-acre Waimanalo Gulch Landfill property (Hammatt and Shideler 1999) and the current AIS investigation of the 36-acre study area, 100 percent of the project APE was subjected to systematic pedestrian inspection, with limited subsurface testing where appropriate.

1.2 Scope of Work

The archaeological inventory survey and its accompanying report document all historic properties within the project's APE. The following scope of work satisfies State and County requirements for an archaeological inventory survey [per HAR 13-13-276]:

1. A complete ground survey of the entire project area for the purpose of site inventory was completed. All sites were located, described, and mapped with evaluation of function, interrelationships, and significance. Documentation included photographs and scale drawings of selected sites and complexes. All sites were assigned State Inventory of Historic Properties (SIHP) numbers.
2. Limited subsurface testing was conducted to determine if subsurface deposits were located in the project area (particularly in potential archaeological sites).
3. Research on historic and archaeological background, including search of historic maps, written records, and Land Commission Award documents. This research focused on the specific area with general background on the *ahupua'a* and district and emphasized settlement patterns.
4. As appropriate, consultation with knowledgeable individuals regarding the project area's history, past land use, and the function and age of the historic properties documented within the project area.
5. Preparation of this inventory survey report included the following:
   a) A project description;
   b) A section of a USGS topographic map showing the project area boundaries and the location of all recorded historic properties;
   c) Historical and archaeological background sections summarizing prehistoric and historic land use of the project area and its vicinity;
   d) Descriptions of all historic properties, including selected photographs, scale drawings, and discussions of age, function, laboratory results, and significance, per the requirements of HAR 13-276;
   e) A section concerning cultural consultations [per the requirements of HAR 13-276-5(g) and HAR 13-275/284-8(a)(2)].

f) A summary of historic property categories, integrity, and significance based upon the Hawai'i Register of Historic Places criteria;

g) A project effect recommendation;

h) Treatment recommendations to mitigate the project's adverse effect on any historic properties identified in the project area that are recommended eligible to the Hawai'i Register of Historic Places.

This scope of work included coordination with the State Historic Preservation Division (SHPD), and County relating to archaeological matters.

1.3 Environmental Setting

1.3.1 Natural Environment

The proposed Waimānalo Gulch Landfill expansion area is located within Waimānalo Gulch, in the southern foothills of the Wai'anae Mountain range. The proposed expansion area is located approximately 400 to 970 meters east of the coastline. Elevations within the proposed expansion area range from approximately 90 to 1000 ft AMSL. Lands within the proposed expansion area generally consist of steep sloping gulch walls, with a dry stream channel at the base of the gulch. The stream channel is understood to only have running water during periods of heavy rainfall, which are relatively uncommon in dry leeward O'ahu. The proposed expansion area receives an average of approximately 600-700 mm (24-28 in.) of annual rainfall (Giambelluca et al. 1986).

Soils within the study area consist entirely of Rock Land (rRK) (Foote et al. 1972) (Figure 4). Rock Land is described as "made up of areas where exposed rock covers 25 to 90 percent of the surface...rock outcrops and very shallow soils are the main characteristics" (Foote et al. 1972).

With regards to the vegetation Frierson (1972) suggests that prior to the introduction of exotic vegetation in 1790, the slopes of the Wai'anae Range extending down to about 150 m (500 ft.) elevation supported a dry forest of native trees and shrubs between an upper *'ōhi'a* wet forest and lower grassy savannah area. Frierson (1972:4) summarizes the following patterns suggested by J.F. Rock (1913) for the indigenous vegetation in the area prior to 1778:

a) Lowland zone - open grassland on the leeward side

b) Lower Forest - beginning about 1000 feet and richer in species than the rainforest: *kukui*, *'ōhi'a 'ai, koa, kalia*, sandalwood, *'ōhi'a lehua, hau, ti, ape, pia*, banana, ginger, birdnest fern and *honohono*, as well as grasses and cyperaceous plants.

c) Specifically leeward lower forest – *'ohe, wiliwili, maile, halapepe* and *alani*, with almost no undergrowth.

Historical accounts presented by Frierson (1972) describe these lower forest species as extending to 500 feet, with the presence of sandalwood observed down to as low as 300 feet. The lower forest then is hypothesized to have covered much of the current landfill expansion area. This was always a rain shadow slope and we may more accurately envisage a park land community rather than a thick forest in early Hawaiian times.

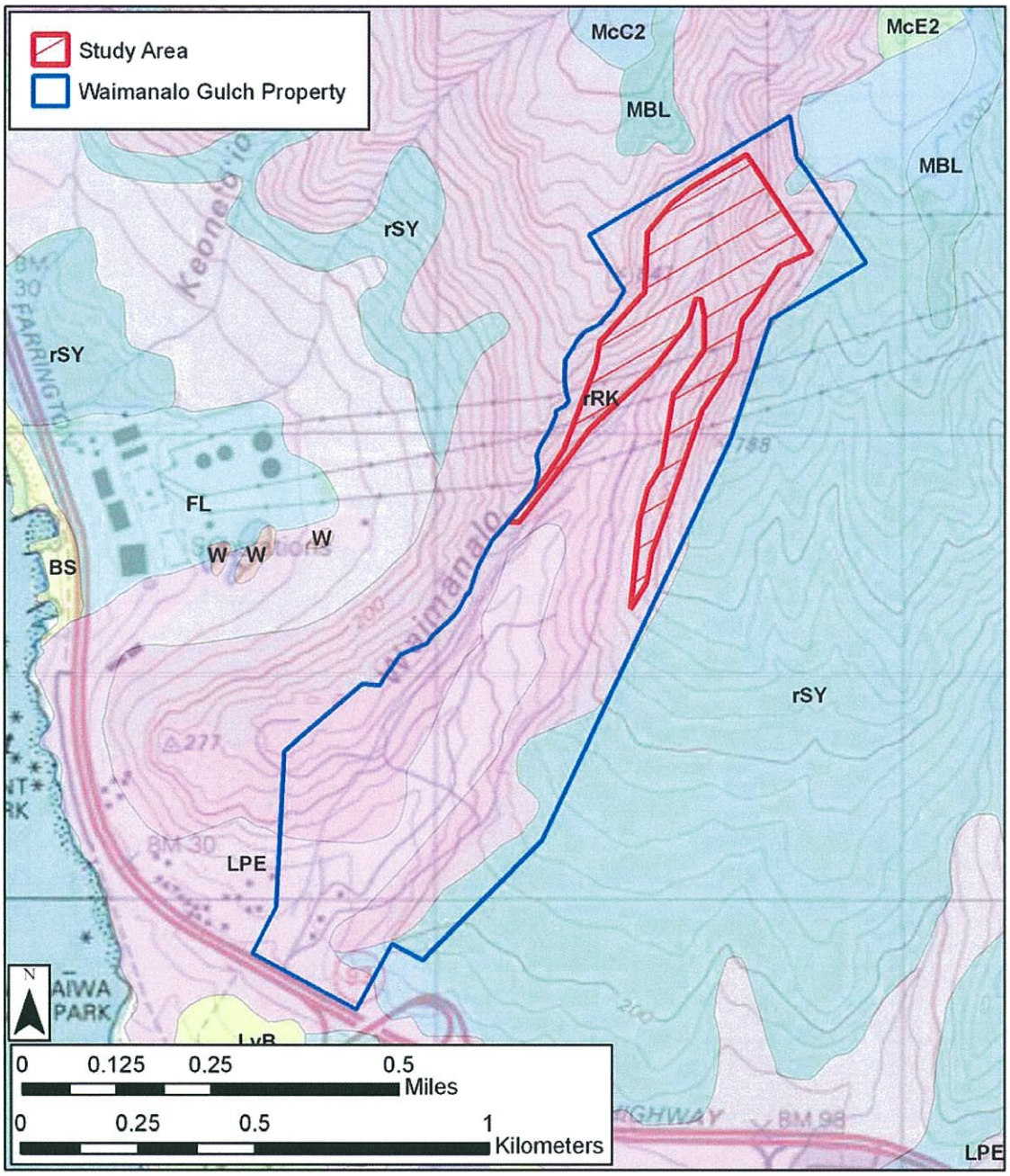

Figure 4. Overlay of Soil Survey of the State of Hawai'i (Foote et al. 1972), indicating sediment types within the study area (source: Soils Survey Geographic Database [SSUGRO] 2001, U.S. Department of Agriculture)

The current vegetation in the project area is comprised mostly of scattered *koa haole* and various grasses. As a result of a relatively recent wildfire, the grasses within the project area have grown dense and thick, covering about 90% of the ground surface, making ground surface observation difficult throughout the project area (Figure 5 and Figure 6).

1.3.2 Built Environment

Lands within the study area are currently undeveloped, with the exception of unpaved access roads. Lands within Waimānalo Gulch, immediately *makai* (southwest) of the study area consist of the active Waimānalo Gulch Sanitary Landfill, and include solid waste disposal sites and associated landfill infrastructure. *Makai* (southwest) of the landfill site is the Ko Olina Resort, including a golf course and residential subdivision. West of the landfill site are the Kahe Point Homes residential subdivision and the HECO Kahe Power Plant. Lands to the east and north of the Waimānalo Gulch landfill are the undeveloped Makaiwa Hills and Palehua areas.

The present state of the study area can be seen in Figure 5 and Figure 6.

Figure 5. Photograph showing the *makai* portion of the study area, view to southwest

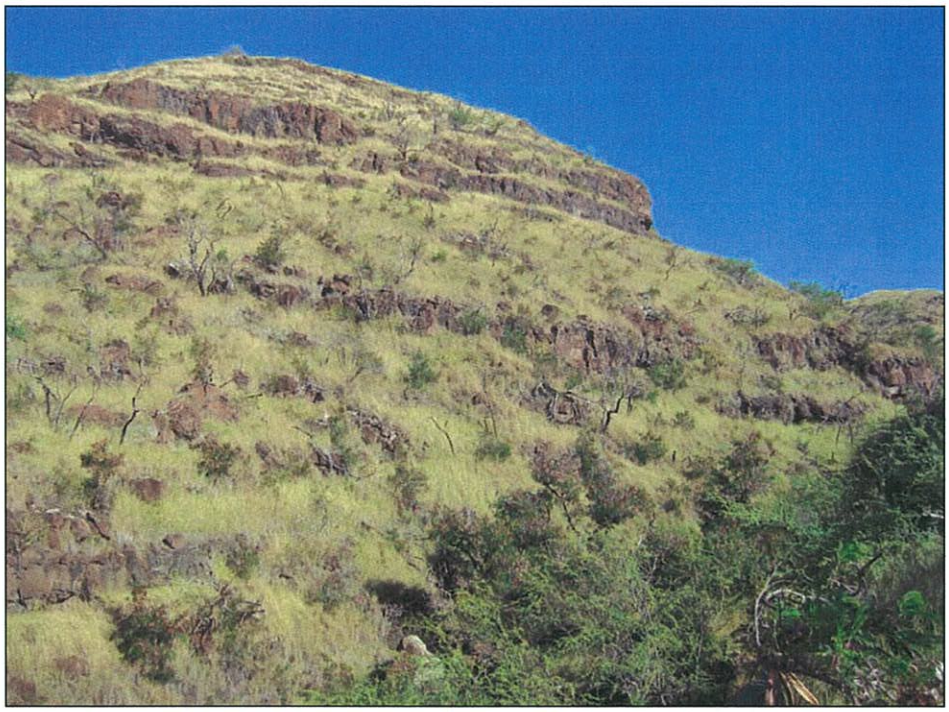

Figure 6. Photograph showing the *mauka* portion of the study area, view to northeast

Section 2 Methods

2.1 Field Methods

Fieldwork was accomplished over a one-week period from January 25th to February 2nd, 2007. The CSH field crew consisted of Matt Bell, B.A., Amy Hammermiester, B.A., and Kevin Dalton, B.A., under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). The field effort required 13 person-days to complete.

Fieldwork consisted of a 100% coverage pedestrian inspection of the study area and limited subsurface testing at select locations. The pedestrian inspection of the study area was accomplished through systematic sweeps (transects). The spacing interval between archaeologists was 5-10 meters. Cliffs and rock overhangs were inspected thoroughly for evidence of burials or cultural activity. All potential historic properties encountered were recorded and documented with a written field description, site map, photographs, and located utilizing the Global Positioning System technology utilizing a Garmin GPSmap76S unit (three to five meter horizontal accuracy) or a Trimble PRO XR GPS (submeter horizontal accuracy).

Subsurface testing consisted of the partial excavation, by hand, of selected natural features located during the pedestrian survey. The purpose of the subsurface testing was to aid in determining if selected geological features (i.e. rock shelters, rock mounds, etc.) had been culturally modified or contained subsurface cultural deposits. All excavated material was sifted through a 1/8 in. wire mesh screen to separate out the soil matrix. Each test excavation was documented with a scale section profile, photographs, and sediment descriptions. Sediment descriptions included characterizations of Munsell color, compactness, texture, structure, inclusions, cultural material present, and boundary distinctness and topography.

2.2 Document Review

Background research included a review of previous archaeological studies on file at the State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources (DLNR); a review of geology and cultural history documents at Hamilton Library of the University of Hawai'i, the Hawai'i State Archives, the Mission Houses Museum Library, the Hawai'i Public Library, and the Archives of the Bishop Museum; study of historic photographs at the Hawai'i State Archives and the Archives of the Bishop Museum; and a study of historic maps at the Survey Office of the DLNR. Information on LCAs was accessed through Waihona 'Āina Corporation's Māhele Data Base (www.waihona.com).

This research provided the environmental, cultural, historic, and archaeological background for the project area. The sources studied were used to formulate a predictive model regarding the expected type and location of sub-surface pre and post-contact historic properties in the project area.

2.3 Consultation

For the project's archeological inventory survey consultation effort, carried out pursuant to the requirements of HAR 13-276-5(g) and HAR 13-275/284-8(a)(2), CSH worked with the

Office of Hawaiian Affairs (OHA), SHPD, and knowledgeable cultural consultants. This effort is dove-tailed with the cultural consultation effort currently underway for the project's cultural impact assessment, which CSH is also preparing pursuant to HRS Chapter 343 and the Office of Environmental Quality Control's guidelines for assessing cultural impacts. Table 1 summarizes the individuals and organizations/agencies that have been consulted.

Table 1. Cultural and/or Agency Consultants

Name	Affiliation
Ailā , William	Hui Malāma I Nā Kūpuna
Amaral, Annelle	'Ahahui Siwila Hawai'i O Kapolei Hawaiian Civic Club
Cope, Aggie	Hale O Na'auao Society
Desoto, Frenchy	Wai'anae Coast Archaeological Preservation Representative
Davan, Teresa	O'ahu Island Archaeologist, SHPD
Eaton, Arline	*Kupuna* at Iroquois Elementary School
Enos, Eric	Cultural practitioner and director of Ka'ala Farms
Flanders, Judith	Granddaughter of Alice Kamōkila Campbell
Greenwood, Alice	O'ahu Island Burial Council Member, Wai'anae District
Ho'ohuli, "Black" Jo	Wai'anae Neighborhood Board No 24
Rezentes, Cynthia	Wai'anae Neighborhood Board No 24
Johnson, Adam	Former Oahu Island Archaeologist, SHPD
Johnson, Rubellite	Hawaiian scholar
Josephides, Analu	O'ahu Island Burial Council Member, Wai'anae District
Kanahele, Kamaki	President of Nānākuli Homestead Association
Kane, Shad	Member of the Makakilo, Kapolei, Honokai Hale Neighborhood Board and 'Ahahui Siwila Hawai'i O Kapolei Hawaiian Civic Club
Kila, Glenn	Koa Mana
Makaiwi, Martha	Makakilo, Kapolei, Honokai Hale Neighborhood Board No. 34
McKeaque, Kawika	O'ahu Island Burial Council member 'Ewa District
Momoa, Joseph	Kama'āina of Nānākuli and member of Kamo'i Canoe Club
Morawski, Lauren	O'ahu Island Archaeologist, SHPD
Nāmu'o, Clyde	Administrator at Office of Hawaiian Affairs
Paik, Kaleo	Culture and Historic Branch, SHPD
Philpotts, McD	Cultural practitioner and long time resident of Waimānalo 'Ili
Silva, Alika	Koa Mana

Name	Affiliation
Tiffany, Nettie	Kahu of Lanikūhonua and Former O'ahu Island Burial Council member, 'Ewa District
Timson, Maeda	Member of the Makakilo, Kapolei, Honokai Hale Neighborhood Board No. 34 and President of Ua Au O Kapolei

This consultation effort has included written consultation letters, which were sent via email and U. S. post. These consultation letters were followed up with telephone communication. Additionally, project-related cultural consultation included several on-site meetings that included SHPD personnel (Mr. Adam Johnson, Ms. Teresa Davan, Ms. Linda Kaleo Paik, and Ms. Lauren Morawski), as well as knowledgeable cultural consultants, including Mr. McD Philpotts, Mr. Alika Silva, Mr. Glen Kila, Mr. Shad Kane, Mr. William Ailā, and Mr. Eric Enos. Through this consultation CSH has sought the opinions of cultural consultants regarding the age, function, cultural affiliation, and significance of the single historic property documented within the project's APE. Potential historic property mitigation measures, including preservation in place and relocation, were discussed with these cultural consultants during the on-site meetings.

Section 3 Background Research

3.1 Traditional and Historical Background

3.1.1 Historical Setting

Waimānalo Gulch is located in the western portion of Honouliuli Ahupua'a, within the 'Ewa District of Leeward O'ahu (Figure 7). Honouliuli Ahupua'a is the largest traditional land unit on O'ahu, extending from the West Loch of Pearl Harbor in the east, to the border of Nānākuli Ahupua'a at Pili o Kahe in the west. Honouliuli Ahupua'a includes approximately 19 km (12 mi.) of open coastline from One'ula westward to Pili o Kahe. The *ahupua'a* extends *mauka* (almost pie-shaped) from West Loch nearly to Schofield Barracks in Wahiawā; the western boundary is the Wai'anae Mountain crest running north as far as Pu'u Hapapa (or to the top of Ka'ala Mountain according to some).

Within Honouliuli Ahupua'a, not only is there a long coastline fronting the normally calm waters of leeward O'ahu, but there is also four miles of waterfront along the west side of West Loch of Pearl Harbor. The land immediately *mauka* of the coast consists of a flat, karstic raised limestone reef, forming a level nearly featureless "desert" plain marked in pre-contact times by a thin or non-existent soil mantle. The micro-topography is notable in containing countless sinkholes caused by chemical weathering (dissolution) of the limestone shelf. Proceeding *mauka* from this limestone plain, the shelf is overlain by alluvium deposited through a series of gulches draining the Wai'anae Mountains. The largest of these is Honouliuli Gulch, located in eastern Honouliuli, which empties into the West Loch of Pearl Harbor. To the west are fairly steep gradient gulches forming a more linear than dendritic drainage pattern. The major gulches are, from east to west: Kalo'i, Makakilo, Awanui, Pālailai, Makaīwa, Waimānalo, and Limaloa. These gulches are steep-sided in the uplands and generally of a high gradient until they emerge onto the flat 'Ewa plain. The alluvium they have carried has spread out in delta fashion over the *mauka* portions of the plain, which comprises a dramatic depositional environment at the stream gradient change. These gulches are generally dry, but during seasonal Kona storms carry immense quantities of runoff onto the plain and into the ocean. As typical drainages in arid slopes they are either raging uncontrollably or are dry, and as such do not form stable water sources for traditional agriculture in their upper reaches. The western Honouliuli gulches, in contrast to those draining into Pearl Harbor to the east, do not have valleys suitable for extensive irrigated agriculture. However, this lack is more than compensated by the rich watered lowlands of the base of Honouliuli Gulch (the *'ili* of Honouliuli).

Honouliuli Ahupua'a, as a traditional land unit, had tremendous and varied resources available for exploitation by early Hawaiians. The "karstic desert" and marginal characterization of the limestone plain, which is the most readily visible terrain, does not do justice to the *ahupua'a* as a whole. The richness of this land unit is marked by the following available resources:

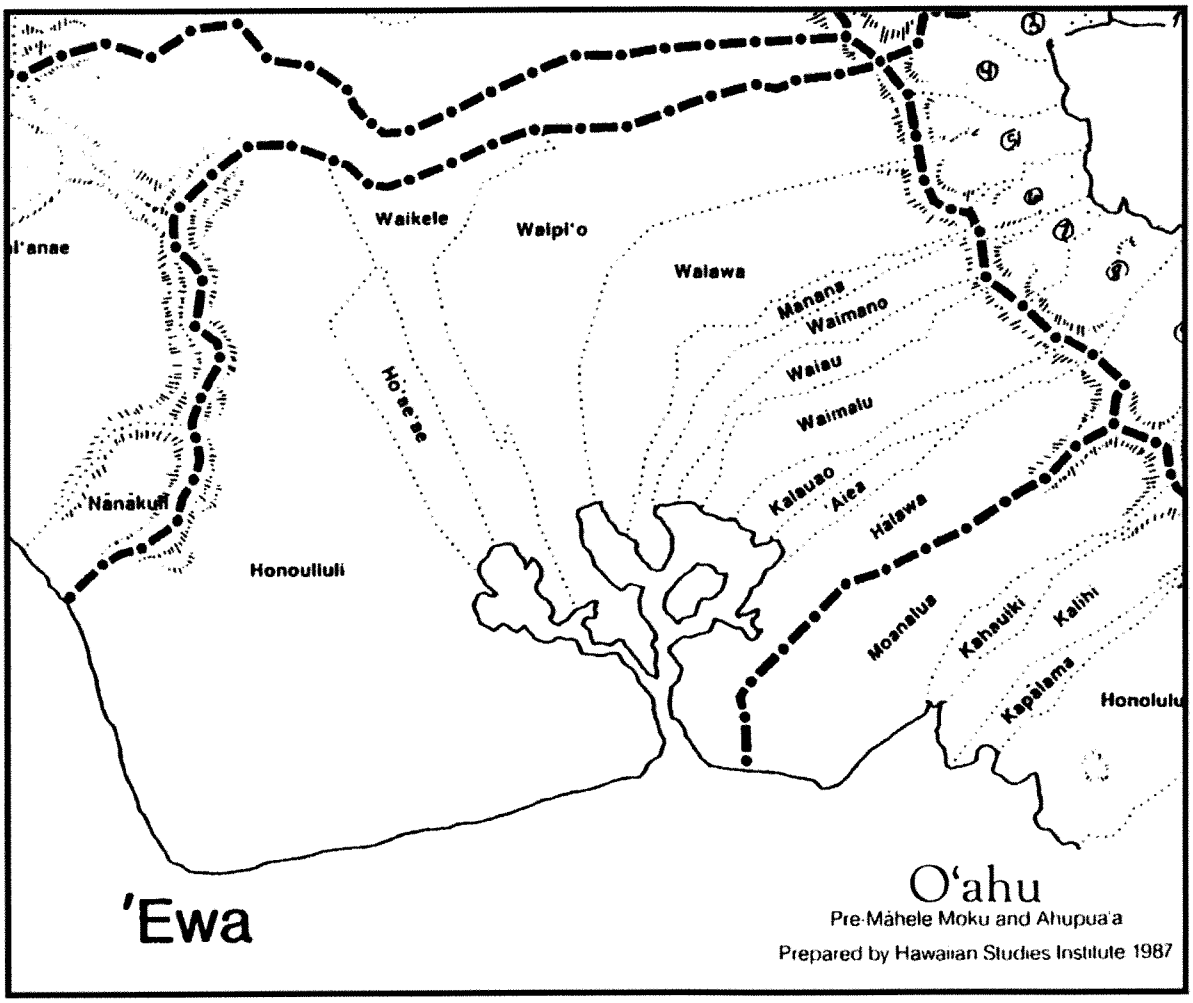

Figure 7. Portion of Hawaiian Studies Institute (1987) map of O'ahu, showing pre-Māhele *moku* (district) and *ahupua'a* boundaries

1. 12 miles of coastline with continuous shallow fringing reef, which offered rich marine resources.

2. Four miles of frontage on the waters of West Loch that offered extensive fisheries (mullet, *awa*, shellfish) as well as frontage suitable for development of fishponds (for example, Laulaunui).

3. The lower potion of Honouliuli Gulch in the 'Ewa plain offered rich level alluvial soils with plentiful water for irrigation from the stream as well as abundant springs. This irrigable land would have stretched well up the valley.

4. A broad limestone plain which, because of innumerable limestone sinkholes, offered a nesting home for a large population of avifauna. This resource may have been one of the early attractions to human settlement.

5. An extensive upland forest zone extending as much as 12 miles inland from the edge of the coastal plain. As Handy and Handy (1972:469) have pointed out, the forest was much more distant from the lowlands here than on the windward coast, but it was much more extensive. Much of the upper reaches of the *ahupua'a* would have had species-diverse forest with *kukui*, *'ōhia*, *'iliahi* (sandalwood), *hau*, *ti*, banana, etc.

The political and cultural center of the Honouliuli Ahupua'a is understood to have been the relatively dense settlement and rich lands for irrigated taro cultivation at the *'ili* of Honouliuli located where Honouliuli Stream empties into the north portion of West Loch. The name of the *ahupua'a*, translated as "dark bay" (Pukui et al. 1974:51) may refer to the nature of the waters of West Loch at the mouth of Honouliuli Stream. Early accounts and maps indicate a large settlement at the *'ili* of Honouliuli and it may well be that the political power of this village was so great that it was able to extend its jurisdiction well to the northwest into an area which might have been anticipated to fall under the dominion of the Wai'anae ruling chiefs.

3.1.2 Mythological and Traditional Accounts

The traditions of Honouliuli Ahupua'a have been complied and summarized numerous times, in studies by Sterling and Summers (1978), Hammatt and Folk (1981), Kelly (1991), Charvet-Pond and Davis (1992), Maly and Rosendahl (1993), and Tuggle & Tuggle (1997). Some of the themes of these traditions, include connections with Kahiki (the traditional homeland of Hawaiians, probably in reference to central Polynesia) and the special character and relationship of the places known as Pu'uokapolei and Kualaka'i (near Barbers Point).

Connections with Kahiki are found in numerous place names, traditional events, and with the beings associated with Honouliuli. There are several versions of Kaha'i leaving from Kalaeloa for a trip to Kahiki to bring breadfruit back to 'Ewa (e.g. Kamakau 1991:110). There are several stories that associate places in the region with Kamapua'a and the Hina family, as well as with Pele's sisters, all of whom have strong connections with Kahiki (cf. Kamakau 1961:111; Pukui et al. 1974:200).

Pu'uokapolei was one of the most sacred places in Honouliuli (cf Sterling and Summers 1978:33). Pu'uokapolei's connections with Kahiki are emphasized when it is noted that the hill was the home of Kamapua'a's grandmother, Kamaunuaniho, the Kahiki ancestor to the people of O'ahu (Fornander 1916-20, V:318; Kahiolo 1978:81, 107). By name, Kapolei is associated with the goddess Kapo, another connection with the Pele and Kamapua'a stories (Kamakau 1976:14).

McAllister (1933:108) records that a *heiau*, or temple, was located on Pu'uokapolei, but was destroyed before his survey of the early 1930s. The *heiau* may have been associated with the sun (Fornander 1916-20, III:292). The hill was used as a point of solar reference or as a place where such observations were made. Pu'uokapolei might have been understood as the gate of the setting sun. It is notable that the rising sun at the eastern gate of Kumukahi in Puna is associated with the Hawaiian goddess Kapo (Emerson 1978:41). There is little specific information for Pu'uokapolei, but the place name itself ("hill of beloved Kapo") is hard to ignore. It is mentioned in some cosmologies that Kū was the god of the rising sun, and Hina should be associated with the setting sun (Hina is the mother of Kamapua'a). Fornander (1916-20, III; 292) states, Pu'uokapolei may have been a jumping off place (also connected with the setting sun) and associated with the dead who roamed the adjacent Plain of Kaupe'a.

Pu'uokapolei was also the primary landmark for travelers between Pearl Harbor and the west O'ahu coast, with a main trail running just inland of it ('Ī'ī 1959:27, 29; Figure 8). Pu'uokapolei was probably the most common name used as a reference for the area of the 'Ewa Plain in traditional Hawai'i (cf. Fornander 1916-20, II: 318; E.M. Nakuina 1904, in Sterling and Summers 1978:34).

3.1.3 Early Historic Period

Although no specific documentation of pre-contact or early historic land use is known for the specific study area in Waimānalo Gulch, various Hawaiian legends and early historical accounts indicate that the *ahupua'a* of Honouliuli was once widely inhabited by pre-contact Hawaiian populations, including the Hawaiian *ali'i*. This substantial population is attributable for the most part to the plentiful marine and estuarine resources available at the coast, along which several sites interpreted as permanent habitations were located. Other attractive subsistence-related features of the *ahupua'a* included irrigated lowlands suitable for wetland taro cultivation (Hammatt and Shideler 1990), as well as the lower forest area of the mountain slopes for the procurement of forest goods.

Exploitation of the forest resources along the slopes of the Wai'anae Range - as suggested by E. S. and E.G. Handy - probably acted as a viable subsistence alternative during times of famine:

> ...The length or depth of the valleys and the gradual slope of the ridges made the inhabited lowlands much more distant from the *'wao*, or upland jungle, than was the case on the windward coast. Yet the *'wao* here was more extensive, giving greater opportunity to forage for wild foods during famine time. (Handy and Handy 1972:469-470)

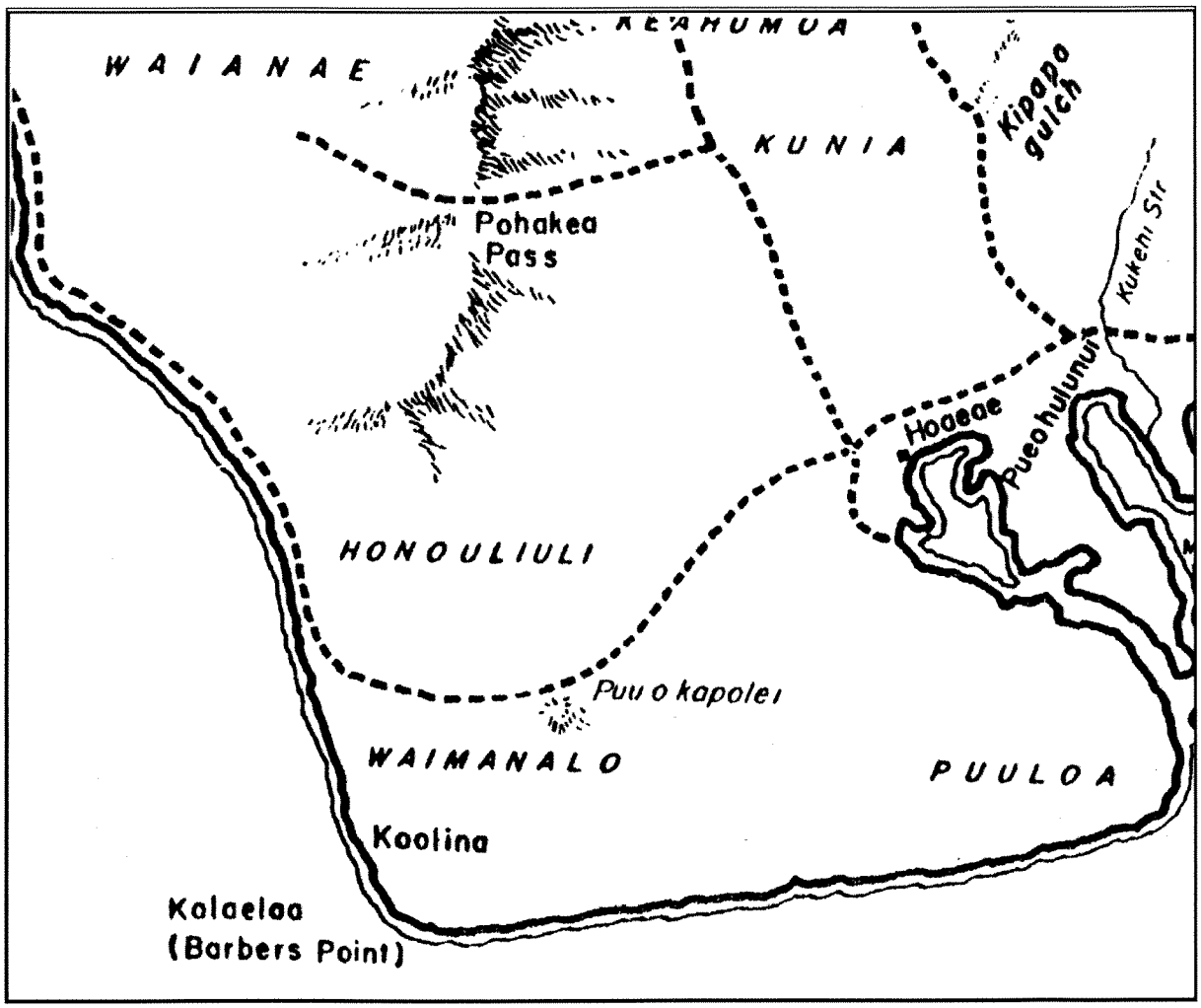

Figure 8. Trails of Leeward O'ahu as Described by John Papa 'Ī'ī; Map by Paul Rockwood ('Ī'ī 1983:96)

These upper valley slopes may have also been a significant resource for opportunistic quarrying of basalt for the manufacturing of stone tools. This is evidenced in part by the existence of a probable quarrying site (50-80-12-4322) in Makaīwa Gulch at 152 m (500 ft.) elevation, east of the current project area (Hammatt et al. 1991).

The Hawaiian *ali'i* were also attracted to the region. One historical account of particular interest refers to an *ali'i* residing in Ko Olina, southwest of the current project area:

> Ko Olina is in Waimānalo near the boundary of 'Ewa and Wai'anae. This was a vacationing place for chief Kākuhihewa and the priest Napuaikamao was the caretaker of the place. Remember reader, this Ko Olina is not situated in the Waimānalo on the Ko'olau side of the island but the Waimānalo in 'Ewa. It is a lovely and delightful place and the chief, Kākuhihewa loved this home of his (Sterling and Summers 1978:41).

John Papa 'Ī'ī describes a network of Leeward O'ahu trails (see Figure 8) which in later historic times encircled and crossed the Wai'anae Range, allowing passage from West Loch to the Honouliuli lowlands, past Pu'u Kapolei and Waimānalo Gulch to the Wai'anae coast and onward circumscribing the shoreline of O'ahu ('Ī'ī 1959:96-98). Following 'Ī'ī's description, a portion of this trail network would have passed immediately *makai* (south) of the southern border of the Waimānalo Gulch property, roughly following the route of the present Farrington Highway.

'Ī'ī, who was born about 1800, also recounts an incident at Waimānalo that occurred when he was eight or nine years old. While the young 'Ī'ī was staying at Nānākuli, he learned:

> ...of the burning of the houses in Waimanalo. The overseer in charge of the burning told ['Ī'ī and his relatives] that it was so ordered by the royal court because the people there had given shelter to the chiefess, Kuwahine, who ran away from her husband Kalanimoku after associating wrongfully with someone. Kuwahine was the daughter of the Kaikioewa who reared Kamehameha III in his infancy. She had run away because she had been beaten for her offense and for other reasons, too, perhaps. She had remained hidden for about four or five days before she was found. Here we see the sadness that befell the people through the fault of the chiefs. The punishment fell on others, though they were not to blame. ('Ī'ī 1959:29)

'Ī'ī's sad account reveals that the coastal Waimānalo portion of Honouliuli Ahupua'a continued to be inhabited during the first portion of the 19th century.

Other early historical accounts of the general region typically refer to the more populated areas of the 'Ewa district, where missions and schools were established and subsistence resources were perceived to be greater. However, the presence of archaeological sites along the coral plains and coast of southwest Honouliuli Ahupua'a, indicate that pre-contact and early post-contact populations also adapted to less inviting areas, despite the environmental hardships.

Subsequent to western contact in the area, the landscape of the 'Ewa plains and Wai'anae slopes was adversely affected by the removal of the sandalwood forest, and the introduction of domesticated animals and new vegetation species. Domesticated animals including goats, sheep

and cattle were brought to the Hawaiian Islands by Vancouver in the early 1790s, and allowed to graze freely about the land for some time after. L.A. Henke reports the existence of a longhorn cattle ranch in Wai'anae by at least 1840 (in Frierson 1972:10). During this same time, perhaps as early as 1790, exotic vegetation species were introduced to the area. These typically included vegetation best suited to a terrain disturbed by the logging of sandalwood forest and eroded by animal grazing. The following dates of specific vegetation introduced to Hawai'i are given by R. Smith and outlined by Frierson (1972:10-11):

1. "early," c. 1790:

   Prickly pear cactus, *Opuntia tuna*
   Haole koa, *Leucaena leucocephala*
   Guava, *Psidium guajava*

2. 1835-1840:

   Burmuda [sic] grass, *Cynodon dactylon*
   Wire grass, *Eleusine indica*

3. 1858:

   Lantana, *Lantana camara*

The *kiawe* tree (*Prosopis pallida*) was also introduced during this period, either in 1828 or 1837 (Frierson 1972:11).

Intensive sandalwood harvesting, according to H. St. John (in Frierson 1972:7) occurred in the Hawaiian Islands between 1815-1830. As it is likely that sandalwood forests once occupied the lower, dry slopes of the Wai'anae Range, the current project area was likely impacted by the cutting and burning of these forests.

3.1.4 Mid- to late-1800s

Associated with the Māhele of 1848, 99 individual land claims in the *ahupua'a* of Honouliuli were registered and immediately awarded by King Kamehameha III. The vast majority of the Land Commission Awards (LCA) were located near the Pu'uloa Salt Works and the taro lands of the *'ili* of Honouliuli. The present study area appears to have been included in the largest award (Royal Patent 6071, LCA 11216, 'Āpana 8) granted in Honouliuli Ahupua'a to Miriam Ke'ahi-Kuni Kekau'ōnohi on January 1848 (Native Register). Kekau'ōnohi acquired a deed to all unclaimed land within the *ahupua'a*, including a total of 43,250 acres.

Kamaukau relates the following about Kekau'ōnohi as a child:

> Kamehameha's granddaughter, Ke-ahi-Kuni Kekau-'ōnohi...was also a tabu chiefess in whose presence the other chiefesses had to prostrate and uncover themselves, and Kamehameha would lie face upward while she sat on his chest. (in Hammatt and Shideler 1990:19-20)

Kekau'ōnohi was one of Liholiho's (Kamehameha II's) wives, and after his death, she lived with her half-brother, Luanu'u Kahala'i'a, who was governor of Kaua'i (Hammatt and Shideler

1990:20). Subsequently, Kekau'ōnohi ran away with Queen Ka'ahumanu's stepson, Keli'i-ahonui, and then became the wife of Chief Levi Ha'alelea. Upon her death on June 2, 1851, all her property was passed on to her husband and his heirs. When Levi Ha'alelea died the property went to his surviving wife, who in turn leased it to James Dowsett and John Meek in 1871 for stock running and grazing.

In 1877, James Campbell purchased most of Honouliuli Ahupua'a for a total of $95,000. He then drove off 32,347 head of cattle belonging to Dowsett, Meek and James Robinson and constructed a fence around the outer boundary of his property (Bordner and Silva 1983:C-12). In 1879, Campbell brought in a well-driller from California to search the 'Ewa plains for water, and a "vast pure water reserve" was discovered (Armstrong and Bier 1983). Following this discovery, plantation developers and ranchers drilled numerous wells in search of the valuable resource. By 1881, the Campbell property of Honouliuli prospered as a cattle ranch with "abundant pasturage of various kinds" (Briggs in Haun and Kelly 1984:45). Within 10 years of the first drilled well in 'Ewa, the addition of a series of artesian wells throughout the island was supplying most of Honolulu's water needs (Armstrong and Bier 1983).

In 1889, Campbell leased his property to Benjamin Dillingham, who subsequently formed the O'ahu Railway & Land Co. (O.R. & L) in 1890. To attract business to his new railroad system, Dillingham subleased all land below 200 feet elevation to William Castle who in turn sublet the area to the 'Ewa Plantation Company for sugar cane cultivation (Frierson 1972:15)(Figure 9). Dillingham's Honouliuli lands above 200 feet elevation that were suitable for sugar cane cultivation were sublet to the O'ahu Sugar Co. Throughout this time and continuing into modern times, cattle ranching continued in the area, and Honouliuli Ranch established by Dillingham was the "fattening" area for the other ranches (Frierson 1972:15).

'Ewa Plantation Co. was incorporated in 1890 and continued in full operation up into modern times (Figure 9). The plantation grew quickly with the abundant artesian water. As a means to generate soil deposition on the coral plain and increase arable land in the lowlands, the 'Ewa Plantation Co. installed ditches running from the lower slopes of the mountain range to the lowlands and then plowed the slopes vertically just before the rainy season to induce erosion (Frierson 1972:17).

The O'ahu Sugar Co. was incorporated in 1897, and included lands in the foothills above the 'Ewa plain and Pearl Harbor. Prior to commercial sugar cultivation, the lands occupied by the O'ahu Sugar Co. were described as being "of near desert proportion until water was supplied from drilled artesian wells and the Waiāhole Water project" (Conde and Best 1973:313). The O'ahu Sugar Co. took control over the 'Ewa Plantation lands in 1970 and continued operations into the 1990s.

Dillingham's *mauka* lands in western Honouliuli that were unsuitable for commercial sugar production remained pasture for grazing livestock. From 1890 to 1892, the Ranch Department of the O.R. & L. Co. desperately sought water for their herds of cattle by tapping plantation flumes and searching for alternative sources of water. Ida von Holt leaves this account of her husband Harry's (Superintendent of the O.R. & L Ranch Dept.) search for water in the foothills of the Wai'anae Range:

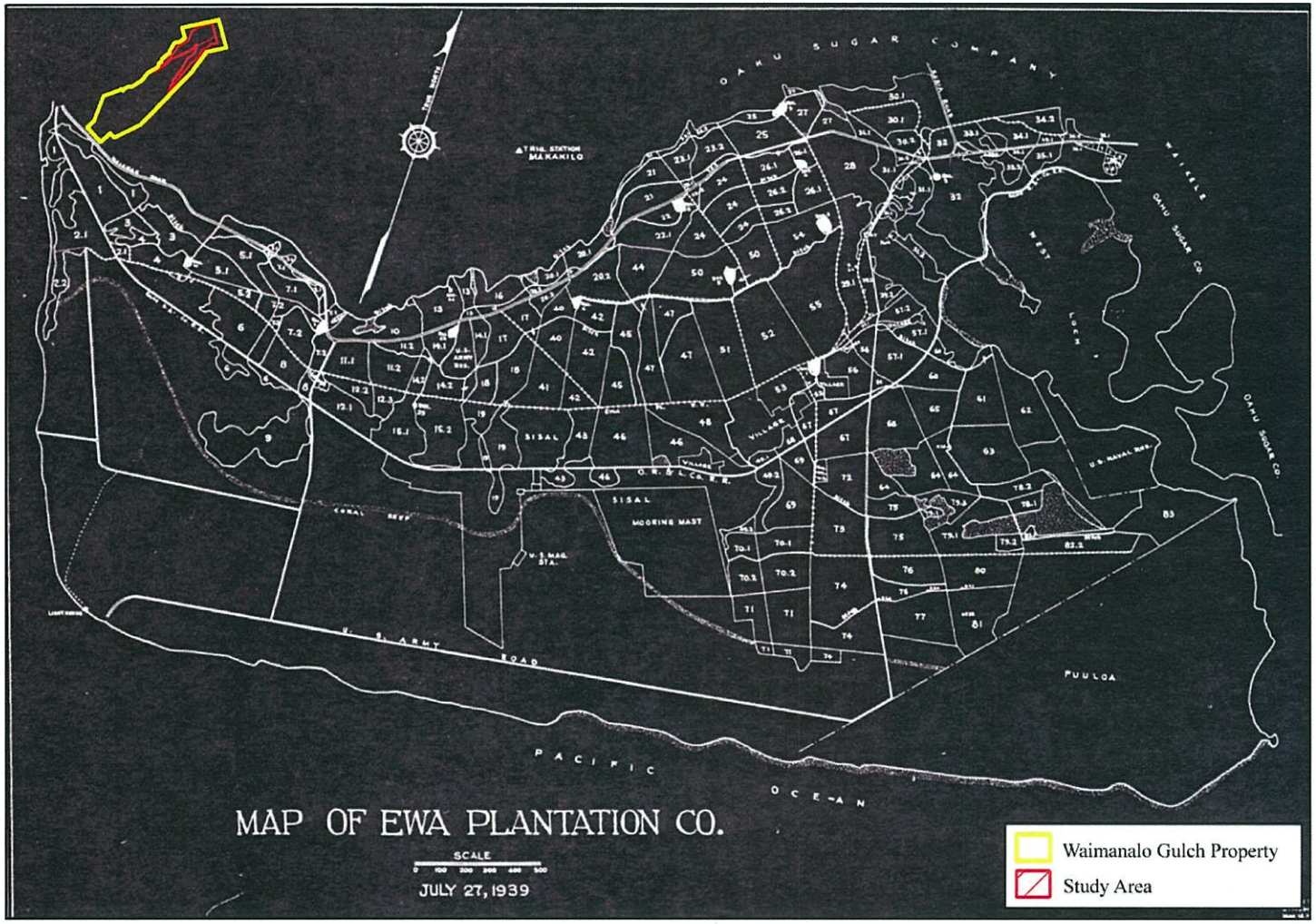

Figure 9. Map of 'Ewa Plantation Co. (Conde and Best 1973:285), showing the extent of sugar cane cultivation in the vicinity of the study area.

> One of those places is on the old trail to Palehua, and had evidently been a place of which the Hawaiians had known, for its name is Kaloi (the taro patch), and even in dry weather water would be standing in the holes made by the cattle, as they tried to get a drop or two. (Von Holt 1985:136)

A second account is given of the discovery of spring water in an area over the ridge on the north side of Kalo'i Gulch:

> Shouting to the men to come over with their picks and shovels, he [Harry von Holt] soon got them busy clearing away lots of small stones and earth. Almost at once they could see that there were evidences of a paved well, and at about three feet down they came upon a huge flat rock, as large around as two men could span with their arms. Digging the rock loose and lifting it to one side, what was their astonishment to find a clear bubbling spring! (Von Holt 1985:138).

Following the discovery, two old Hawaiians began to ask Von Holt about the spring:

> Finally he [Harry von Holt] got them to explain that the spring, called "Waihuna" (Hidden Spring) had been one of the principal sources of water for all that country, which was quite heavily populated before the smallpox epidemic of 1840...A powerful Kahuna living at the spring had hidden it before he died of the smallpox, and had put a curse on the one who disturbed the stone, that he or she would surely die before a year was out. (Von Holt 1985:138-140)

3.1.5 1900s

By 1920, the lands of Honouliuli were used primarily for commercial sugar cane cultivation and ranching (Frierson 1972:18). Much of the *mauka* lands in western Honouliuli, including ridges and deep gulches, were unsuitable for commercial sugar cultivation and remained pasture for grazing livestock. Historic maps of the Waimānalo Gulch area indicate a lack of any significant development in the area into the 1940s (Figure 10, Figure 11, & Figure 12). Modest constructions in the area included the realignment of the "Waianae Road" (present Farrington Hwy.) to run along the *makai* (southern) edge of the Waimānalo Gulch property, and a road the top of the Kahe Point ridge, within the Waimānalo Gulch property.

In the late 1920s, the main residential communities were at the northeast edge of the 'Ewa Plain. The largest community was still at Honouliuli village. 'Ewa was primarily a plantation town, focused around the sugar mill, with a public school as well as a Japanese School. Additional settlement was in Waipahu, centered around the Waipahu sugar mill, operated by the O'ahu Sugar Company.

Major land use changes came to western Honouliuli when the U.S. Military began development in the area. Long before the Japanese bombing of Pearl Harbor in December 1941, the U.S. military had initiated the Oahu Coast Defense Command, a series of coastal artillery batteries designed to assist in the defense of Pearl Harbor and to prevent invasion of O'ahu. Military installations were constructed both near the coast, as well as in the foothills and upland areas. The following military installations were located in the general vicinity of the current study area. Barbers Point Military Reservation (a.k.a. Battery Barbers Point,

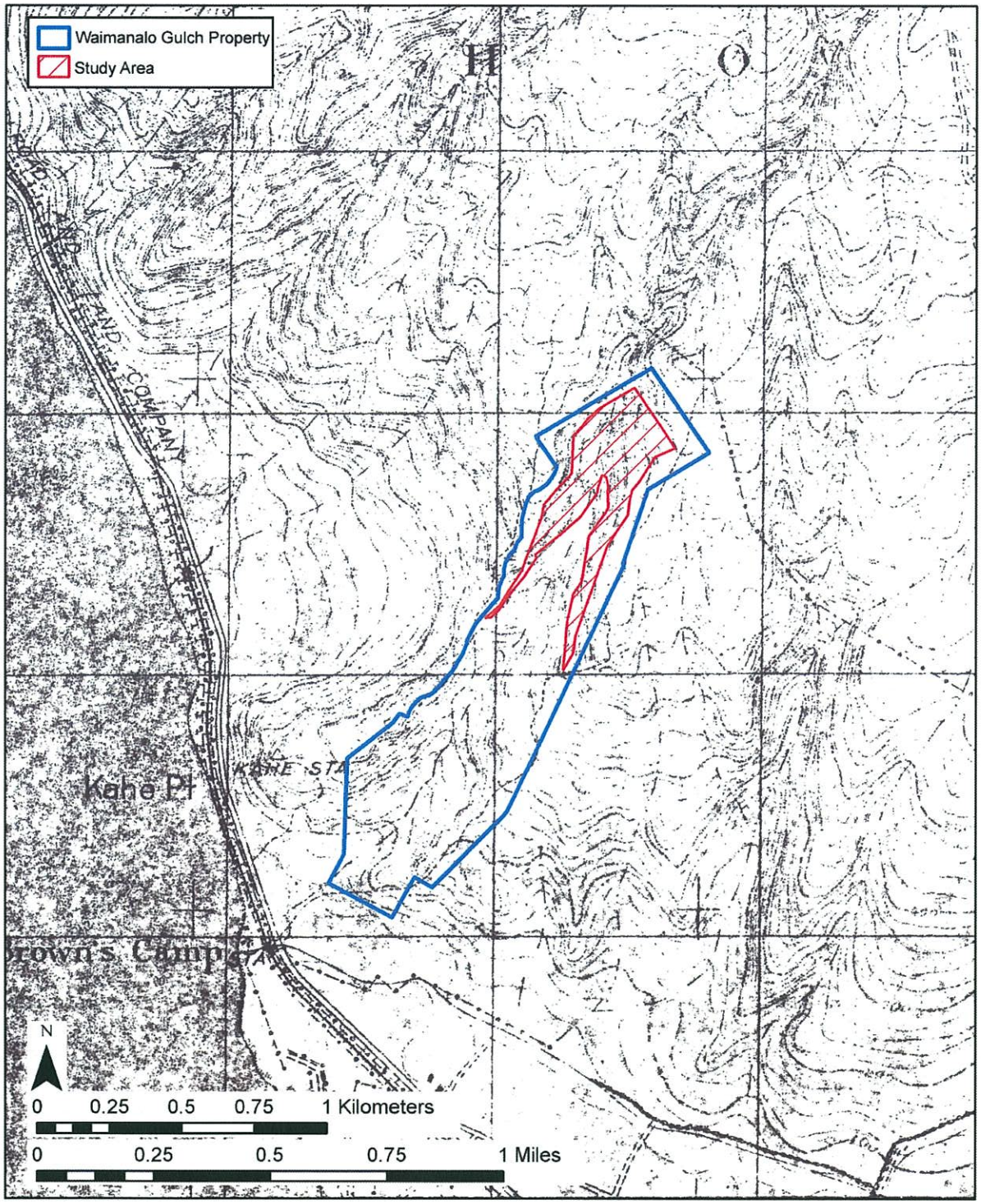

Figure 10. 1918 Fire Control Map, showing the location of the Waimānalo Gulch property and study area

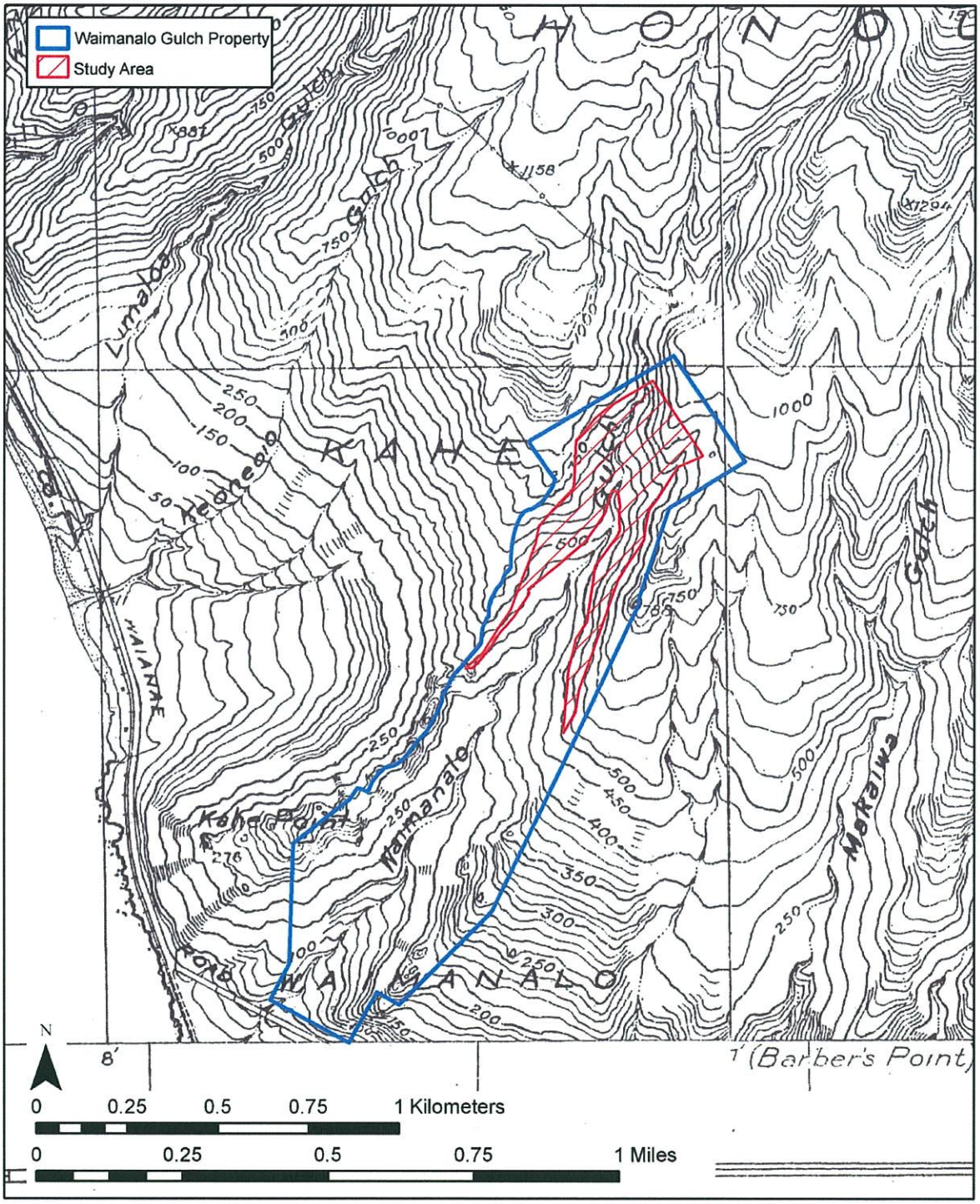

Figure 11. 1928 USGS Topographic Map, Wai'anae Quad, showing the location of the Waimānalo Gulch property and the study area

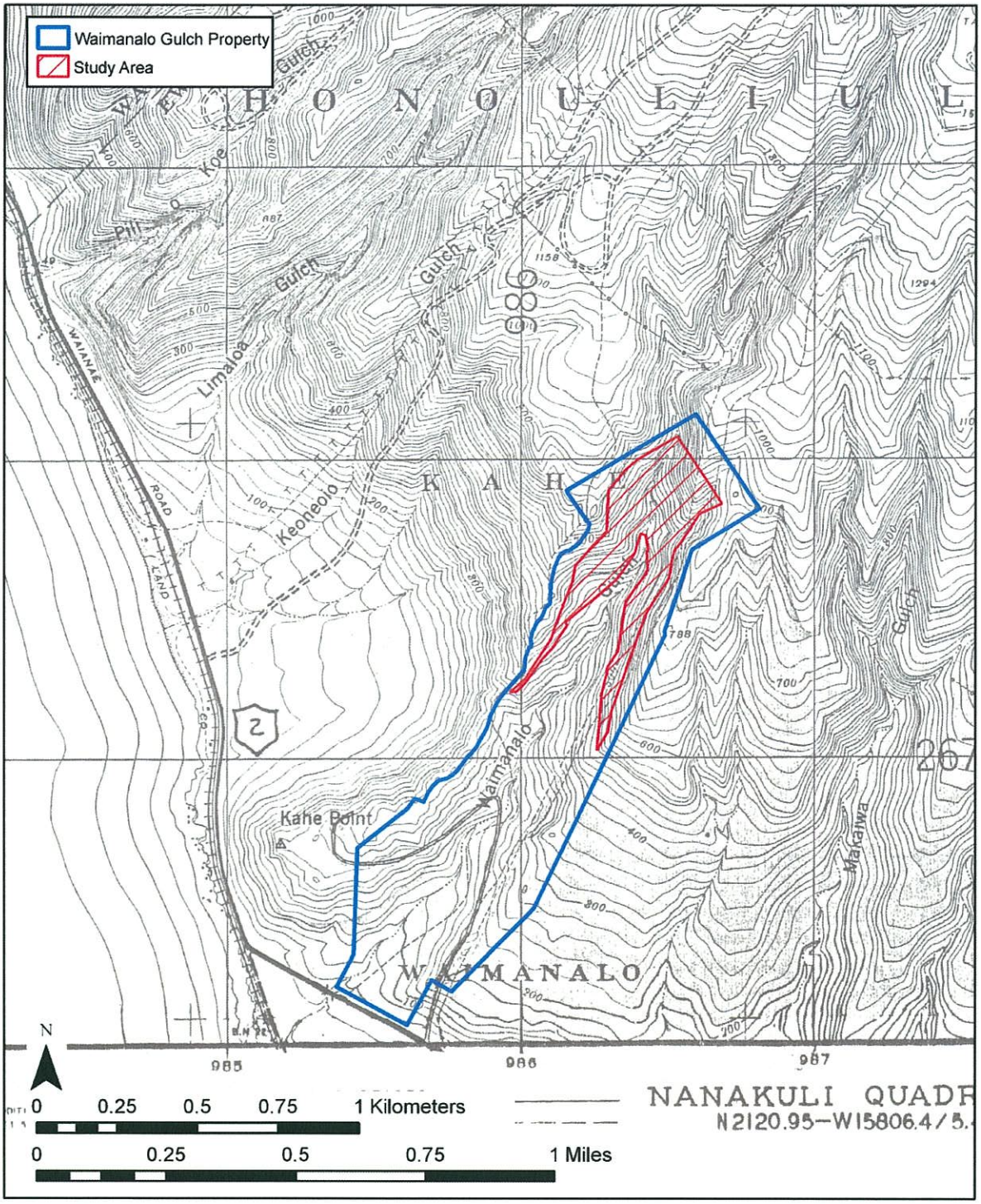

Figure 12. 1943 War Department Map, Nanakuli Quad, showing the location of the Waimānalo Gulch property and the study area

1937-1942), located at Barbers Point Beach, was used beginning in 1921 as a training area for firing 155 mm guns (Payette 2003). Camp Malakole Military Reservation (a.k.a. Honouliuli Military Reservation until 1941), located south of Barbers Point Harbor, was used from 1939 as an anti-aircraft artillery training firing point (Payette 2003). Gilbert Military Reservation, located east of Barbers Point Harbor, was used from 1922-1944 as a railway battery firing position (Payette 2003). Brown's Camp Military Reservation (a.k.a. Brown's Camp Battery from 1937-1944 and Battery Awanui from 1940-1945), located near Kahe Point (Figure 13), was a railway battery firing position (Payette 2003). Fort Barrette (a.k.a. Kapolei Military Reservation and Battery Hatch), located atop Pu'u Kapolei, was in use from 1931 to 1948 for housing four 3-inch anti-aircraft batteries (Payette 2003). In the 1950s, the site was used as a NIKE missile base. Palailai Military Reservation (a.k.a. Battery Palailai from 1942-1944), located atop Pu'u Palailai, was used from the 1920s and included Fire Control Station "B" (Payette 2003). Barbers Point NAS, in operation from 1942 into the 1990s, was the largest and most significant base built in the area. It housed numerous naval and defense organizations, including maritime surveillance and anti-submarine warfare aircraft squadrons, a U.S. Coast Guard Air Station, and the U.S. Pacific Fleet.

3.1.6 Battery Arizona

On the southwest ridge above Waimānalo Gulch are the subterranean remnants of Battery Arizona, an ambitious World War II military project. The attack of December 7, 1941 impelled the construction of further defensive armament for portions of the O'ahu coastline not protected by the existing batteries. Even the sunken ships at Pearl Harbor would be enlisted in O'ahu's defense. When, early in 1942, it was discovered that the two rear three-gun turrets of the U.S.S. Arizona were salvageable, an ambitious plan to mount them at two land installations on O'ahu was set into motion. The two sites chosen were the tip of Mōkapu Peninsula at Kāne'ohe Bay, designated Battery Pennsylvania, and Kahe Point above the Wai'anae Coast, designated Battery Arizona.

Construction of Batteries Pennsylvania and Arizona commenced in April 1943. A formidable subterranean complex was contrived to house the turrets at the two sites. According to a U.S. Army Corps of Engineers report prepared in 1946:

> The design that was eventually produced consists of a central barbette well of concrete set in rock, having an overall depth of about 60 ft. and an inside diameter of about 24 ft., with three levels below the bottom of the turret connected by stairways. Two tunnels radiate from this well to house projectiles and powder magazines immediately adjacent to the well. Beyond and in line with the projectile magazine is a large power room for three 125 KW generators, all miscellaneous switchgear, air conditioning, and ventilating equipment. In a separate tunnel off the main tunnel in the vicinity of the powder room is a 10,000 gallon emergency water tank to maintain the battery for several days in case of siege. Beyond the power room in a separate leg of the tunnel are the operations rooms. Because during prolonged action it might be necessary for the entire

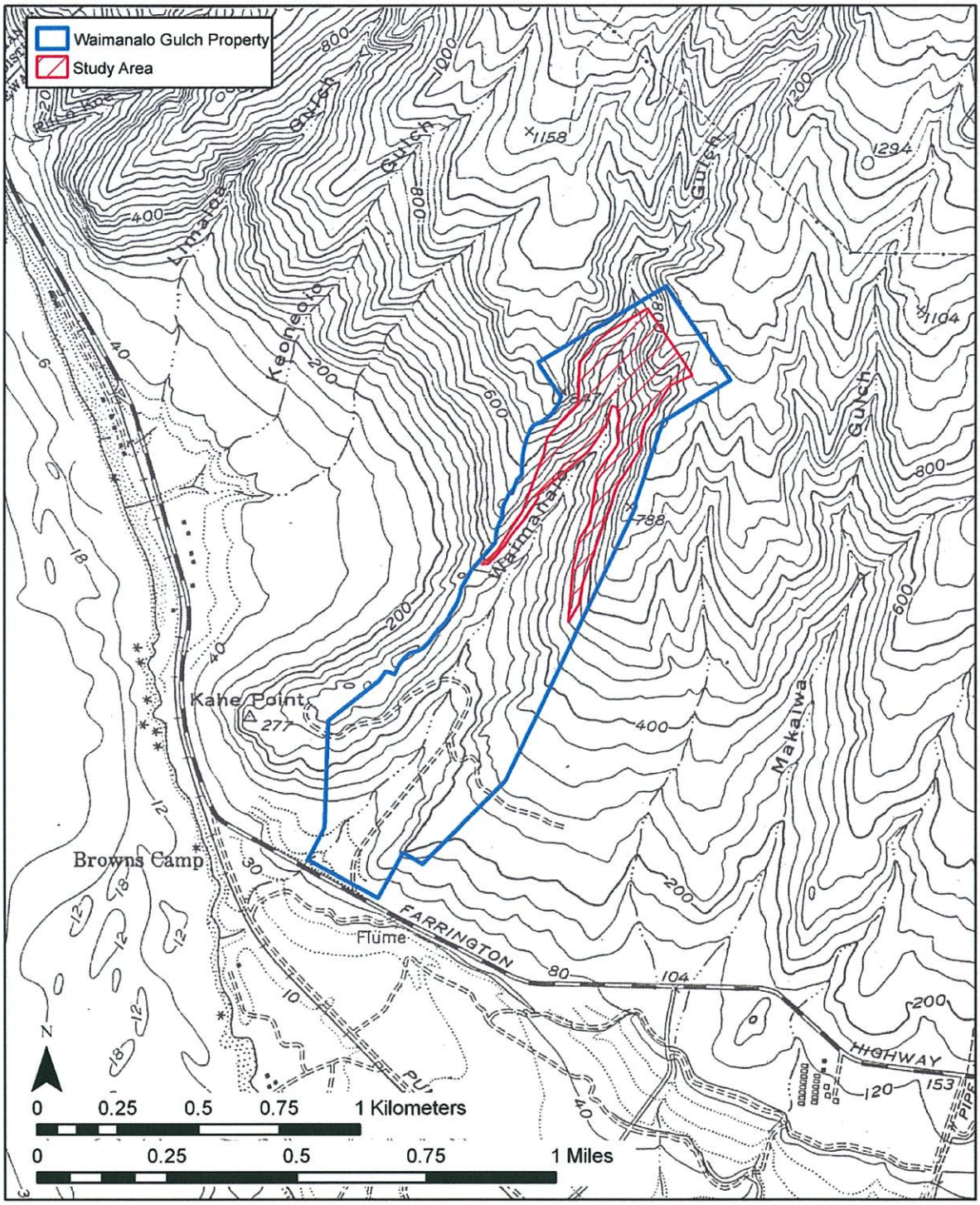

Figure 13. 1953 USGS Topographic Map, 'Ewa Quad., showing the location of the Waimānalo Gulch property and the study area

> battery personnel to remain in the battery and be self sustaining, these gas proofed and air conditioned operations rooms normally comprised of radio and switchboard, plotting, and radar rooms included latrines for officers and enlisted men, a galley, first aid room, offices, and storerooms.

The salvaged turrets were stored at a facility on Pearl City Peninsula. Refurbishing of the turrets proved to be a formidable task:

> An immediate complication arose from the fact that removal of the turrets from the Arizona was begun prior to any thought of their reuse; hence, much of the cutting was done rapidly and crudely with no consideration for future reassembly. As a result, the reconstruction frequently was held up by the painstaking realignment and joining of turret segments. Other difficulties arose from the initial damage and subsequent immersion suffered by the armament components. (Kirchner and Lewis 1967:432)

Records in the archives of the U.S. Army Museum at Ft. DeRussy reveal the months' long search across the Mainland for replacement parts, especially motors, and for parts to adapt the turrets to installation on land. It was finally determined that, because they had been so long under water, every part of the turrets' operating systems had to be repaired or replaced.

Perhaps appropriately for the former battleship armaments, the turrets were transported to their respective battery sites by sea. According to the 1946 Army Corps of Engineers report:

> The heavy section of the turrets comprising three 14-inch guns were moved by barge from Pearl Harbor to beaches near the battery sites. Here they were cleaned, painted, and put into condition for installation in the barbette. Special equipment was designed at each site for raising the parts from the ground and lowering to their correct position in the barbette.

Construction of the two batteries continued through all of 1944 and into two-thirds of 1945. Problems--associated with wartime conditions and the unique engineering feat of adapting shipboard weaponry to land installation--dogged the two projects over the many months:

> This work involving repair, replacement, or remanufacture of thousands of separate parts placed great demands upon the Army and Navy ordnance facilities and workers. Often, drawings were not available for damaged or missing items, and a particular stage of reconstruction had to be awaited before such parts could be reproduced...In one instance, well over a year was required to procure a single turret turning gear worm and pinion.
>
> ...The various problems were further complicated by the sheer mass of the armament and the size of the battery structures...Special heavy equipment...had to be erected at each installation for raising the turret members from the shore and for assembling the armament at the site. Some segments had to be moved on rollers along specially constructed roads, while the 71-ton gun tubes were lifted by parkbuckles from the beaches to the emplacements high above.

> ...Site peculiarities placed severe restrictions upon the battery layouts. The fire-control radars, for example, because of their sensitivity to concussion, could not be near the turrets; yet the ideal positions for the radars both technically and topographically were but a few yards away...
>
> During late 1944, the battery construction reached a bottleneck stage when progress depended upon a few highly skilled technicians and the closely timed arrival of a few critical armament components. By Christmas, 1944, the number of personnel that could effectively work at the two installations was limited to about 35 specialists. At this time, Battery Pennsylvania's turret was roughly half assembled, while Battery Arizona was even further behind. (Kirchner and Lewis 1967:432-433)

The slow pace of construction of the two batteries reflected a diminishing urgency for defense of O'ahu and its military installations. The war front was moving west across the Pacific as successive defeats impelled Japan's retreat. Battery Pennsylvania at Mōkapu Point was near completion in August 1945 when its guns were test fired around the same time of Japan's surrender. Battery Arizona had not been completed by the war's end; its guns, though installed, were never fired.

Neither of the two batteries was ever placed in operation during the post-war years. The batteries had been rendered obsolete "due to the development of air power, new assault techniques and nuclear weapons. The guns were scrapped in 1949..." (Bouthillier 1995: 12).

A 1943 War Department map (see Figure 12) indicates a road was constructed within the *makai* (southern) portion of Waimānalo Gulch, ascending the western slope to the top of the Kahe Point ridge. This road, along with several other roads and trails indicated on the map, were likely constructed in association with the Battery Arizona complex and other military installations and training areas in the vicinity.

3.1.7 1950s to Present

Waimānalo would once again play a role in the O'ahu defense system when, sometime after 1959, the United States Army purchased or exchanged land with the Campbell Estate for the construction of a Nike-Hercules anti-aircraft missile base located at the head of Waimānalo Gulch (Figure 14). The Nike complex, in used between 1961 and 1968 consisted of two control sites and one double-sized launcher site (Murdock 2003). The tunnel complex of Battery Arizona was also used for civil defense circa 1960.

Development in the uplands of western Honouliuli have generally been limited to ranch related housing and infrastructure, military training and NIKE missile stations, as well as the construction of military and commercial communication and atmospheric observation stations on the ridges near Pālehua. In 1975, the U.S. Air Force constructed the Pālehua Solar Observatory with five solar optical telescopes. A circa 1980s aerial photograph (Figure 15) shows limited development in the vicinity of the Waimānalo Gulch landfill property.

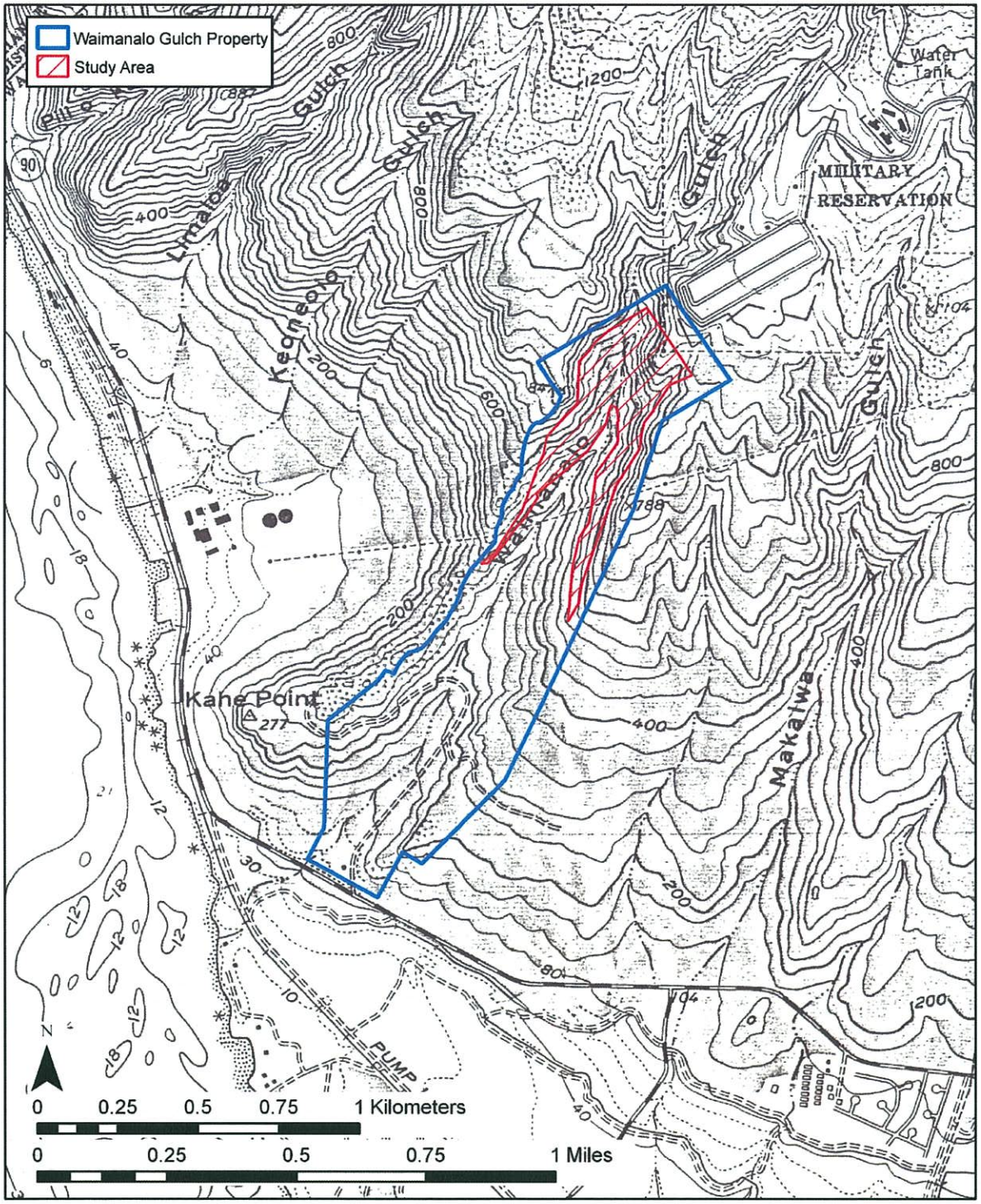

Figure 14. 1962 USGS Topographic Map, 'Ewa Quad., showing the location of the Waimānalo Gulch property and the study area

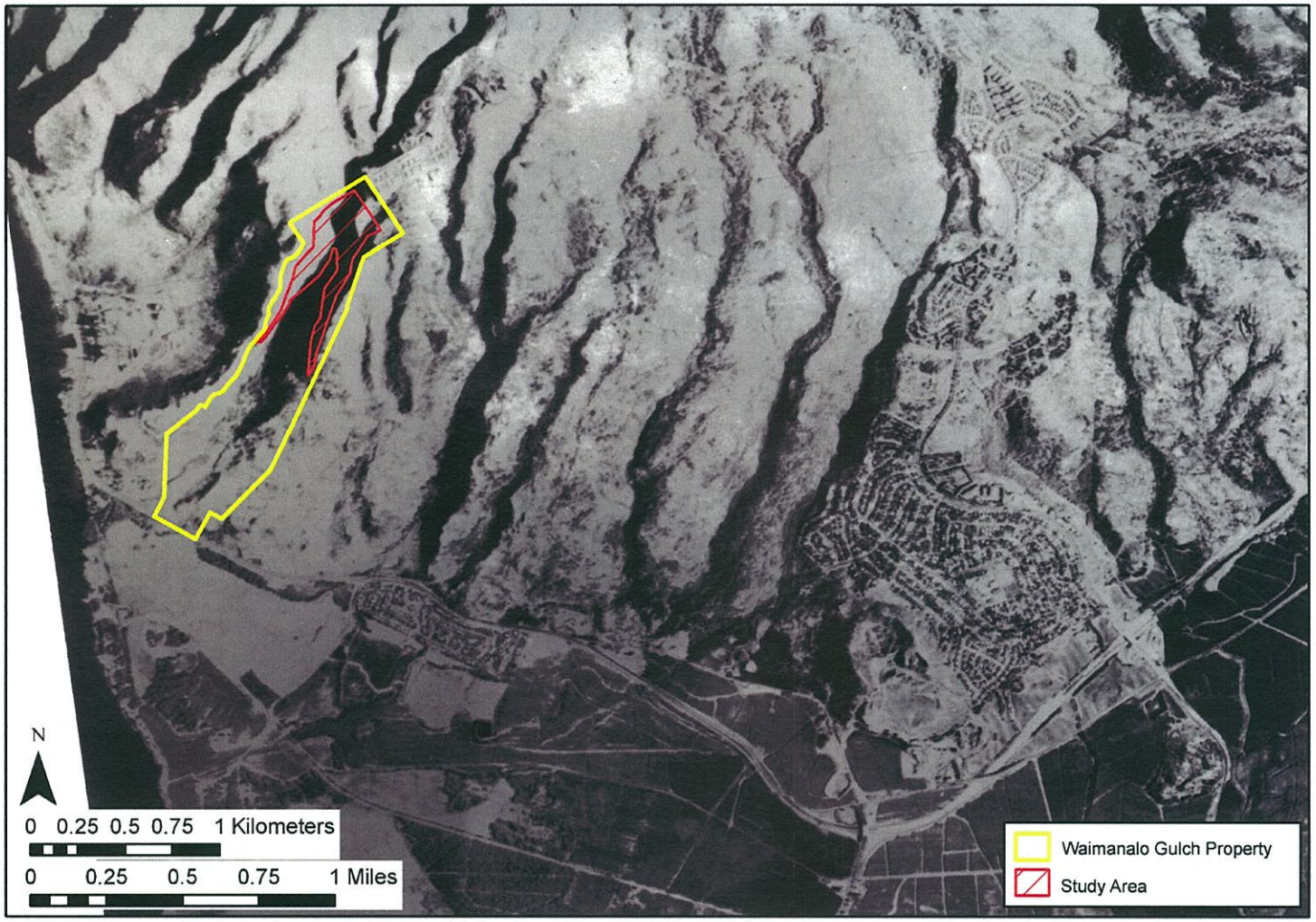

Figure 15. Circa 1980s aerial photograph of western Honouliuli, showing the location of the Waimānalo Gulch property and the study area

In 1985, the City and County of Honolulu condemned 81.5 acres of agricultural land in Waimānalo Gulch for use as a landfill to dispose of municipal refuse and ash from the H-POWER incinerator to be built nearby at Campbell Industrial Park. Work on the landfill began in 1987. In 1988, workers constructing the Waimānalo Gulch landfill were reporting strange incidents at the site. According to a newspaper article by Bob Krauss:

> "We've been having funny things happen," said one of the men on the site. "Unnatural things. In one case, a man was standing on a flat rock and the thing threw him over. All of a sudden, it just flipped over."
>
> Another time a backhoe was knocking down kiawe trees. The trees have shallow roots systems so they usually just fall down. But one of the trees jumped up and did a somersault...
>
> Then there was the payloader filling in a huge hole where a $17,000 fiberglass fuel tank had been placed. The story is that the driver put his machine in reverse but it jumped forward and leaped into the hole, smashing the tank (Honolulu Advertiser, 6/20/88:A-1, A-4).

Other incidents reported to Krauss were a truck that had flipped over, tools that had vanished, and a huge stone that had disappeared. The workers called in:

> a woman recommended for lifting curses and banishing evil spirits. She said the trouble was caused by a certain stone, the "chief of the valley," which was lying on its side.
>
> The men quickly set the stone upright. But they got it upside down. Things went from bad to worse. The woman came out again and recommended they place the stone on the hill where it will not be covered by rubbish when the landfill opens(Honolulu Advertiser, 6/20/88:A-1, A-4).

According to Krauss, in April 1988, the stone was moved to a "nest of boulders so that it faces east," at the "end of a Hawaiian Electric Co. Road to one of its relay stations on top of [a] hill." This site lies close to the Battery Arizona bunkers in the southwest portion of the Waimānalo Gulch landfill property.

3.2 Previous Archaeological Research

The coral plains of 'Ewa have been the focus of more than 50 archaeological studies over the last two decades, largely as the result of required compliance with county, state, and federal legislation. The Kalaeloa (Barber's Point) area is one of the most studied places in Polynesia. In contrast, relatively little research has been conducted in the uplands of Honouliuli, along the southern slopes of the Wai'anae Range. This discussion of previous archaeological research will focus on the results of this prior archaeological work at the southern end of the Wai'anae range (Table 1).

Recent archaeological investigations in the southern Wai'anae Range have generally been focused on deep gulch areas for potential landfill locations, lower slopes for residential development, and mountain peaks for antennae or satellite tracking infrastructure (Figure 16).

Table 1. Previous Archaeological Investigations in the in the Uplands of Honouliuli Ahupua'a

Reference	Type of Investigation	General Location	Findings
Kelly 1959	Kū'ula stone documentation	Along Pālehua Rd., TMK [1] 9-2-003: 002	One Kū'ula stone documented (SIHP No. 50-80-08-2316).
Soehren 1964	House site documentation	Waimānalo Gulch, TMK [1] 9-2-003: 072	House site documented (SIHP No. 50-80-12-2317).
Bordner 1977a	Archaeological Reconnaissance	Proposed Makaīwa Gulch Landfill Site	No archaeological sites identified.
Bordner 1977b	Archaeological Reconnaissance	Proposed Kalo'i Gulch Landfill Site	3 sites (-2600, -2601, -2602), low stacked boulder walls.
Bordner and Silva 1983	Archaeological Reconnaissance and Historical Documentation	Proposed Waimānalo Gulch Landfill Site	No archaeological sites identified.
Sinoto 1988	Archaeological Reconnaissance	Makakilo Golf Course	Low stacked boulder wall (-1975).
Bath 1989	Petroglyph Documentation	Waimānalo Gulch	3 petroglyphs (SIHP No. 50-80-12-4110).
Hammatt & Shideler 1989	Archaeological Reconnaissance	[1] 9-2-003: 027	One pre-Contact agricultural terrace observed.
Hammatt et al. 1991	Archaeological Inventory Survey	Makaīwa Hills Project Site, TMK: [1] 9-1-015: 005 & 017; 9-2-003: 002, 005, and 084.	34 sites, including prehistoric habitation and agricultural features, rock shelters, petroglyphs, *ahu*, and various sugar cane cultivation infrastructure.
Cleghorn & Anderson 1992	Archaeological Inventory Survey	Kahe Point "Tracks" Beach Park, TMK [1] 9-2-003: 26	Section of the previously recorded Oahu Railway and Land Company Right of Way (SIHP No. 50-80-12-9714) observed.

Reference	Type of Investigation	General Location	Findings
Hammatt 1992	Archaeological Inventory Survey	KAIM Radio Tower, Pālehua, TMK [1] 9-2-005: 013	No archaeological sites identified.
Nakamura et al. 1993	Archaeological Inventory Survey	Makakilo D and D-1 Development Parcels	Cement irrigation flume (-4664).
Borthwick & Hammatt 1997	Archaeological Assessment	Satellite Multi-Ranging Station, Pālehua, TMK: TMK: [1] 9-2-003: 002	No archaeological sites identified.
Dega et al. 1998	Archaeological Inventory Survey	UH West O'ahu, TMK: [1] 9-2-002: 001 & [1] 9-2-002: 001	Two historic site complexes, (50-80-08-5593 historic irrigation system and 50-80-09-2268 Waiāhole Ditch System).
Hammatt and Shideler 1999	Archaeological Inventory Survey and Assessment	Waimānalo Gulch Sanitary Landfill Project Site	Battery Arizona Complex and modern "shrine" site.
Hammatt and Shideler 2001	Archaeological Assessment	TMK: TMK: 9-2-03: 084	No archaeological sites identified.
Monahan 2004	Archaeological Inventory Survey	TMK: 9-2-03: 002	4 historic properties associated with19th or 20th century commercial agriculture identified: SIHP No. 50-80-12-4341, water flume that is a component of the previously identified site by Hammatt et al. 1991; SIHP No. 50-80-12-6654, a stone ranch wall; SIHP No. 50-80-12-6655, a pair of concrete bridge supports; and SIHP No. 50-80-12-6656, low rock walls and rock stacking.

Reference	Type of Investigation	General Location	Findings
Tulchin, J and Hammatt 2004	Archaeological Field Inspection	Proposed HECO Meteorological Observation Stations	Three small stone features identified: an *ahu*, a stone terrace, and a small C-shape.
Tulchin, T. and Hammatt 2004a	Archaeological Inventory Survey	86-Acre Proposed Pālehua Community Association (PCA) Common Areas Parcels, Makakilo (TMK: 9-2-03: 78 por. and 79)	4 historic properties identified: a complex of concrete and iron structures associated with industrial rock quarry operations (Site 50-80-12-6680); three boulder mounds believed to be related to land clearing or ditch construction by the Oahu Sugar Co. (Site 50-80-12-6681); a small terrace believed to function as a historic water diversion feature (Site 50-80-12-6682); and a remnant portion of the Waiāhole Ditch (Site 50-80-09-2268).
Tulchin, T. and Hammatt 2004b	Archaeological Inventory Survey	Adjacent to Kahe Power Plant, TMK [1] 9-2-03: 027	A total of four archaeological sites (SIHP No. 50-80-12-6647, -6648, -6649, & -6650) comprising fifteen individual features were identified. Sites observed consisted of rock walls, mounds, and platforms. Site age ranged from historic to pre-Contact. Site function was determined to be predominantly agricultural in nature.
Hoffman et al. 2004	Archaeological Assessment	Adjacent to Kahe Power Plant, TMK [1] 9-2-03: 027	No historic properties identified.
Tulchin, T. and Hammatt 2005	Archaeological Inventory Survey	71-Acre Proposed Pālehua East B Project, Makakilo, (TMK: 9-2-03: 76 and 78)	Three historic properties identified: SIHP No. 50-80-12-6666 (pre-contact agricultural alignment and mound), SIHP No. -6667 (plantation-era stacked basalt boulder walls and a ditch), and SIHP No. -6668 (single alignment of upright basalt boulders and a small, low terrace).

Reference	Type of Investigation	General Location	Findings
O'Leary et al. 2007	Archaeological Inventory Survey Addendum	Makaīwa Hills Project Site, TMK: [1] 9-1-015: 005 & 017; 9-2-003: 002, 005, and 084.	Two historic properties identified: SIHP No. 50-80-12-6870, a terrace, three springs, and a small rock shelter; SIHP No. -6871, a paved area situated on a ridge top.
Tulchin & Hammatt 2007	Archaeological Field Inspection	TMK: [1] 9-2-003:002 por. and 005 por.	A total of 26 archaeological sites were identified. Archaeological features representing distinct periods of land use were observed, including: pre-contact indigenous Hawaiian habitation and associated agricultural and ceremonial features; historic ranching and related features; and historic quarrying and related features.
Tulchin & Hammatt 2008	Archaeological Field Inspection	TMK: [1] 9-2-003: 004, 009, 029, 084 por., & 085	Pedestrian inspection has confirmed the presence of 10 archaeological sites within the study area. Archaeological features representing distinct periods of land use were observed, including: pre-contact indigenous Hawaiian habitation; historic ranching; and historic railroad operations.

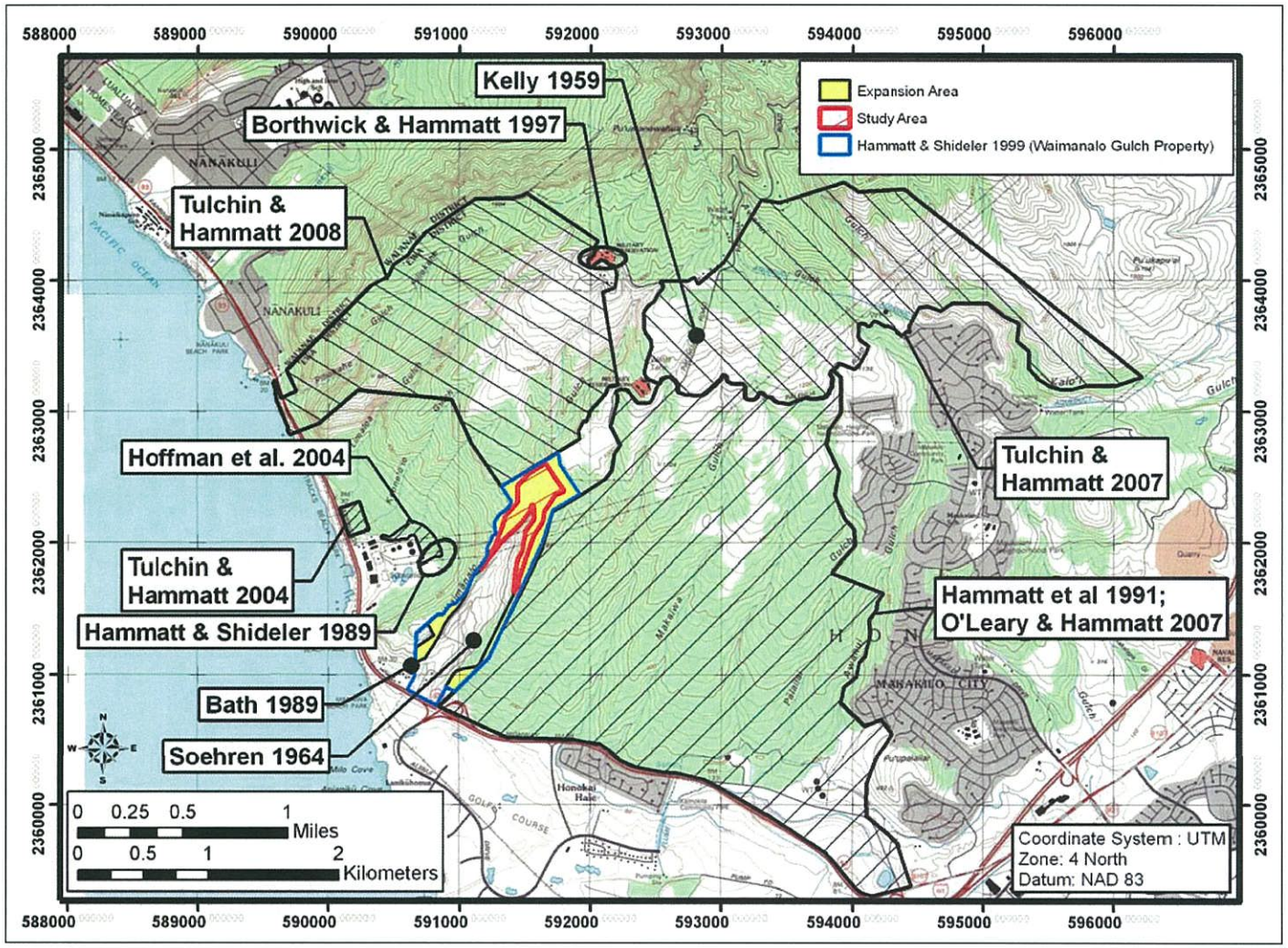

Figure 16. Previous archaeological investigations in the vicinity of the study area

The earliest attempt to record archaeological remains in Honouliuli Ahupua'a was made by Thrum (1906). He reports the existence of a *heiau* located on Pu'u Kapolei, approximately 5 km (3 mi.) southeast of the current study area. Pu'u Kapolei Heiau was described as "Ewa-size and class unknown. Its walls thrown down for fencing" (Thrum 1906:46).

In his surface survey of 1930, archaeologist J. Gilbert McAllister recorded the specific locations of important sites, and the general locations of less important sites (at least at Honouliuli). Archaeological investigations by McAllister along the southern slopes of the Wai'anae Range identified a number of sites which are of interest (Figure 17).

McAllister documents Pu'u Kapolei Heiau as Site 138 and notes:

> The stones from the heiau supplied the rock crusher which was located on the side of this elevation, which is about 100 feet away on the sea side. There was formerly a large rock shelter on the sea side where Kamapuaa (the pig-god) is said to have lived with his grandmother (Kamaunuahihio). (McAllister 1933:108)

McAllister's Site 136 is located near Mauna Kapu, northeast of the current study area, and is described as a small platform on the ridge dividing the 'Ewa and Wai'anae districts. The 4 to 6 square foot platform was constructed of coral and basalt stones, and was believed to be an alter (McAllister 1933:107). It is noted to have been destroyed by the time of Sterling and Summers' work in the late 1950's (Sterling and Summers 1978:32).

McAllister's Site 137 is located at Pu'u Ku'ua, a prominent landmark northeast of the current study area. Pu'u Ku'ua Heiau was described by McAllister as:

> (Destroyed) The heiau was located on the ridge overlooking Nanakuli as well as Honouliuli at the approximate height of 1800 feet. Most of the stones of the heiau were used for a cattle pen located on the sea side of the site. The portion of the heiau which has not been cleared for pineapple has been planted in ironwoods. (McAllister 1933:32)

The presence of Pu'u Ku'ua *heiau*, provides some archaeological evidence of the Pu'u Ku'ua settlement described in the Hawaiian Newspaper "*Ka Loea Kalaiaina*" (see Section III: Honouliuli Settlement Patterns).

None of these sites are in the immediate vicinity of the current study area. However, the presence of extant or former archaeological remains demonstrates Hawaiian use of these *mauka* lands.

In 1959, the Bishop Museum was notified of a *kū'ula* stone (stone god used to attract fish) located along Pālehua Road. The *kū'ula* stone was briefly documented and assigned as SIHP No. 50-80-08-2316 (Kelly 1959). SIHP No. 50-80-08-2316 is located approximately 1500 m northeast of the current study area, along the western edge of Pālehua Road.

In 1964, the Bishop Museum was notified of a "house site" located in the lower elevations of Waimanalo Gulch. The site was briefly documented and assigned as SIHP No. 50-80-12-2317 (Soehren 1964). SIHP No. 50-80-12-2317 is located approximately 500 m southwest of the current study area.

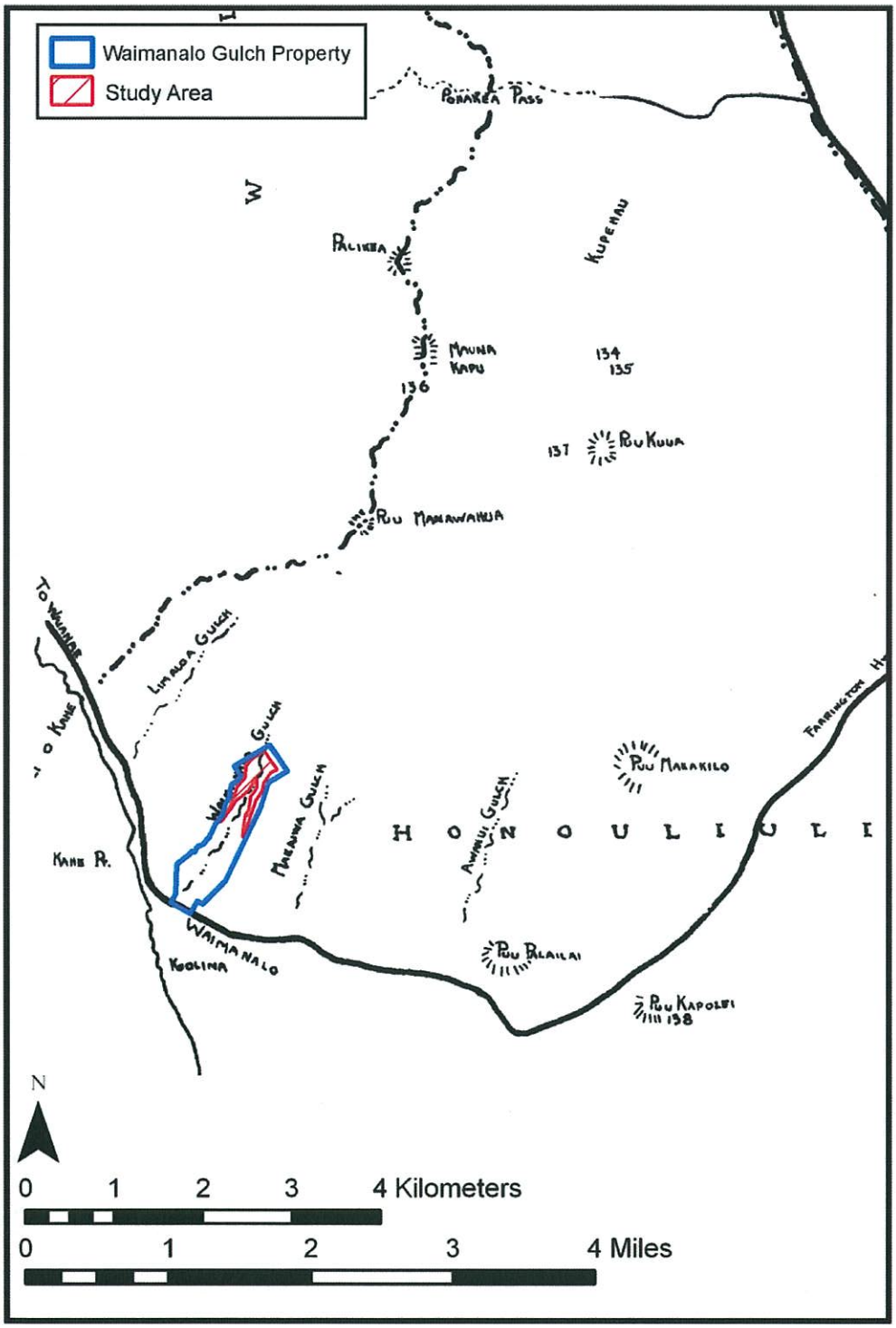

Figure 17. Portion of Map by Sterling and Summers (1978), showing the location of the Waimānalo Gulch property in relation to archaeological sites discussed in the text

In 1983, an archaeological survey of the lower portions of Waimānalo Gulch (the future site of the Waimānalo Gulch Sanitary Landfill), up to the 430-foot elevation, identified no archaeological sites (Bordner and Silva 1983).

In 1989, SHPD was notified of petroglyphs located in the lower elevations at the mouth of Waimanalo Gulch. Three petroglyphs were observed "pecked into black lava rock" (Bath 1989). Two were anthropomorphic and one consisted of abstract symbols. The site was briefly documented and assigned as SIHP No. 50-80-12-4110. SIHP No. 50-80-12-4110 is located approximately 900 m southwest of the current study area.

In 1989, CSH conducted an archaeological reconnaissance for a proposed HECO training facility located approximately 200 m west of the current study area (Hammatt & Shideler 1989). One small rock terrace was observed and documented. The terrace was thought to be associated with pre-contact agricultural activities.

An archaeological inventory survey of the "Makaīwa Hills" development project, just 80 m east of the current study area, located several pre-contact as well as post-contact archaeological sites (Hammatt et al. 1991). A total of 34 historic properties were located, including pre-contact habitation structures (temporary and permanent), agricultural features (terrace and mounds), rock shelters, petroglyphs, *ahu*, and various sugar cane cultivation infrastructure (Figure 18).

Within the "Makaīwa Hills" project area, habitation sites were found to be clustered in higher elevations above 1000 ft., and in lower elevations below 500 ft (Hammatt et al. 1991). The higher elevations would contain ample forest subsistence resources for gathering on both a continual basis, as well as during times of famine and drought. The lower elevations would be in close proximity to the shoreline and bountiful coastal resources.

In 1997, CSH conducted an archaeological assessment for the proposed Ministry of Transportation Satellite Multi-Ranging Station project site, located 1500 m to the northwest of the current study area (Borthwick & Hammatt 1997). No historic properties were identified.

In 1999, CSH conducted an archaeological inventory survey for the proposed Waimanalo Gulch Sanitary Landfill Project Site (Hammatt & Shideler 1999). The study area included a large section of Waimanalo Gulch, extending from the base of the gulch up to a 1000 ft elevation, and encompasses the proposed expansion area, including the current study area. The "Battery Arizona" military complex (WWII bunker complex) and a contemporary shrine site (two sacred stones and a petroglyph) were observed (Figure 19). The stones of the "shrine" site were understood to have been previously relocated from the central portion of Waimānalo Gulch circa 1988. Both sites are located within the Waimanalo Gulch property, but are outside of the proposed expansion area. It was recommended that impact to the southwestern portion of the Waimanalo Gulch Sanitary Landfill property, containing the Battery Arizona and the contemporary shrine, be avoided.

In 2004, CSH conducted an archaeological assessment of an approximately 30-acre parcel adjacent to the Kahe Power Plant, located approximately 640 m southwest of the current study area (Hoffman et al. 2004). No historic properties were observed.

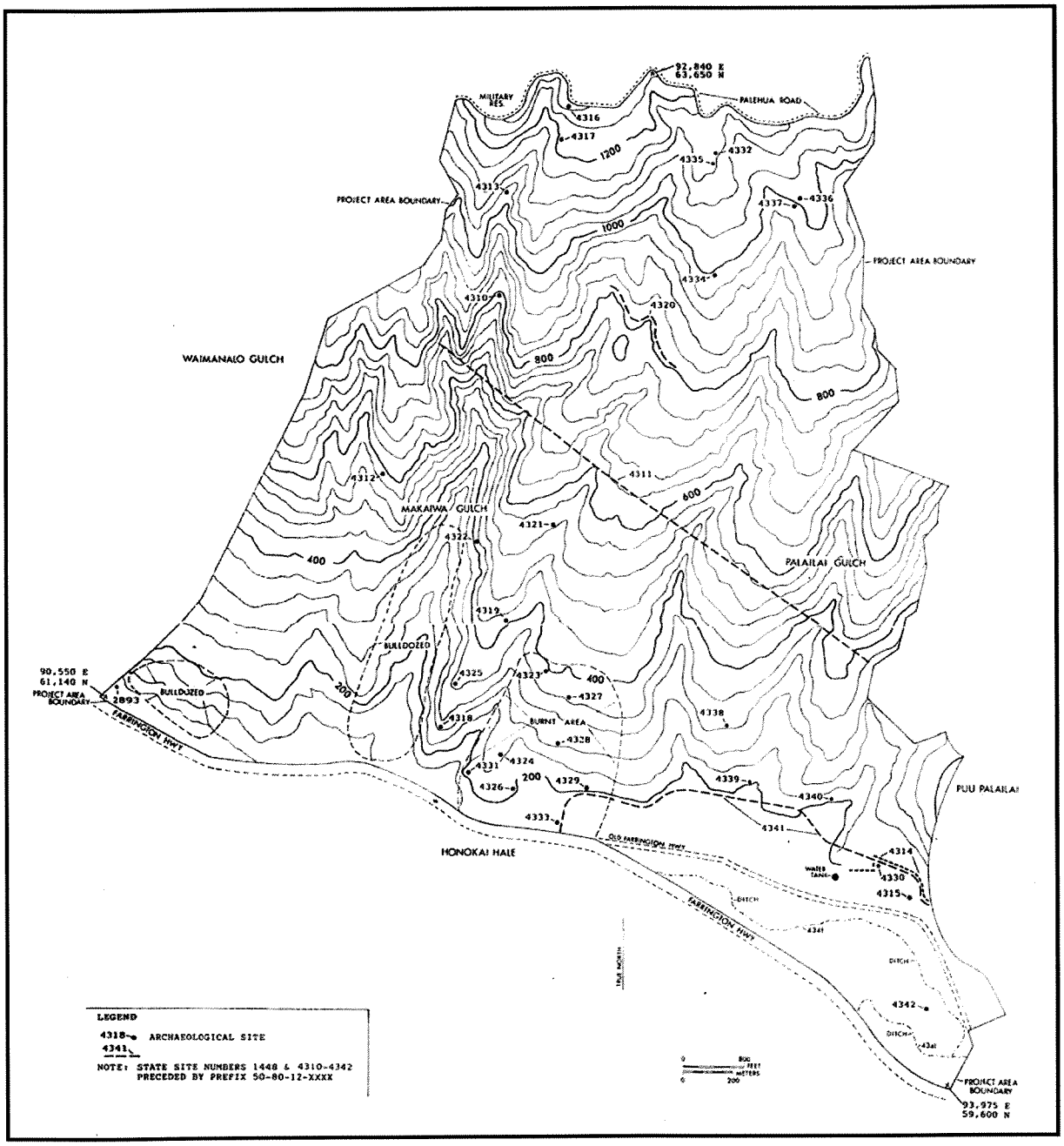

Figure 18 . Makaīwa Hills Project Area Showing the Location of Identified Archaeological Sites (Hammatt et al 1991:7)

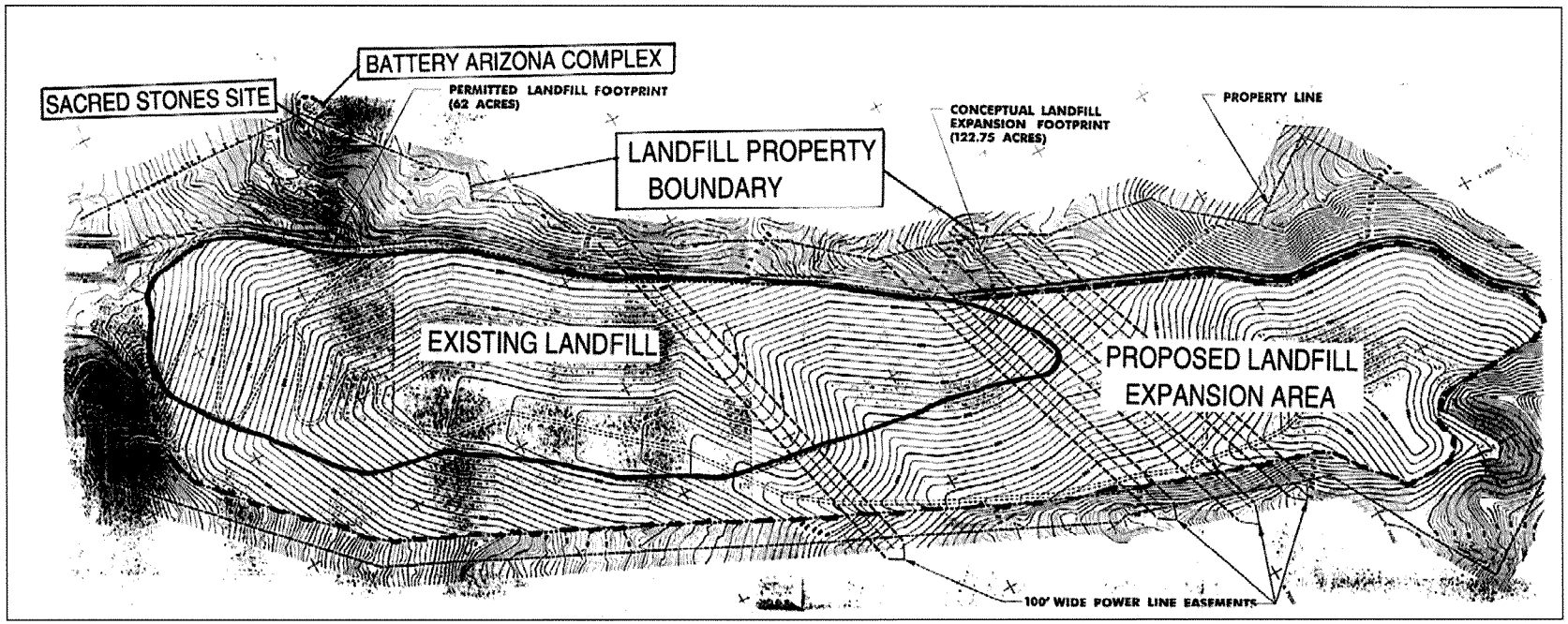

Figure 19. Waimanalo Gulch Sanitary Landfill Project Site Showing the Location of Identified Archaeological Sites (Hammatt & Shideler 1999)

In 2004, CSH conducted an archaeological inventory survey of an approximately 24-acre parcel adjacent to the Kahe Power Plant, located approximately 630 m south of the current study area (T. Tulchin & Hammatt 2004). A total of four archaeological sites (SIHP No. 50-80-12-6647, -6648, -6649, & -6650) comprising fifteen individual features were identified. Sites observed consisted of rock walls, mounds, and platforms. Site age ranged from historic to pre-Contact. Site function was determined to be predominantly agricultural in nature. Of note was the presence of a possible fishing shrine (*ko'a*) at the base of Keone'ō'io Gulch. The shrine is constructed of both upright and stacked limestone boulders creating a level paved platform. Branch coral and water rounded coral cobbles were observed within the interior cobble fill of the structure.

In 2007, O'Leary conducted an addendum to the archaeological inventory survey conducted for the "Makaīwa Hills" development project, originally surveyed by Hammatt et al in 1991 (see above). Because 15 years had passed since the last archaeological inspection of the project area CSH field personnel conducted a reconnaissance of the project area to relocate the 17 historic properties. During this fieldwork two additional historic properties were identified in the *mauka*/west corner of the project area. SIHP No. 50-80-12-6870 consists of a historic ranching-era terrace constructed to create a large level soil area in front of three natural springs. The second site, SIHP # 50-80-12-6871, consists of a paved area comprised of large basalt boulders prominently positioned on a ridge top overlooking the western half of the 'Ewa Plain, possibly functioning as a resting place, a trail marker, or possibly had a religious role. The excavation of test units at both sites did not reveal any further information regarding site function.

In 2007, CSH conducted an archaeological field inspection of an approximately 790-acre parcel at Pālehua, located just east of the current study area (J. Tulchin & Hammatt 2007). A total of 26 archaeological sites were identified. Archaeological features representing distinct periods of land use were observed, including: pre-contact indigenous Hawaiian habitation and associated agricultural and ceremonial features; historic ranching and related features; and historic quarrying and related features.

In 2008, CSH conducted an archaeological field inspection of an approximately 809-acre of Kahe Ranch Land, abutting the northeast corner of the current study area (J. Tulchin & Hammatt 2008). A total of 10 archaeological sites were identified. Archaeological features representing distinct periods of land use were observed, including: pre-Contact indigenous Hawaiian habitation; historic ranching; and historic railroad operations.

3.3 Background Summary and Predictive Model

Historical background research of Honouliuli Ahupua'a indicated that pre-contact settlement of the *ahupua'a* would have been centered around the rich cultivated lands of Honouliuli *'ili* for extensive wetland taro cultivation and abundant coastal resources. The extensive limestone plain would also include recurrent use habitations for fishermen and gatherers, and sometimes gardeners. The upland dry forest areas would be used for hunting and gathering of forest resources, but likely not for widespread permanent settlement. In the intermediate area between the limestone plain and the upland forests indigenous Hawaiian activities would have been limited to dry land agriculture within gulches or near springs, and *mauka*/*makai* transportation routes (i.e. trails) and associated temporary shelters.

By 1920, the lands of Honouliuli were used primarily for commercial sugar cane cultivation and ranching (Frierson 1972:18). Much of the *mauka* lands in western Honouliuli, including ridges and deep gulches, were unsuitable for commercial sugar cultivation and remained pasture land for grazing livestock. Historic maps indicate a lack of any significant development within the study area into the late 1920s, suggesting that the lands within the study area were unsuitable for commercial sugar cane cultivation and were utilized as pasture land for grazing livestock.

Major land use changes came to western Honouliuli when the U.S. Military began development in the area. Military installations were constructed both near the coast, as well as in the foothills and upland areas. A 1943 War Department map reflects the military presence and associated land use within and south of the study area during this time period. Access roads to power lines and telecommunications lines are indicated throughout the southeastern portion of study area. Also of note are the presence of access roads leading to the Battery Arizona, a subterranean WWII bunker complex identified by Hammatt and Shideler in 1999, situated on the southwest ridge above Waimānalo Gulch.

Previous archaeological research in the vicinity of the study area has identified numerous pre-contact sites including: habitation structures (platforms and enclosures), agricultural features (walls, terraces, and mounds), and religious sites (*kū'ula* stone and *ko'a*). Within the "Makaīwa Hills" project area, which is abuts the southeastern boundary of the current study area, pre-contact habitation sites were found to be clustered in higher elevations above 1000 ft., and in lower elevations below 500 ft (Hammatt et al. 1991).

Historic archaeological sites identified in the vicinity of the study area include the Battery Arizona military complex (WWII bunker complex), sugar cane cultivation infrastructure, and walls and fences attributed to the Campbell Ranch.

Based on background research historic properties are not expected to be encountered within the study area. This is based on a review of the archaeological inventory survey for the proposed Waimanalo Gulch Sanitary Landfill Project Site conducted by CSH in 1999, in which no historic properties were identified within the current study area (Hammatt & Shideler 1999). However, if historic properties are encountered they are likely to include both pre-contact and historic archaeological sites. Pre-contact archaeological sites may include: dry land agricultural sites, including planting mounds and terraces in the vicinity of springs or drainage gulches; habitation sites, including enclosures and platforms; trail markers (*ahu)*; religious sites including enclosures, terraces, platforms, and/or upright stones located on prominent hills or other significant locations; and burials located within discrete rock shelters and/or caves. Historic archaeological sites may include: ranch related structures including walls, fences, and maintained springs; and military related structures including concrete bunkers, radio towers and related infrastructure.

Section 4 Results of Fieldwork

Fieldwork for the current AIS investigation of the study area was accomplished over a one-week period from January 25, 2007 to February 2, 2007. The CSH field crew consisted of Matt Bell, B.A., Amy Hammermiester, B.A., and Kevin Dalton, B.A., under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator). The field effort required 13 person-days to complete. CSH completed the archaeological assessment fieldwork under state archaeological permit No. 07-19 issued by SHPD, per HAR Chapter 13-13-282. Fieldwork involved a 100% pedestrian inspection of the study area with limited subsurface testing.

4.1 Survey Findings

Pedestrian inspection of the study area identified one historic property, State Inventory of Historic Properties (SIHP) # 50-80-12-6903, within the study area (Figure 20). SIHP #50-80-12-6903 is of pre-contact origin, and consists of three large upright boulders potentially utilized as trail or boundary markers. A detailed description of this historic property is presented in Section 4.3 below.

Numerous caves and rock shelters were observed within the study area. These caves and rock shelters were thoroughly inspected for cultural modifications and/or the presence of human burials. Where significant sediment deposits were observed, subsurface testing in the form of controlled hand excavation was undertaken to establish if any subsurface cultural deposits were present. Documentation of the inspection and testing of these natural geologic features is presented in Section 4.2 below.

The observed topography within the study area consisted of talus slopes with an average slope of 65°. The observed geology consisted of exposed basalt outcrops with minimal soil deposition. Figure 21 shows the topography and geology encountered during the survey of the study area.

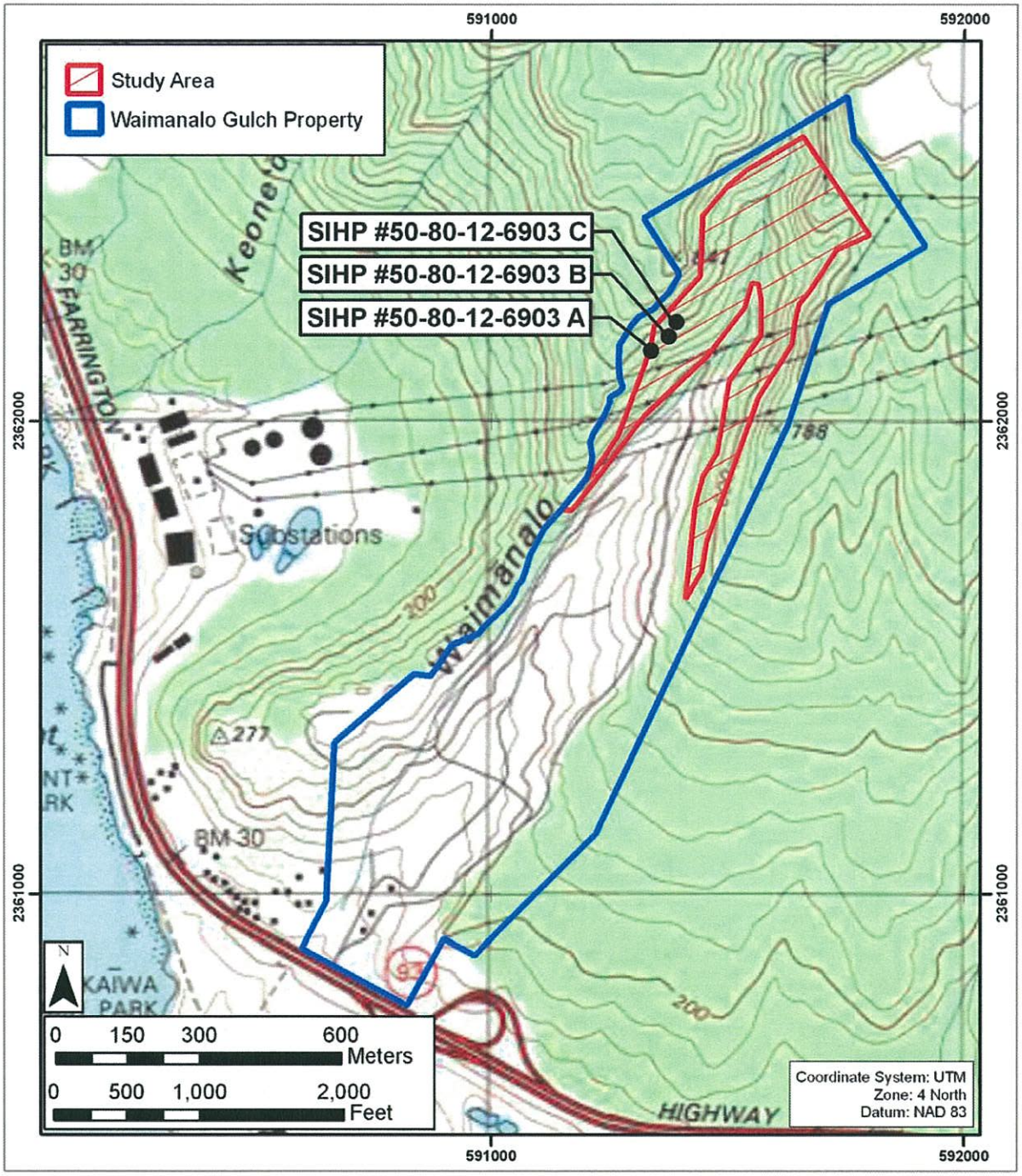

Figure 20. USGS 7.5 Minute Series Topographic Map, Ewa Quadrangle (1998), showing location of SIHP #50-80-12-6903 (Features A-C)

Figure 21. Photograph looking west, showing the topography and geology of the study area

4.2 Inspection and Subsurface Testing of Geologic Features

Numerous natural caves and rock overhangs area were discovered and investigated during the pedestrian inspection of the study area. The larger caves and overhangs (greater than two meters in depth and 4 meters in width) were documented and their position mapped using a Garmin GPSmap76S unit or a Trimble PRO XR GPS (Figure 22).

Also of note was a rock alignment (CSH 3) located near the northeastern edge of the study area. The alignment was determined to be of modern origin due to its location along a talus slope, in which soil erosion and rainwater runoff channels were observed. If the feature was of antiquity it would reflect disturbances associated with erosion and/or rainwater runoff, such as the retention of eroding rock and soil or the displacement of boulders incorporated into the alignment. Subsurface testing was conducted at this alignment to confirm the initial age determination of this feature.

4.2.1 Cave 1

Cave 1 is located on the western slope of Waimānalo Gulch, situated at the base of a small rock outcrop (see Figure 22). The mouth of the cave opens to the northeast and measures 1.5 m high (Figure 23). The internal dimensions of the cave are as follows: 8.0 m wide and 4.0 m deep, with a maximum ceiling height of 1.2 m. No cultural material or human skeletal remains were observed on the surface of the cave floor.

Due to the presence of soil within the cave interior, two 0.5m^2 test units (TU 1 & TU 2) were excavated in order to determine if any subsurface cultural deposits were present (Figure 24). The stratigraphy of Test Unit 1 (TU 1) consisted of a single stratum of sandy loam (Stratum I) overlying bedrock (Figure 25 & Table 2). No cultural material was observed during the excavation of this test unit.

The stratigraphy of Test Unit 2 (TU 2) consisted of consisted of a sandy loam deposit (Stratum I) overlying a thin layer of decomposing bedrock (Stratum II) (Figure 26 & Table 3). No cultural material was observed during the excavation of this test unit.

4.2.2 Cave 2

Cave 2 is located on the western slope of Waimānalo Gulch, situated at the base of a pronounced rock outcrop (see Figure 22). The mouth of the cave opens to the east and measures 1.3 m high (Figure 27). The internal dimensions of the cave are as follows: 8.0 m wide and 4.1 m deep, with a maximum ceiling height of 0.8 m. The roof of the cave has experienced some collapse and now covers approximately 70 percent of the floor (Figure 28). No cultural material or human skeletal remains were observed on the surface of the cave floor.

Due to the presence of soil within the cave interior, two 0.5m^2 test units (TU 1 & TU 2) were excavated in order to determine if any subsurface cultural deposits were present. The stratigraphy of Test Unit 1 (TU 1) consisted of a sandy loam deposit (Stratum I) followed by a layer of decomposing bedrock (Stratum II) (Figure 29 & Table 4). No cultural material was observed during the excavation of this test unit.

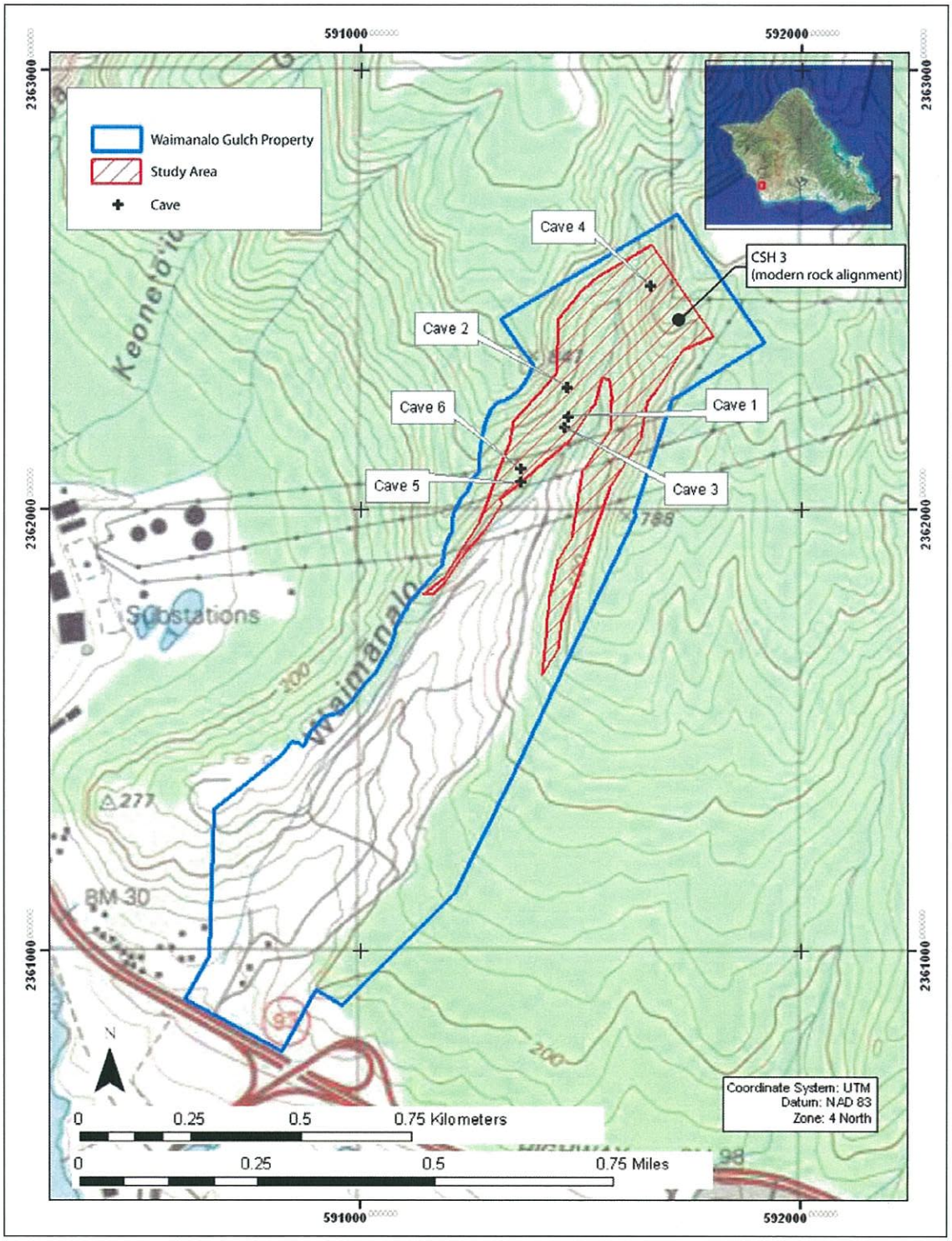

Figure 22. USGS 7.5 Minute Series Topographic Map, Ewa Quadrangle (1998), showing the location of documented caves within the study area

Figure 23. Photograph of opening of Cave 1, view to north

Figure 24. Photograph of interior of Cave 1, view to south

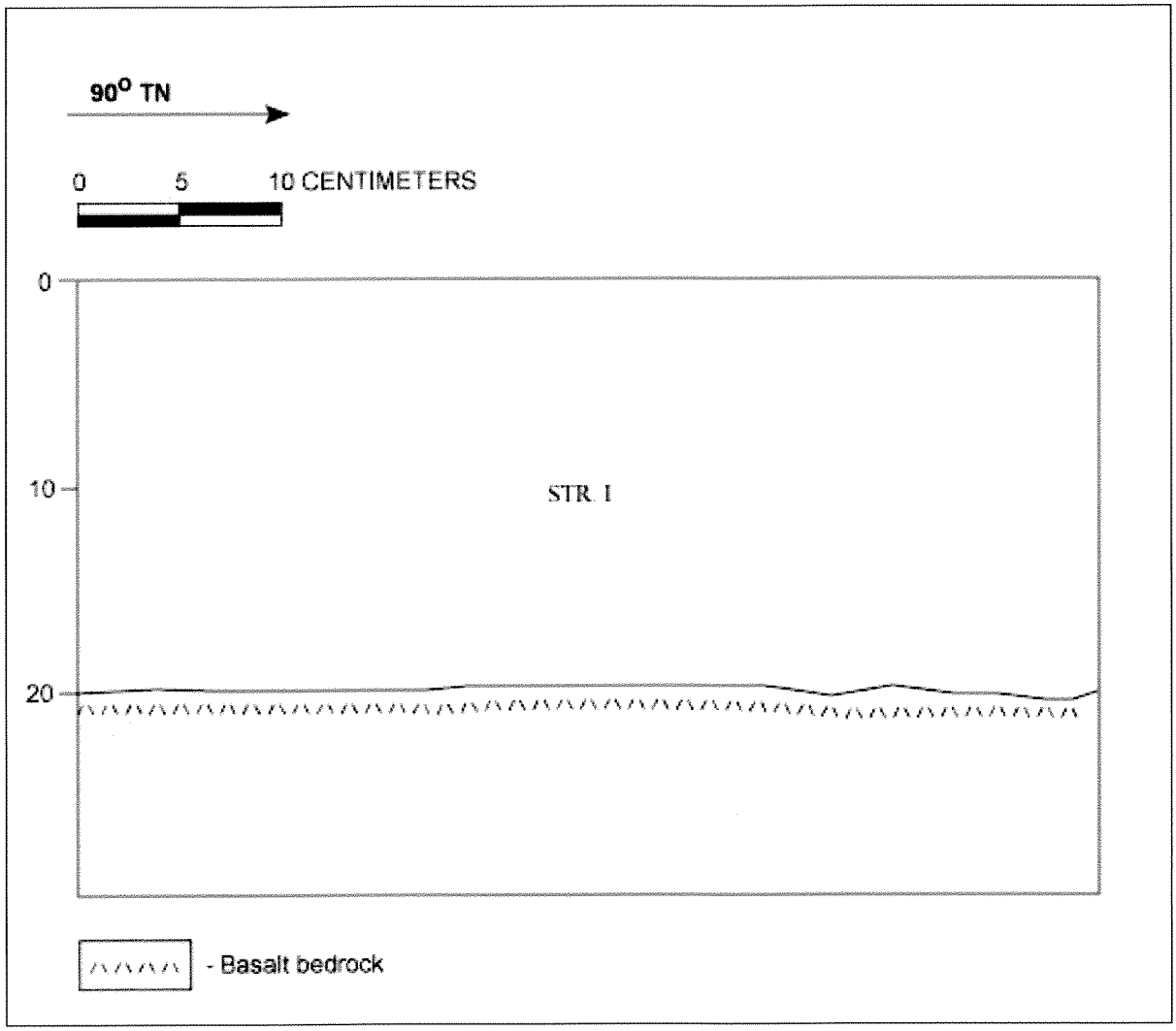

Figure 25. Cave 1, profile of the east wall of Test Unit 1

Table 2. Strata Observed at Cave 1, Test Unit 1

Stratum	Depth (cmbs)	Description
I	0 – 20	10 YR 3/2, dark brown; sandy loam; weak, fine, crumb structure; weakly coherent dry consistency; non plastic; no cementation; terrestrial origin; clear boundary; smooth topography. Stratum I is conprised of loose volcanic soil of aeoloian origin. No clutural material observed.

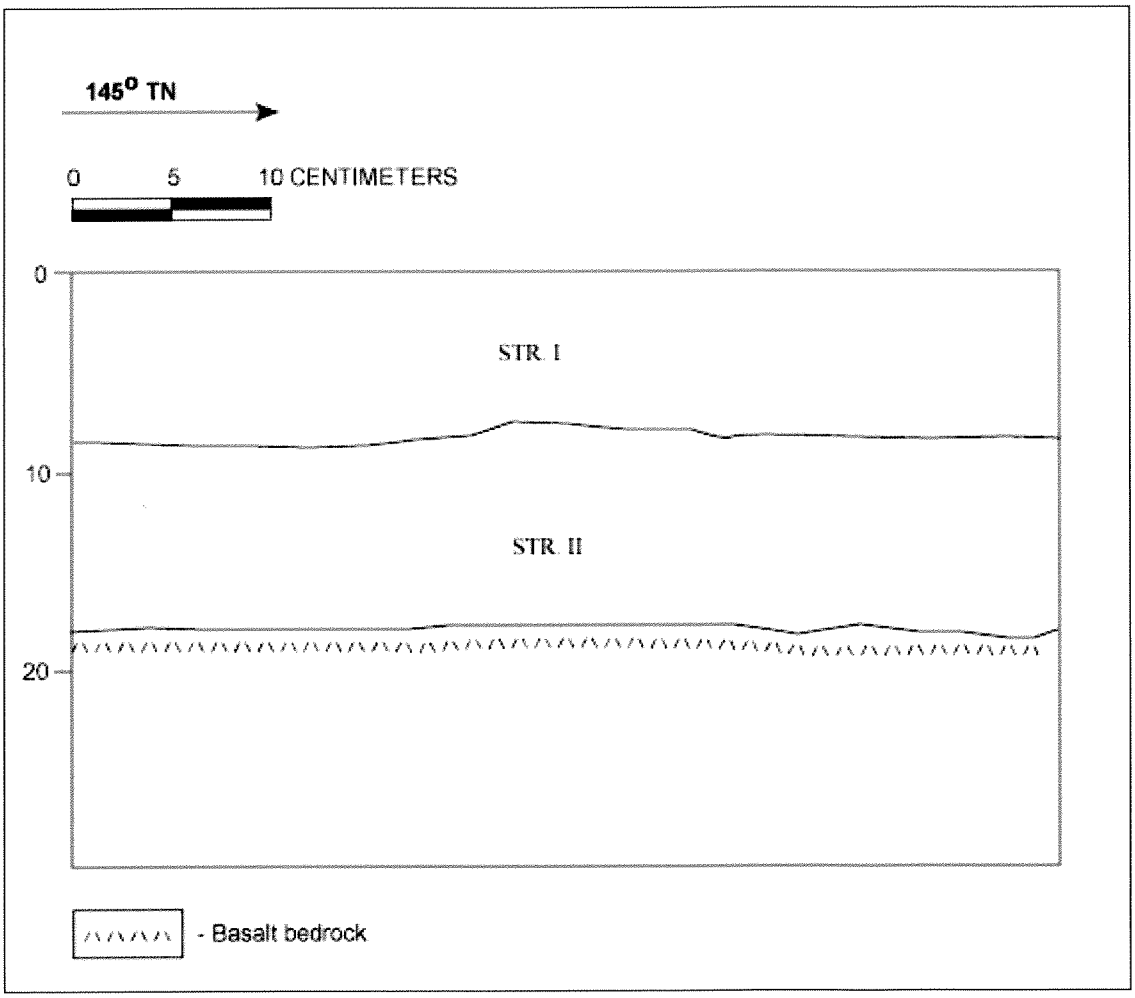

Figure 26. Cave 1, profile of the south wall of Test Unit 2

Table 3. Strata Observed at Cave 1, Test Unit 2

Stratum	Depth (cmbs)	Description
I	0 – 8	10 YR 3/2, very dark grayish brown; sandy loam; weak, fine, crumb structure; weakly coherent dry consistency; non plastic; no cementation; terrestrial origin; clear boundary; smooth topography. Stratum I is comprised of loose volcanic soil of aeoloian origin. One fish vertabra was observed. No ccultural material observed.
II	8 - 18	10 YR 5/4, yellowish brown; deteriorated bedrock; weak, coarse, crumb structure; slightly hard dry consistency; non plastic; weak cementation; terrestrial origin; abrupt boundary; irregular topography. Sediment is a mixture of aeolian silt and decomposing bedrock. No clutural material observed.

Figure 27. Photograph of Cave 2 opening, view to the northwest

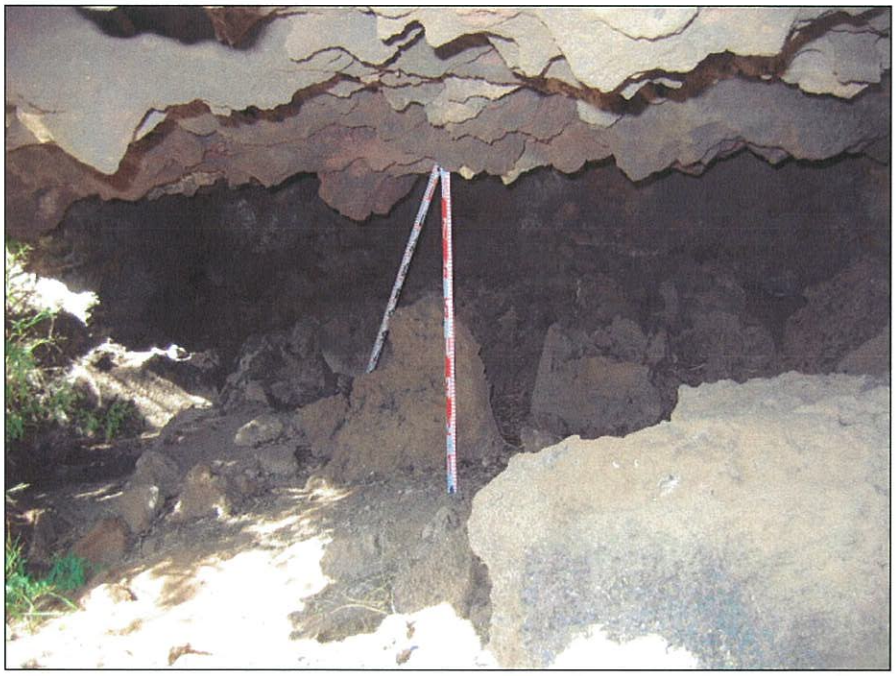

Figure 28. Photograph Cave 2 interior, view to the west

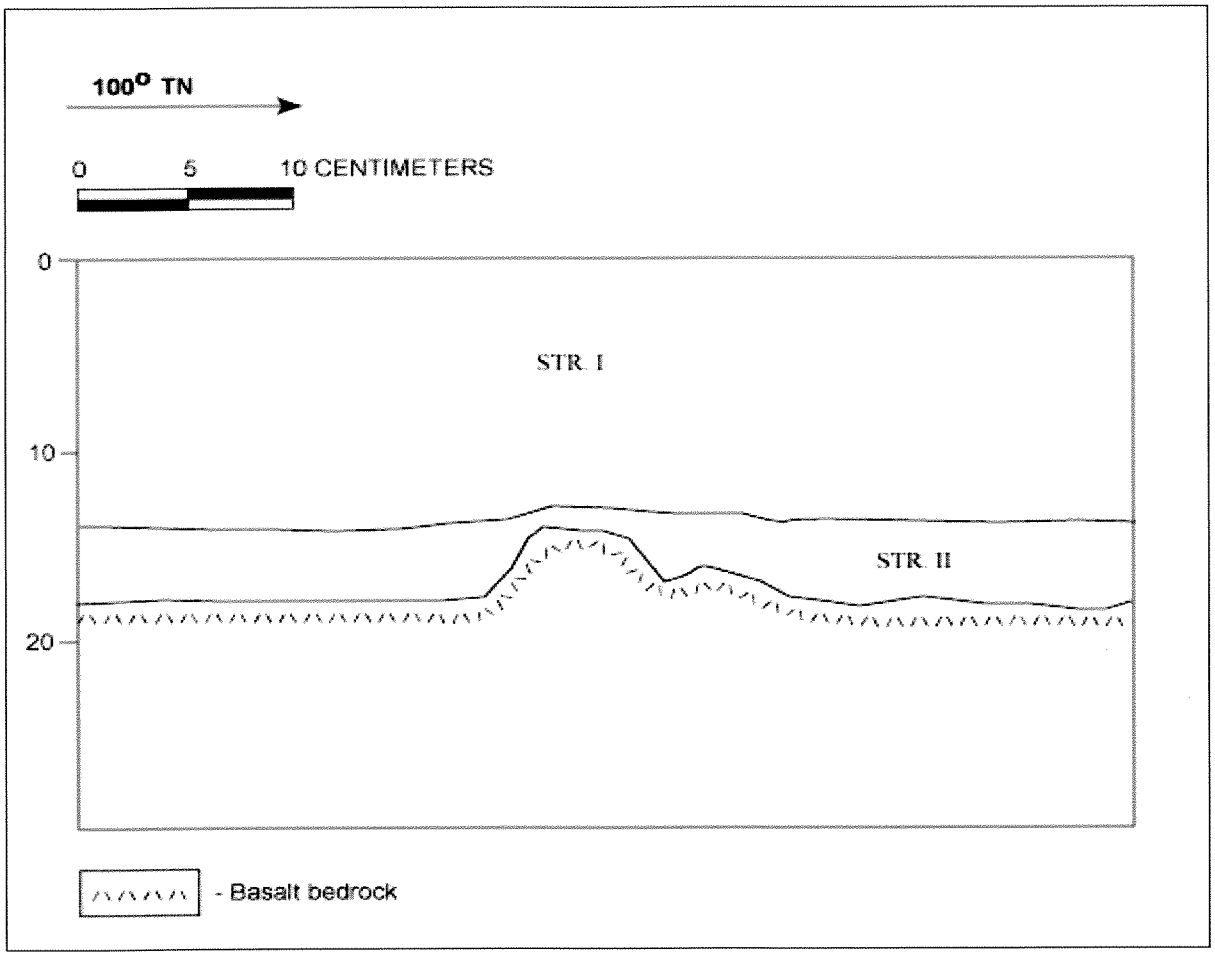

Figure 29. Cave 2, profile of the north wall of Test Unit 1

Table 4. Strata Observed at Cave 2, Test Unit 1

Stratum	Depth (cmbs)	Description
I	0 – 14	10 YR 3/3, dark brown; sandy loam; weak, fine, granular structure; weakly coherent dry consistency; non plastic; no cementation; terrestrial origin; clear boundary; irregular topography. Stratum I is comprised of loose volcanic soil of aeoloian origin. No cultural material observed.
II	14 - 18	10 YR 4/6, dark yellowish brown; deteriorated bedrock and sandy loam mix; weak, coarse, crumb structure; slightly hard dry consistency; non plastic; weak cementation; terrestrial origin; abrupt boundary; irregular topography. Sediment is a mixture of aeolian silt and decomposing bedrock. No cultural material observed.

The stratigraphy of Test Unit 2 (TU 2) consisted of sandy loam (Stratum I) overlying bedrock (Figure 30 & Table 5). No cultural material was observed during the excavation of this test unit.

4.2.3 Cave 3

Cave 3 is located on the western slope of Waimānalo Gulch (see Figure 22). The mouth of the cave opens to the south and measures 1.2 m high. The internal dimensions of the cave are as follows: 4.0 m wide and 2.0 m deep, with a maximum ceiling height of 1.2 m. No cultural material or human skeletal remains were observed on the surface of the cave floor.

Only minimal soil deposits were observed within the cave interior and thus no subsurface testing was conducted at Cave 3.

4.2.4 Cave 4

Cave 4 is located on the eastern slope of Waimānalo Gulch (see Figure 22). This cave consists of a rock overhang situated at the base of the large rock outcrop (Figure 31). The mouth of the cave opens to the west and measures 2.0 m high. The internal dimensions of the cave are as follows: 10.0 m wide and 4.0 m deep, with a maximum ceiling height of 2.5 m. A pair of small skeleton keys was observed within the cave (Figure 32). No other cultural material or human skeletal remains were observed on the surface of the cave floor.

Only minimal soil deposits were observed within the cave interior and thus no subsurface testing was conducted at Cave 4.

4.2.5 Cave 5

Cave 5 is located on the western slope of Waimānalo Gulch, situated near the southwestern end of the study area, overlooking the modern landfill (see Figure 22). The mouth of the cave opens to the south and measures 1.0 m high. The internal dimensions of the cave are as follows: 1.4 m wide and 1.3 m deep, with a maximum ceiling height of 0.8 m. No cultural material or human skeletal remains were observed on the surface of the cave floor.

Only minimal soil deposits were observed within the cave interior and thus no subsurface testing was conducted at Cave 5.

4.2.6 Cave 6

Cave 6 is located on the western slope of Waimānalo Gulch (see Figure 22). The mouth of the cave opens to the east and measures 1.2 m high. The internal dimensions of the cave are as follows: 2.4 m wide and 1.5 m deep, with a maximum ceiling height of 0.7 m. No cultural material or human skeletal remains were observed on the surface of the cave floor.

Only minimal soil deposits were observed within the cave interior and thus no subsurface testing was conducted at Cave 6.

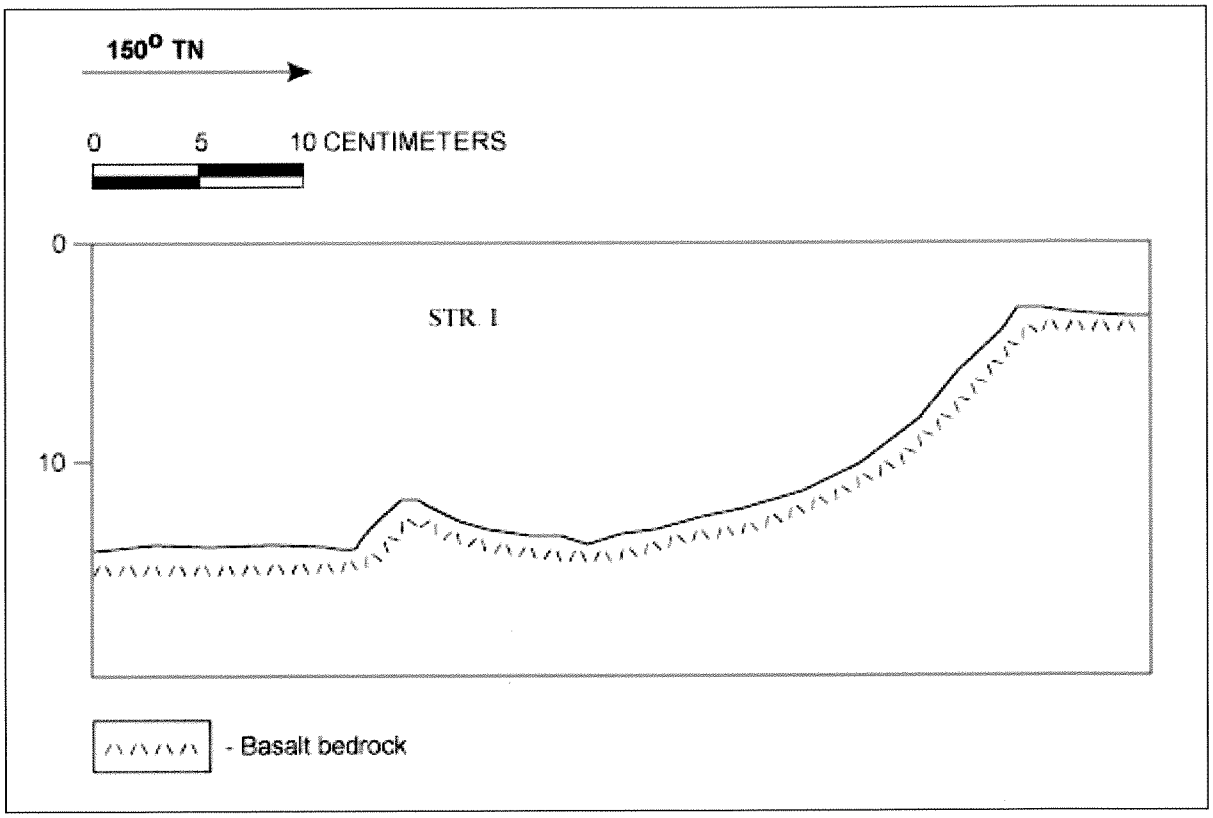

Figure 30. Cave 2, profile of the north wall of Test Unit 2

Table 5. Strata Observed at Cave 2, Test Unit 2

Stratum	Depth (cmbs)	Description
I	0 - 14	10 YR 3/3, dark brown; sandy loam; weak, fine, granular structure; weakly coherent dry consistency; non plastic; no cementation; terrestrial origin; clear boundary; irregular topography. Stratum I is comprised of loose volcanic soil of aeoloian origin. No cultural material observed.

Figure 31. Photograph of Cave 4 opening, view to the northeast

Figure 32. Photograph of skeleton keys from Cave 4

4.2.7 Modern Rock Alignment (CSH 3)

A linear rock alignment (CSH 3) was located near the northeastern edge of the study area (see Figure 22). The alignment is constructed of a single course of six small boulders, situated on the eastern slope of Waimānalo Gulch (Figure 33 & Figure 34). It measures 1.2 m long and 0.6 m wide, and is aligned cross slope. The alignment was determined to be of modern origin due to its location along a talus slope, in which soil erosion and rainwater runoff channels were observed. If the feature was of antiquity it would reflect disturbances associated with erosion and/or rainwater runoff, such as the retention of eroding rock and soil or the displacement of boulders incorporated into the alignment. No cultural material was observed on the ground surface in the vicinity of this feature.

One 0.5m^2 test unit (TU 1) was excavated in the center of the rock alignment (CSH 3) to prospect for subsurface cultural deposits and to confirm the initial age determination of this feature. The stratigraphy of Test Unit 1 (TU 1) consisted of sandy loam (Stratum I) overlying bedrock (Figure 35 & Table 6). No cultural material was observed during the excavation of this test unit. Test excavation confirmed that the alignment consisted of only a single course of boulders and that no buried wall construction was present, thus confirming the modern origin of the feature.

Figure 33. Photograph of CSH 3, view to west

Figure 34. Photograph of CHS 3, view to south

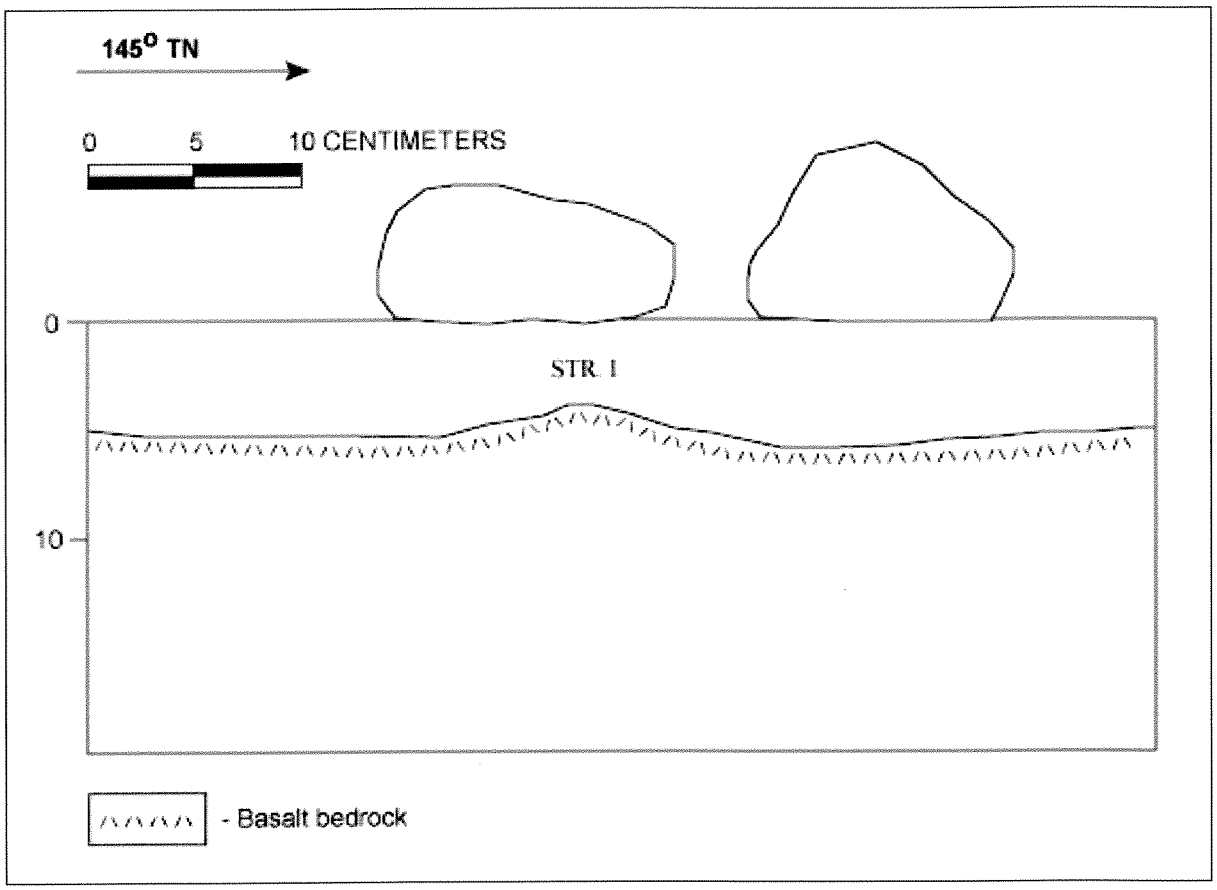

Figure 35. CSH 3, profile of the east wall of Test Unit 1

Table 6. Strata Observed at CSH 3, Test Unit 1

Stratum	Depth (cmbs)	Description
I	0 - 5	10 YR 3/2, dark brown; sandy loam; weak, fine, granular structure; weakly coherent dry consistency; non plastic; no cementation; terrestrial origin; clear boundary; irregular topography. Stratum I is comprised of loose volcanic soil of aeoloian origin. No cultural material observed.

4.3 Historic Property Descriptions

4.3.1 SIHP # 50-80-12-6903

FORMAL TYPE:	Rock uprights
FUNCTION:	Trail / boundary marker
# OF FEATURES:	3
AGE:	Pre-contact
DIMENSIONS:	80 m long (NE-SW) x 10 m wide (NW-SE)
LOCATION:	Waimānalo Gulch
TAX MAP KEY:	TMK: [1] 9-2-003:073
LAND JURISDICTION:	City and County of Honolulu

SIHP #50-80-12-6903 consists of three large upright boulders (Features A-C) utilized as trail or boundary markers, located approximately 1320 m (4330 ft) inland of the coast along the western edge of the study area (see Figure 20). The site is situated approximately 140 m (459 ft) north of existing Waimanalo Landfill operations. The topography of the immediate area is moderately sloping to the southwest, while the geology consists of exposed basalt bedrock outcrops with pockets of shallow soil. *Koa haole* and exotic grasses dominate the surrounding landscape.

SIHP# 50-80-12-6903 Feature A consists of a large upright basalt boulder measuring 1.20 m length, 1.12 m wide, and 2.10 m high (Figure 36 & Figure 37). There appears to be no intentionally placed rocks surrounding the base of this upright. The flat face of this stone is directed south, as to mark a trail or boundary for a traveler moving up slope. The face of this feature is discolored and appears to have once rested on the ground. Feature A is interpreted as being of pre-contact origin, and its function is determined to be a trail or boundary marker. No cultural material was observed on the ground surface in the vicinity of this feature.

SIHP # 50-80-12-6903 Feature B consists of a large triangular upright basalt boulder measuring 1.63 m long, 0.75 m wide, and 1.78 m high (Figure 38 & Figure 39). The upright appears to have one or more stones intentionally set at its western base. However, the majority of the upright's base rests upon naturally exposed bedrock. Feature B is interpreted as being of pre-contact origin, and its function is determined to be a trail or boundary marker. No cultural material was observed on the ground surface in the vicinity of this feature.

SIHP # 50-80-12-6903 Feature C consists of a large upright basalt boulder measuring 2.3 m long, 1.7 m wide, and 2.5 m high (Figure 40 & Figure 41). This feature is believed to be in a natural upright position. Feature C is interpreted as being of pre-contact origin, and its function is determined to be a trail or boundary marker. No cultural material was observed on the ground surface in the vicinity of this feature.

Cultural consultation with knowledgeable community members was utilized to better establish the age, function, cultural affiliation, and significance of this historic property (see Section 5 below).

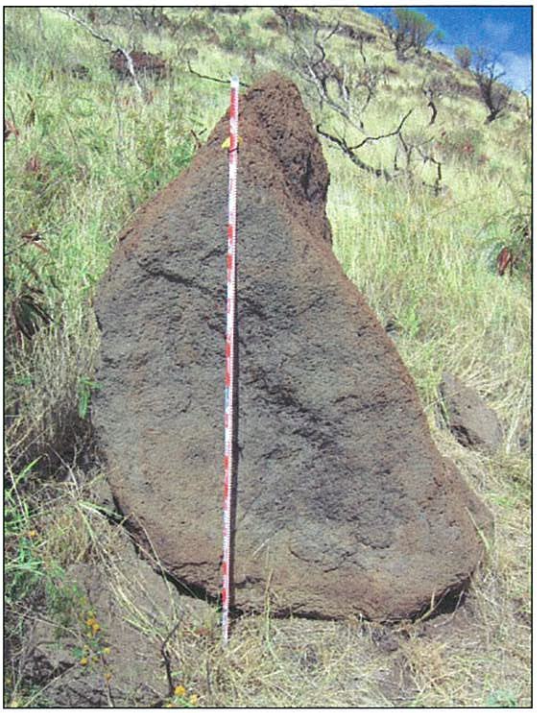

Figure 36. Photograph of SIHP #50-80-12-6903 Feature A, upright boulder, view to north

Figure 37. Photograph of SIHP #50-80-12-6903 Feature A, upright boulder, view to west

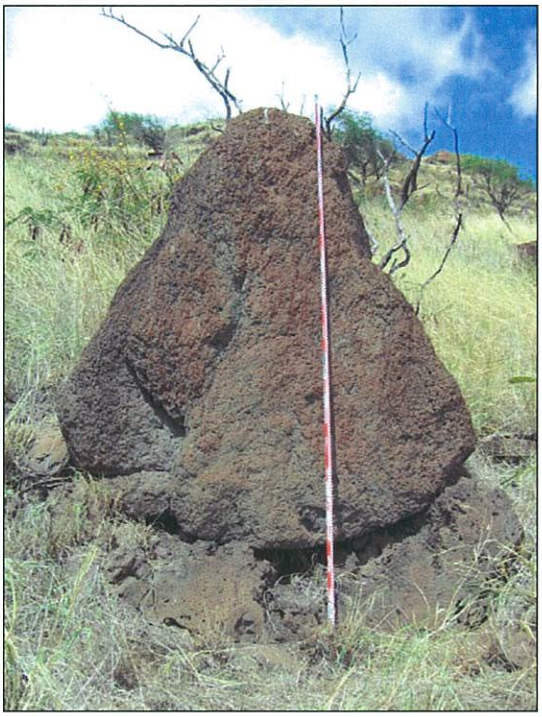

Figure 38. Photograph of SIHP #50-80-12-6903 Feature B, upright boulder, view to north

Figure 39. Photograph of SIHP #50-80-12-6903 Feature B, upright boulder, view to west

Figure 40. Photograph of SIHP #50-80-12-6903 Feature C, upright boulder, view to west

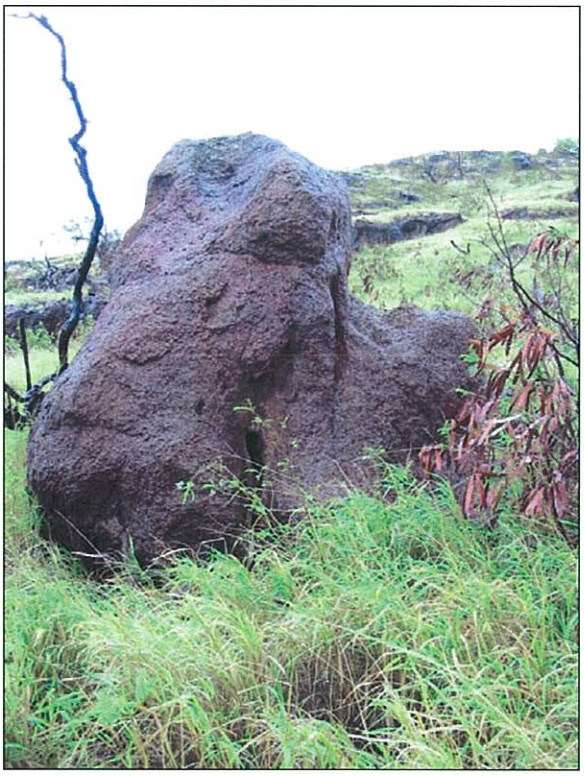

Figure 41. Photograph of SIHP #50-80-12-6903 Feature C, upright boulder, view to northwest

Section 5 Cultural Consultation Results

Pursuant to the requirements of State of Hawaii archaeological inventory survey regulations [HAR 13-276-5(g)] and State of Hawaii historic preservation review legislation [HAR 13-275-8(a)(2)], CSH carried out cultural consultation for this archaeological inventory survey investigation. This cultural consultation effort focused on locating any additional cultural and/or historical land use information for the study area. It also focused on better establishing the age, function, cultural affiliation, and significance of the historic property documented within the study area. Finally, this consultation effort focused on the development of appropriate mitigation for the significant historic property that will be affected by landfill expansion.

This consultation effort focused particularly on SIHP #50-80-12-6903, three large upright boulders utilized as trail or boundary markers. The following discussion is arranged chronologically and documents the effort and the results.

5.1 Chronology of Consultation Effort and Results

March 13, 2007

During an SHPD site visit to the study area, then Oahu Island Archaeologist Mr. Adam Johnson toured the location of SIHP #50-80-12-6903 and its vicinity. At this on-site meeting SHPD directed CSH to proceed with cultural consultation to establish the cultural significance of the three upright stones. Mr. Johnson indicated that, based on the results of this consultation, it was likely that the upright stones would be determined significant under criteria D (information content) and E (traditional cultural significance to an ethic group) of the Hawaii Register of Historic Places.

March 27 2007

CSH conducted a cultural consultant site visit of SIHP #50-80-12-6903 and its vicinity with Mr. William Ailā (Hui Malāma I Nā Kūpuna), Mr. Eric Enos (cultural practitioner and Director of Ka'ala Farms), Mr. Shad Kane ('Ahahui Siwila Hawai'i O Kapolei Hawaiian Civic Club), and Mr. McD Philpotts (long-time resident of Waimānalo 'Ili). At this meeting the age, function, cultural affiliation, and significance of the upright stones were discussed. Potential functions for the stones included trail markers, markers for observation points for celestial observation and/or navigation, or markers used to calculate the location of specific coastal and/or off-shore resources. Although there was no clear consensus regarding the function of the stones, all of the cultural consultants present indicated that the stones were significant and that they had been used by traditional Native Hawaiian cultural practitioners in the past. They indicated that the stones' location was likely an important part of their cultural significance and function. Potential mitigation measures, including preservation in place and relocation were discussed.

The cultural consultants at this meeting expressed concern regarding the final appearance of the landfill once it has reached capacity and will no longer be used. They wanted to see the new surface of the landfill naturalized with the random placement of basalt boulders and more natural vegetation, preferably Native Hawaiian dry land species, so that the final landfill surface appears more like the surrounding hill sides.

May 1 2007

CSH mailed out a consultation letter to the Office of Hawaiian Affairs (OHA). This consultation was initiated pursuant to HAR Chapter 13-276-5 and 13-275-6. Appendix A is a copy of this consultation letter.

May 24 2007

OHA provides a response to CSH's May 1 2007 consultation letter. Appendix B is a copy of this letter. With its response letter, OHA asked for additional project-related cultural consultation with members of the Koa Mana organization, as well as Ms. Nettie Tiffany of Lanikūhonua. Additionally, the letter queried whether or not subsurface testing was undertaken as part of the project's archaeological inventory survey. Finally, OHA's letter took the position that the single historic property documented in the project area, SIHP #50-80-12-6903--three upright stones, should be preserved through adjustment of the current study area boundaries.

CSH responded to OHA's May 24 2007 letter in a March 7 2008 mitigation consultation letter, see discussion below. As a result of OHA's suggestions, members of the Koa Mana organization came out to the SIHP #50-80-12-6903 location and its vicinity and provided their input. Additionally, Ms. Nettie Tiffany was included in further cultural consolation.

July 18 2007

CSH held another on-site cultural consultant visit to the SIHP #50-80-12-6903 location and its vicinity. Mr. Glenn Kila and Mr. Alika Silva from Koa Mana were present, along with Ms. Kaleo Paik from the SHPD Culture and History Branch. At this meeting the age, function, cultural affiliation, and significance of the upright stones were discussed. Potential mitigation measures, including preservation in place and relocation were discussed. Once again, there was no clear consensus regarding the function of the stones, all of the cultural consultants present indicated that the stones were significant and that they had been used by traditional Native Hawaiian cultural practitioners in the past.

October 5 2007

CSH holds another on-site meeting at the SIHP #50-80-12-6903 location with the current SHPD Oahu Island Archaeologists, Ms. Lauren Morawski and Ms. Teresa Davan. The archaeological inventory survey effort and results are discussed and the three upright stones are observed. CSH provided the SHPD archaeologists with a summary of the project's cultural consultation effort to date.

March 7 2008

A mitigation consultation letter was sent out to OHA, SHPD, Mr. William Ailā (Hui Malāma I Nā Kūpuna), Mr. Eric Enos (cultural practitioner and Director of Ka'ala Farms), Mr. Shad Kane ('Ahahui Siwila Hawai'i O Kapolei Hawaiian Civic Club), Mr. McD Philpotts (long-time resident of Waimānalo 'Ili), Ms. Nettie Tiffany (Lanikūhonua), Mr. Glenn Kila (Koa Mana) and Mr. Alika Silva (Koa Mana). This consultation letter included response information to OHA's May 24, 2007 letter. It included the results of the project's archaeological inventory survey investigation and a description of SIHP #50-80-12-6903, the three upright stones. It also summarized the project's cultural consultation effort to date. Finally, it described the proposed mitigation measures for SIHP #50-80-12-6903. Appendix C is a copy of this consultation letter.

In March 2008, following the posting and emailing of the March 7 2008 consultation letter, CSH attempted to contact letter recipients by email and telephone to obtain their feedback and comments. As a result of this effort on March 20 2008, CSH was contacted by telephone by Mr. Shad Kane ('Ahahui Siwila Hawai'i O Kapolei Hawaiian Civic Club) and Mr. McD Philpotts (long-time resident of Waimānalo 'Ili). Their comments are summarized below.

Mr. Doug "McD" Philpotts telephoned Matt McDermott of CSH at 3:45 pm on March 20 2008. Mr. Philpotts had four general comments based on his review of the March 7 2008 mitigation consultation letter:

1) He confirmed that he felt the stones were indeed naturally occurring and that they had not been modified or set up-right by human hands.
2) He and his son went out in his canoe to see how visible the stones were from offshore Lanikūhonua, *makai* of Waimanalo Gulch. He said he could see the stones faintly, by knowing where to look, but that the stones did not stand out on the Waimanalo Gulch slope and were hard to see. He said the stones did line up with the location of a fishing spot he knew, but that other landscape features were more easily discernable and made much better geographic reference points for triangulation.
3) He finds the proposed treatment of the stones, their movement to the Battery Arizona location, an acceptable form of mitigation
4) He is most concerned about the final look of the landfill once it reaches capacity and the area will no longer be used. He feels the new final surface of the landscape needs to be landscaped to be more natural, with native Hawaiian dry-land vegetation, and a more natural land covering of basalt stones. He thinks this naturalization of the surface will make the area much more useful in the future.

Mr. Shad Kane telephoned Matt McDermott of CSH at 5:45 pm on March 20 2008. Mr. Kane had five general comments based on his review of the March 7 2008 mitigation consultation letter:

1) He is disappointed about the landfill project as a whole as well as the proposed movement of the three stones (SIHP #50-80-12-6903)—but he understands the need and why the landfill needs to be expanded and the stones need to be moved.
2) He indicated that the stones' meaning and significance will be lost once they are moved from their original location.
3) He is interested in having research continue on the stones after they were moved. This further research should focus on determining the stones past use and/or significance to Native Hawaiian cultural practitioners.
4) He is in favor of interpretation of the stones based on the results of further research, with signage and public access.
5) He would like to see the stones moved back to as close as possible to their original location, from temporary curation at Battery Arizona, after the landfill has reached capacity and it would be safe to move the stones back.

As a result of follow up telephone contact to the March 7, 2008 consultation letter, Ms. Nettie Tiffany (Lanikūhonua) telephoned Matt McDermott of CSH at 8:45 am on March 31, 2008. Although Ms. Tiffany had not participated in the previous site visits to the SIHP # 50-80-12-

6903 location, she did have four general comments based on her review of the mitigation consultation letter:

1) She indicated the description of the stones, their location, and photographs included in the consultation letter accurately portrayed what her mother described to her as trail markers that marked *mauka/makai* trails. These trails were used by Native Hawaiians to support *mauka/makai* trade and/or resource distribution. They were also used by bird catchers to access the *mauka* forests.
2) She was disappointed with the Landfill expansion project and that the stones could not be left in place.
3) She felt that the stones significance as trail markers would be ruined if the stones are relocated.
4) She would like to see the stones moved back to as close as possible to their original location, from temporary curation at Battery Arizona, after the landfill has reached capacity and it would be safe to move the stones back.

March 25 2008

SHPD staff Ms Kaleo Paik (Culture and History Branch) and Oahu Island Archaeologists Ms. Lauren Morawski and Ms. Teresa Davan met with CSH to discuss the project's ongoing consultation effort results. The project proponent's proposed mitigation for SIHP #50-80-12-6903 where also discussed. The SHPD staff had the following comments regarding the stones and their proposed mitigation:

1) Ms. Kaleo Paik thought it was unlikely that the stones would have functioned for marking coastal or offshore locations or resources, because of their position and the difficulty of seeing the stones from a distance.
2) All felt that the stones should be preserved in place if at all possible because their significance and function are likely tied to their current location.
3) If preservation in place is truly not an option, they were in favor of temporary relocation of the stones to Battery Arizona, with movement back of the stones to as near as possible to their original location once the landfill is closed.
4) They all were in favor of further research regarding the stones significance and function, with eventual public signage and interpretation for the stones once they are moved back to as close as possible to their original location.

5.2 Consultation Summary

This cultural consultation effort focused on locating any additional cultural and/or historical land use information for the study area. It also focused on better establishing the age, function, cultural affiliation, and significance of SIHP #50-80-12-6903, three large upright boulders documented within the study area. Finally, this consultation effort focused on the development of appropriate mitigation for the significant historic property (SIHP #50-80-12-6903) that will be affected by landfill expansion.

Consultation efforts determined that there was no clear consensus regarding the function of SIHP #50-80-12-6903, however, all of the cultural consultants indicated that the stones were significant and that they had been used by traditional Native Hawaiian cultural practitioners in the past. All cultural consultants also felt that the stones should be preserved in place if at all possible because their significance and function are likely tied to their current location. If preservation in place is truly not an option, most were in favor of temporary relocation of the stones to Battery Arizona, with movement of the stones back to as near as possible to their original location once the landfill is closed.

Some cultural consultants expressed an interest in having research continue on the stones after they were moved. This further research would focus on determining the stones past use and/or significance to Native Hawaiian cultural practitioners. Once the results of this additional research were interpreted, public access to the stones with interpretive signage was felt to be appropriate.

The cultural consultants also expressed concern regarding the final appearance of the landfill once it has reached capacity and will no longer be used. They wanted to see the new surface of the landfill naturalized with the random placement of basalt boulders and more natural vegetation, preferably Native Hawaiian dry land species, so that the final landfill surface appears more like the surrounding hill sides.

CSH would like to thank all the cultural consultants and OHA and SHPD representatives for their time and consideration during the project's archaeological consultation effort. Their input is extremely valuable and will help all concerned parties make the best, most well-informed management decisions for the historic property in the project APE.

Section 6 Summary and Interpretation

In compliance with and to fulfill applicable Hawai'i state historic preservation legislation, CSH completed this archaeological inventory survey investigation for the proposed Waimānalo Gulch Landfill Expansion. Land disturbing activities associated with the landfill expansion would include: major grading, including blasting of exposed rock surfaces, and excavation of the base and walls of Waimānalo Gulch to prepare the expansion area for landfill use; grading for a perimeter road around the expansion area; excavations for stockpiling of sediment for use as cover material; excavations for associated landfill infrastructure; excavation for the installation of a storm water runoff control channel along the west side of the gulch; and filling of the expansion area with refuse material.

Per the Hawai'i state requirements for archaeological inventory surveys [HAR Chapter 13-276], this inventory survey investigation includes the results of cultural, historical, and archaeological background research, cultural consultation, and fieldwork. The background research focused on summarizing the study area's pre- and post-contact land use, cultural significance, and types and locations of potential historic properties within the study area and its vicinity. The cultural consultation focused on potential mitigation measures for the single historic property identified within the study area.

Pedestrian inspection of the study area identified one historic property, SIHP #50-80-12-6903. SIHP #50-80-12-6903 is located along the western edge of the study area, situated on the western slope of Waimānalo Gulch (see Figure 20). It is of pre-contact origin, and consists of three large upright boulders (Features A-C) utilized potentially as trail or boundary markers.

The inventory survey fieldwork also involved a thorough inspection of caves and rock shelters observed within the study area (see Figure 22). These caves and rock shelters were inspected for cultural modifications and/or the presence of human burials. Where significant sediment deposits were observed, subsurface testing in the form of controlled hand excavation was undertaken to establish if any subsurface cultural deposits were present. All observed and inspected caves contained no indications of cultural modification, subsurface cultural deposits, or use a human interment site.

Also of note was a rock alignment (CSH 3) located near the northeastern edge of the study area (see Figure 22). The alignment was determined to be of modern origin due to its location along a talus slope, in which soil erosion and rainwater runoff channels were observed. If the feature was of antiquity it would reflect disturbances associated with erosion and/or rainwater runoff, such as the retention of eroding rock and soil or the displacement of boulders incorporated into the alignment. Test excavations yielded no cultural material and confirmed the modern construction of the alignment.

These findings are largely in keeping with expectations, based on background research. An archaeological inventory survey of the "Makaīwa Hills" development project, totaling 1850 acres and encompassing large portions of Makaīwa and Pālailai gulches, identified pre-contact habitation sites clustered in higher elevations above 1000 ft., and in lower elevations below 500 ft (Hammatt et al. 1991). Hammatt et al. (1991) indicated that the higher elevations would contain ample forest subsistence resources for gathering on both a continual basis, as well as

during times of famine and drought, while the lower elevations would be in close proximity to the shoreline and bountiful coastal resources. The current study area is located 80 m east of the "Makaīwa Hills" development project, contains a similar topographic and geologic setting, and is situated within an elevation range of 400 to 900 ft, the zone in which pre-contact archaeological sites were absent in the neighboring "Makaīwa Hills" study area. Thus, the fact that only a single historic property was identified within the current study area is not surprising as it is consistent with the pattern observed by Hammatt et al. in 1991. Furthermore the historic property (SIHP #50-80-12-6903) consists of trail and/or boundary markers utilized by pre-contact populations, suggesting that portions of the study area were utilized for transportation to more resource rich areas (i.e. the coast and upland forest).

Both the Hammatt et al. (1991) study and the current archaeological inventory survey are important because they have provided valuable data towards establishing a settlement pattern for the leeward gulches and ridges of Honouliuli Ahupua'a. The current study area has been determined to be situated in an intermediate zone between the coast and the upland forest. This intermediate zone is defined by an extremely arid environment, a lack of vegetation, and steep rocky terrain which would have made pre-contact habitation and agriculture very difficult. This intermediate zone is focused between 500 and 1000 ft elevations and was most likely utilized for transportation between the more hospitable coast and upland forest areas.

Section 7 Significance Assessments

The inventory survey investigation and documentation of the project area's single historic property have provided sufficient information for significance evaluations. Significance is determined after evaluation of each historic property in light of the five broad criteria used by the Hawai'i State Registers of Historic Places (HAR 13-275-6). The criteria are the following:

A Historic property reflects major trends or events in the history of the state or nation.

B Historic property is associated with the lives of persons significant in our past.

C Historic property is an excellent example of a site type.

D Historic property has yielded or may be likely to yield information important in prehistory or history.

E Historic property has cultural significance to an ethnic group, including, but not limited to, religious structures and burials.

SIHP #50-80-12-6903, three rock uprights, has integrity of location and materials and is recommended eligible to the Hawai'i Register under criteria D & E

Section 8 Project Effect and Mitigation Recommendations

It is the position of the project proponents (the City and County of Honolulu) that, as the only municipal landfill site on the island of O'ahu, the continued use of the Waimānalo Gulch facility is of utmost importance to the health and safety of the island's population. The expansion of the existing Waimānalo Gulch facility is crucial to the facility's continued operation over the next decades. After weighing the options, the project proponents have determined that the three stones that make up SIHP #50-80-12-6903 cannot be preserved in place in a safe and appropriate manner.

Preservation in place would require a significant reduction of the overall area and volume of the proposed facility expansion. Additionally, with the proposed blasting, mass grading, and excavation in the vicinity of the stones, the safety of the stones cannot be guaranteed if they were preserved in place. For example, refer to Figure 42, which shows the stones' proximity to the large storm water drainage channel and Cell E6, immediately above and below the stones' location. The blasting, mass grading, and excavation associated with the installation of these needed landfill features would subject the stones to repeated vibration and blasting debris over the next approximately 15 years as the landfill expansion progressed. The vibrations from blasting and mass grading would potentially be sufficient to dislodge the stones from their current resting place, causing them to roll down the steep slope they rest on. Finally, considering the use of the site as a landfill, preservation in place is not thought to be an appropriate mitigation treatment for the stones, considering their cultural sensitivity.

8.1 Project Effect

After weighing the options, the project proponents have determined that the three stones that make up SIHP # 50-80-12-6903 cannot be preserved in place in a safe and appropriate manner. Accordingly, a project effect determination of "effect with agreed upon mitigation commitments" is warranted.

8.2 Mitigation Recommendations

The project proponents propose the relocation of the three SIHP # 50-80-12-6903 stones to Battery Arizona, located in the southwestern portion of the Waimānalo Gulch facility (Figure 43). There is a precedent for this relocation as three noteworthy stones of cultural significance to Native Hawaiians have already been relocated to the Battery Arizona site from the expanding Waimānalo Gulch Landfill. These stones, described by Hammatt and Shideler (1999), were relocated to the Battery Arizona site in 1988. Figure 44 shows the location of this already established stone repository in relation to the Battery Arizona features. Figures 48 and 49 are photographs, showing the proposed relocation area for SIHP # 50-80-12-6903 along the southeast facing slope at Battery Arizona and in relation to the already established stone repository. The proposed relocation would ensure the safety of the stones during the landfill's expansion and would make them much more accessible to interested parties.

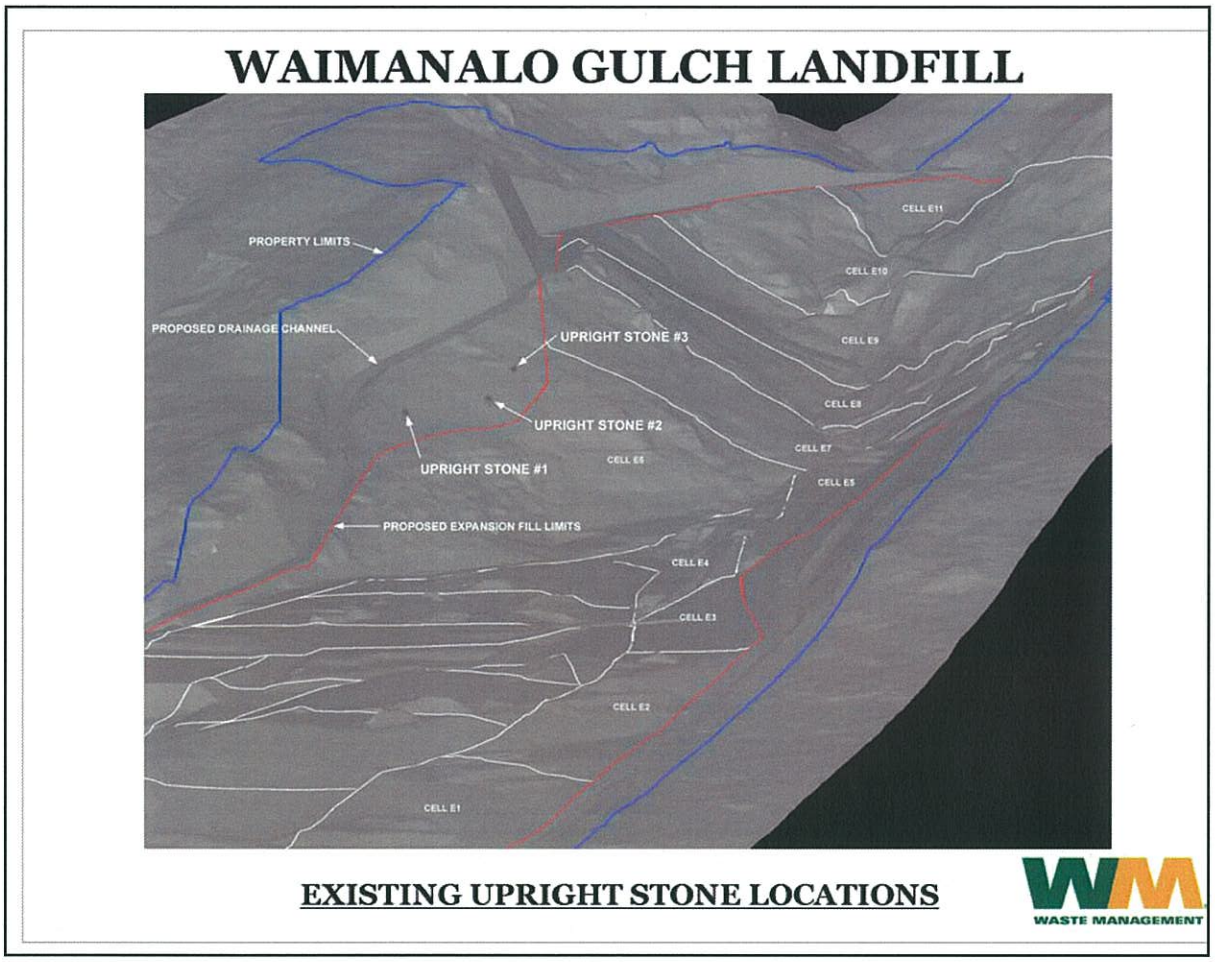

Figure 42. Three-dimensional graphic showing the proposed landfill expansion in relation to the three stones of SIHP # 50-80-12-6903. Note the large drainage channel upslope of the stones and the cell E6 immediately down slope

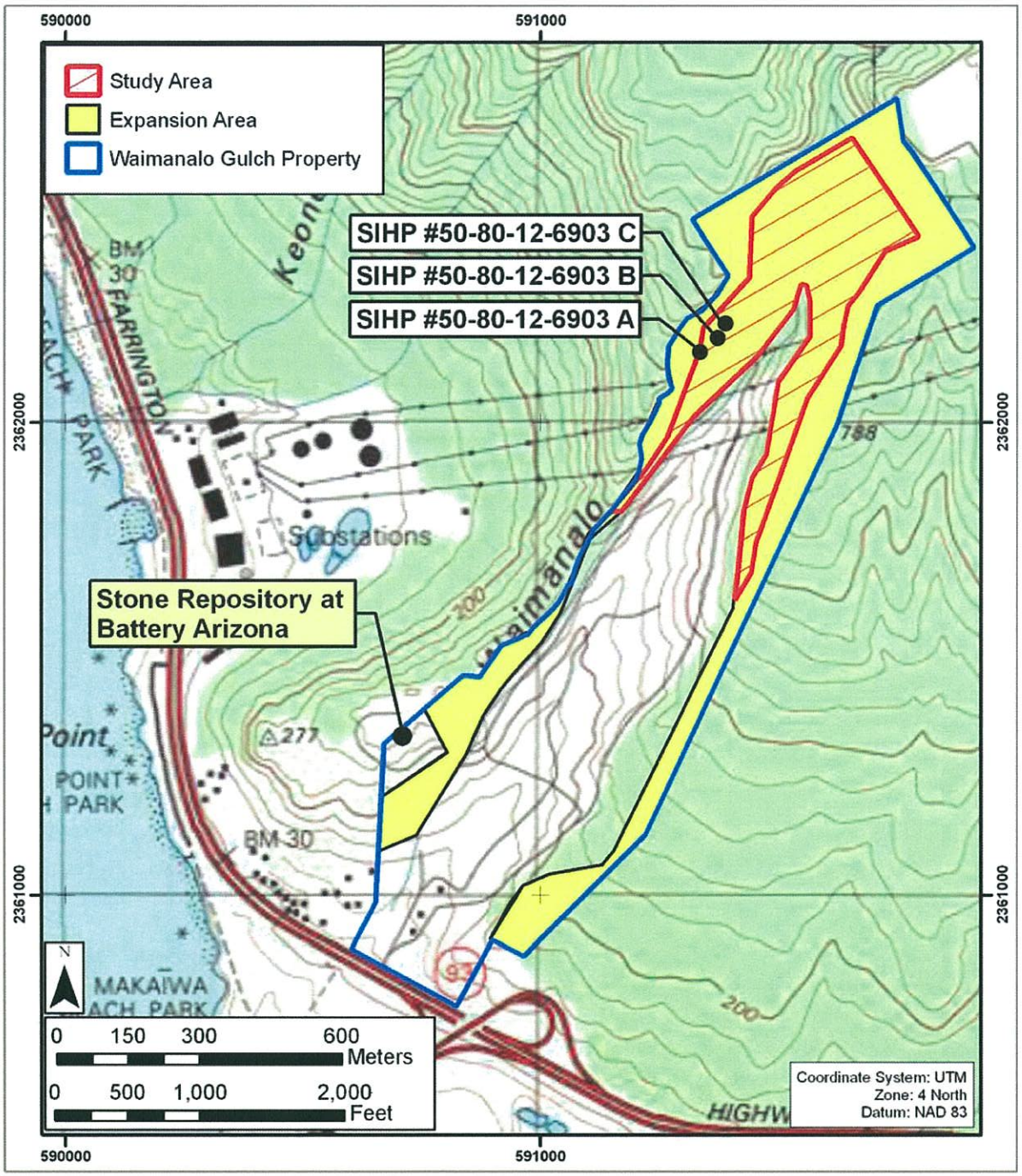

Figure 43. Portion of the 1998 `Ewa USGS 7.5-minute topographic quadrangle showing the Waimānalo Gulch property boundaries, the boundaries of the proposed 90-acre expansion area, the 36-acre study area, the location of Features A, B, and C of SIHP #50-80-12-6903, and the previously established stone repository at Battery Arizona.

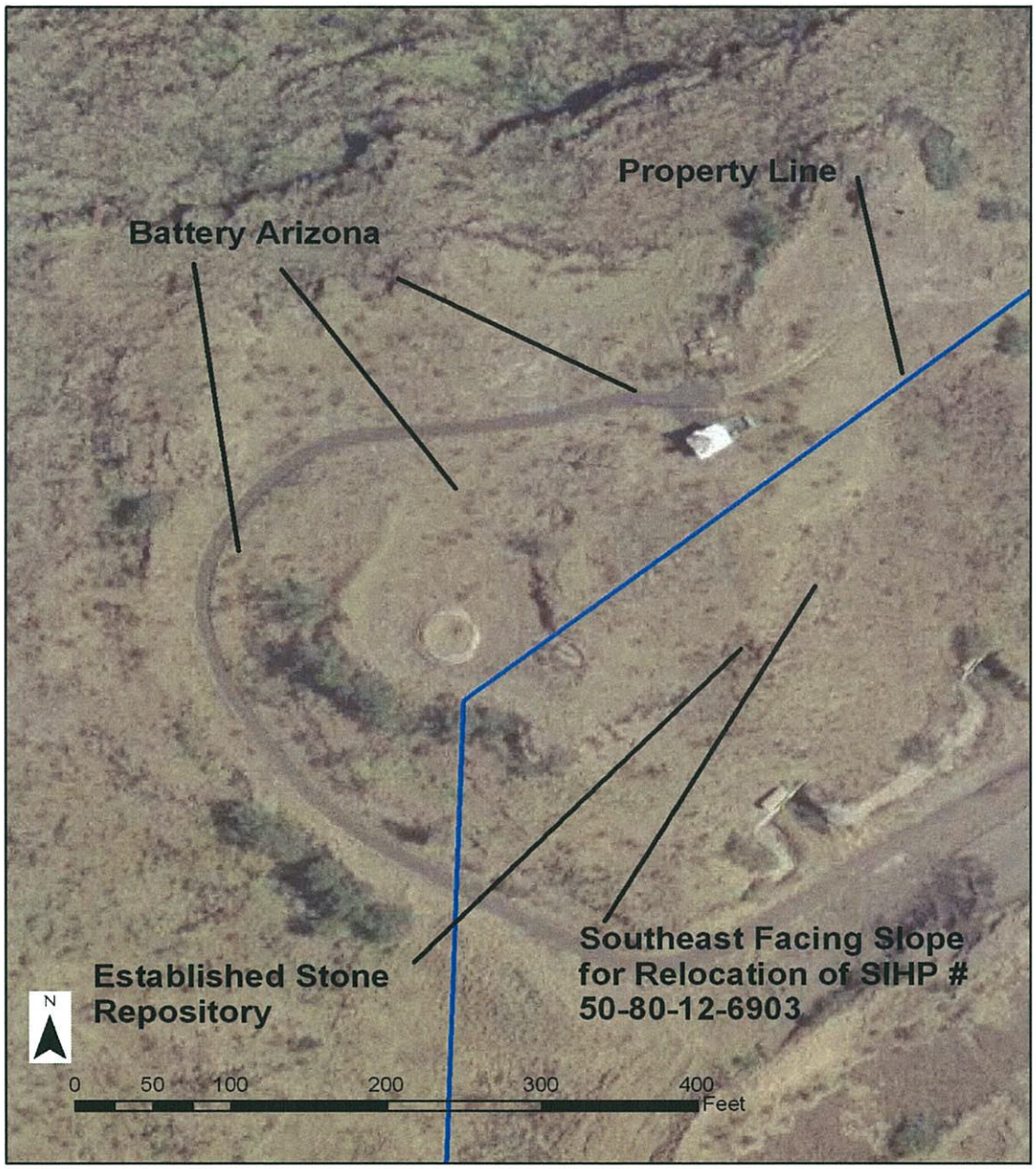

Figure 44. Aerial photograph of Battery Arizona showing the established stone repository and the proposed relocation area for SIHP # 50-80-12-6903

Figure 45. Photograph, view to the south, of the proposed relocation area at Battery Arizona for SIHP # 50-80-12-6903

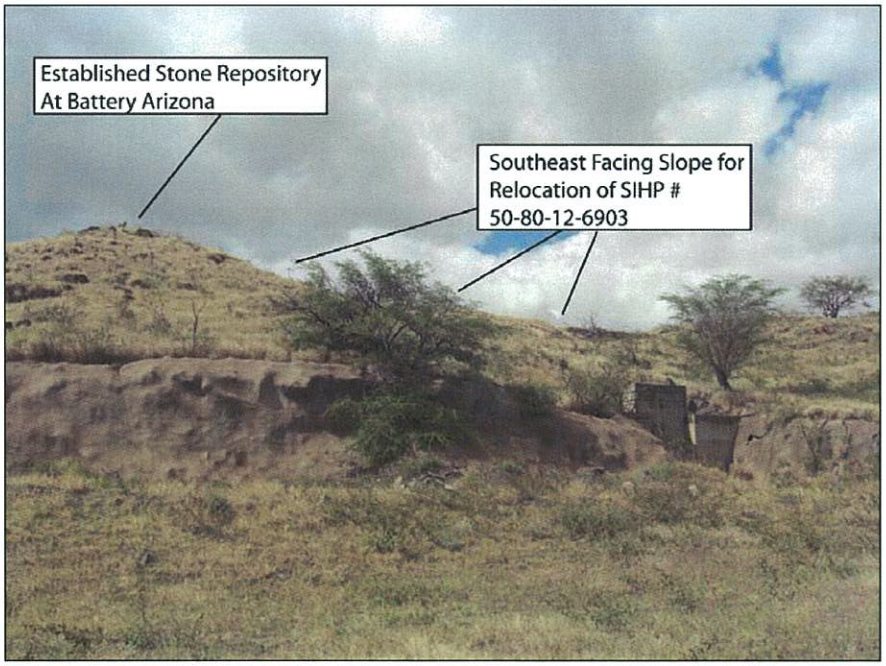

Figure 46. Photograph, view to the north, of the proposed relocation area at Battery Arizona for SIHP # 50-80-12-6903

The specifics of the proposed stone relocation would be the subject of the project's archaeological mitigation plan for SIHP # 50-80-12-6903. These specifics would be worked out through further consultation with cultural consultants, SHPD, and the project proponents. The mitigation plan should include additional research to help better establish the function of the three stones. There is the option of putting the stones back near their original resting places. Figure 47 is a modified photograph that shows approximately what this would look like from coastal Honouliuli. This relocation could only take place after that portion of the landfill had been filled, most likely in approximately 15 years. The permanent relocation of the stones to Battery Arizona is another, more feasible mitigation option. Based on the results of cultural consultation, however, cultural informants would prefer to see the stones eventually returned to near their original resting places, once the landfill is no longer active, with interpretive signage based on further background research and public access.

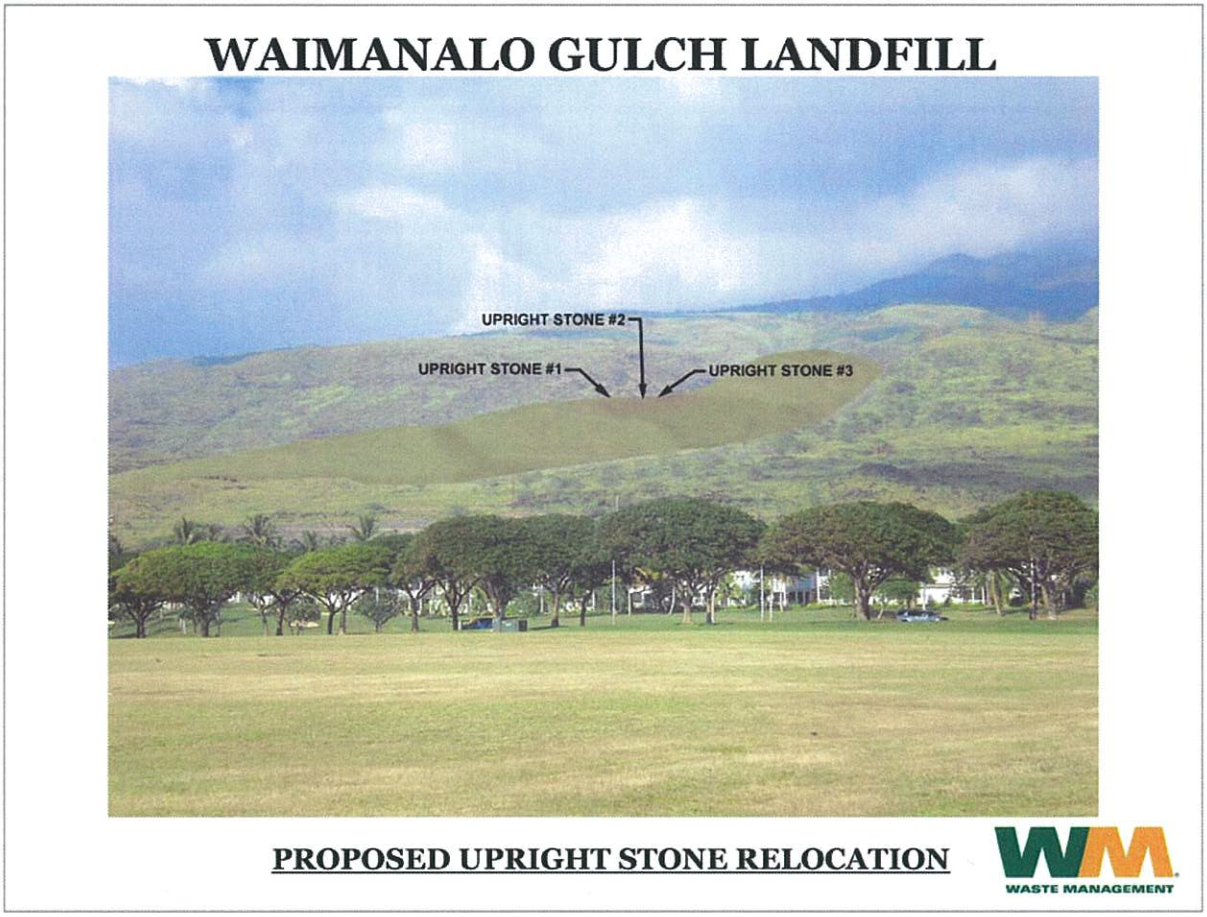

Figure 47. Altered photograph showing the planned landfill surface topography in 15 years. The potential SIHP # 50-80-12-6903 relocation site, on top of the new landfill surface, is shown

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Appendix A CSH Request for Cultural Consultation from OHA

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

O'ahu P.O. Box 1114
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Fax.: (808) 262-4950

Maui 16 S. Market St., #2N
Wailuku, HI 96793
Ph.: (808) 242-9882
Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

CSH Job Code: HONOU 6

1 May 2007

Mr. Clyde W. Nāmu'o
Administrator
State of Hawai'i Office of Hawaiian Affairs (OHA)
711 Kapi'olani Boulevard, Suite 500
Honolulu, Hawai'i 96813

Subject: CSH's request to OHA for cultural consultation and/or comment regarding the archaeological inventory survey fieldwork results, historic property significance evaluations, and proposed historic property treatment/mitigation for the Waimānalo Gulch Sanitary Landfill expansion project Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu TMK: [1] 9-2-003:073 por.

Dear Mr. Nāmu'o:

Cultural Surveys Hawai'i, Inc. (CSH) recently completed fieldwork for an archaeological inventory survey associated with the Waimānalo Gulch Sanitary Landfill expansion. The landfill expansion area is located immediately mauka of the existing Waimānalo Gulch Sanitary Landfill. Waimānalo Gulch is generally located immediately inland of Farrington highway, roughly between the Honokai Hale residential subdivision and Ko Olina Resort to the southeast, and the Hawaiian Electric Co.'s (HECO) Kahe Power Plant to the northwest. Please refer the to Figure 1 for area orientation.

The proposed landfill expansion area is comprised of approximately 36-acres of undeveloped land within the Waimānalo Gulch Landfill property. The proposed landfill expansion area is to be used for the disposal of municipal refuse. The landfill expansion is meant to increase the capacity and lifespan of the existing Waimānalo Gulch Sanitary Landfill. Minimally, land disturbing activities associated with the landfill expansion project would include: major grading and excavation of the base and walls of Waimānalo Gulch to prepare the expansion area for landfill use; grading for a perimeter road around the expansion area; excavations for stockpiling of sediment for use as cover material; excavations for associated landfill infrastructure; and filling of the expansion area with refuse material. The project's area of potential effect (APE) is defined as the entire proposed expansion area.

With this letter, CSH is providing OHA with a summary of the archaeological inventory survey fieldwork results and the significance assessments and potential mitigation recommendations for one historic property located within the project area. This historic property (SIHP # 50-80-12-6903) was discovered during the archaeological inventory survey near the southwest edge of the Waimānalo Gulch Sanitary

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Landfill expansion area. This resource is comprised of three rock uprights designated Features A-C, which may have been placed upright or may be in a natural standing position. These features rest on an east facing slope, they are situated on exposed outcrops, with Feature A and Feature B along the same outcrop, and Feature C located on an outcrop upslope, they are spaced 50-60 meters apart. This resource is interpreted as traditional Native Hawaiian, and may have functioned as a trail or boundary markers. No additional cultural constituents were observed near this location. In consultation with the State Historic Preservation Division, this historic property is recommended eligible to the Hawai'i Register of Historic Places (Hawai'i Register) under criterion D, for its potential to yield information important in prehistory or history, and under criterion E, for its cultural significance to an ethnic group.

Pursuant to Hawai'i Administrative Rules (HAR) Chapter 13-276-5 and 13-275-6, CSH is hereby seeking OHA's input regarding the significance and treatment of these historic properties.

As part of this cultural consultation effort, CSH is working with SHPD and knowledgeable cultural consultants, including Mr. William Aila and Mr. Shad Kane. In mid-March 2007 SHPD Oahu Island Archaeologist Mr. Adam Johnson visited the site with CSH personnel. In late March 2007, CSH made a site visit to SIHP # 50-80-12-6903 with Mr. William Aila and Mr. Shad Kane, where their opinions regarding the age, function, and significance of the site were discussed. Throughout April 2007 CSH has worked with the cultural consultants to obtain their input regarding the site. This input will be included in the project's archaeological inventory survey report.

The project's archaeological inventory survey fieldwork was carried out in January and February 2007. Background research confirmed that that some of the project area had been surveyed by Cultural Surveys Hawaii previously, however due to changes in the project area and the political context of this project, a new 100% pedestrian survey was conducted of the entire proposed expansion area. The archaeological inventory survey resulted in the location of one new historic property (SIHP # 50-80-12-6903). This historic property is briefly described below and shown on the attached USGS topographic map (Figure 2 and Figure 3).

SIHP # 50-80-12-6903 was discovered during the archaeological inventory survey near the southwest edge of the Waimānalo Gulch Sanitary Landfill expansion area and is comprised of three stone uprights designated Features A-C.

SIHP # 50-80-12-6903 Feature A measures 1.20 m maximum length, 1.12 m maximum width, and 2.10 m maximum height. There appear to be no intentionally placed rocks surrounding the base of this upright. The flat face of this stone is directed south. The face of this feature is discolored and appears to have once rested on the ground (Figure 4 and Figure 5).

SIHP # 50-80-12-6903 Feature B measures 1.63 m maximum length, .75 m maximum width, and 1.78 m maximum height. The upright appears to have one or more stones at its western base, which may have been intentionally placed, however the majority of this uprights base rests in a natural area of exposed bedrock. Once identified this feature could be clearly scene from the landfill below. Feature B is triangular in shape forming a small point at its apex (Figure 6 and Figure 7).

1 May 2007

SIHP # 50-80-12-6903 Feature C measures 2.3 m maximum length, 1.7 m maximum width, and 2.5 m maximum height. The upright is believed to be in a natural standing position. This upright has a natural crack in the east face, which may give it a feminine association (Figure 8 and Figure 9).

It is CSH's understanding that this resource will be removed under the current landfill expansion plan. Potential ideas for mitigation include: preservation, relocation, and or adjustment of the expansion area.

I hope the attached summary provides the information you require to comment on the inventory survey findings and the proposed historic property significance assessments and treatment. Per the requirements of HAR Chapter 13-276-8, CSH is interested in OHA's input and comment regarding the significance of these resources.

Thank you very much for your assistance with this matter. Please contact me with any questions.

Sincerely,

Matt McDermott
Projects Manager, Cultural Surveys Hawaii, Inc.
P. O. Box 1114
Kailua, Hawaii 96734
Tel. (808) 262-9972
Fax. (808) 262-4950
mmcdermott@culturalsurveys.com

1 May 2007

Attachments:

Figure 1. Aerial photograph showing the location of the Waimānalo Gulch Sanitary Landfill property and the proposed expansion project area (source: USGS Orthoimagery 2005)

Figure 2. USGS 7.5 Minute Series Topographic Map, Ewa Quadrangle (1998), showing the location of the Waimānalo Gulch Sanitary Landfill property, the proposed expansion project area, and the newly documented historic property (SIHP # 50-80-12-6903)

Figure 3. USGS 7.5 Minute Series Topographic Map, Ewa Quadrangle (1998), showing a close-up view of the location of historic property (SIHP # 50-80-12-6903)

Figure 4. SIHP # 50-80-12-6903 Feature A, Photograph of face of rock upright, view to the north

Figure 5. SIHP # 50-80-12-6903 Feature A Photograph of side profile of rock upright, view to the south

Figure 6. SIHP # 50-80-12-6903 Feature B, Photograph of face of rock upright, view to the northwest

Figure 7. SIHP # 50-80-12-6903 Feature B, Photograph of side profile of rock upright, view to the south

Figure 8. SIHP # 50-80-12-6903 Feature C, Photograph of side profile of rock upright, view to the

Figure 9. SIHP # 50-80-12-6903 Feature B, Photograph of side profile of rock upright, view to the southwest

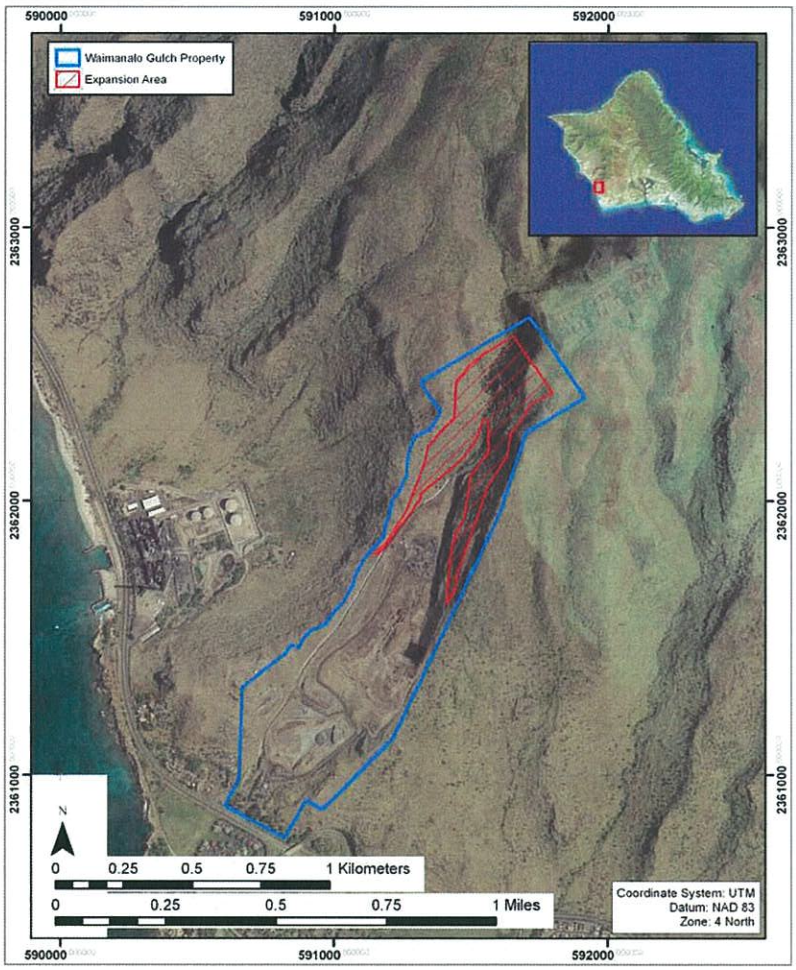

Figure 1. Aerial photograph showing the location of the Waimānalo Gulch Sanitary Landfill property and the proposed expansion project area (source: USGS Orthoimagery 2005)

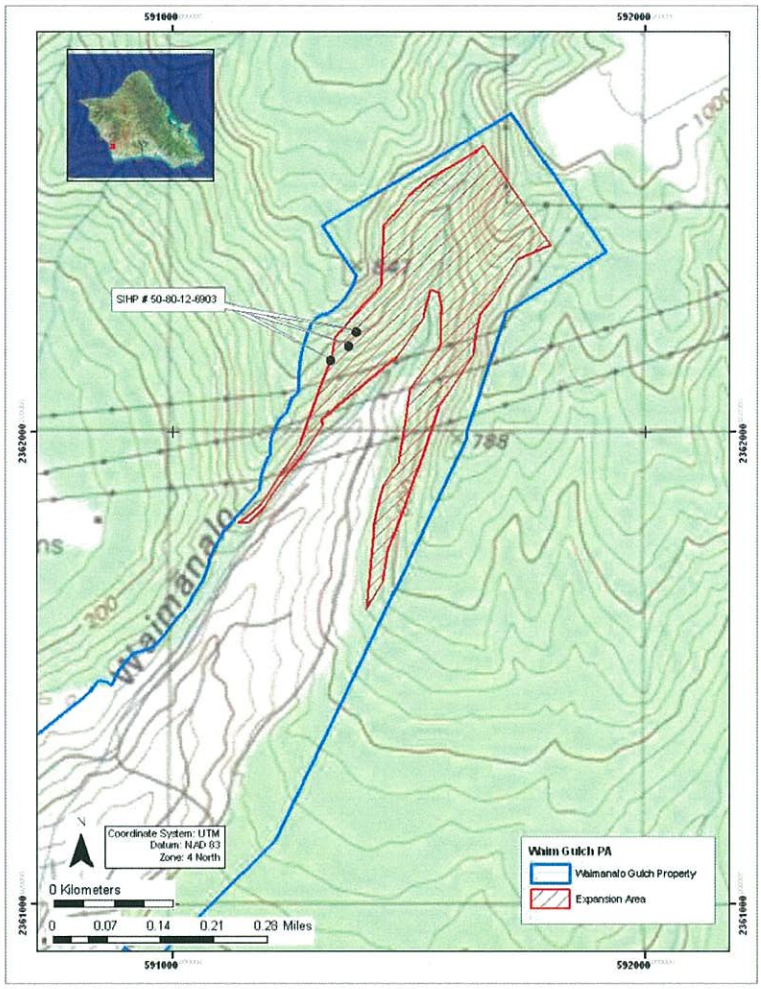

Figure 2. USGS 7.5 Minute Series Topographic Map, Ewa Quadrangle (1998), showing the location of the Waimānalo Gulch Sanitary Landfill property, the proposed expansion project area, and the newly documented historic property (SIHP # 50-80-12-6903)

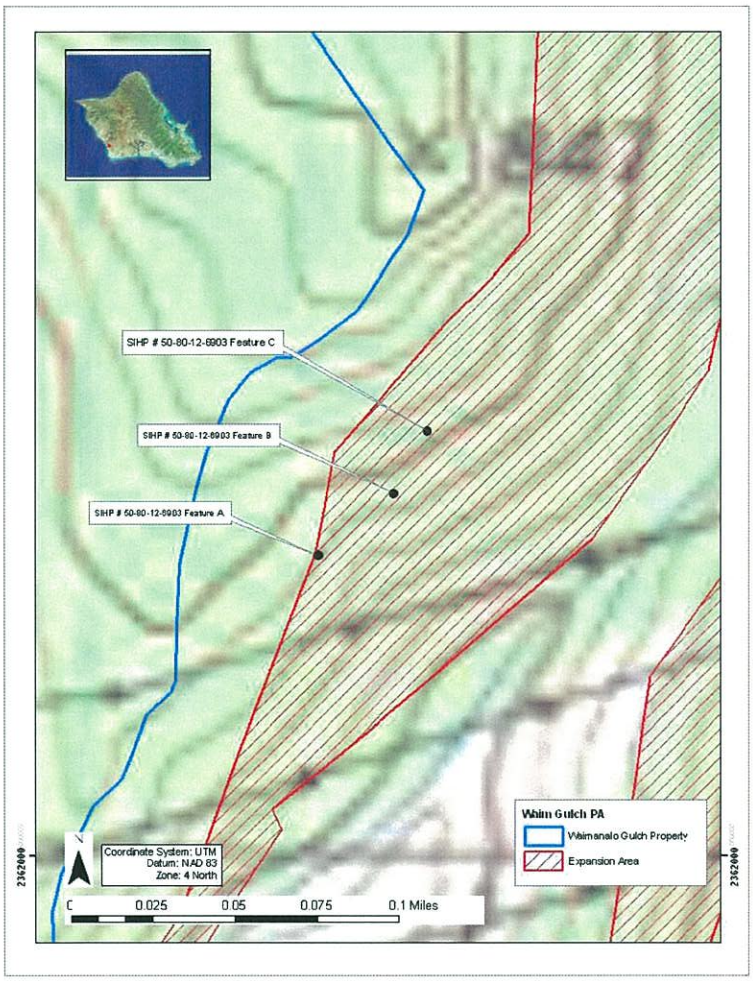

Figure 3. USGS 7.5 Minute Series Topographic Map, Ewa Quadrangle (1998), showing a close-up view of the location of historic property (SIHP # 50-80-12-6903)

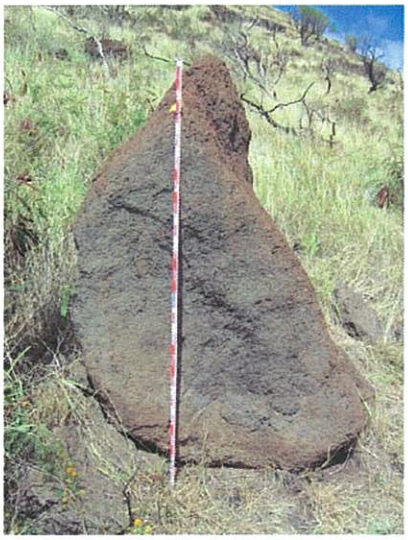

Figure 4. SIHP # 50-80-12-6903 Feature A, Photograph of face of rock upright, view to the north

Figure 5. SIHP # 50-80-12-6903 Feature A Photograph of side profile of rock upright, view to the south

Figure 6. SIHP # 50-80-12-6903 Feature B, Photograph of face of rock upright, view to the northwest

Figure 7. SIHP # 50-80-12-6903 Feature B, Photograph of side profile of rock upright, view to the south

Figure 8. SIHP # 50-80-12-6903 Feature C, Photograph of side profile of rock upright, view to the west

Figure 9. SIHP # 50-80-12-6903 Feature B, Photograph of side profile of rock upright, view to the southwest

Appendix B OHA Response to CSH Request for Cultural Consultation

PHONE (808) 594-1888 FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

May 24, 2007 HRD07_2765C

Matt McDermott, Projects Manager
Cultural Surveys Hawai'i, Inc.
P.O. Box 1114
Kailua, Hawai'i 96734

Dear Mr. McDermott

Re: Request for cultural consultation and/or comment regarding the archaeological inventory survey fieldwork results, historic property significance evaluations, and proposed historic property treatment/mitigation for the Waimanalo Gulch Sanitary Landfill expansion project
Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu
TMK: (1) 9-2-003:073 por.

The Office of Hawaiian Affairs (OHA) is in receipt of your May 1, 2007 letter which provides a summary of archaeological inventory survey fieldwork results and the significance assessments and potential mitigation recommendations for one historic property (SIHP # 50-80-12-6903) identified within the subject project area.

SIHP # 50-80-12-6903 consists of three component features spaced 50-60 meters apart, is currently interpreted as traditional Native Hawaiian, and is believed to have functioned as a trail or boundary marker. This cultural resource is currently recommended eligible to the Hawai'i Register of Historic Places under criterion D for its potential to yield information important in prehistory and history, and under criterion E for its cultural significance to an ethnic group.

OHA commends you for initiating a consultation effort, and conducting site visits with State Historic Preservation Division staff and knowledgeable individuals, including Mr. William Aila and Shad Kane. OHA recommends that you also initiate consultation with Mr. Alika Silva and Mr. Glen Kila of the community group Koa Mana, and Ms. Nettie Tiffany of Lani Ku Honua.

Matt McDermott, Project Manager
Cultural Surveys Hawai'i Inc.
May 24, 2007
Page 2

There is also institutional knowledge within OHA which indicates reinterments of Native Hawaiian burials have occurred mauka of Farrington Highway in the general vicinity of the project area.

OHA initially questions whether the transect distances used during the pedestrian survey were adequate, and whether subsurface testing was conducted during archeological inventory survey fieldwork.

Should SIHP # 50-80-12-6903 prove to function as a trail marker, it is highly probable that such a trail would continue beyond the currently identified boundaries of the site. Consideration should also be given for modern access to the trail for protected cultural and traditional purposes.

It appears that the site is located on the periphery of the project area, and OHA maintains a position that the site should be preserved through adjustment of the current project area and appropriate mitigation measures established.

Thank you for the opportunity to review and provide comment on the archaeological inventory survey fieldwork results, historic property significance evaluations, and proposed historic property treatment/mitigation for the Waimanalo Gulch Sanitary Landfill project area. Should you have any questions, please contact Keola Lindsey, Lead-Advocate-Culture at (808) 594-1904 or keolal@oha.org.

'O wau iho nō,

Clyde W. Nāmu'o
Administrator

Appendix C CSH Response to OHA

CULTURAL SURVEYS HAWAI'I
ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL DOCUMENTATION SERVICES - SINCE 1982

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Branch Offices:
Hilo, Hawai'i
Kona, Hawai'i
Lawai, Kaua'i

7 March 2008

Mr. Clyde W. Nāmu'o
Administrator
State of Hawai'i Office of Hawaiian Affairs (OHA)
711 Kapi'olani Boulevard, Suite 500
Honolulu, Hawai'i 96813

Subject: Proposed historic property treatment/mitigation for the Waimānalo Gulch Sanitary Landfill Expansion Project, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu TMK: [1] 9-2-003:073 por.

Cultural Surveys Hawaii, Inc (CSH). Job Code: HONOU 6

Aloha Mr. Nāmu'o:

Background to This Letter and Purpose

In a May 1st, 2007 letter to the Office of Hawaiian Affairs (OHA), CSH asked for cultural consultation regarding the archaeological inventory survey results, historic property significance evaluations, and proposed historic property treatment for the proposed Waimānalo Gulch Sanitary Landfill Expansion Project. This consultation was initiated pursuant to Hawai'i Administrative Rules (HAR) Chapter 13-276-5 and 13-275-6. OHA responded in a May 24th, 2007 letter, asking for additional cultural consultation with members of the Koa Mana organization, as well as Ms. Nettie Tiffany of Lani Ku Honua. Additionally, the letter queried whether or not subsurface testing was undertaken as part of the project's archaeological inventory survey. Finally, OHA's letter took the position that the single historic property documented in the project area, State Inventory of Historic Properties (SIHP) # 50-80-12-6903--three upright stones, should be preserved through adjustment of the current project area boundaries.

With this letter, CSH is responding to OHA's May 24th, 2007 letter, providing a response to OHA's request for information, and offering an update concerning CSH's on-going project-related cultural consultation with knowledgeable parties. Additionally, CSH is hereby seeking OHA's input regarding the proposed mitigation of SIHP # 50-80-12-6903.

Project Description

The landfill expansion area is located immediately *mauka* of the existing Waimānalo Gulch Sanitary Landfill. Waimānalo Gulch is generally located immediately inland of Farrington Highway, roughly between the Honokai Hale residential subdivision and Ko Olina Resort to the southeast, and the Hawaiian Electric Co.'s (HECO) Kahe Power Plant to the northwest. Please refer the to Figure 1 for area orientation.

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The proposed landfill expansion area is comprised of approximately 92.5-acres of undeveloped land within the Waimānalo Gulch Landfill property. The proposed landfill expansion area is to be used for the disposal of municipal refuse, H-POWER associated ash and residue, and operational activities associated with running the landfill. The landfill expansion is meant to increase the capacity and lifespan of the existing Waimānalo Gulch Sanitary Landfill. Minimally, land disturbing activities associated with the landfill expansion project would include: major grading, including blasting of exposed rock surfaces, and excavation of the base and walls of Waimānalo Gulch to prepare the expansion area for landfill use; grading for a perimeter road around the expansion area; excavations for stockpiling of sediment for use as cover material; excavations for associated landfill infrastructure; excavation for the installation of a storm water runoff control channel along the west side of the gulch; and filling of the expansion area with refuse material. The project's area of potential effect (APE) is defined as the entire proposed expansion area.

Archaeological Inventory Results and Description of SIHP # 50-80-12-6903

Background research confirmed that the 92.5-acre landfill expansion project area had been surveyed by CSH as part of an earlier archaeological inventory survey of Waimānalo Gulch (Hammatt and Shideler 1999). In early 2007, at the request of the project proponents, CSH completed additional archeological inventory survey investigation, including systematic pedestrian inspection and limited subsurface testing, of a 36-acre portion of the overall 92.5-acre APE that represents the core of the expansion area (refer to Figure 1 where the 36-acre survey area is shown in red and labeled the Expansion Area). For the investigation's pedestrian inspection there was a 10 to 15 meter interval between archaeologists (the general standard in Hawaii for archaeological inventory surveys). CSH's subsurface testing program for this project's archaeological inventory survey included the excavation of controlled test units in several natural rock shelters/overhangs that were noted in the project area. Although there were no surface indications of archaeological deposits in these natural features, this testing was carried out to determine if buried cultural deposits were present. No cultural deposits were found as a result of this subsurface testing.

The single historic property (SIHP # 50-80-12-6903) that was documented during the archaeological inventory survey was found near the southwest edge of the Waimānalo Gulch Sanitary Landfill expansion area (Figure 1). This resource is comprised of three rock uprights designated Features A-C, which, based on available information are naturally upright standing. These stone uprights rest on a steep southeast facing slope, are spaced 50-60 meters apart, and are situated on exposed outcrops (Figure 2). Feature A and Feature B are along the same outcrop, while Feature C is located on a higher outcrop upslope. This resource is interpreted as traditional Native Hawaiian, and may have functioned as trail or boundary markers. No additional feature components were observed near this location. In consultation with the State Historic Preservation Division (SHPD), this historic property is recommended eligible to the Hawai'i Register of Historic Places (Hawai'i Register) under criterion D, for its potential to yield information important in prehistory or history, and under criterion E, for its cultural significance to Native Hawaiians. This historic property is briefly described below and shown on the attached USGS topographic map and photograph (Figure 1 and Figure 2). Figures 3 and 4, a map and photograph respectively, show SIHP # 50-80-12-6903 as viewed from coastal Honouliuli.

SIHP # 50-80-12-6903 Feature A measures 1.20 m maximum length, 1.12 m maximum width, and 2.10 m maximum height. There appear to be no intentionally placed rocks surrounding the base of this upright.

The flat face of this stone is directed south. One surface of this stone is discolored and appears to have once rested on the ground (Figure 5 and Figure 6).

SIHP # 50-80-12-6903 Feature B measures 1.63 m maximum length, 0.75 m maximum width, and 1.78 m maximum height. The upright appears to have one or more stones at its western base, which may have been intentionally placed, however the majority of this upright's base rests in a natural area of exposed bedrock. Feature B is triangular in shape, forming a small point at its apex (Figure 7 and Figure 8).

SIHP # 50-80-12-6903 Feature C measures 2.3 m maximum length, 1.7 m maximum width, and 2.5 m maximum height. The upright is believed to be in a natural standing position. This upright has a natural crack in the east face, which may give it a feminine association (Figure 9 and Figure 10).

Summary of Consultation Effort

For the project's archeological inventory survey consultation effort, CSH is working with OHA, SHPD and knowledgeable cultural consultants. This effort is dove-tailed with the cultural consultation effort currently underway for the project's cultural impact assessment, which CSH is also preparing pursuant to HRS Chapter 343 and the Office of Environmental Quality Control's guidelines for assessing cultural impacts. Table 1 summarizes the individuals and organizations/agencies that have been consulted.

Table 1. Cultural and/or Agency Consultants

Name	Affiliation
Ailā , William	Hui Malāma I Nā Kūpuna
Amaral, Annelle	'Ahahui Siwila Hawai'i O Kapolei Hawaiian Civic Club
Cope, Aggie	Hale O Na'auao Society
Desoto, Frenchy	Wai'anae Coast Archaeological Preservation Representative
Davan, Teresa	O'ahu Island Archaeologist, SHPD
Eaton, Arline	*Kupuna* at Iroquois Elementary School
Enos, Eric	Cultural practitioner and director of Ka'ala Farms
Flanders, Judith	Granddaughter of Alice Kamōkila Campbell
Greenwood, Alice	O'ahu Island Burial Council Member, Wai'anae District
Ho'ohuli, "Black" Jo	Wai'anae Neighborhood Board No 24
Rezentes, Cynthia	Wai'anae Neighborhood Board No 24
Johnson, Adam	Former Oahu Island Archaeologist, SHPD
Johnson, Rubellite	Hawaiian scholar
Josephides, Analu	O'ahu Island Burial Council Member, Wai'anae District
Kanahele, Kamaki	President of Nānākuli Homestead Association
Kane, Shad	Member of the Makakilo, Kapolei, Honokai Hale Neighborhood Board and 'Ahahui Siwila Hawai'i O Kapolei Hawaiian Civic Club
Kila, Glenn	Koa Mana
Makaiwi, Martha	Makakilo, Kapolei, Honokai Hale Neighborhood Board No. 34

McKeaque, Kawika	O'ahu Island Burial Council member 'Ewa District
Momoa, Joseph	Kama'āina of Nānākuli and member of Kamo'i Canoe Club
Morawski, Lauren	O'ahu Island Archaeologist, SHPD
Nāmu'o, Clyde	Administrator at Office of Hawaiian Affairs
Paik, Kaleo	Culture and Historic Branch, SHPD
Philpotts, McD	Cultural practitioner and long time resident of Waimānalo 'Ili
Silva, Alika	Koa Mana
Tiffany, Nettie	Kahu of Lanikūhonua and Former O'ahu Island Burial Council member, 'Ewa District
Timson, Maeda	Member of the Makakilo, Kapolei, Honokai Hale Neighborhood Board No. 34 and President of Ua Au O Kapolei

This consultation effort has included several on-site, at the SIHP # 50-80-12-6903 location, meetings that included SHPD personnel (Mr. Adam Johnson, Ms. Teresa Davan, Ms. Linda Kaleo Paik, and Ms. Lauren Morawski), as well as knowledgeable cultural consultants, including Mr. McD Philpotts, Mr. Alika Silva, Mr. Glen Kila, Mr. Shad Kane, Mr. William Ailā, and Mr. Eric Enos. Through this consultation CSH has sought the opinions of cultural consultants regarding the age, function, cultural affiliation, and significance of the three stone uprights.

All cultural consultants felt the stones were significant Native Hawaiian cultural resources that were used in the past by traditional Hawaiian cultural practitioners. There is no clear consensus, however, regarding the specific function of the upright stones. Potential functions discussed included trail markers, markers for observation points for celestial observation and/or navigation, or markers used to calculate the location of specific coastal and/or off-shore resources. Potential mitigation measures for the stones, including preservation in place and relocation, were discussed with these cultural consultants during the on-site meetings.

Proposed Mitigation

It is the position of the project proponents (the City and County of Honolulu) that, as the only municipal landfill site on the island of O'ahu, the continued use of the Waimānalo Gulch facility is of utmost importance to the health and safety of the island's population. The expansion of the existing Waimānalo Gulch facility is crucial to the facility's continued operation over the next decades. After weighing the options, the project proponents have determined that the three stones that make up SIHP # 50-80-12-6903 cannot be preserved in place in a safe and appropriate manner.

Preservation in place would require a significant reduction of the overall area and volume of the proposed facility expansion. Additionally, with the proposed blasting, mass grading, and excavation in the vicinity of the stones, the safety of the stones cannot be guaranteed if they were preserved in place. For example, refer to Figure 11, which shows the stones' proximity to the large storm water drainage channel and Cell E6, immediately above and below the stones' location. The blasting, mass grading, and excavation associated with the installation of these needed landfill features would subject the stones to repeated vibration and blasting debris over the next approximately 15 years as the landfill expansion progressed. The vibrations from blasting and mass grading would potentially be sufficient to dislodge the stones from

their current resting place, causing them to roll down the steep slope they rest on. Finally, considering the use of the site as a landfill, preservation in place is not thought to be an appropriate mitigation treatment for the stones, considering their cultural sensitivity.

The project proponents propose the relocation of the three SIHP # 50-80-12-6903 stones to Battery Arizona, located in the southwestern portion of the Waimānalo Gulch facility (refer to Figure 1). There is a precedent for this relocation as three noteworthy stones of cultural significance to Native Hawaiians have already been relocated to the Battery Arizona site from the expanding Waimānalo Gulch Landfill. These stones, described by Hammatt and Shideler (1999), were relocated to the Battery Arizona site in 1988. Figure 12 shows the location of this already established stone repository in relation to the Battery Arizona features. Figures 13 and 14 are photographs, showing the proposed relocation area for SIHP # 50-80-12-6903 along the southeast facing slope at Battery Arizona and in relation to the already established stone repository. The proposed relocation would ensure the safety of the stones during the landfill's expansion and would make them much more accessible to interested parties.

The specifics of the proposed stone relocation would be the subject of the project's mitigation plan for SIHP # 50-80-12-6903. These specifics would be worked out through further consultation with cultural consultants. There is the option of putting the stones back near their original resting places. Figure 15 is a modified photograph that shows approximately what this would look like from coastal Honouliuli. This relocation could only take place after that portion of the landfill had been filled, most likely in approximately 15 years. The permanent relocation of the stones to Battery Arizona is another, more feasible mitigation option.

Versions of this consultation letter will be sent to SHPD and the cultural consultants that made site visits to the project area. Along with OHA's response, the archaeological inventory survey report will summarize the input from these cultural consultants.

Thank you very much for your assistance with this matter. Please contact me with any questions.

Sincerely,
Cultural Surveys Hawaii, Inc.

Matt McDermott
Projects Manager, Cultural Surveys Hawaii, Inc.
P. O. Box 1114
Kailua, Hawaii 96734
Tel. (808) 262-9972
Fax. (808) 262-4950
mmcdermott@culturalsurveys.com

C: Mr. Keola Lindsey, OHA; Ms. Linda Kaleo Paik and Ms. Lauren Morawski, SHPD

Hammatt, Hallett H. and David Shideler
1999 *An Archaeological Inventory Survey for the Waimānalo Gulch Sanitary Landfill Project Site, Honouliuli, 'Ewa, O'ahu.* Cultural Surveys Hawaii, Inc. Kailua, HI.

Attachments:

Figure 1. Portion of the 1998 'Ewa USGS 7.5-minute topographic quadrangle showing the Waimānalo Gulch property boundaries, the boundaries of the proposed 36-acre expansion area, the location of Features A, B, and C of SIHP # 50-80-12-6903, and the previously established stone repository at Battery Arizona.

Figure 2. Photograph of the southeast facing slope of Waimānalo Gulch, showing the locations of features A, B, and C of SIHP # 50-80-12-6903

Figure 3. Map showing the location from which the Figure 4 photograph was taken

Figure 4. Photograph of the SIHP # 50-80-12-6903 location, taken from coastal Honouliuli, view to the northeast (refer to Figure 3), showing the stones' visibility from the coast

Figure 5. SIHP # 50-80-12-6903 Feature A, Photograph of face of rock upright, view to the north

Figure 6. SIHP # 50-80-12-6903 Feature A Photograph of side profile of rock upright, view to the south

Figure 7. SIHP # 50-80-12-6903 Feature B, Photograph of face of rock upright, view to the northwest

Figure 8. SIHP # 50-80-12-6903 Feature B, Photograph of side profile of rock upright, view to the south

Figure 9. SIHP # 50-80-12-6903 Feature C, Photograph of side profile of rock upright, view to the

Figure 10. SIHP # 50-80-12-6903 Feature B, Photograph of side profile of rock upright, view to the southwest

Figure 11. Three-dimensional graphic showing the proposed landfill expansion in relation to the three stones of SIHP # 50-80-12-6903. Note the large drainage channel upslope of the stones and the cell E6 immediately down slope

Figure 12.Aerial photograph of Battery Arizona, refer to Figure 1 for its location within the project area, showing the established stone repository and the proposed relocation area for SIHP # 50-80-12-6903

Figure 13. Photograph, view to the south, of the proposed relocation area at Battery Arizona for SIHP # 50-80-12-6903

Figure 14. Photograph, view to the north, of the proposed relocation area at Battery Arizona for SIHP # 50-80-12-6903

Figure 15. Altered photograph showing the planned landfill surface topography in 15 years. The potential SIHP # 50-80-12-6903 relocation site, on top of the new landfill surface, is shown

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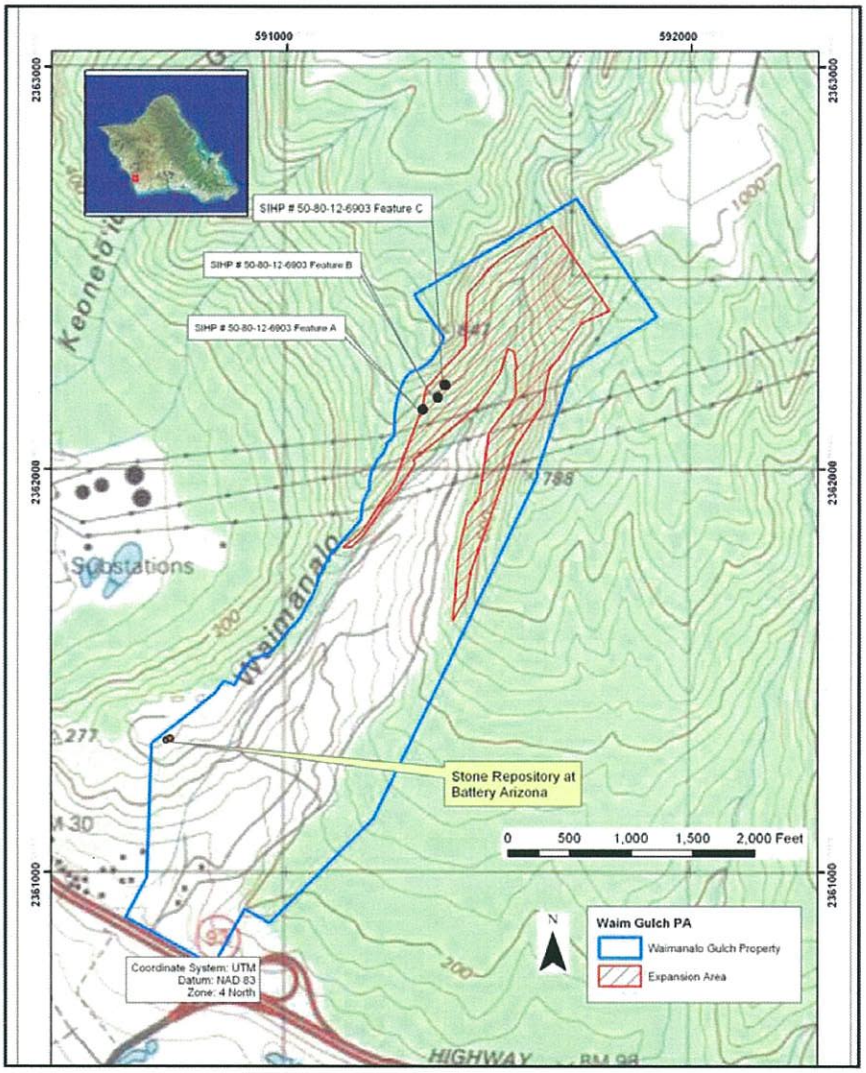

Figure 1. Portion of the 1998 'Ewa USGS 7.5-minute topographic quadrangle showing the Waimānalo Gulch property boundaries, the boundaries of the proposed 36-acre expansion area, the location of Features A, B, and C of SIHP # 50-80-12-6903, and the previously established stone repository at Battery Arizona.

Proposed historic property treatment/mitigation for the Waimānalo Gulch Sanitary Landfill Expansion Project, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu TMK: [1] 9-2-003:073 por.

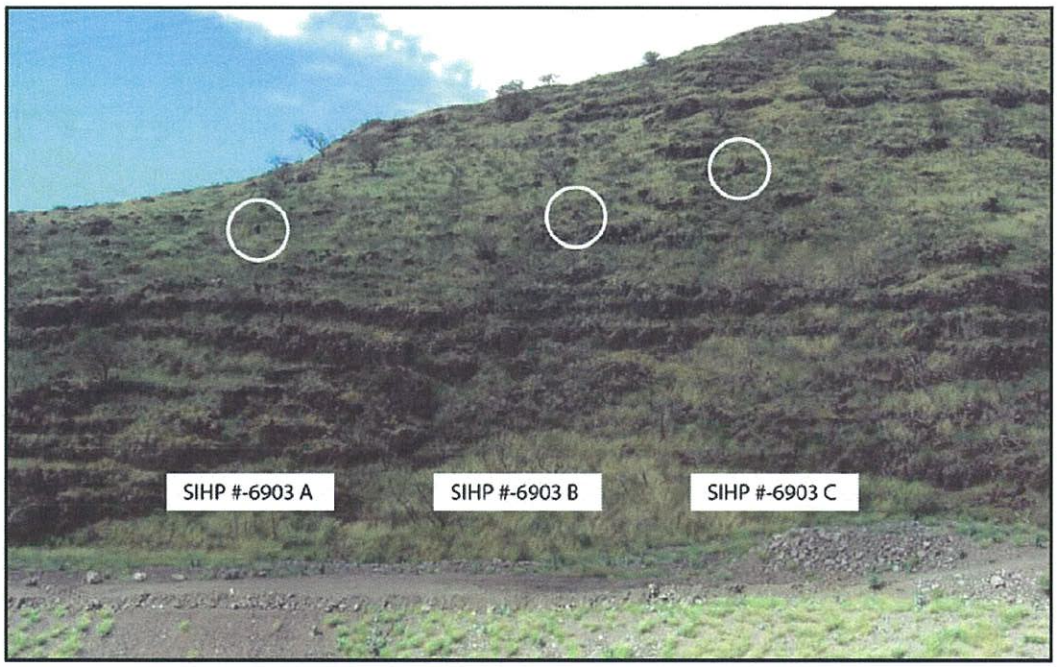

Figure 2. Photograph of the southeast facing slope of Waimānalo Gulch, showing the locations of features A, B, and C of SIHP # 50-80-12-6903

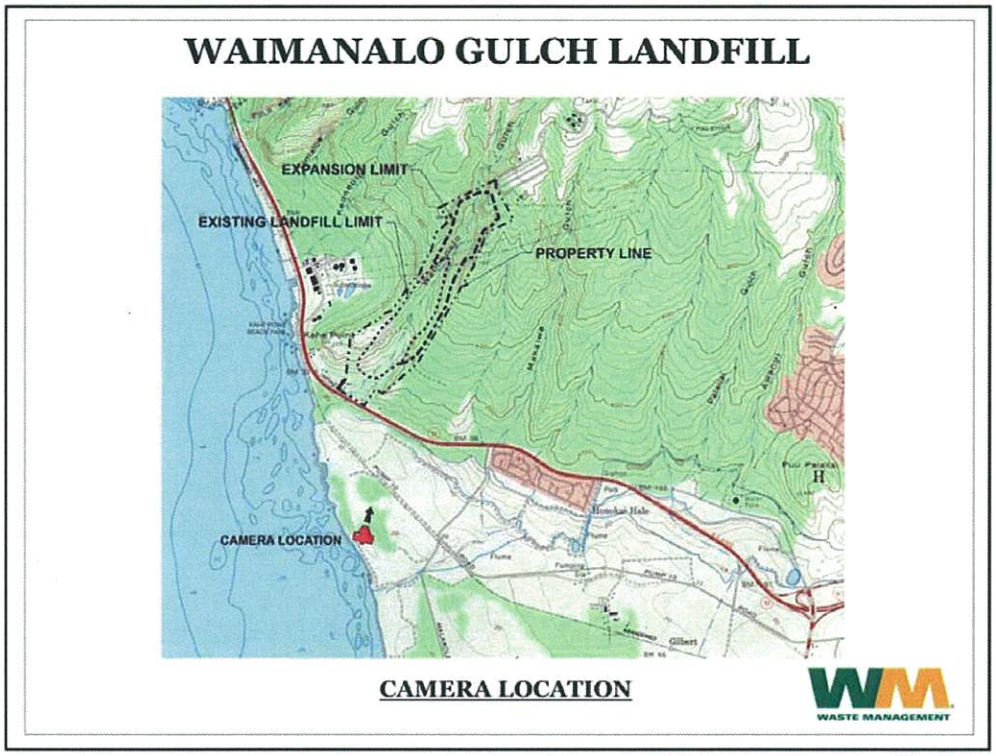

Figure 3. Map showing the location from which the Figure 4 photograph was taken

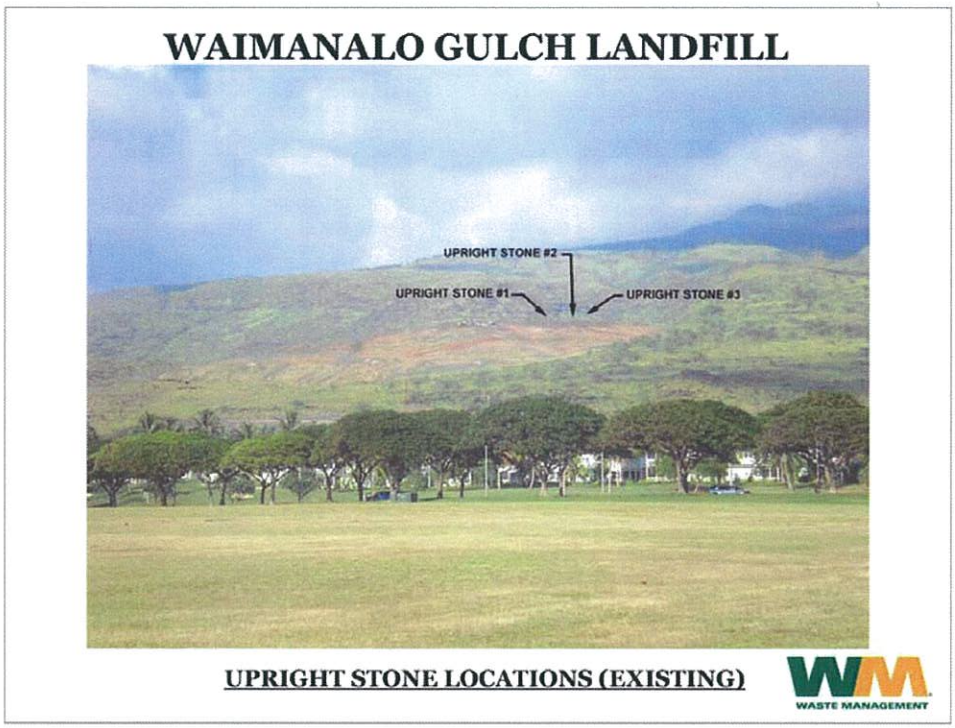

Figure 4. Photograph of the SIHP # 50-80-12-6903 location, taken from coastal Honouliuli, view to the northeast (refer to Figure 3), showing the stones' visibility from the coast

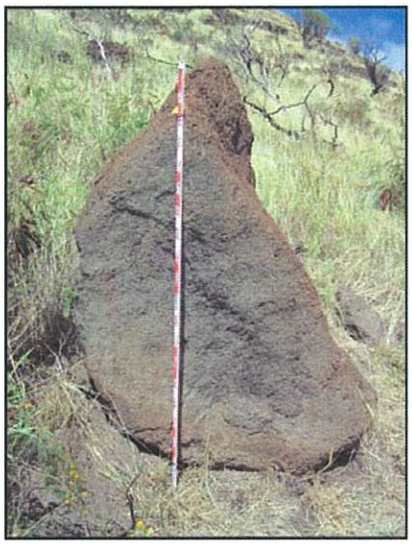

Figure 5. SIHP # 50-80-12-6903 Feature A, Photograph of face of rock upright, view to the north

Figure 6. SIHP # 50-80-12-6903 Feature A Photograph of side profile of rock upright, view to the south

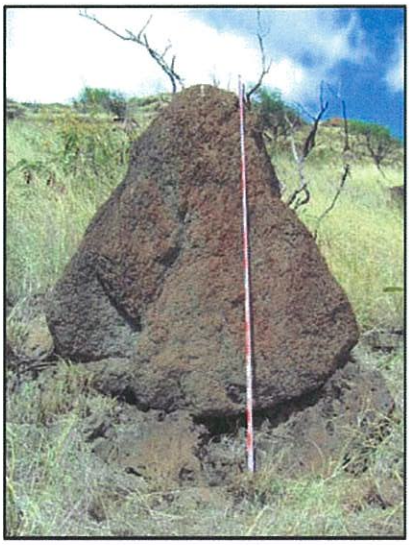

Figure 7. SIHP # 50-80-12-6903 Feature B, Photograph of face of rock upright, view to the northwest

Figure 8. SIHP # 50-80-12-6903 Feature B, Photograph of side profile of rock upright, view to the south

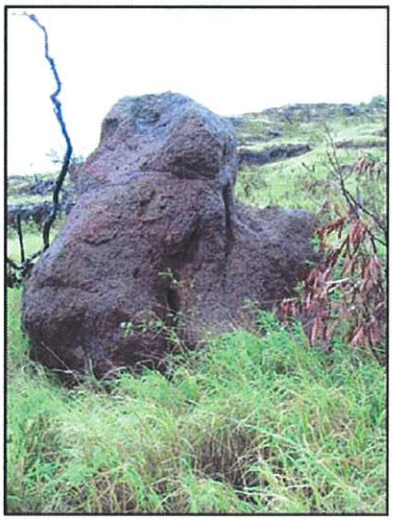

Figure 9. SIHP # 50-80-12-6903 Feature C, Photograph of side profile of rock upright, view to the west

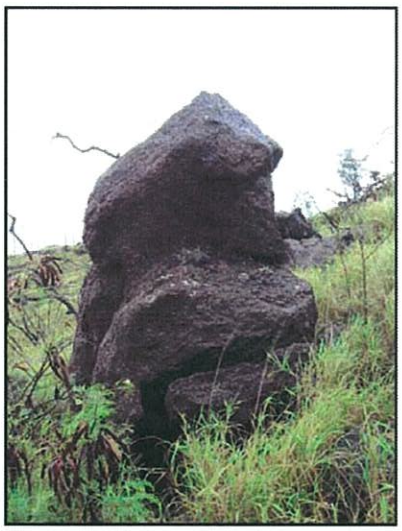

Figure 10. SIHP # 50-80-12-6903 Feature B, Photograph of side profile of rock upright, view to the southwest

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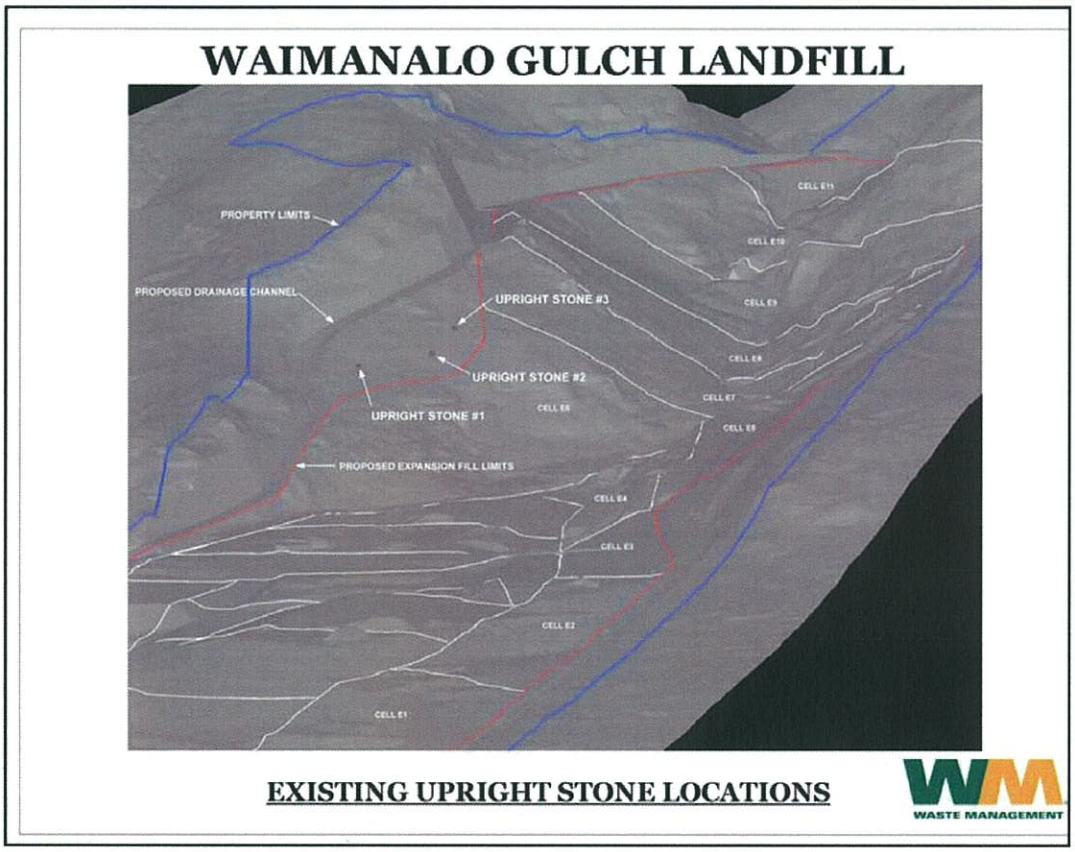

Figure 11. Three-dimensional graphic showing the proposed landfill expansion in relation to the three stones of SIHP # 50-80-12-6903. Note the large drainage channel upslope of the stones and the cell E6 immediately down slope

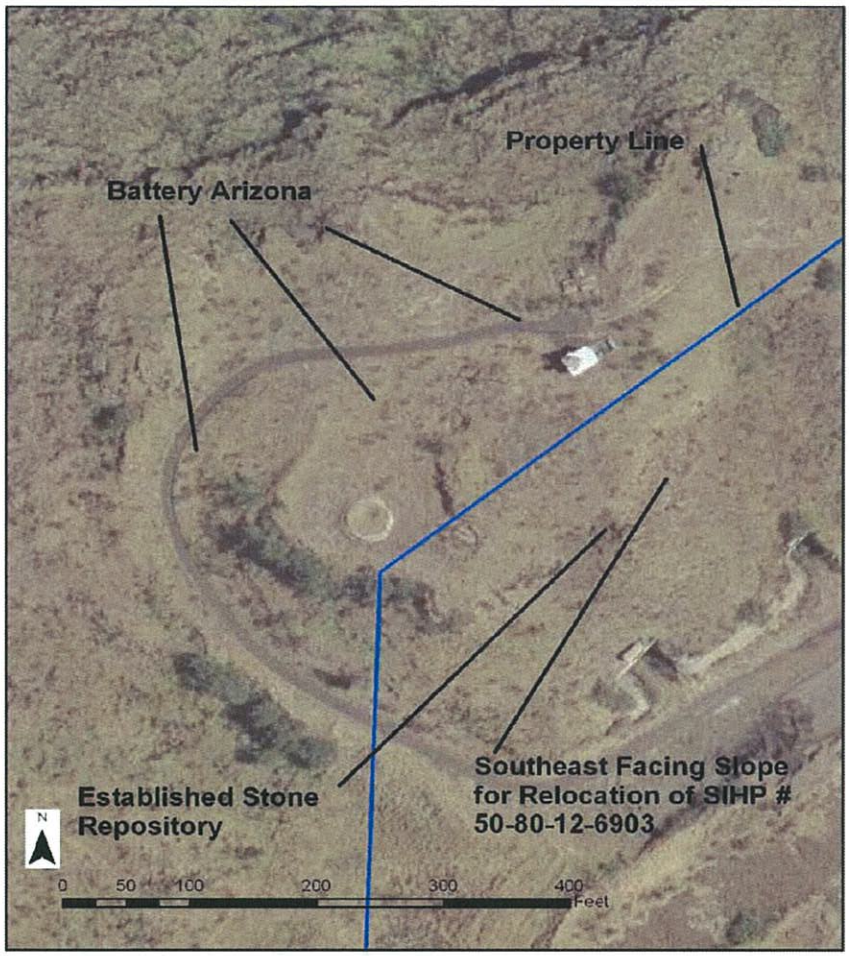

Figure 12. Aerial photograph of Battery Arizona, refer to Figure 1 for its location within the project area, showing the established stone repository and the proposed relocation area for SIHP # 50-80-12-6903

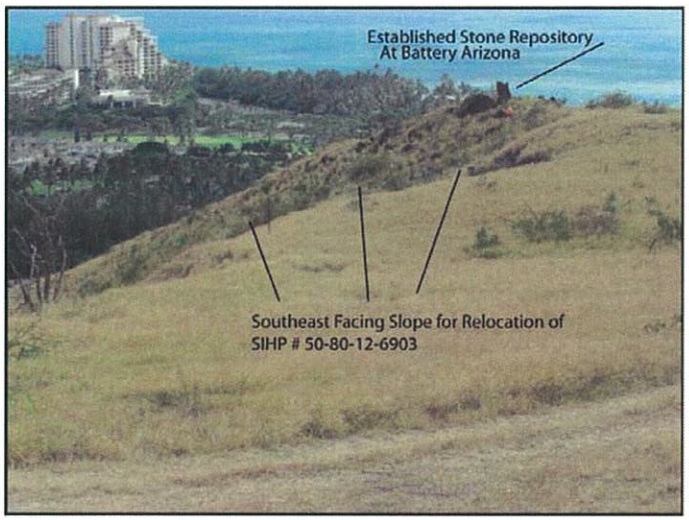

Figure 13. Photograph, view to the south, of the proposed relocation area at Battery Arizona for SIHP # 50-80-12-6903

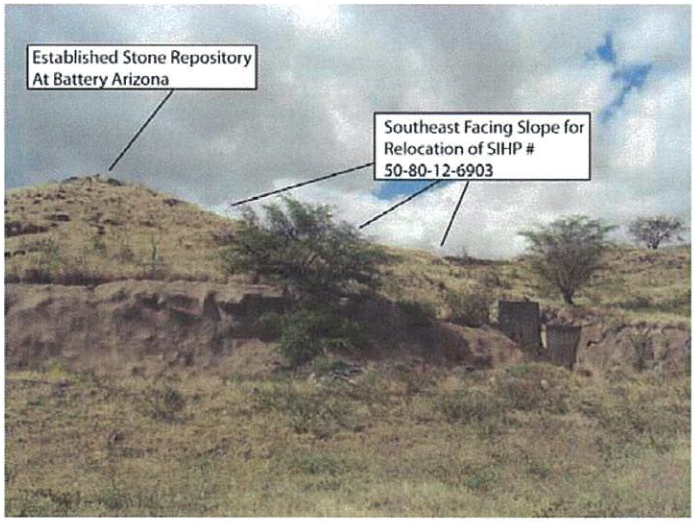

Figure 14. Photograph, view to the north, of the proposed relocation area at Battery Arizona for SIHP # 50-80-12-6903

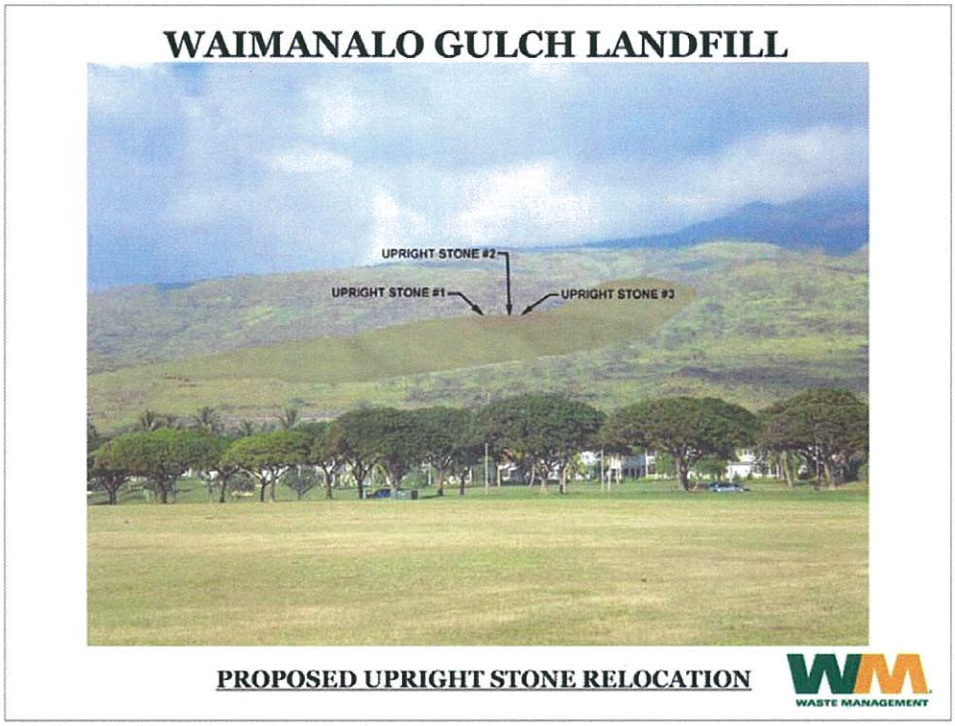

Figure 15. Altered photograph showing the planned landfill surface topography in 15 years. The potential SIHP # 50-80-12-6903 relocation site, on top of the new landfill surface, is shown

Appendix H

Cultural Impact Assessment
Waimānalo Gulch Landfill Expansion Project, 2008

A Cultural Impact Assessment for the Waimānalo Gulch Landfill Expansion Project Waimānalo ʻIli, Honoʻuliʻuli Ahupuaʻa, ʻEwa District TMK: [1] 9-2-003:073 por.

Prepared for

R. M. Towill Corporation

Prepared by

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Management Summary

Reference	Cultural Impact Assessment for the Waimānalo Gulch Sanitary Landfill Expansion Project, Hono'uli'uli Ahupua'a, 'Ewa District, Island of O'ahu (TMK: [1] 9-2-003:073 por.) (Souza, Uyeoka, Shideler and Hammatt 2008)
Date	April 2008
Project Number(s)	HONOU 7 (and companion Archaeological Inventory Survey HONOU 6)
Project Location	The proposed project area is located *mauka* (inland) and northeast of the existing Waimānalo Gulch Sanitary Landfill, just inland of Farrington Highway; between the Honokai Hale residential subdivision and Ko Olina Resort to the southeast, and the Kahe Power Plant to the northwest. This area is depicted on the 1998 'Ewa USGS 7.5 minute topographic quadrangle.
Land Jurisdiction	City and County of Honolulu
Agencies	City and County Department of Environmental Services, State Historic Preservation Division (SHPD)
Project Description	The proposed landfill expansion is meant to increase the capacity and lifespan of the existing Waimānalo Gulch Sanitary Landfill. Planned construction includes: major grading and excavation of the base and walls of Waimānalo Gulch to prepare the expansion area for landfill use; grading for a perimeter road around the expansion area; excavations for stockpiling of sediment for use as cover material; excavations for associated landfill infrastructure; and filling of the expansion area with refuse material.
Project Acreage	Approximately 90 acres, of which approximately 36 acres will be used as the actual foot print of the landfill cells used for refuse.
Document Purpose	This project requires compliance with the State of Hawai'i environmental review process [Hawai'i Revised Statutes (HRS) Chapter 343], which requires consideration of a proposed project's effect on cultural practices. At the request of R.M. Towill Corporation, CSH undertook this Cultural Impact Assessment (CIA). Through document research and cultural consultation efforts this document provides information pertinent to the assessment of the proposed project's impacts to cultural practices (per the OEQC's Guidelines for Assessing Cultural Impacts). The document is intended to support the project's environmental review and may also serve to support the project's historic preservation review under HRS Chapter 6E-8 and Hawai'i Administrative Rules (HAR) Chapter 13-275.
Consultation Effort	Twenty-one (21) Hawaiian organizations, agencies and community members contributed specific knowledge of and / or concerns about the project area and vicinity. The organizations consulted included the State Historic Preservation Division (SHPD), the Office of Hawaiian Affairs (OHA), the O'ahu Island Burial Council (OIBC), Wai'anae Neighborhood Board, The Cultural Learning Center at Ka'ala, Wai'anae Elders and Nānāikapono Hawaiian Civic Club. Site visits were conducted with McD Philpotts, Shad Kane, William Ailā and Eric Enos. Seventeen (17) individuals contributed specific information via formal interviews, informal "talk story" discussion and / or email. One person (McD Philpotts) was formally interviewed for this project (see Appendix B). One person (Shad Kane) was previously interviewed during a prior (2002) CIA for an earlier version of the subject project (see Appendix A, used with permission from Shad Kane).

Cultural Impact Results	Background research for this CIA yielded the following results: (1) The nearest main settlement areas in pre-Contact and early historic times were located *makai* (seaward) of the project area along the coast at Ko'olina and Kalaeloa. The project area is a transitional zone between the *mauka* (upland) resources of the mountains and the *makai* resources of the coast and ocean; and it also marks the boundary between Wai'anae and 'Ewa Moku (traditional districts). The main trail from Pu'uloa (Pearl Harbor area) to Wai'anae runs just below the project area near the existing Farrington Highway. Other trails followed the ridges defining either side of Waimānalo Gulch. (2) The subject project area is associated with numerous named *pu'u* (hills and mountains) in the general vicinity, all of which are associated with specific *mo'olelo.* (3) There are a few specific *mo'olelo* (oral histories) about Waimānalo 'Ili dealing with the marking of the boundary between Wai'anae and 'Ewa at Pili o Kahe. (4) There are dozens of specific *mo'olelo* about Hono'uli'uli Ahupua'a dealing with gods and demi-gods such as Kāne, Kanaloa, Pele, Pele's sister Hi'iaka, Pele's sister Kapo (as in Kapo-lei), Māui, Kamapua'a (pig god), Maunauna (shark deity), Ka'ahupāhau, and Palila; with chiefly lineages and references to the ruling chiefs Hilo-a-Lakapu, Kūali'i, and Kākuhihewa; and with connections to other parts of O'ahu (e.g., Wai'anae). Community consultation yielded the following results: (1) Many participants talked about the project area as a pathway for *huaka'i pō* (the night marchers) as they move between the mountains and the sea; preservation of the view plane of this pathway from *mauka* to *makai* is important to many people. (2) Several participants made site visits to a group of several large *pōhaku* (stones) located in the project area (designated State Inventory of Historic Properties [SIHP] No. 50-80-12-6903); although no specific cultural information or associated *mo'olelo* was shared by participants about this site at this time, there is general agreement that the *pōhaku* should be protected from harm. (3) At least one participant is concerned about several caves and rock overhangs located in the northwest portion of the project area (documented in detail by Dalton and Hammatt 2008), although archaeological investigations of these by CSH indicated they contain no cultural materials, burials, or human remains. (4) Participants provided new *mo'olelo* about Waimānalo Gulch for which no previous written documentation has been found, including stories and legends about the Spirits *('Uhane*), the "Legend of the Slain Girl," the "Legend of Two Giants," and associations with the Pueo 'Aumakua (Owl Family Deity).

Cultural Impact Recommendations	Based on the results of this CIA, CSH recommends the following actions in order to address the concerns raised by community members: (1) Should removal of the *pōhaku* designated SIHP # 50-80-12-6903 be necessary, it should be conducted in a culturally sensitive manner with a cultural monitor given the opportunity to carry out appropriate protocols. Several participants agree the *pōhaku* should be removed from their original locations during construction, then later reunited with their former locations and preserved in place. A preservation plan should guide all aspects of the movement of these *pōhaku*, as well as their temporary storage and care, and return to their original locations. Community members should be involved in this process. (2) The traditional view of the Hawaiian landscape as a continuum should be taken into consideration during the planning process. (3) Several community members believe it is important to keep the pathway of the *pōhaku* (night marchers) clear of visual and / or structural blockage from *mauka* to *makai* on the east ridge of Waimānalo Gulch. CSH recommends this topic should be addressed in greater detail through further consultation with the community. (4) Six caves and rock overhangs in the northwestern portion of the project area documented by CSH during archaeological inventory survey (Dalton and Hammatt 2008) yielded no significant cultural material. However, at least one community participant (see Table 2) has voiced concerns about possible disturbances to burials in these caves. CSH recommends cultural monitoring of any proposed disturbance to these caves by qualified native Hawaiians familiar with the project area. (5) Although the land has been dramatically altered, there remains a possibility that burials and other archaeological sites may be present in and around the proposed project area. Efforts need to be made to insure adequate archaeology and cultural monitoring are conducted at this project site. In addition to this cultural impact assessment, CSH is conducting an Archaeological Inventory Survey for this project area that was ongoing at the time of this report's completion (Dalton and Hammatt 2008); its findings and recommendations should be faithfully carried out in accordance with applicable laws and administrative rules governing historic preservation work in the State of Hawai'i. (6) CSH recommends that consultation with community members continue throughout the planning process. Addressing these cultural concerns is part of the City and County of Honolulu's "good faith" effort to minimize the impact of the proposed project on Hawaiian culture, its practices and traditions. (7) The consultation results contained in this CIA, which refer specifically to the 36-acre area of the landfill proper, will be augmented and expanded prior to preparation of the Final Environmental Impact Statement. The individuals and agencies listed in Table 2 will be contacted again with the new information about the larger project area.

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Section 1 Introduction

1.1 Project Background

At the request of R.M. Towill Corporation, on behalf of the City and County of Honolulu Department of Environmental Services/Refuse Division, Cultural Surveys Hawai'i Inc. (CSH) conducted a Cultural Impact Assessment (CIA) of the Waimānalo Gulch Sanitary Landfill Expansion Project, Waimānalo 'Ili, Hono'uli'uli Ahupua'a, 'Ewa District, O'ahu (TMK: 9-2-003: 073). The purpose of the CIA is to assess potential impacts to cultural practices and resources resulting from the future development of the proposed Landfill Expansion Project, which is intended to increase the capacity and lifespan of the existing Waimānalo Gulch Sanitary Landfill.

The proposed landfill expansion area is located immediately *mauka* (inland) and northeast of the existing Waimānalo Gulch Sanitary Landfill (Figures 1-4). Waimānalo Gulch is generally located immediately inland of Farrington highway, roughly between the Honokai Hale residential subdivision and Ko Olina Resort to the southeast, and the Hawaiian Electric Co.'s (HECO) Kahe Power Plant to the northwest. This area is depicted on the 1998 'Ewa USGS 7.5 minute topographic quadrangle.

The Waimānalo Gulch Sanitary Landfill was established in 1989; is owned by the City and County of Honolulu under the jurisdiction of the Department of Environmental Services/Refuse Division, and operated by Waste Management of Hawai'i. The landfill currently takes in roughly 500,000 tons of waste per year.

The project area is comprised of approximately 90 acres of currently undeveloped land within the Waimānalo Gulch Landfill property. The proposed landfill expansion area—that is, the total area to be used for the disposal of municipal refuse—comprises an approxiamtly 36-acre portion of the total 90-acre area. Portions of the remaining area outside of the 36-acre landfill site proper will be modified for drainage improvements, roads, and stockpile areas needed for continued use of the landfill. Minimally, land disturbing activities associated with the landfill expansion project would include: major grading and excavation of the base and walls of Waimānalo Gulch to prepare the expansion area for landfill use; grading for a perimeter road around the expansion area; excavations for stockpiling of sediment for use as cover material; excavations for associated landfill infrastructure; and filling of the expansion area with refuse material.

When the expansion project's CIA consultation was initiated, communication with the project proponents indicated that the proposed expansion area would be 36 acres—the same 36 acres that the project proponents were having surveyed as part of the project's archaeological inventory survey of the expansion area. For this reason, the initial project consultation letters describe the expansion area as approximately 36 acres. It was only later that CSH learned that the expansion area was actually approximately 90 acres. The 36 acres corresponds with the actual foot print of the landfill cells that will be created and used for refuse. Portions of the remaining approximately 90-acre expansion area will be used for the aforementioned appurtenances. Therefore, although the foot print of the proposed area to be disturbed is larger than the 36 acres indicated in the initla CIA consultation, the actual portion of the gulch to be used specifically as a landfill (36 acres) has not changed. The consultation results contained in

this CIA, which refer specifically to the 36-acre area of the landfill proper, will be augmented and expanded prior to preparation of the Final Environmental Impact Statement, as described and discussed in Section 5 (Results of the Community Contact Process).

1.1.1 Archaeological Inventory Survey

An archaeological inventory survey including a 100% coverage pedestrian inspection of the project area and limited subsurface testing at select locations is being conducted for the project area. The results of the archaeological study will be presented in a companion report titled, "Archaeological Inventory Survey for the Waimānalo Gulch Sanitary Landfill Expansion Project, Hono'uli'uli Ahupua'a, 'Ewa District, Island of O'ahu, TMK: [1] 9-2-003:073 por." (Dalton and Hammatt 2008).

1.2 Document Purpose

The purpose of this CIA is to consider the effects the proposed expansion of the Waimānalo Gulch Sanitary Landfill may have on traditional cultural practices and resources. The Hawai'i State Constitution, Article XII, Section 7 protects "all rights" of native Hawaiians that are "customarily and traditionally exercised for subsistence, cultural and religious purposes".

In 1997, the Office of Environmental Quality Control (OEQC) issued Guidelines for Assessing Cultural Impacts. The Guidelines discuss the types of cultural practices and beliefs that might be assessed.

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man-made and natural, including submerged cultural resources, which support such cultural practices and beliefs.

Most recently, H. B. No. 2895 was passed by the 20th Legislature, and approved by then Governor Cayetano as Act 50 on April 26, 2000. The bill acknowledges that:

> . . the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture. The legislature further finds that due consideration of the effects of human activities on native Hawaiian culture and the exercise thereof is necessary to ensure the continued existence, development, and exercise of native Hawaiian culture.

This bill issues a directive that " . . . environmental assessments or environmental impact statements should identify and address effects on Hawai'i's culture, and traditional and customary rights." The process for evaluating cultural impacts is constantly evolving. There continue to be gray areas and unresolved issues pertaining to traditional access and gathering rights. Act 50 is an attempt to balance the scales between traditional lifestyles and development and economic growth.

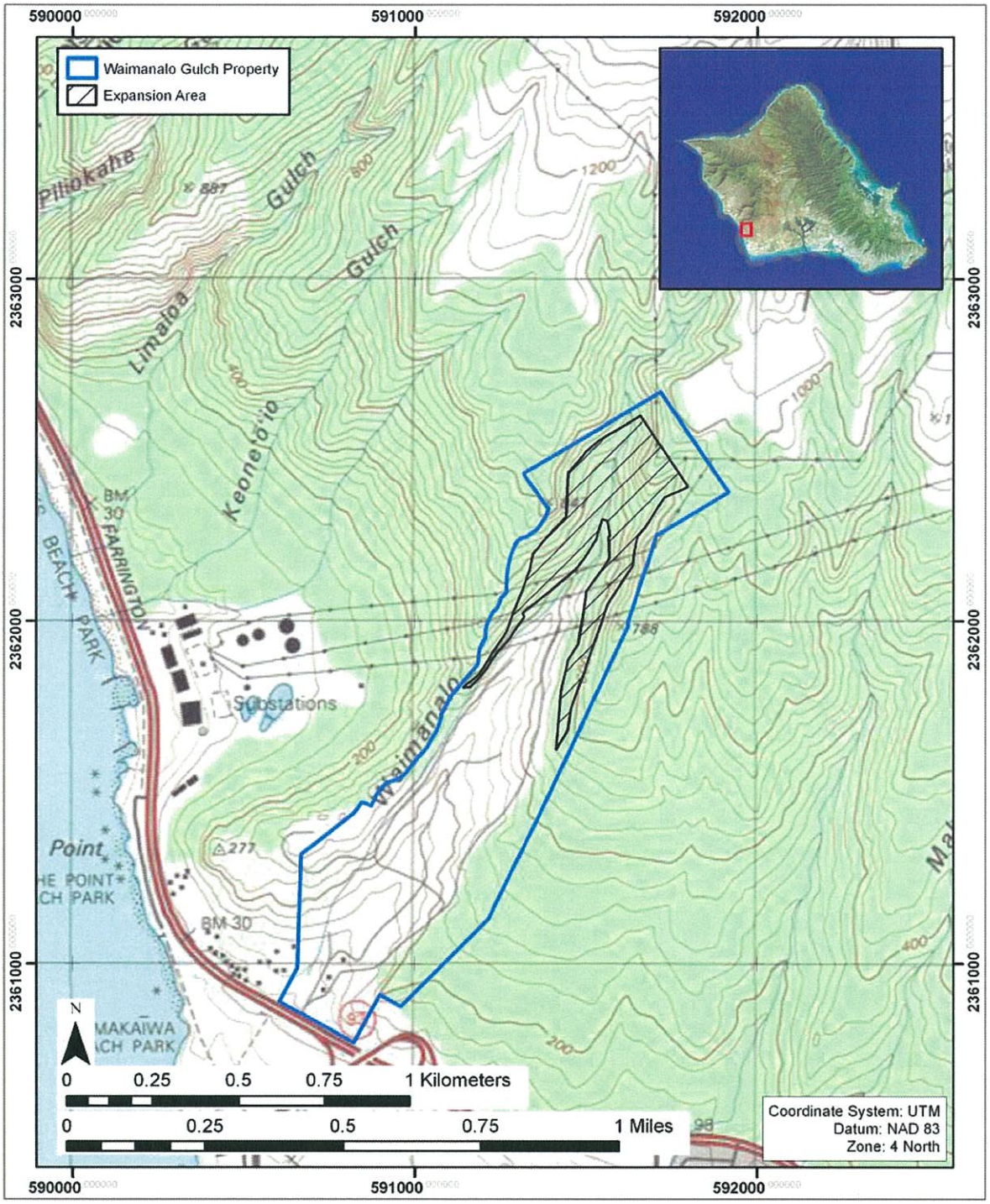

Figure 1. USGS 7.5 Minute Series Topographic Map, Ewa Quadrangle (1998), showing the location of the Waimānalo Gulch Sanitary Landfill property and the proposed expansion project area

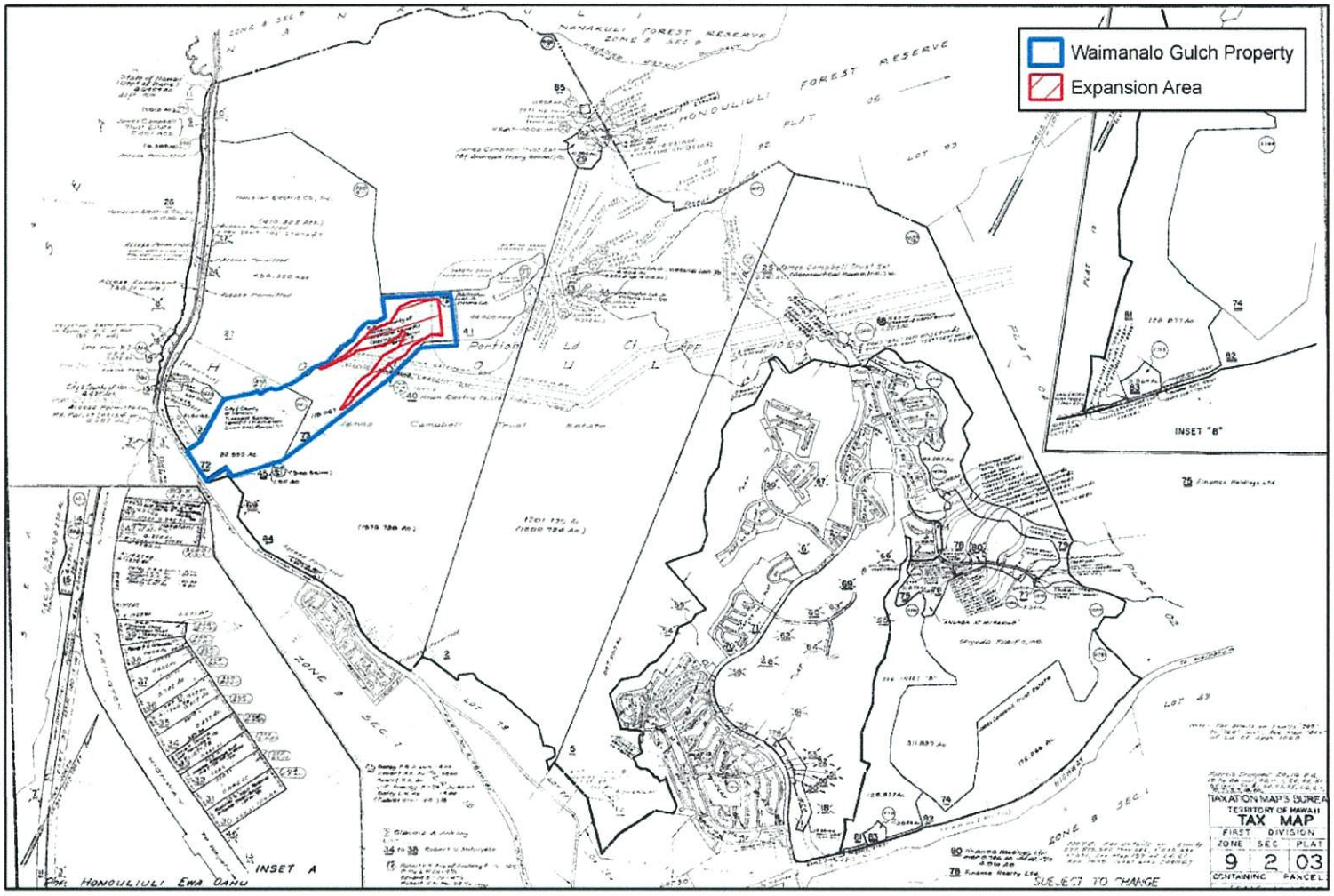

Figure 2. TMK 9-2-03 showing the location of the Waimānalo Gulch Sanitary Landfill property and the proposed expansion project area

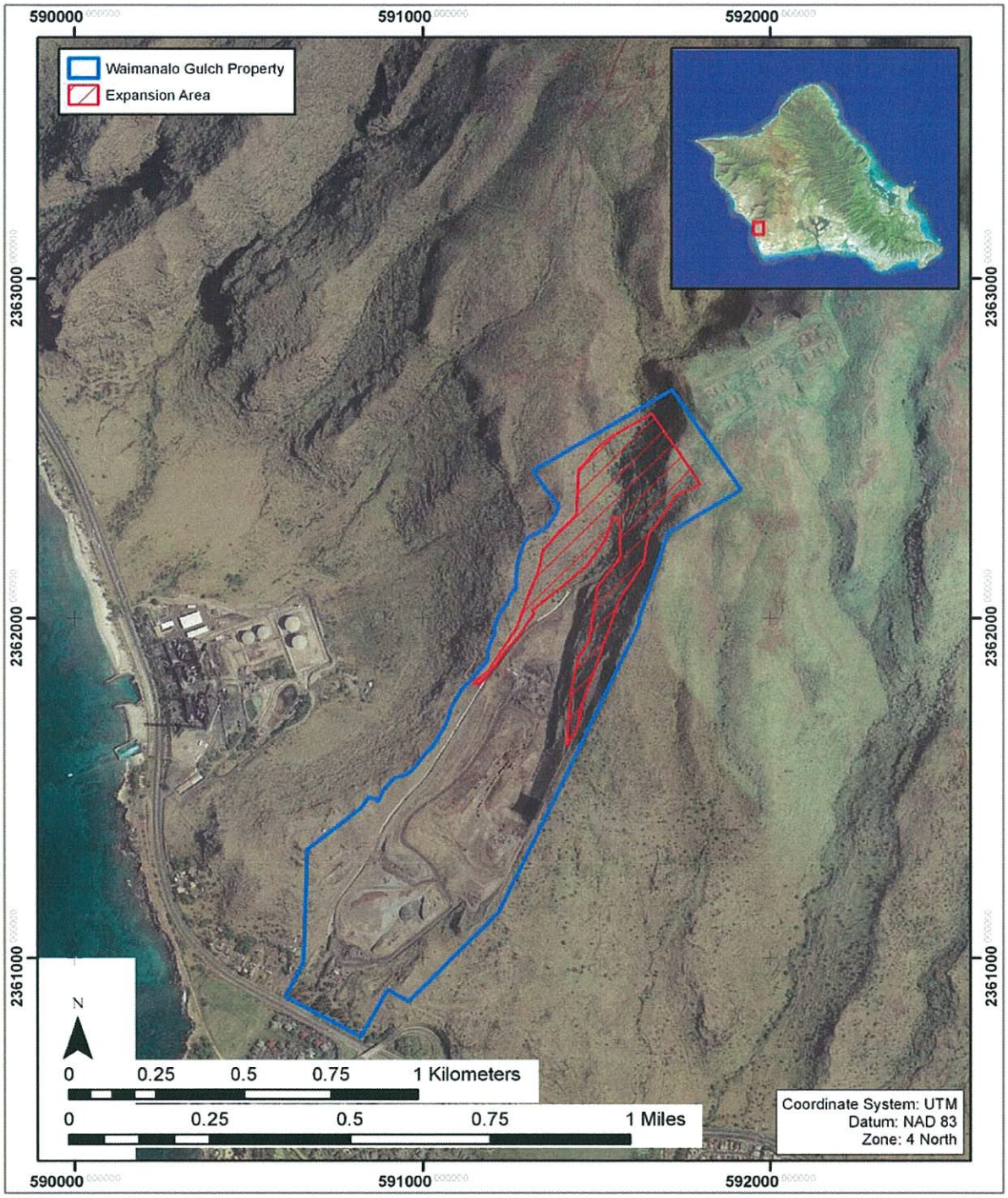

Figure 3. Aerial photograph showing the location of the Waimānalo Gulch Sanitary Landfill property and the proposed expansion project area (USGS Orthoimagery 2005)

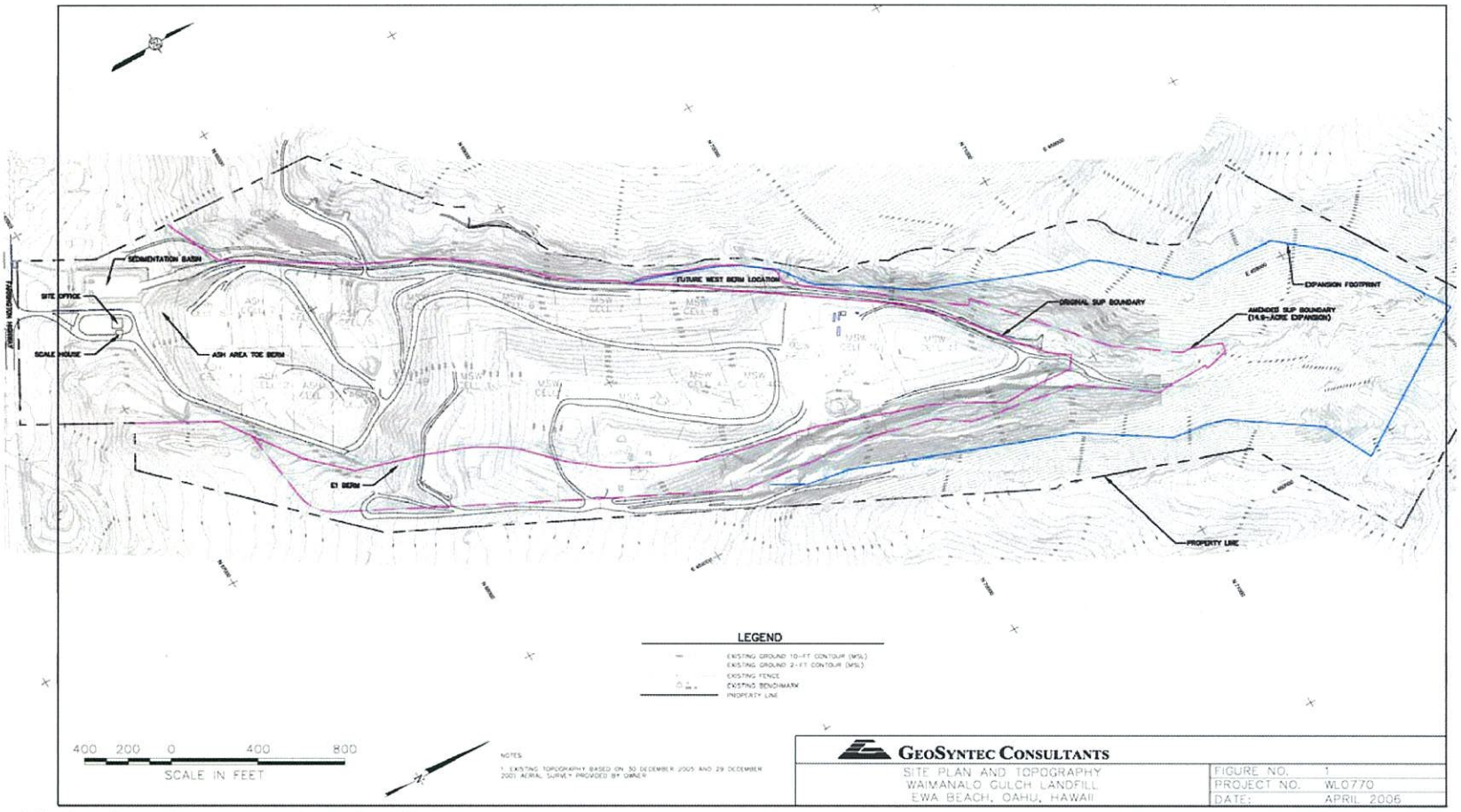

Figure 4. Site plan for the proposed Waimānalo Gulch Landfill Expansion project, showing the location of the existing landfill and proposed expansion area

This project requires compliance with the State of Hawai'i environmental review process [Hawai'i Revised Statutes (HRS) Chapter 343], which requires consideration of a proposed project's effect on cultural practices. At the request of R.M. Towill Corporation, CSH undertook this CIA. Through document research and cultural consultation efforts this document provides information pertinent to the assessment of the proposed project's impacts to cultural practices (per the OEQC's Guidelines for Assessing Cultural Impacts). The document is intended to support the project's environmental review and may also serve to support the project's historic preservation review under HRS Chapter 6E-8 and Hawai'i Administrative Rules (HAR) Chapter 13-275.

1.3 Scope of Work

The scope for the CIA includes:

1. Examination of historical documents, Land Commission Awards, and historic maps with the specific purpose of identifying Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits as may be indicated in the historic record.
2. A review of the existing archaeological information pertaining to the sites on the property as they may allow us to reconstruct traditional land use activities and identify and describe the cultural resources, practices and beliefs associated with the parcel and identify present uses, if appropriate.
3. Oral interviews with persons knowledgeable about the historic and traditional practices in the project area and region.
4. Preparation of a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The report will assess the impact of the proposed action on the cultural practices and features identified.

1.4 Methods

Historical documents, maps and existing archaeological information pertaining to the sites in the vicinity of this project were researched at the State Historic Preservation Division library, the Cultural Surveys Hawai'i library, and the University of Hawai'i's Hamilton Library. The Office of Hawaiian Affairs, O'ahu Island Burial Council, and members of other community organizations were contacted in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the study area and the surrounding vicinity. The names of potential community contacts were also provided by colleagues at CSH and from the researchers' familiarity with the families who live in the area. Some of the prospective community contacts were not available to be interviewed as part of this project. A discussion of the consultation process can be found in Section 5 (Results of the Community Contact Process). Please refer to Table 2 in Section 6 below for a complete list of individuals and organizations contacted.

Section 2 Project Area Description

2.1 Environmental Setting

2.1.1 Natural Environment

The proposed Waimānalo Gulch Landfill expansion area is located within the *mauka* portion of Waimānalo Gulch, in the southern foothills of the Wai'anae Mountain range. The project area is located 970 meters east of the coastline. Elevations within the proposed expansion area range from approximately 90-210 m (300-700 ft.) AMSL. Lands within the proposed expansion area generally consist of steep sloping gulch walls, with a dry stream channel at the base of the gulch. The stream channel is understood to only have running water during periods of heavy rainfall, which are relatively uncommon in the dry, leeward O'ahu. The proposed expansion area receives an average of approximately 600-700 mm (24-28 in.) of annual rainfall (Giambelluca et al. 1986).

Soils within the undeveloped portions of the Waimānalo Gulch Landfill property consist primarily of Rock Land (rRK), with a small area of Stony Steep Land (rSY) in the northeastern portion of the property. Soils within the proposed landfill expansion area consist entirely of Rock Land (rRK) (Foote et al. 1972) (Figure 5). Rock Land is described as "made up of areas where exposed rock covers 25 to 90 percent of the surface...rock outcrops and very shallow soils are the main characteristics" (Foote et al. 1972). Stony Steep Land is described as consisting of "a mass of boulders and stones deposited by water and gravity on side slopes of drainage-ways...stones and boulders cover 50 to 90 percent of the surface...there is a small amount of soil among the stones that provides a foothold for plants...rock outcrops occur in many places" (Foote et al. 1972).

With regards to the vegetation, Frierson (1972) suggests that prior to the introduction of exotic vegetation in 1790, the slopes of the Wai'anae Range extending down to about 150 m (500 ft.) elevation supported a dry forest of native trees and shrubs between an upper *'ōhi'a* wet forest and lower grassy savannah area. Frierson (1972:4) summarizes the following patterns suggested by J.F. Rock (1913) for the indigenous vegetation in the area prior to 1778:

a) Lowland zone - open grassland on the leeward side

b) Lower Forest - beginning about 1000 feet and richer in species than the rainforest: *kukui*, *'ōhi'a 'ai, koa, kalia*, sandalwood, *'ōhi'a lehua, hau, tī, ape, pia*, banana, ginger, birdnest fern and *honohono*, as well as grasses and cyperaceous plants.

c) Specifically leeward lower forest – *'ohe, wiliwili, maile, halapepe* and *alani*, with almost no undergrowth.

Historical accounts presented by Frierson (1972) describe these lower forest species as extending to 500 feet, with the presence of sandalwood observed down to as low as 300 feet. The lower forest then is hypothesized to have covered much of the current landfill expansion area. This was always a rain shadow slope and we may more accurately envisage a park land community rather than a thick forest in early Hawaiian times.

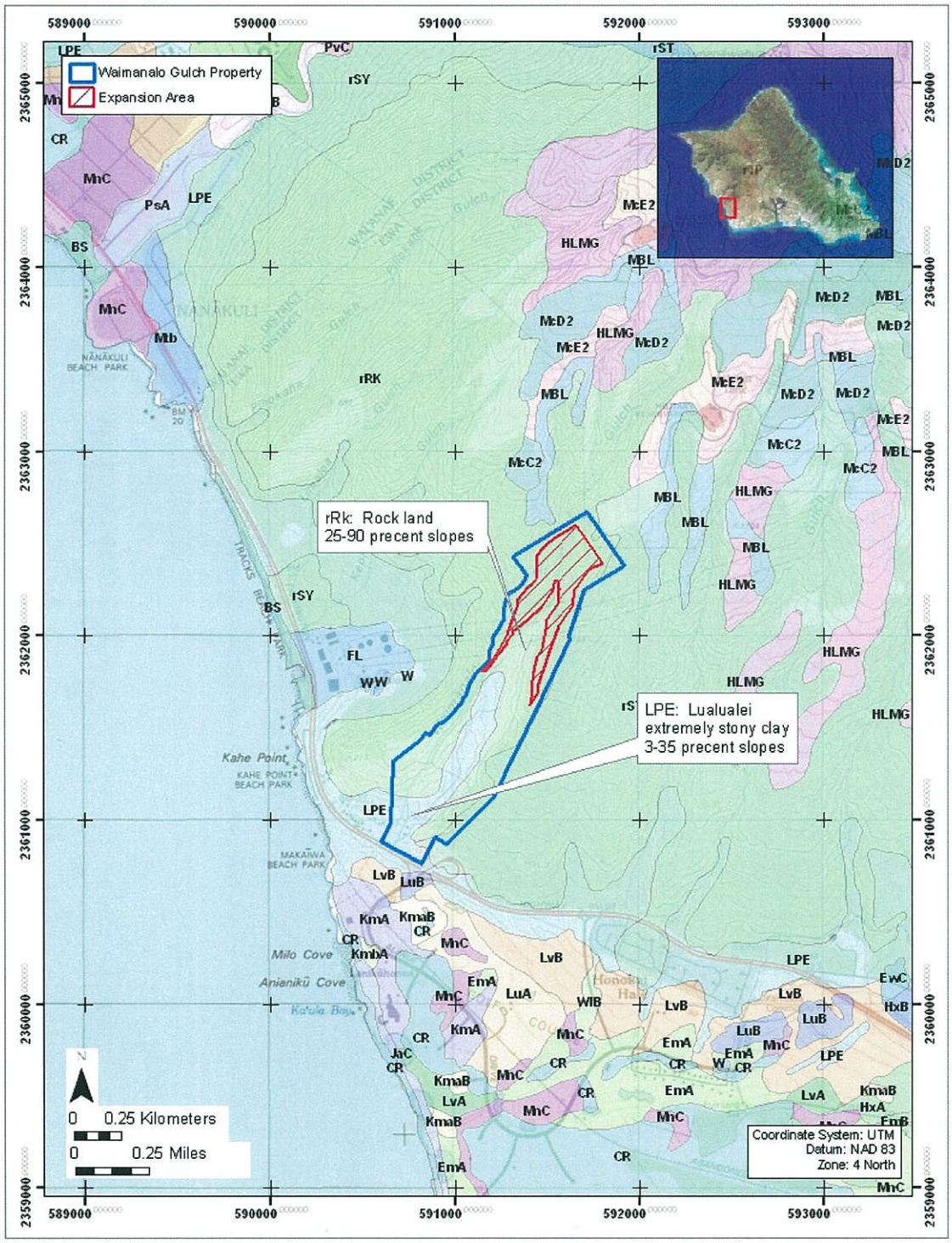

Figure 5. Waimānalo Gulch soils (http://soils.usda.gov/survey/printed_surveys/state.asp?state=Hawaii&abbr=HI)

The current vegetation in the project area is comprised mostly of scattered *koa haole* and various grasses. As a result of a relatively recent wildfire, the grasses within the project area have grown dense and thick, covering about 90% of the ground surface, making ground surface observation difficult throughout the project area.

2.1.2 Built Environment

Lands within the proposed landfill expansion area are currently undeveloped, with the exception of unpaved access roads. Lands within Waimānalo Gulch immediately *makai* (seaward) of the proposed expansion area consist of the active Waimānalo Gulch Sanitary Landfill, and include solid waste disposal sites and associated landfill infrastructure. *Makai* of the landfill site is the Ko Olina Resort, including a golf course and residential subdivision. West of the landfill site are the Kahe Point Homes residential subdivision and the HECO Kahe Power Plant. Lands to the east and north of the Waimānalo Gulch landfill are the undeveloped Makaīwa Hills and Pālehua areas.

Section 3 Traditional and Historic Background

3.1 Introduction to the Cultural Landscape

The project area is situated on the eastern side of the Wai'anae Mountains in Hono'uli'uli Ahupua'a (traditional land division) sub-divided into the *'ili* of Waimānalo in the *moku* or district of 'Ewa. Hono'uli'uli is the largest *ahupua'a* on the island of O'ahu. Hono'uli'uli includes all the land from the western boundary of Pearl Harbor (West Loch or Kaihuopala'ai) westward around the southwest corner of O'ahu to the 'Ewa/ Wai'anae District Boundary with the exception of the west side of the harbor entrance which is in the *ahupua'a* of Pu'uloa (the 'Ewa Beach/Iroquois Point area). Hono'uli'uli Ahupua'a includes approximately nineteen kilometers (twelve miles) of open coastline from One'ula westward to the boundary known as Pili o Kahe. The *ahupua'a* extends *mauka*, almost pie-shaped, from West Loch nearly to Schofield Barracks in Wahiawā; the western boundary is the Wai'anae Mountain crest running north as far as Pu'u Hapapa (or to the top of Ka'ala Mountain according to some).

Not only does Hono'uli'uli Ahupua'a include a long coastline fronting the normally calm waters of leeward O'ahu but there is also four miles of waterfront along the west side of West Loch. The land immediately *mauka* of the Pacific coast consists of a flat karstic raised limestone reef forming a level nearly featureless "desert" plain marked in pre-Contact times (previous to illuviation caused by sugar cultivation) by a thin or non-existent soil mantle. The micro-topography is notable in containing countless sinkholes caused by chemical weathering (dissolution) of the limestone shelf. Proceeding *mauka* from this limestone plain, this shelf is overlain by alluvium deposited through a series of gulches draining the Wai'anae Mountains. The largest of these is Hono'uli'uli Gulch towards the east side of the plain that drains into West Loch. To the west are fairly steep gradient gulches forming a more linear than dendritic drainage pattern. The major gulches are, from east to west: Awanui, Pālailai, Makaīwa, Waimānalo and Limaloa. These gulches are steep-sided in the uplands and generally of a high gradient until they emerge onto the flat 'Ewa plain. The alluvium they have carried has spread out in delta fashion over the *mauka* portions of the plain, which comprises a dramatic depositional environment at the stream gradient change. These gulches are generally dry, but seasonal Kona storms carry immense quantities of runoff onto the plain and into the ocean. As typical drainages in arid slopes they are either raging uncontrollably, or are dry and as such do not form stable water sources for traditional agriculture in their upper reaches. The Hono'uli'uli gulches, in contrast to those draining into Pearl Harbor to the east, do not have valleys suitable for extensive irrigated agriculture. However, the lack of suitable valleys is compensated for by the rich watered lowlands at the base of Hono'uli'uli Gulch (the *'ili* of Hono'uli'uli).

Hono'uli'uli Ahupua'a, as a traditional land unit, had tremendous and varied resources available for exploitation by early Hawaiians. The "karstic desert" and marginal characterization of the limestone plan, which is the most readably visible terrain, does not do justice to the *ahupua'a* as a whole. The richness of this land unit is marked by the following resources:

1) Twelve miles of coastline with continuous shallow fringing reef that offered rich marine resources.

2) Four miles of frontage on the waters of West Loch which offered extensive fisheries (mullet, *awa*, shellfish), as well as frontage suitable for development of fishponds (for example, Laulaunui)
3) The lower portion of Hono'uli'uli Valley in the 'Ewa plain offered rich level alluvial soils with plentiful water for irrigation from the stream as well as abundant springs. This land would have stretched well up the valley.
4) A broad limestone plain which because of innumerable limestone sink holes offered a nesting home for a large population of avifauna. This resource may have been one of the early attractions to human settlement.
5) An extensive upland forest zone extending as much as twelve miles inland from the edge of the coastal plain. As Handy and Handy have pointed out, the forest was much more distant from the lowlands here than it was on the windward side, but on the leeward side was more extensive (1972:469). Much of the upper reaches of the *ahupua'a* would have had species-diverse forest with *kukui, 'ōhi'a*, sandalwood, *hau*, *kī,* banana, etc.
6) A network of trails giving access to Lualualei and Wai'anae coastal reaches.

3.2 Main Areas of Settlement

Within this natural setting, cultural, archaeological, and historical sources show a general pattern of three main areas of settlement within the *ahupua'a*: a coastal zone, inland settlement at Pu'u Ku'ua and the Hono'uli'uli taro lands.

3.2.1 The Coastal Zone - Ko'olina and Kalaeloa (Barbers Point)

Ko'olina

There are three major studies on the Ko'olina project area (Davis et al. 1986a; Davis et al. 1986b; and Davis and Haun 1987). Davis documents around 180 component features at 48 sites and site complexes consisting of habitation sites, gardening areas, and human burials. Chronologically the occupation covers the entire span of Hawaiian settlement in what Davis and Haun describe as "one of the longest local sequences in Hawaiian prehistory" (Davis and Haun 1987:37). The earliest part of the sequence relates to the discovery of an inland marsh and early dates were also obtained for the beachfront site (Lanikūhonua) and an inland rock shelter.

Kalaeloa (Barbers Point)

Archaeological research at Barbers Point has focused on the areas in and around the newly constructed Deep Draft Harbor (Barrera 1975; Davis and Griffin 1978; Hammatt and Folk 1981, McDermott et al. 2000). Series of small clustered shelters, enclosures and platforms show limited but recurrent use at the shoreline zone for marine oriented exploitation. This settlement covers much of the shoreline with more concentrated features around small marshes and wet sinks. Immediately behind the shoreline under a linear dune deposit is a buried cultural layer believed to contain some of the earliest habitation evidence in the area.

A significant attraction of the area to early Hawaiians was the plentiful and easily exploited bird population. Particular evidence for taking of petrel occurs at Site -2763 (Hammatt and Folk 1981:13). Initial heavy exploitation of nesting seabirds and other species in conjunction with habitat destruction probably led to early extinction.

There is some indication of limited agriculture in mulched sink holes and limited soil areas. Considering the low rainfall, this activity would have been limited, but probably involved tree crops and roots (sweet potatoes). The archaeological content of the sites indicates a major focus on marine resources.

Davis and Griffin (1978) distinguish functional classes of sites, based on surface area size and argue that the Barbers Point settlement consists of functionally integrated multi-household residence groups. Density contours of midden (by weight) and artifacts (by numbers) plotted for residence sites by Hammatt and Folk (1981) generally indicate narrowly defined spatial foci of discard, possibly indicating continuous use, or at least with no refurbishing or additions to the structures through time (Hammatt and Folk 1981). The focus is small habitation sites, typically lacking the full range of features found in large permanent residence complexes such as high platforms, complex enclosures, and ceremonial sites.

3.2.2 Pu'uku'ua: Inland Settlement

It is mentioned in *mo'olelo* (oral history) that the area of Pu'uku'ua, on the east side of the Wai'anae Ridge, north east of the current project area, seven miles inland of the coast, was a Hawaiian place of great importance.

In 1899, the Hawaiian language Newspaper "*Ka Loea Kālai'āina*" relates a story of Pu'uku'ua as "a place where chiefs lived in ancient times" and a "battle field," "thickly populated." This area was well known by all O'ahu chiefs and customary for them to visit. The term Kauwā was first used here because of a one armed chiefess who was ashamed and ran when other chiefs would visit. She was not a Kauwā she only behaved as one. The article:

> The chiefs of old, who lived at that time, were of divine descent. The two gods [Kāne and Kanaloa] looked down on the hollow [vicinity of Pu'u Ku'ua] and saw how thickly populated it was. The mode of living here was so that chiefs and commoners mixed freely and they were so like the lowest of people (Kauwā). That is what these gods said and that was the time when the term kauwā was first used, and was used for many years afterwards. After the first generations of chiefs had passed away and there descendants succeeded them, a chiefess Oahu to visit this place to see the local chiefs. They did this always. When the time came in which a new chiefess ruled, an armless chiefess, she ran away to hide when other chiefs came to visit as usual because she was ashamed of her lack of an arm. Because she was always running away because of being ashamed the chiefs that visited her called her the low-born (kauwā). Thus the term remained in the thoughts down to this enlightened period. She was no truly a kauwā but was called that because she behaved like one. This was how they were made to be kauwā.... (Ka Loea Kālai'āina, July 8, 1899 in Sterling and Summers 1978:33).

McAllister recorded three sites in this area: two *heiau* (shrines) (sites 134 Pu'u Kuina and 137 Pu'uku'ua; both destroyed) and a series of enclosures in Kukuilua which he calls "*kuleana* sites" (McAllister, 1933). On the opposite side of the Wai'anae range along the trail to Pōhākea Pass, as Cordy (2002) states, "Kākuhihewa was said to have built (or rebuilt) Nīoi'ula, a *po'okanaka heiau* (1,300 sq. m.) in Hālona in upper Lualualei, along the trail to Pōhākea Pass leading into 'Ewa, ca. A.D. 1640-1660" (Cordy 2002:36). There is no direct archaeological evidence

available to the authors' knowledge that intensive Hawaiian settlement occurred along the Pōhākea Pass trail but it is considered as a place of higher probability for traditional Hawaiian sites, based on the above indications. John Papa 'Ī'ī (1959) described a journey that Liholiho took which led him and an entourage through inland Hono'uli'uli and over Pōhākea Pass. Geographically, the area receives sufficient quantities of water and would have had abundant locally available forest resources.

3.2.3 Hono'uli'uli Taro Lands

Centered around the west side of Pearl Harbor at Hono'uli'uli Stream and its broad outlet into the West Loch are the rich irrigated lands of the *'ili* of Hono'uli'uli which give the *ahupua'a* its name. The major archaeological reference to this area is Dicks, Haun and Rosendahl (1987) who documented remnants of a once-widespread wetland system (*lo'i* and fishponds) as well as dry land cultivation of the adjacent slopes.

The area bordering West Loch was clearly a major focus of population within the Hawaiian Islands and this was a logical response to the abundance of fish and shellfish resources in proximity to a wide expanse of well-irrigated bottomland suitable for wetland taro cultivation. The earliest detailed map (Malden 1825) shows all the roads of southwest O'ahu coalescing and descending the *pali* as they funnel into the locality (i.e., Hono'uli'uli Village) which gave the *ahupua'a* of Hono'uli'uli its name. Dicks et al. (1987:78-79) conclude, on the basis of nineteen carbon isotope dates and three volcanic glass dates that "Agricultural use of the area spans over 1,000 years." Undoubtedly, Hono'uli'uli was a locus of habitation for thousands of Hawaiians. Prehistoric population estimates are a matter of some debate but it is worth pointing out that in the earliest mission census (Schmitt 1973:19) 1831-1832, the land (*'āina*) of Hono'uli'uli contained 1,026 men, women, and children. It is not clear whether this population relates to Hono'uli'uli Village or to the entire *ahupua'a* but the village probably contained the vast majority of the district's population at that time. The nature of the reported population structure for Hono'uli'uli (less than 20% children under twelve years of age) and the fact that the population decreased more than 15% in the next four years (Schmitt 1973:22) suggests that the prehistoric population of Hono'uli'uli Village may well have been significantly greater than it was in 1831-1832. A conservative estimate would be that tens of thousands of Hawaiians lived and died at Hono'uli'uli Village.

3.3 Traditional and Legendary Accounts of Hono'uli'uli

Hono'uli'uli, O'ahu is associated with a number of legendary accounts. Many of these concern the actions of gods or demi-gods such as Kāne, Kanaloa, Māui, Kamapua'a, the pig god, Maunauna, the shark deity, Ka'ahupāhau, and the hero Palila. There are several references to chiefly lineages and references to the ruling chiefs Hilo-a-Lakapu and Kūali'i, (Ko 'Olina is reported to have been a vacationing place for Kākuhihewa). Traditional and legendary accounts are presented below starting with the one's pertaining to Pōhākea Pass and then in a loose arrangement from more mythological accounts of gods and demi-gods to accounts of a more historical nature. There is no sharp distinction in this regard.

3.3.1 The Naming of Hono'uli'uli (Legend of Lepeamo'a)

In the legend of Lepeamoa, the chicken-girl of Pālama, Hono'uli'uli is the name of the husband of the chiefess Kapālama and grandfather of Lepeamoa (Thrum 1923:164-184). "Her grandfather gave his name, Hono'uli'uli to a land district west of Honolulu..." (Thrum 1923:170). Westervelt (1917:209) gives an almost identical account.

3.3.2 The Pele Family at Hono'uli'uli

Kapolei (beloved Kapo), specifically the 166-foot high cone of that name, is understood to have been named in reference to the volcano goddess Pele's sister Kapo (Pukui et al. 1974:89). Pōhākea Pass is understood as one of the resting places of Pele's sister Hi'iaka as she was returning from Kaua'i with Pele's lover Lohiau (Fornander 1919 Vol. V: 188 note 6). A considerable number of *mele* (songs) and *pule* (prayers) are ascribed to Hi'iaka as she stood at the summit of Pōhākea (*Aluna au a Pōhākea, Kū au, nānā ia Puna...*)(Emerson 1915:162-168). From this vantage point Hi'iaka could see, through her powers of vision, that her beloved *lehua* groves and friend Hopoe at Puna, Hawai'i Island had been blasted by her jealous sister Pele. She could also see that in her canoe, off the coast of Wai'anae, Lohiau was seducing her traveling companion Wahine'ōma'o! A spring located at Kualaka'i near Barbers Point was named Hoaka-lei (*lei* reflection) because Hi'iaka picked *lehua* flowers here to make a *lei* and saw her reflection in the water.

3.3.3 Keahumoa, Residence of Māui's Grandfather (Legend of Māui's Flying Expedition)

In the Legend of Māui's Flying Expedition (Thrum 1923:252-259) Māui-kupua looks toward Pōhākea Pass and sees his wife, Kumulama, being carried away by chief Pe'ape'amakawalu. After failing to recover her, Māui returns and tells his problems to his mother, Hina. Hina instructs her son to go to Keahumoa and visit his grandfather Kuolokele who lives there in a large hut. The hump-backed Kuolokele returns home with a load of potato leaves and Māui cures him by striking him in the back with a stone (which Kuolokele throws to Waipahu where it remains). Kuolokele has Māui gather *kī* leaves *'ie'ie* vines and bird feathers from which the old man fabricates a "bird-ship" (*moku-manu*) which Māui uses to defeat Pe'ape'amakawalu and recover his wife. They return to Kuolokele's house where they feast and Māui eats Pe'ape'amakawalu's eyeballs.

3.3.4 Kāne and Kanaloa and the Boundaries of 'Ewa (Simeon Nawaa account)

It seems likely the boundaries of the western-most *ahupua'a* of 'Ewa were and still are often contested between the Wai'anae and 'Ewa people:

> When Kāne and Kanaloa were surveying the islands they came to O'ahu and when they reached Red Hill saw below them the broad plains of what is now 'Ewa. To mark boundaries of land they would throw a stone and where the stone fell would be the boundary line...They hurled the stone as far as the Wai'anae Range and it landed somewhere in the Waimānalo section...Eventually the stone was found at Pili o Kahe. This is a spot where two small hills of the Wai'anae Range come down parallel on the boundary between Hono'uli'uli and Nānākuli ('Ewa and Wai'anae). The ancient Hawaiians said the hill on the 'Ewa side was

> the male and the hill on the Wai'anae side was female. The stone was found on the Waianae side hill and the place is known as Pili oKahe (Pili= to cling to, Kahe= to flow). The name refers, therefore, to the female or Waianae side hill. And that is where the boundary between the two districts runs. (Simeon Nawaa in Sterling and Summers 1978:1)

3.3.5 Kamapua'a, the pig god, is associated with Hono'uli'uli:

> Kamapua'a subsequently conquered most of the island of O'ahu, and, installing his grandmother [Kamaunuaniho] as queen, took her to Puuokapolei, the lesser of the two hillocks forming the southeastern spur of the Wai'anae Mountain Range, and made her establish her court there. This was to compel the people who were to pay tribute to bring all the necessities of life from a distance, to show his absolute power over all. (Nakuina 1904:50)

Emma Nakuina goes on to note: "A very short time ago [prior to 1904] the foundations of Kamaunuaniho's house could still be seen at Puuokapolei" (Nakuina 1904:50). Another account (*Ka Loea Kālai'āina* January 13, 1900) speaks of Kekeleaiku, the older brother of Kamapua'a, who also was said to have lived on Pu'uokapolei.

3.3.6 Home of the Shark-Goddess Ka'ahupāhau (Legend of Ka'ehuikimanōo Pu'uloa)

In the Legend of Ka'ehuikimanōo Pu'uloa (Thrum 1923:293-306) the Big Island shark god, Ka'ehuiki travels to visit the famous shark deity Ka'ahupāhau "reaching Hono'uli'uli, the royal residence." Ka'ahupāhau is said to have lived in a royal cave at Hono'uli'uli (Thrum 1923:302).

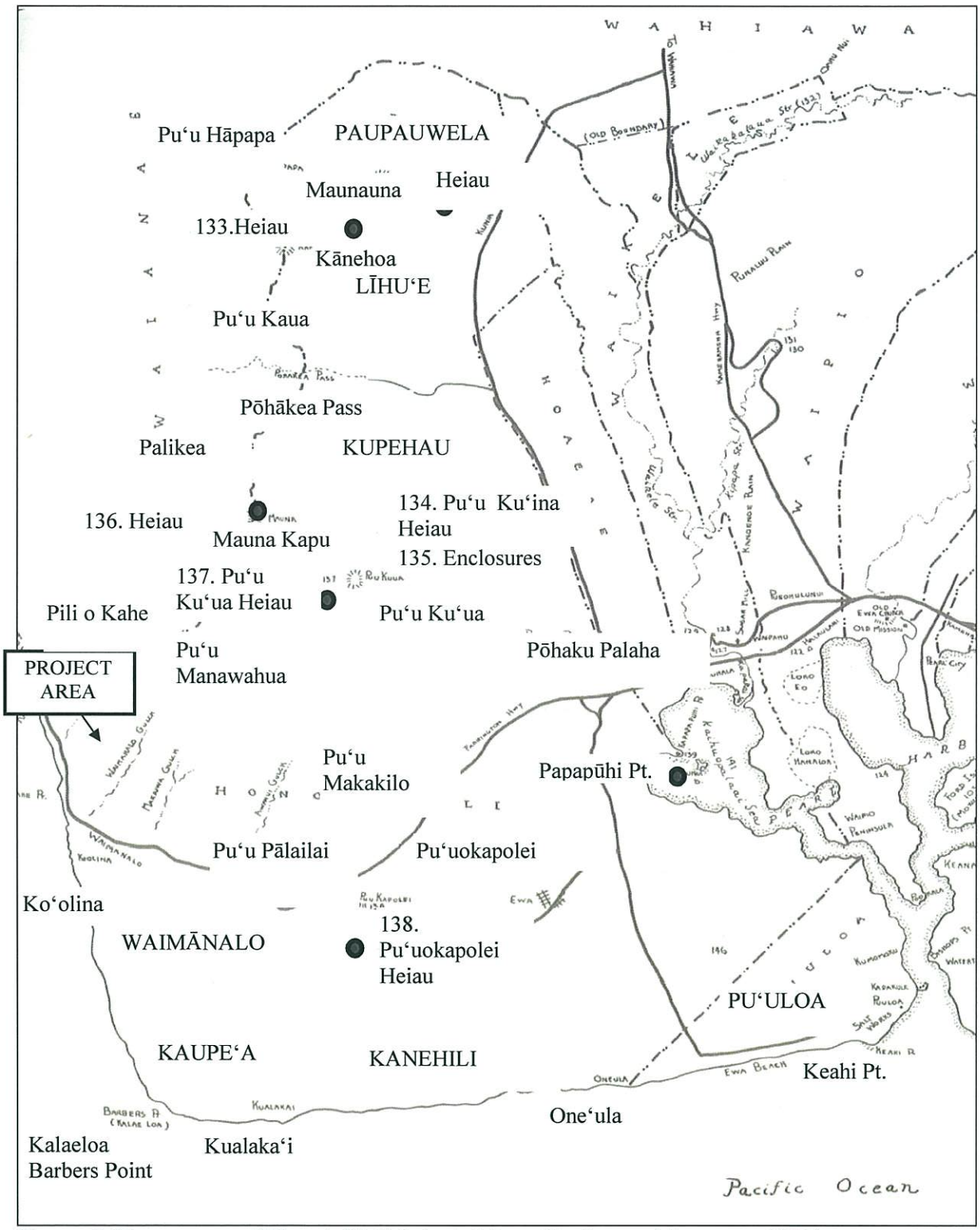

Figure 6. Place names of Hono'uli'uli (adapted from Sterling and Summers 1978)

3.3.7 The Frightened Populace of Hono'uli'uli *(He Ka'ao no Palila)*

In the Legend of Palila, the *kupua* or demigod hero of Kaua'i, he lands at Ka'ena point with his fabulous war club (*lā'au pālau*), which required eighty men to carry it, and crosses into Hono'uli'uli through the Pōhākea Pass. He descends to the plain of Keahumoa:

> Kū kēia i laila nānā i ke kū ka ea o ka lepo i nā kānaka, e pahu aku ana kēia i ka lā'au pālau aia nei i kai o Hono'uli'uli, kū ka ea o ka lepo o ka honua, me he ōla'i la, maka'u nā kānaka holo a hiki i Waikele...
>
> At this place he stood and looked at the dust as it ascended to the sky caused by the people who had gathered there; he then pushed his war club toward Hono'uli'uli. When the people heard something roar like an earthquake they were afraid and they all ran to Waikele ... (Fornander 1917 Vol. V 136-153)

3.3.8 Two Old Women Who Turned To Stone *(Ka Loea Kālai'āina)*

The Hawaiian language newspaper *Ka Loea Kālai'āina* relates that near Pu'uokapolei, on the plain of Pukaua, on the *mauka* side of the road, there was a large rock. The legend is as follows:

> There were two supernatural old women or rather peculiar women with strange powers and Pu'ukaua belonged to them. While they were down fishing at Kualaka'i [near Barbers Point] in the evening, they caught these things, 'a'ama crabs, pipipi shellfish, and whatever they could get with their hands. As they were returning to the plain from the shore and thinking of getting home while it was yet dark, they failed for they met a one-eyed person [bad omen]. It became light as they came near to the plain, so that passing people were distinguishable. They were still below the road and became frightened lest they be seen by men. They began to run - running, leaping, falling, sprawling, rising up and running on, without a thought of the 'a'ama crabs and seaweeds that dropped on the way, so long as they would reach the upper side of the road. They did not go far for by then it was broad daylight. One woman said to the other, "Let us hide lest people see us," and so they hid. Their bodies turned into stone and that is one of the famous things on this plain to this day, the stone body. This is the end of these strange women. When one visits the plain, it will do no harm to glance on the upper side of the road and see them standing on the plain. (Ka Loea Kālai'āina, January 13, 1900)

3.3.9 The Strife of Nāmakaokapāo'o and Puali'i (*Ka'ao no* Nāmakaokapāo'o)

In the Legend of Nāmakaokapāo'o the brave boy, Nāmakaokapāo'o, and his mother, Pōka'ī, appear to have been living near the coast but were quite destitute (*'ilihune loa*). His mother met Puali'i when he came from Līhu'e to fish at Hono'uli'uli and the family went to live on the plains of Keahumoa (*ke kula o Keahumoa*). Puali'i kept sweet potato patches (*māla 'uala*) and fished for *ulua*. Following a dispute over sweet potatoes, Nāmakaokapāo'o defeated his step-father, Puali'i and:

> Lālau aku la o Nāmakaokapāo'o i ke po'o o Puali'i a kiola aku la i kai o Waipouli, he ana ma kahakai o Hono'uli'uli, o kona loa, 'elima mile ka loa...
>
> Nāmakaokapāo'o picked up Puali'i's head and threw it towards Waipouli, a cave situated on the beach at Hono'uli'uli (a distance of about five miles)... (Fornander 1917 Vol. V 274-277)

3.3.10 The Story of Kaihuopala'ai Pond, Hono'uli'uli (*Ka'ao no Maikohā*)

In the Legend of Maikohā a sister of Maikohā (a deified hairy man who became the god of tapa makers) named Kaihuopala'ai, journeys to O'ahu:

> 'Ike aku la o Kaihuopala'ai i ka maikai o Kapapaapuhi, he kāne e noho ana ma Hono'uli'uli ma 'Ewa. Moe iho la lāua, a noho iho la o Kaihuopala'ai i laila a hiki i kēia lā. 'Oia kēlā loko kai e ho'opuni ia nei i ka 'anae, nona nā i'a he nui loa, a hiki i kēia kākau ana.
>
> Kaihuopala'ai saw a goodly man by the name of Kapapaapuhi who was living at Hono'uli'uli, 'Ewa; she fell in love with him and they were united, so Kaihuopala'ai has remained in 'Ewa to this day. She was changed into that fishpond in which mullet are kept and fattened, and that fishpond is used for that purpose to this day [1919]. (Fornander 1917 Vol. V 270-271)

3.3.11 The Traveling Mullet of Hono'uli'uli (Fish Stories)

The story of (Ka)Ihuopala'ai is also associated with the tradition of the *'anae-holo* or traveling mullet (Thrum 1907:270-272):

> The home of the 'anae-holo is at Hono'uli'uli, Pearl Harbor, at a place called Ihuopala'ai. They make periodical journeys around to the opposite side of the island, starting from Pu'uloa and going to windward, passing successively Kumumanu, Kalihi, Kou, Kālia, Waikīkī, Ka'alāwai, and so on, around to the Ko'olau side, ending at Lā'ie, and then returning by the same course to their starting point.(Thrum 1907:271)

In Thrum's account, Ihuopala'ai is a male who possesses a Kū'ula or fish god which supplied the large mullet known as *'anae*. His sister lived in Lā'ie and there came a time when there were no fish. She sent her husband to visit Ihuopala'ai who was kind enough to send the fish following his brother-in-law on his trip back to Lā'ie.

This story is associated with a poetical saying documented by Mark Pukui about Hono'uli'uli:

> Ka i'a hali a ka makani
>
> The fish fetched by the wind (Pukui 1983: # 1330)

Pukui explains "The *'anaeholo*, a fish that travels from Hono'uli'uli, where it breeds, to Kaipāpa'u on the windward side of O'ahu. It then turns about and returns to its original home. It is driven closer to shore when the wind is strong." Whether this saying was used in contexts other than in reference to mullet is unclear.

3.3.12 Hono'uli'uli and the Head of Hilo-a-Lakapu (Legend of the Sacred Spear-point)

In the Legend of the Sacred Spear-point (Kalākaua 1888:209-225) is a reference to the Hawai'i Island chief Hilo-a-Lakapu. Following his unsuccessful raid against O'ahu "he was slain at Waimano, and his head was placed upon a pole near Hono'uli'uli for the birds to feed upon"(Kalākaua 1888:224).

3.3.13 The Strife at Hono'uli'uli from which Kūali'i unites Hawai'i nei (Mo'olelo o Kūali'i)

The celebrated chief, Kūali'i, is said to have lead an army of twelve thousand *('ekolu mano)* against the chiefs of Ko'olauloa with an army of twelve hundred *('ekolu lau)* upon the plains of Keahumoa (Fornander 1917 Vol. IV 364-401). Perhaps because the odds were so skewed the battle was called off and the *ali'i* (chiefs) of Ko'olau ceded (*ha'awi a'e*) the districts of Ko'olauloa, Ko'olaupoko, Waialua and Wai'anae to Kūali'i. When the *ali'i* of Kaua'i heard of this victory at Hono'uli'uli they gave Kaua'i to Kūali'i as well and thus he became possessed of all the islands (*a lilo a'e la nā moku a pau ia Kūali'i mai Hawai'i a Ni'ihau*). The strife at Hono'uli'uli was the occasion of the recitation of a song for Kūali'i by a certain Kapa'ahulani (*Ka Pule Ana a Kapa'ahulani*) that makes passing reference in word play to the blue poi, which appeases the hunger of Hono'uli'uli (*Uliuli ka poi e piha nei - o Hono'uli'uli*).

3.3.14 The Last Days of Kahahana and Hono'uli'uli (The Land is the Sea's)

In the tradition of the prophecy of the *kahuna* Ka'opulupulu, Moke Manu relates that the deposed O'ahu chief Kahahana fled for his life:

> Upon the arrival here at O'ahu of Kahekili, Kahahana fled, with his wife Kekuapoi, and friend Alapa'i, and hid in the shrubbery of the hills. They went to Āliamanu, Moanalua, to a place called Kinimakalehua; then moved along to Keanapua'a, and Kepo'okala, at the lochs of Pu'uloa, and from there to upper Waipi'o; thence to Wahiawā, Helemano, and on to Līhu'e; thence they came to Po'ohilo, at Hono'uli'uli, where they first showed themselves to the people and submitted themselves to their care. (Thrum 1907:203-214)
>
> Through treachery, Kahahana was induced to leave Po'ohilo, Hono'uli'uli and was killed on the plains of Hō'ae'ae (Thrum 1907:213-214).

3.3.15 Pu'uokapolei and the Reckoning of the Seasons (Kamakau)

Samuel Kamakau relates:

> ...the people of O'ahu reckoned from the time when the sun set over Pu'uokapolei until it set in the hollow of Mahinaona and called this period Kau [summer], and when it moved south again from Pu'uokapolei and it grew cold and the time came when young sprouts started, the season was called from their germination ('ōilo) the season of Ho'oilo [winter, rainy, season]. (Mo'olelo Hawai'i Vol. I, Chap. 2, p. 23)

3.3.16 Hono'uli'uli in the Poetry of Halemano (Ka'ao no Halemano)

In the Legend of Halemano the romantic O'ahu anti-hero chants a love song with a reference to Hono'uli'uli:

> Huli a'e la Ka'ala kau i luna, Waiho wale kai o Pōka'ī, Nānā wale ke aloha i Hono'uli'uli, Kokolo kēhau he makani no Līhu'e...
>
> Search is made to the top of Ka'ala, The lower end of Pōka'ī is plainly seen. Love looks in from Hono'uli'uli, The dew comes creeping, it is like the wind of Līhu'e... (Fornander 1917 Vol. V 252)

3.4 Legends and Traditional Places in Upland Hono'uli'uli

3.4.1 Kahalaopuna at Pōhākea Pass

One of the most popular legends of O'ahu is that of Kahalaopuna (or Kaha) a young woman of Mānoa who is slandered by others and is then killed by her betrothed, Kauhi, a chief from Ko'olau, O'ahu. While the numerous accounts (Day 1906:1-11, Fornander 1919 Vol. V: 188-193, Kalākaua 1888:511-522, Nakuina 1904:41-45, Patton 1932:41-49, Skinner 1971:220-223, Thrum 1907:118-132, Westervelt 1907a 127-137, Westervelt 1907b 84-93) vary in details they typically have Kahalaopuna slain and then revived repeatedly with the aid of a protective owl spirit. Kauhi forces her to hike west from Mānoa through the uplands until they get to Pōhākea Pass through the southern Wai'anae Range in north Hono'uli'uli. At Pōhākea Pass, Kauhi beats her with a stick until she is very dead ("*Ia hahau ana a Kauhi i ka lā'au, make loa o Kahalaopuna*"). Her spirit (*'uhane*) flies up into a *lehua* tree and chants for someone to go notify her parents of her fate. Upon hearing the news her parents fetch Kahalaopuna back to Mānoa and she is restored to life.

3.4.2 *Mo'o* at Maunauna (*Kuokoa*)

Moses Manu in recounting the Legend of Keaomelemele makes a reference to a *mo'o* (fabulous lizard, dragon, serpent) named Maunauna who lived above Līhu'e (presumably at the landform of that name in extreme northern Hono'uli'uli) and who was regarded as a bad lizard (*Kuokoa* April 25, 1885).

3.4.3 Paupauwela and Līhu'e

Paupauwela, also spelled Popouwela (derivation unknown), is the name of the land area in the extreme *mauka* section of Hono'uli'uli Ahupua'a. The land area of Līhu'e is just *makai* of this land, and extends into the *ahupua'a* of Waipi'o (adjacent to the eastern border of Hono'uli'uli). Both place names are mentioned in a chant recorded by Abraham Fornander, which was composed as a *mele* for the O'ahu king, Kūali'i, as he was preparing to battle Kuiaia, the chief of Wai'anae:

Where? Where is the battle field	Ihea, ihea la ke kahua,
Where the warrior is to fight?	Paio ai o ke koa-a?

On the field of Kalena,	I kai i kahua i Kalena,
At Manini, at Hanini,	I Manini, i Hanini
Where was poured the water of the god	I ninia i ka wai akua,
By your work at Malamanui;	I ko hana i Malamanui
On the heights of Kapapa, at Paupauwela,	Ka luna o Kapapa, i Paupauwela,
Where they lean and rest;	I ka hilinai i ke kalele,
At the hala trees of indolent Halahalanui,	Ka hala o Halahalanui maauea,
At the ohia grove of Pule-e	E kula ohia ke Pule-e,
The god of Lono, of Makalii	Ke 'kua o Lono o Makalii
Thr fragrant branch of the Ukulonoku,	Ka lala aalao Ukulonoku,
Mayhap from Kona, from Lihue,	No Kona paha, no Lihue.
For the day at Maunauna	No ka la i Maunauna,
For the water at Paupauwela.	No ka wai i Paupauwela.
Red is the water of Paupauwela,	Ula ka wai i Paupauwela,
From the slain at Malamani,	Ke kilau o Malamani,
The slain on the ridge at Kapapa.	Ka moo kilau I Kapapa.

(Fornander 1917, Vol. IV, Part 2:384-386).

The derivation of the place name Līhu'e (meaning "cold chill") is illustrated in the following poem; all other places names mentioned in this poem are in Waipi'o:

The icy wind of Lihue plied its spurs,

Pulling up the bridle of Haleauau,

Speeding headlong over Kalena

And running over the plain of Kanoenoe

(Ka Loea Kālai'āina, July 22, 1899, translated in Sterling and Summers 1978:21)

This explains the meaning of a Hawaiian saying "*Hao na kēpā o Līhu'e i ke anu*" (The spurs of Līhu'e dig in with cold) (Pukui 1983:#479).

The icy winds of Hono'uli'uli are also noted in a *mele* for the high king Kūali'i. In this *mele*, the cold winds of Kumomoku and Leleiwe, near Pu'uloa in Hono'uli'uli are compared unfavorably to the god Kū.

Not like these are thou, Ku	Aole i like Ku.
[Nor] the rain that brings the land breeze,	Ia ua hoohali kehau,
Like a vessel of water poured out.	Mehe ipu wai ninia la,

Nor to the mountain breeze of Kumomoku,	Na hau o Kumomoku;
[The] land breeze coming round to Leleiwi.	Kekee na hau o Leleiwi,
Truly, have you not known?	Oi ole ka oe i ike
The mountain breezes, that double up your back,	I ka hau kuapuu.
[That make you] sit crooked and cramped at Kaimohala,	Kekee noho kee, o Kaimohala,
The Kanehili at Kaupea?	O Kanehili i Kaupea-la
Not like these are thou, Ku.	Aole i like Ku.

(Fornander 1917, Vol. IV, Part II:390-391)

In the Legend of Halemano (Fornander 1919, Vol. V, Part II: 252), the romantic O'ahu anti-hero chanted a love song with a reference to the winds of Līhu'e:

Search is made to the top of Ka'ala,	Huli a'e la Ka'ala kau i luna,
The lower end of Pōka'ī is plainly seen.	Waiho wale kai o Pōka'ī,
Love looks in from Hono'uli'uli,	Nānā wale ke aloha i Hono'uli'uli,
The dew comes creeping, it is like the wind of Līhu'e...	Kokolo kēhau he makani no Līhu'e.

The wind of Līhu'e and others in the region are also named by Moses K. Nakuina, as follows:

Moa'e-kū is of 'Ewaloa

Kēhau is of Waiopua

Waikōloa is of Līhu'e

Kona is of Pu'uokapolei

Maunuunu is of Pu'uloa

(Nakuina 1992:43)

The *ali'i* were closely associated with Līhu'e, which had habitation areas and playing grounds set aside for their sports. 'Ewa

> Lolale was the father and Keleanohoapiapi the mother of Ka-lo-kaholi-a-Lale. He was born in the land of Lihue and there he was reared into manhood. He excelled in good looks and greatly resembled his mother.
>
> In the olden days the favorite occupation of Lihue chiefs was spear throwing and the best instructors hailed from this locality. (Ka Nūpepa Kū'oko'a, Aug. 26, 1865, translation in Sterling and Summers 1978:23)

Līhu'e was also the home of a famous cannibal king-man, Kaupe, who overthrew the ruling chiefs to become the paramount power between Nu'uanu and the sea. He had a home and a *heiau* in Līhu'e. Kaupe was a *kapua*, a supernatural being who could take the form of a man or a dog; this type of dog man was known as an *'ōlohe*. Although he left the O'ahu *ali'i* alone, he killed many commoners in the area, and eventually sailed to the island of Hawai'i on a raid, where he captured a chief's son; he planned to sacrifice this boy at his *heiau* in Līhu'e. The father came to O'ahu, and with the help of the priests of the Hawaiian hero, Kahanaiakeakua, was able to free his son, escape back to Hawai'i, and eventually kill the dog-man, Kaupe (Westervelt 1963:90-96).

3.4.4 Hill of Maunauna

The hill Maunauna lies between the lands Paupauwela and Līhu'e. One translation of Maunauna is "mountain sent [on errands]." Two servant *mo'o* who lived here had no keepers to supply their needs" (Pukui et al. 1974:149). It was at Maunauna, according to one tradition, that the forces of the chiefs Kūali'i and Kuiaia of Wai'anae met to do battle, which was averted when a *mele* honoring the god Kū was chanted (see previous section). (Fornander 1917, Vol IV, Part 2:348). In the Legend of Ke-ao-melemele, a woman named Paliuli traveled in this area.

> In a very short time she [Paliuli] walked over the plain of Ewa; Ewa that is known as the land of the silent fish [pearl oysters]...She went on to the plain of Punalu'u and turned to gaze at Maunauna point and the plain of Lihue. (Manu 1885, translation in Sterling and Summers 1978:21)

Certain place names in the uplands, including Maunauna, are also mentioned in the story of Lo-lae's Lament. The place of Lolale's residence is given in King Kalākaua's version of this story. According to him (Kalākaua 1990:232): "There lived there at that time in Lihue, in the district of 'Ewa, on the island of Oahu, a chief named Lo-lale, son of Kalona-iki, and brother of Piliwale, the *alii-nui*, or nominal sovereign, of the island, whose court was established at Waialua."

In this story, Lolale was a chief of O'ahu who asked his friend Kalamakua to find him a bride (Kalākaua 1990:228-246; Skinner 1971:217-219). Kalamakua traveled to Maui and chose Kelea, the chief's sister, and returned with her to O'ahu; during this time the two grew close. Kelea lived with Lolale for a while, but he was a silent type that was often away from home playing sports and walking in the woodlands. Longing for Kalamakua, Kelea decided to leave her husband, Lolale voiced no "spoken bitterness;" however, after she left, he sang this lament:

> Farewell, my partner of the lowland plains,
>
> On the waters of Pohakeo, above Kanehoa,
>
> On the dark mountain spur of Mauna-una!
>
> O, Lihue, she is gone!
>
> Sniff the sweet scent of the grass,
>
> The sweet scent of the wild vines
>
> That are twisted by Waikoloa,

By the winds of Waiopua,

My flower!

As if a mote were in my eye.

The pupil of my eye is troubled.

Dimness covers my eyes. Woe is me!

[Kalākaua 1990:244-245].

3.5 Prehistory and Early History

Various Hawaiian legends and early historical accounts indicate that the *ahupua'a* of Hono'uli'uli was once widely inhabited by pre-Contact populations. This would be attributable for the most part to the plentiful marine and estuarine resources available at the coast, along which several sites interpreted as permanent habitations and fishing shrines were located. Other attractive subsistence-related features of the *ahupua'a* include irrigated lowlands suitable for wetland taro cultivation (Hammatt and Shideler 1990), as well as the lower forest area of the mountain slopes for the procurement of forest resources.

Exploitation of the forest resources along the slopes of the Wai'anae Range - as suggested by E. S. and E.G. Handy - probably acted as a viable subsistence alternative during times of famine:

> ...The length or depth of the valleys and the gradual slope of the ridges made the inhabited lowlands much more distant from the *wao*, or upland jungle, than was the case on the windward coast. Yet the *wao* here was more extensive, giving greater opportunity to forage for wild foods during famine time. (Handy and Handy 1972:469)

These upper valley slopes may have also been a significant resource for sporadic quarrying of basalt for the manufacturing of stone tools. This is evidenced in part by the existence of a probable quarrying site (50-80-12-4322) in Makaīwa Gulch at 152 m. (500 ft.) a.m.s.l. (Hammatt et al. 1991).

The Hawaiian *ali'i* were also attracted to the region, which is steeped in myth.

> Ko 'Olina is in Waimānalo near the boundary of 'Ewa and Wai'anae. This was a vacationing place for chief Kākuhihewa and the priest Napuaikamao was the caretaker of the place. Remember reader, this Ko Olina is not situated in the Waimānalo on the Ko'olau side of the island but the Waimānalo in 'Ewa. It is a lovely and delightful place and the chief, Kākuhihewa loved this home of his. (Ke Au Hou July 13, 1910)

Other early historical accounts of the general region typically refer to the more populated areas of the 'Ewa district, where missions and schools were established and subsistence resources were perceived to be greater. However, the presence of archaeological sites along the barren coral plains and coast of southwest Hono'uli'uli Ahupua'a, indicate that prehistoric and early historic populations also adapted to less inviting areas, despite the environmental hardships.

Barbers Point is named after Captain Henry Barber whose vessel ran aground on October 31, 1796. Subsequent to western contact in the area, the landscape of the 'Ewa plains and Wai'anae slopes was adversely affected by the removal of the sandalwood forest, and the introduction of domesticated animals and new vegetation species. Domesticated animals including goats, sheep and cattle were brought to the Hawaiian Islands by Vancouver in the early 1790s, and allowed to graze freely about the land for some time after. It is unclear when the domesticated animals were brought to O'ahu; however, L.A. Henke reports the existence of a longhorn cattle ranch in Wai'anae prior to 1840 (in Frierson 1972:10). During this same time, perhaps as early as 1790, exotic vegetation species were introduced to the area. These typically included vegetation best suited to a terrain disturbed by the logging of sandalwood forest and eroded by animal grazing. The following dates of specific vegetation introduced to Hawai'i are given by R. Smith and outlined by Frierson:

1) "early", c. 1790:
Prickly pear cactus, *Opuntia tuna*
Haole koa, *Leucaena glauca*
Guava, *Psidium guajava*

2) 1835-1840
Burmuda [sic] grass, *Cynodon dactylon*
Wire grass, *Eleusine indica*

3) 1858
Lantana, *Lantana camara*

The *kiawe* tree (*Prosopis pallida*) was also introduced during this period, either in 1828 or 1837 (Frierson 1972:11).

Intensive sandalwood harvesting, according to H. St. John (in Frierson 1972:7) occurred in the Hawaiian Islands from 1815 to 1830. As it is likely that sandalwood forests once occupied the lower, dry slopes of the Wai'anae Range, the current project area was likely impacted by the cutting and burning of these forests.

3.5.1 Mid- to late-1800s

Associated with the Māhele of 1848, 99 individual land claims in the *ahupua'a* of Hono'uli'uli were registered and immediately awarded by King Kamehameha III. The vast majority of the Land Commission Awards (LCA) were located near the Pu'uloa salt works and the taro lands of the *'ili* of Hono'uli'uli. The present study area appears to have been included in the largest award (Royal Patent 6071, LCA 11216, 'Āpana 8) granted in Hono'uli'uli Ahupua'a to Miriam Ke'ahi-Kuni Kekau'ōnohi on January 1848 (Native Register). Kekau'ōnohi acquired a deed to all unclaimed land within the *ahupua'a*, including a total of 43,250 acres.

Kamaukau relates the following about Kekau'ōnohi as a child:

> Kamehameha's granddaughter, Ke-ahi-Kuni Kekau-'ōnohi...was also a tabu chiefess in whose presence the other chiefesses had to prostrate and uncover themselves, and Kamehameha would lie face upward while she sat on his chest. (In Hammatt and Shideler 1990:19-20)

Kekau'ōnohi was one of Liholiho's (Kamehameha II) wives, and after his death, she lived with her half-brother, Luanu'u Kahala'i'a, who was governor of Kaua'i (Hammatt and Shideler 1990:20). Subsequently, Kekau'ōnohi ran away with Queen Ka'ahumanu's stepson, Keli'i-ahonui, and then became the wife of Chief Levi Ha'alelea. Upon her death on June 2, 1851, all her property was passed on to her husband and his heirs. When Levi Ha'alelea died the property went to his surviving wife, who in turn leased it to James Dowsett and John Meek in 1871 for stock running and grazing.

In 1877, James Campbell purchased most of Hono'uli'uli Ahupua'a for a total of $95,000. He then drove off 32,347 head of cattle belonging to Dowsett, Meek and James Robinson and constructed a fence around the outer boundary of his property (Bordner and Silva 1983:C-12). In 1879, Campbell brought in a well driller from California to search the 'Ewa plains for water, and a "vast pure water reserve" was discovered (Armstrong and Bier 1983). Following this discovery, plantation developers and ranchers drilled numerous wells in search of the valuable resource. By 1881, the Campbell property of Hono'uli'uli prospered as a cattle ranch with "abundant pasturage of various kinds" (Briggs in Haun and Kelly 1984:45). Within 10 years of the first drilled well in 'Ewa, the addition of a series of artesian wells throughout the island was supplying most of Honolulu's water needs (Armstrong and Bier 1983).

In 1889, Campbell leased his property to Benjamin Dillingham, who subsequently formed the O'ahu Railway & Land Co. (O.R. & L) in 1890. To attract business to his new railroad system, Dillingham subleased all land below 200 feet elevation to William Castle who in turn sublet the area to the 'Ewa Plantation Company for sugar cane cultivation (Frierson 1972:15) (Figure 7). Dillingham's Hono'uli'uli lands above 200 feet elevation that were suitable for sugar cane cultivation were sublet to the O'ahu Sugar Co. Throughout this time and continuing into modern times, cattle ranching continued in the area, and Hono'uli'uli Ranch established by Dillingham was the "fattening" area for the other ranches (Frierson 1972:15).

'Ewa Plantation Co. was incorporated in 1890 and continued in full operation up into modern times (Figure 7). The plantation grew quickly with the abundant artesian water. As a means to generate soil deposition on the coral plain and increase arable land in the lowlands, the 'Ewa

Plantation Co. installed ditches running from the lower slopes of the mountain range to the lowlands and then plowed the slopes vertically just before the rainy season to induce erosion (Frierson 1972:17).

The O'ahu Sugar Co. was incorporated in 1897 and included lands in the foothills above the 'Ewa plain and Pearl Harbor. Prior to commercial sugar cultivation, the lands occupied by the O'ahu Sugar Co. were described as being "of near desert proportion until water was supplied from drilled artesian wells and the Waiāhole Water project" (Condé and Best 1973:313). The O'ahu Sugar Co. took control over the 'Ewa Plantation lands in 1970 and continued operations into the 1990s.

Dillingham's *mauka* lands in western Hono'uli'uli that were unsuitable for commercial sugar production remained pasture for grazing livestock. From 1890 to 1892, the Ranch Department of the O.R. & L. Co. desperately sought water for their herds of cattle by tapping plantation flumes and searching for alternative sources of water. Ida von Holt leaves this account of her husband Harry's (Superintendent of the O.R. & L Ranch Dept.) search for water in the foothills of the Wai'anae Range:

> One of those places is on the old trail to Palehua, and had evidently been a place of which the Hawaiians had known, for its name is Kaloi (the taro patch), and even in dry weather water would be standing in the holes made by the cattle, as they tried to get a drop or two. (Von Holt 1985:136)

A second account is given of the discovery of spring water in an area over the ridge on the north side of Kalo'i Gulch:

> Shouting to the men to come over with their picks and shovels, he [Harry von Holt] soon got them busy clearing away lots of small stones and earth. Almost at once they could see that there were evidences of a paved well, and at about three feet down they came upon a huge flat rock, as large around as two men could span with their arms. Digging the rock loose and lifting it to one side, what was their astonishment to find a clear bubbling spring! (Von Holt 1985:138)

Following the discovery, two old Hawaiians began to ask Von Holt about the spring:

> Finally he [Harry von Holt] got them to explain that the spring, called "Waihuna" (Hidden Spring) had been one of the principal sources of water for all that country, which was quite heavily populated before the smallpox epidemic of 1840...A powerful Kahuna living at the spring had hidden it before he died of the smallpox, and had put a curse on the one who disturbed the stone, that he or she would surely die before a year was out. (Von Holt 1985:138-140)

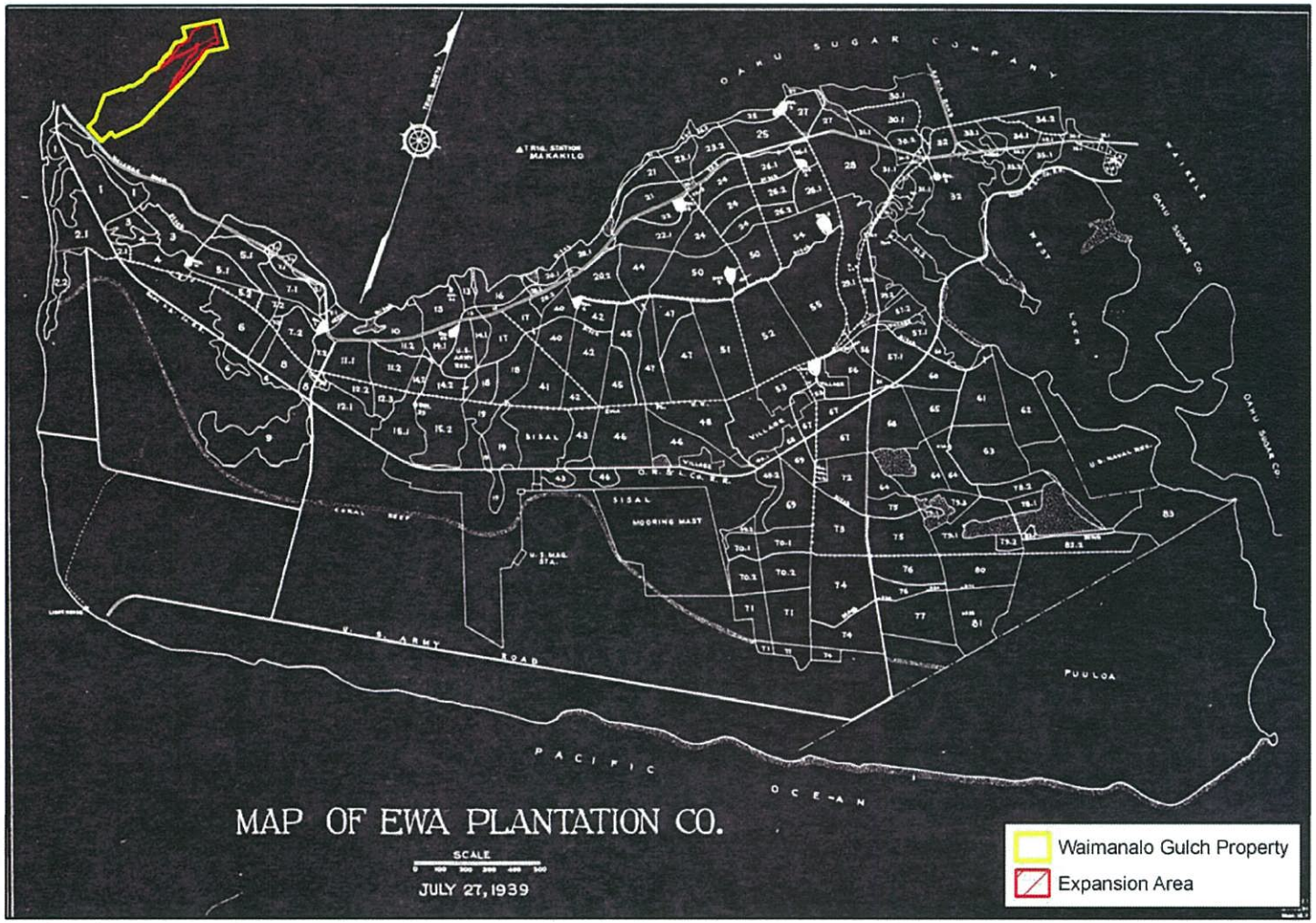

Figure 7. Map of 'Ewa Plantation Co. (Condé and Best 1973:285), showing the extent of sugar cane cultivation in the vicinity of the Waimānalo Gulch property.

3.5.2 1900s

By 1920, the lands of Hono'uli'uli were used primarily for commercial sugar cane cultivation and ranching (Frierson 1972:18). Much of the *mauka* lands in western Hono'uli'uli, including ridges and deep gulches, were unsuitable for commercial sugar cultivation and remained pasture for grazing livestock. Historic maps of the Waimānalo Gulch area indicate a lack of any significant development in the area into the 1940s (Figures 8-10). Modest constructions in the area included the realignment of the "Waianae Road" (present Farrington Hwy.) to run along the *makai* / southern edge of the Waimānalo Gulch property, and a road the top of the Kahe Point ridge, within the Waimānalo Gulch property.

In the late 1920s, the main residential communities were at the northeast edge of the 'Ewa Plain. The largest community was still at Hono'uli'uli village. 'Ewa was primarily a plantation town, focused around the sugar mill, with a public school as well as a Japanese School. Additional settlement was in Waipahu, centered around the Waipahu sugar mill, operated by the Oahu Sugar Company.

Major land use changes came to western Hono'uli'uli when the U.S. Military began development in the area. Long before the Japanese bombing of Pearl Harbor in December 1941, the U.S. military had initiated the Oahu Coast Defense Command, a series of coastal artillery batteries designed to assist in the defense of Pearl Harbor and to prevent invasion of O'ahu. Military installations were constructed both near the coast, as well as in the foothills and upland areas. The following military installations were located in the general vicinity of the current Waimānalo Gulch project area. Barbers Point Military Reservation (a.k.a. Battery Barbers Point, 1937-1942), located at Barbers Point Beach, was used beginning in 1921 as a training area for firing 155 mm guns (Payette 2003). Camp Malakole Military Reservation (a.k.a. Hono'uli'uli Military Reservation until 1941), located south of Barbers Point Harbor, was used from 1939 as an anti-aircraft artillery training firing point (Payette 2003). Gilbert Military Reservation, located east of Barbers Point Harbor, was used from 1922-1944 as a railway battery firing position (Payette 2003). Brown's Camp Military Reservation (a.k.a. Brown's Camp Battery from 1937-1944 and Battery Awanui from 1940-1945), located near Kahe Point was a railway battery firing position (Payette 2003). Fort Barrette (a.k.a. Kapolei Military Reservation and Battery Hatch), located atop Pu'u Kapolei, was in use from 1931 to 1948 for housing four 3-inch anti-aircraft batteries (Payette 2003).

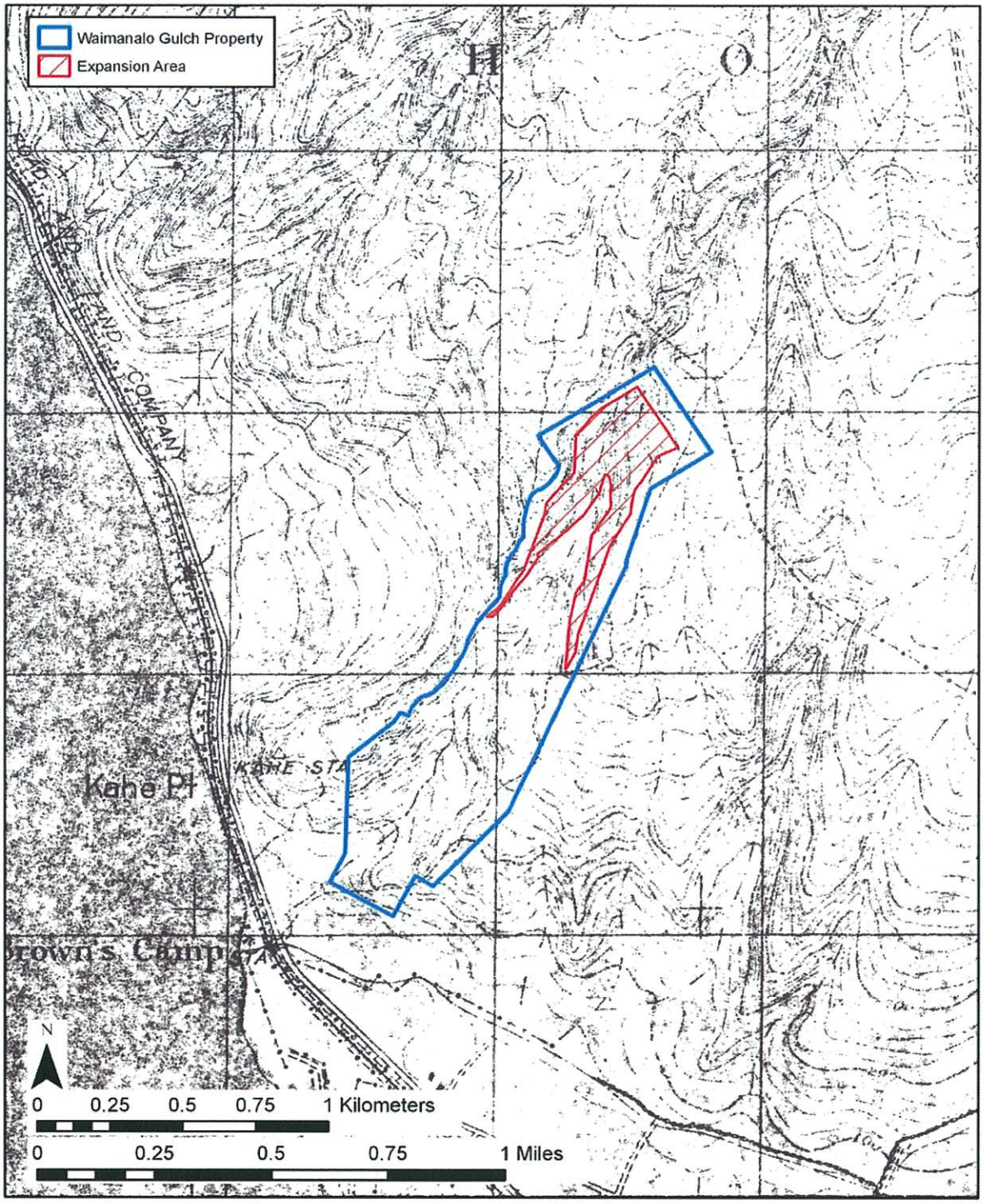

Figure 8. 1918 Fire Control Map, showing the location of the Waimānalo Gulch property and proposed landfill expansion area

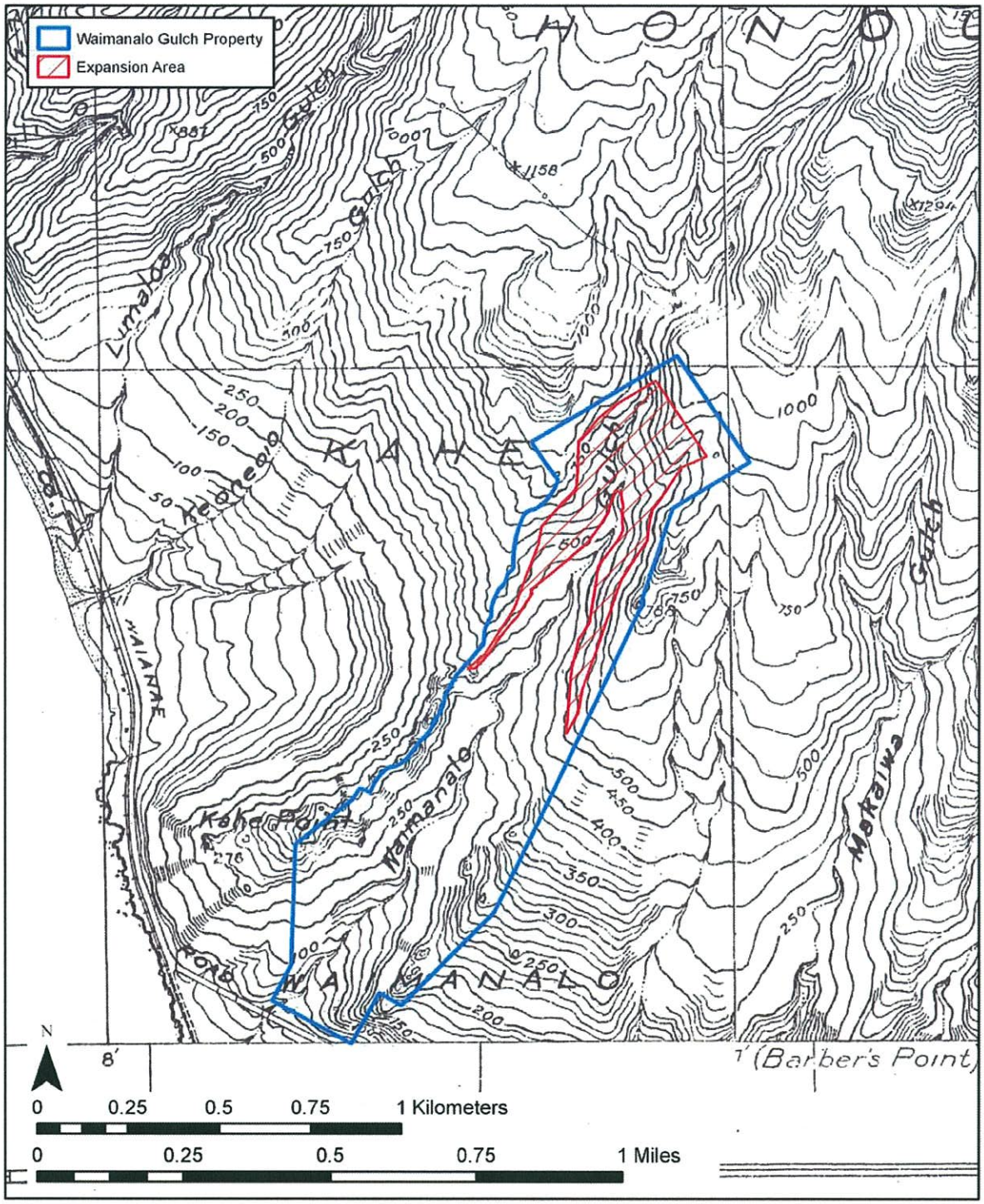

Figure 9. 1928 USGS Topographic Map, Wai'anae Quad, showing the location of the Waimānalo Gulch property and proposed landfill expansion area

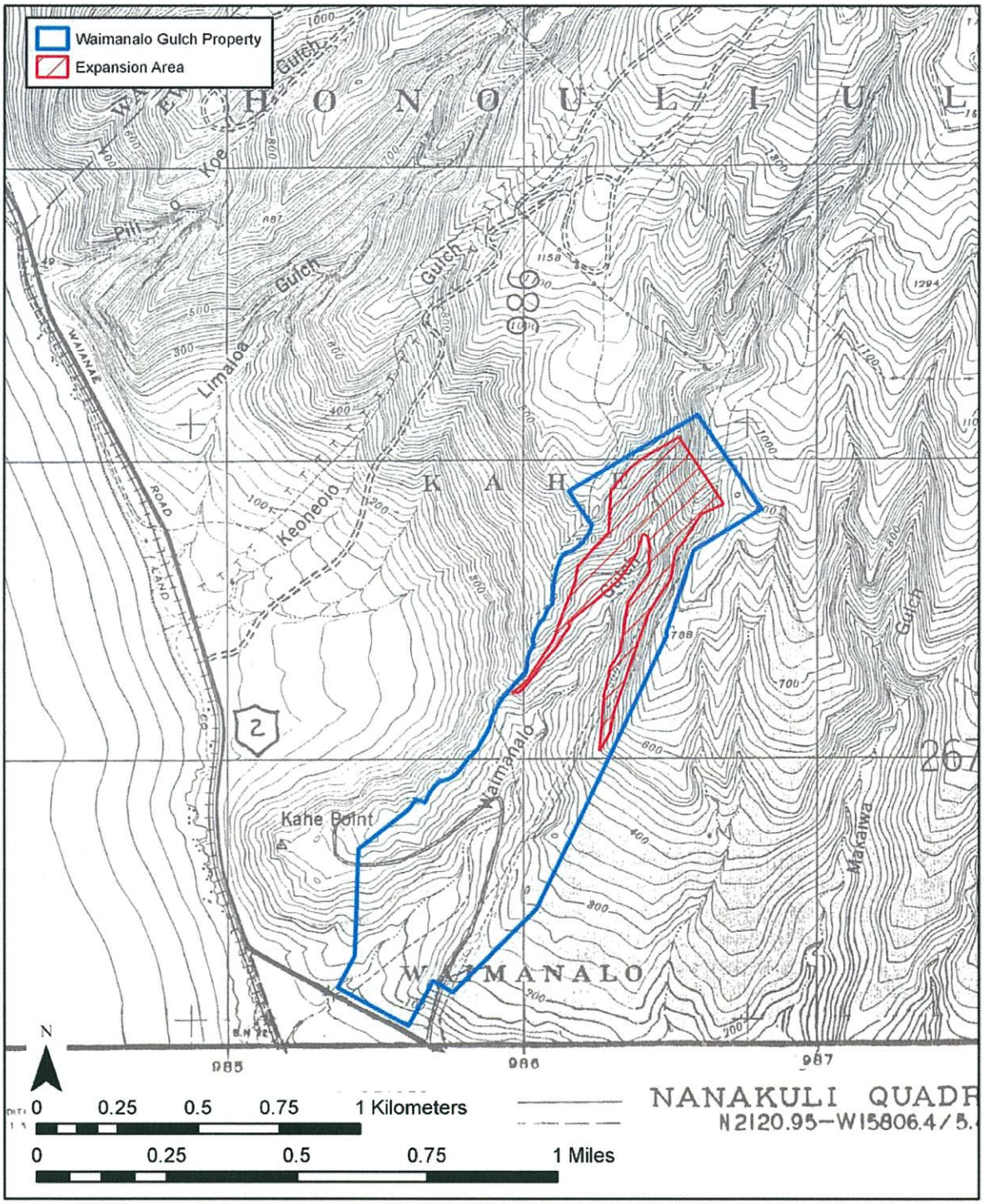

Figure 10. 1928 USGS Topographic Map, Wai'anae Quad, showing the location of the Waimānalo Gulch property and proposed landfill expansion area

In the 1950s, the site was used as a NIKE missile base. Palailai Military Reservation (a.k.a. Battery Palailai from 1942-1944), located atop Pu'u Palailai, was used from the 1920s and included Fire Control Station "B" (Payette 2003). Barbers Point NAS, in operation from 1942 into the 1990s, was the largest and most significant base built in the area. It housed numerous naval and defense organizations, including maritime surveillance and anti-submarine warfare aircraft squadrons, a U.S. Coast Guard Air Station, and the U.S. Pacific Fleet.

3.5.3 Battery Arizona

On the southwest ridge above Waimānalo Gulch are the subterranean remnants of Battery Arizona, an ambitious World War II military project. The attack of December 7, 1941 impelled the construction of further defensive armament for portions of the O'ahu coastline not protected by the existing batteries. Even the sunken ships at Pearl Harbor would be enlisted in O'ahu's defense. When, early in 1942, it was discovered that the two rear three-gun turrets of the U.S.S. Arizona were salvageable, an ambitious plan to mount them at two land installations on O'ahu was set into motion. The two sites chosen were the tip of Mōkapu Peninsula at Kāne'ohe Bay, designated Battery Pennsylvania, and Kahe Point above the Wai'anae Coast, designated Battery Arizona.

Construction of Batteries Pennsylvania and Arizona commenced in April 1943. A formidable subterranean complex was contrived to house the turrets at the two sites. According to a U.S. Army Corps of Engineers report prepared in 1946:

> The design that was eventually produced consists of a central barbette well of concrete set in rock, having an overall depth of about 60 ft. and an inside diameter of about 24 ft., with three levels below the bottom of the turret connected by stairways. Two tunnels radiate from this well to house projectiles and powder magazines immediately adjacent to the well. Beyond and in line with the projectile magazine is a large power room for three 125 KW generators, all miscellaneous switchgear, air conditioning, and ventilating equipment. In a separate tunnel off the main tunnel in the vicinity of the powder room is a 10,000 gallon emergency water tank to maintain the battery for several days in case of siege. Beyond the power room in a separate leg of the tunnel are the operations rooms. Because during prolonged action it might be necessary for the entire battery personnel to remain in the battery and be self sustaining, these gas proofed and air conditioned operations rooms normally comprised of radio and switchboard, plotting, and radar rooms included latrines for officers and enlisted men, a galley, first aid room, offices, and storerooms.

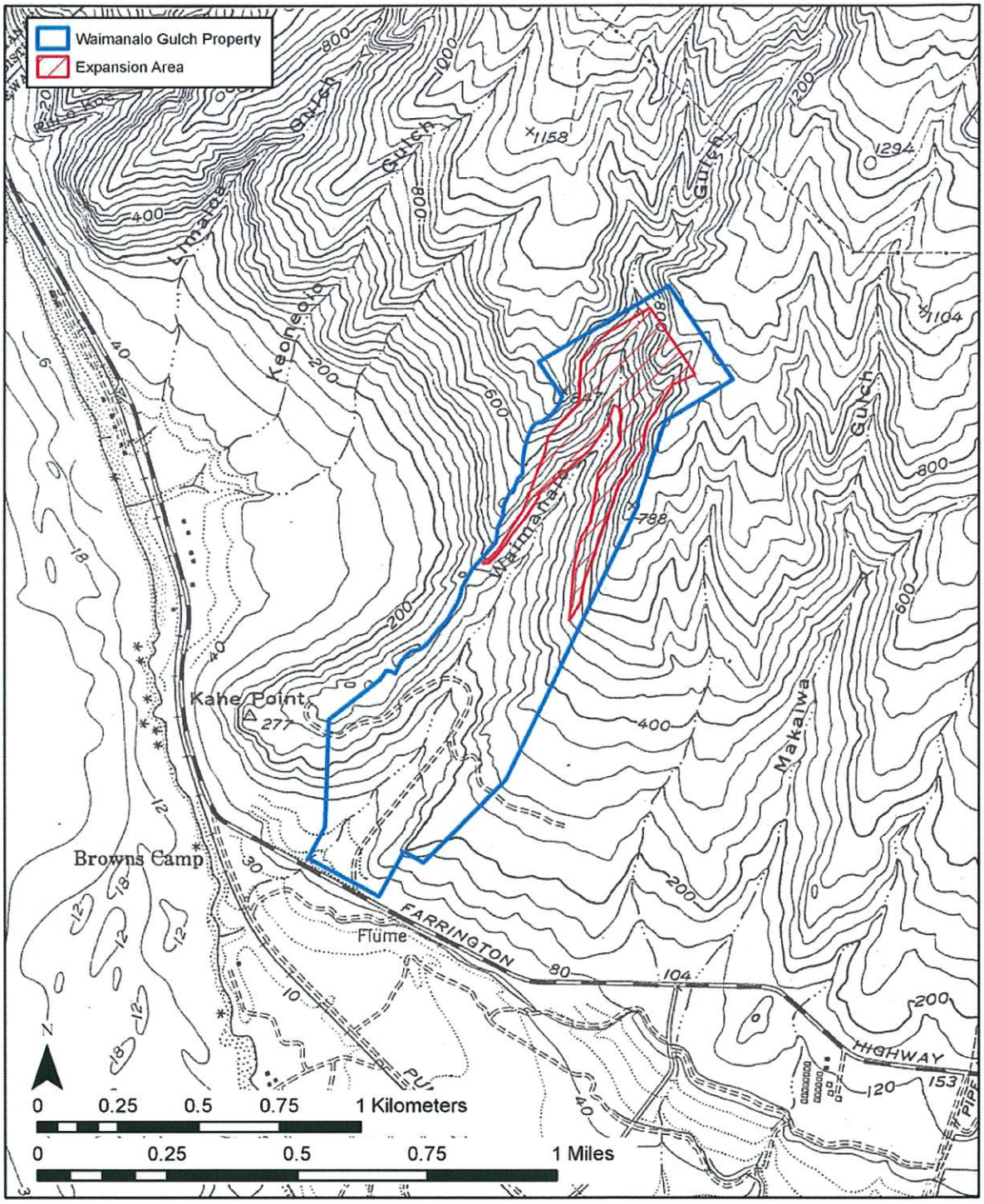

Figure 11. 1953 USGS Topographic Map, 'Ewa Quad., showing the location of the Waimānalo Gulch property and proposed landfill expansion area

The salvaged turrets were stored at a facility on Pearl City Peninsula. Refurbishing of the turrets proved to be a formidable task:

> An immediate complication arose from the fact that removal of the turrets from the Arizona was begun prior to any thought of their reuse; hence, much of the cutting was done rapidly and crudely with no consideration for future reassembly. As a result, the reconstruction frequently was held up by the painstaking realignment and joining of turret segments. Other difficulties arose from the initial damage and subsequent immersion suffered by the armament components. (Kirchner and Lewis 1967:432)

Records in the archives of the U.S. Army Museum at Ft. DeRussy reveal the months-long search across the Mainland for replacement parts, especially motors, and for parts to adapt the turrets to installation on land. It was finally determined that, because they had been so long under water, every part of the turrets' operating systems had to be repaired or replaced.

Perhaps appropriately for the former battleship armaments, the turrets were transported to their respective battery sites by sea. According to the 1946 Army Corps of Engineers report:

> The heavy section of the turrets comprising three 14-inch guns were moved by barge from Pearl Harbor to beaches near the battery sites. Here they were cleaned, painted, and put into condition for installation in the barbette. Special equipment was designed at each site for raising the parts from the ground and lowering to their correct position in the barbette.

Construction of the two batteries continued through all of 1944 and into two-thirds of 1945. Problems--associated with wartime conditions and the unique engineering feat of adapting shipboard weaponry to land installation--dogged the two projects over the many months:

> This work involving repair, replacement, or remanufacture of thousands of separate parts placed great demands upon the Army and Navy ordnance facilities and workers. Often, drawings were not available for damaged or missing items, and a particular stage of reconstruction had to be awaited before such parts could be reproduced...In one instance, well over a year was required to procure a single turret turning gear worm and pinion.
>
> ...The various problems were further complicated by the sheer mass of the armament and the size of the battery structures...Special heavy equipment...had to be erected at each installation for raising the turret members from the shore and for assembling the armament at the site. Some segments had to be moved on rollers along specially constructed roads, while the 71-ton gun tubes were lifted by parkbuckles from the beaches to the emplacements high above.
>
> ...Site peculiarities placed severe restrictions upon the battery layouts. The fire-control radars, for example, because of their sensitivity to concussion, could not be near the turrets; yet the ideal positions for the radars both technically and topographically were but a few yards away...

> During late 1944, the battery construction reached a bottleneck stage when progress depended upon a few highly skilled technicians and the closely timed arrival of a few critical armament components. By Christmas, 1944, the number of personnel that could effectively work at the two installations was limited to about 35 specialists. At this time, Battery Pennsylvania's turret was roughly half assembled, while Battery Arizona was even further behind. (Kirchner and Lewis 1967:432-433)

The slow pace of construction of the two batteries reflected a diminishing urgency for defense of O'ahu and its military installations. The war front was moving west across the Pacific as successive defeats impelled Japan's retreat. Battery Pennsylvania at Mōkapu Point was near completion in August 1945 when its guns were test fired around the same time of Japan's surrender. Battery Arizona had not been completed by the war's end; its guns, though installed, were never fired.

Neither of the two batteries was ever placed in operation during the post-war years. The batteries had been rendered obsolete "due to the development of air power, new assault techniques and nuclear weapons. The guns were scrapped in 1949..." (Bouthillier 1995:12).

A 1943 War Department map indicates a road was constructed within the *makai* / southern portion of Waimānalo Gulch, ascending the western slope to the top of the Kahe Point ridge. This road, along with several other roads and trails indicated on the map, were likely constructed in association with the Battery Arizona complex and other military installations and training areas in the vicinity.

3.5.4 1950s to Present

Waimānalo would once again play a role in the O'ahu defense system when, sometime after 1959, the United States Army purchased or exchanged land with the Campbell Estate for the construction of a Nike-Hercules anti-aircraft missile base located at the head of Waimānalo Gulch. The Nike complex, in used between 1961 and 1968 consisted of two control sites and one double-sized launcher site (Murdock 2003). The tunnel complex of Battery Arizona was also used for civil defense circa 1960.

Development in the uplands of western Hono'uli'uli have generally been limited to ranch related housing and infrastructure, military training and NIKE missile stations, as well as the construction of military and commercial communication and atmospheric observation stations on the ridges near Pālehua. In 1975, the U.S. Air Force constructed the Pālehua Solar Observatory with five solar optical telescopes. A circa 1980s aerial photograph (Figure 13) shows limited development in the vicinity of the Waimānalo Gulch landfill property.

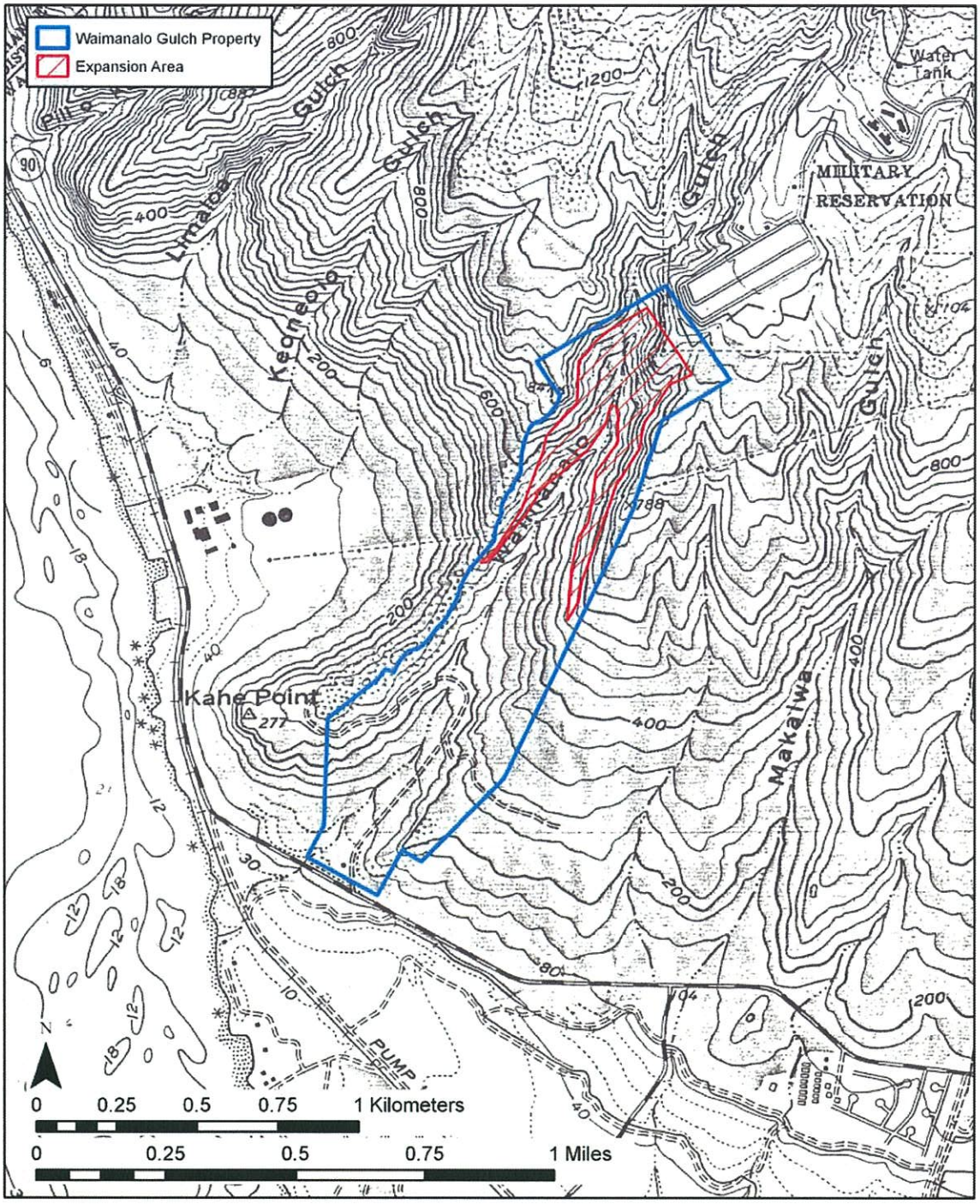

Figure 12. 1962 USGS Topographic Map, 'Ewa Quad., showing the location of the Waimānalo Gulch property and proposed landfill expansion area

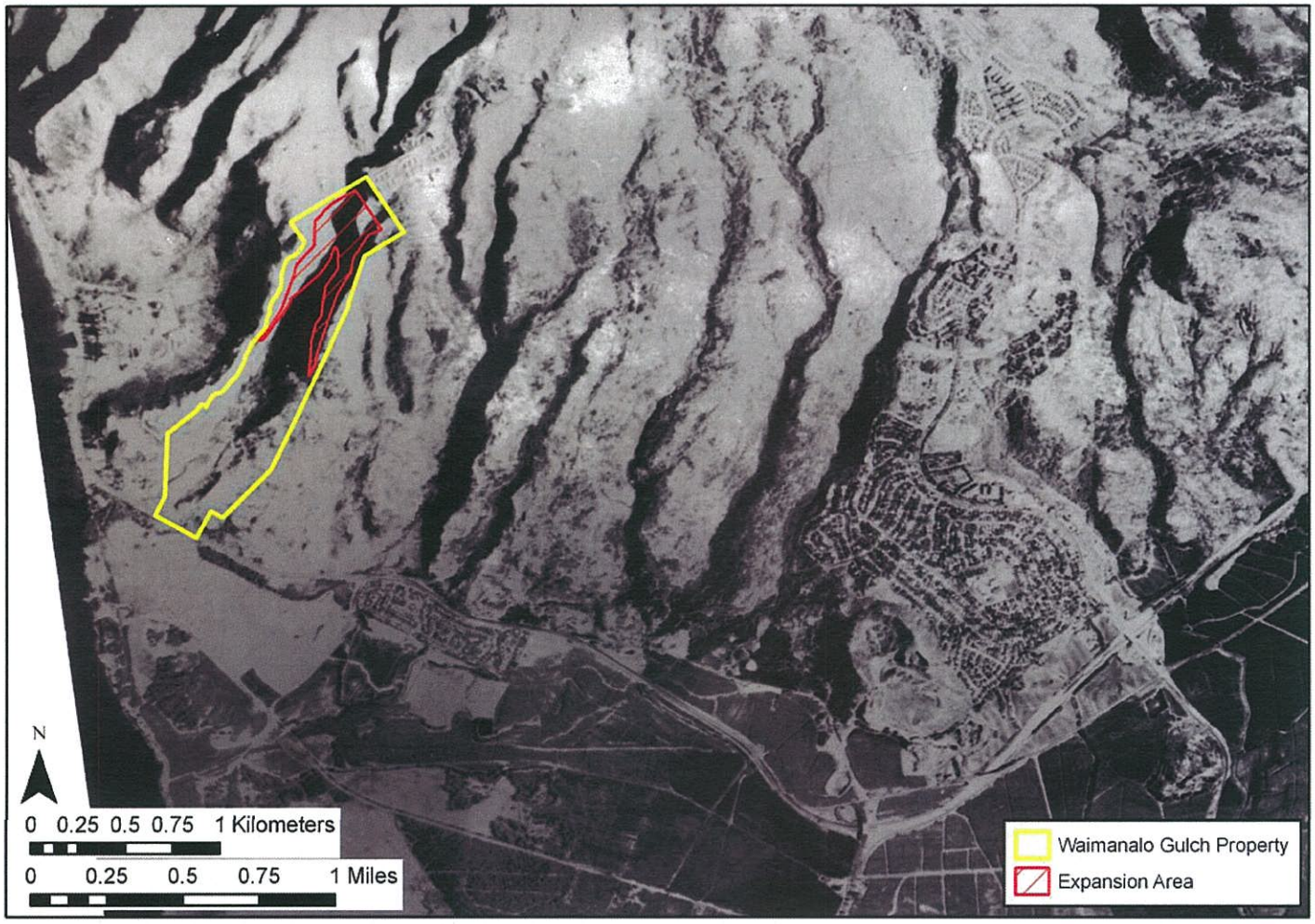

Figure 13. Circa 1980s aerial photograph of western Hono'uli'uli, showing the location of the Waimānalo Gulch property and proposed landfill expansion area

In 1985, the City and County of Honolulu condemned 81.5 acres of agricultural land in Waimānalo Gulch for use as a landfill to dispose of municipal refuse and ash from the H-POWER incinerator to be built nearby at Campbell Industrial Park. Work on the landfill began in 1987. In 1988, workers constructing the Waimānalo Gulch landfill were reporting strange incidents at the site. According to a newspaper article by Bob Krauss:

> "We've been having funny things happen," said one of the men on the site. "Unnatural things. In one case, a man was standing on a flat rock and the thing threw him over. All of a sudden, it just flipped over."
>
> Another time a backhoe was knocking down kiawe trees. The trees have shallow roots systems so they usually just fall down. But one of the trees jumped up and did a somersault...
>
> Then there was the payloader filling in a huge hole where a $17,000 fiberglass fuel tank had been placed. The story is that the driver put his machine in reverse but it jumped forward and leaped into the hole, smashing the tank. (Honolulu Advertiser, 6/20/88:A-1, A-4)

Other incidents reported to Krauss were a truck that had flipped over, tools that had vanished, and a huge stone that had disappeared. The workers called in:

> ...a woman recommended for lifting curses and banishing evil spirits. She said the trouble was caused by a certain stone, the "chief of the valley," which was lying on its side.
>
> The men quickly set the stone upright. But they got it upside down. Things went from bad to worse. The woman came out again and recommended they place the stone on the hill where it will not be covered by rubbish when the landfill opens.(Honolulu Advertiser, 6/20/88:A-1, A-4)

According to Krauss, in April 1988, the stone was moved to a "nest of boulders so that it faces east," at the "end of a Hawaiian Electric Co. Road to one of its relay stations on top of [a] hill." This site lies close to the Battery Arizona bunkers in the southwest portion of the Waimānalo Gulch landfill property.

Section 4 Previous Archaeological Research

The coral plains of 'Ewa have been the focus of more than 50 archaeological studies over the last two decades, largely as the result of required compliance with county, state, and federal legislation. The Kalaeloa (Barbers Point) area, in particular, has been intensively studied. In contrast, relatively little research has been conducted in the uplands of Hono'uli'uli, along the southern slopes of the Wai'anae Range. This discussion of previous archaeological research will focus on the results of this prior archaeological work at the southern end of the Wai'anae range.

Recent archaeological investigations in the southern Wai'anae Range have generally been focused on deep gulch areas for potential landfill locations, lower slopes for residential development, and mountain peaks for antennae or satellite tracking infrastructure (Table 1 and Figure 14).

Table 1. Previous archaeological investigations in the uplands of Hono'uli'uli Ahupua'a

Reference	Type of Investigation	General Location	Findings
Bordner 1977a	Archaeological Reconnaissance	Proposed Makaīwa Gulch Landfill Site	No archaeological sites identified
Bordner 1977b	Archaeological Reconnaissance	Proposed Kalo'i Gulch Landfill Site	3 sites (-2600, -2601, -2602), low stacked boulder walls
Bordner and Silva 1983	Archaeological Reconnaissance and Historical Documentation	Proposed Waimānalo Gulch Landfill Site	No archaeological sites identified
Sinoto 1988	Archaeological Reconnaissance	Makakilo Golf Course	Low stacked boulder wall (-1975)
Bath 1989	Petroglyph Documentation	Waimānalo Gulch	3 petroglyphs (-4110)
Hammatt et al. 1991	Archaeological Inventory Survey	Makaīwa Hills Project Site	34 sites, including prehistoric habitation and agricultural features, rock shelters, petroglyphs, *ahu*, and various sugar cane cultivation infrastructure
Hammatt 1992	Archaeological Inventory Survey	KAIM Radio Tower, Pālehua	No archaeological sites identified

Reference	Type of Investigation	General Location	Findings
Nakamura et al. 1993	Archaeological Inventory Survey	Makakilo D and D-1 Development Parcels	Cement irrigation flume (-4664)
Borthwick 1997	Archaeological Assessment	Satellite Multi-Ranging Station, Pālehua	No archaeological sites identified
Dega et al. 1998	Archaeological Inventory Survey	UH West O'ahu	Two historic site complexes, (50-80-08-5593 historic irrigation system and 50-80-09-2268 Waiahole Ditch System)
Hammatt and Shideler 1998	Archaeological Inventory Survey and Assessment	Waimānalo Gulch Sanitary Landfill Project Site	Battery Arizona Complex and modern "shrine" site

The earliest attempt to record archaeological remains in Hono'uli'uli Ahupua'a was made by Thrum (1906). He reports the existence of a *heiau* located on Pu'u Kapolei, southeast of the current project area. Pu'u Kapolei Heiau was described as "Ewa-size and class unknown. Its walls thrown down for fencing" (Thrum 1906:46).

In his surface survey of 1930, archaeologist J. Gilbert McAllister recorded the specific locations of important sites, and the general locations of less important sites (at least at Hono'uli'uli). Archaeological investigations by McAllister along the southern slopes of the Wai'anae Range identified a number of sites, which are of interest (Figure 15).

McAllister documents Pu'u Kapolei Heiau as Site 138 and notes:

> The stones from the heiau supplied the rock crusher which was located on the side of this elevation, which is about 100 feet away on the sea side. There was formerly a large rock shelter on the sea side where Kamapuaa (the pig-god) is said to have lived with his grandmother (Kamaunuahihio). (McAllister 1933:108)

McAllister's Site 136 is located near Mauna Kapu, northeast of the current project area, and is described as a small platform on the ridge dividing the 'Ewa and Wai'anae districts. The 4 to 6 square foot platform was constructed of coral and basalt stones, and was believed to be an altar (McAllister 1933:107). It is noted to have been destroyed by the time of Sterling and Summers' work in the late 1950's (Sterling and Summers 1978:32).

McAllister's Site 137 is located at Pu'u Ku'ua, a prominent landmark northeast of the current project area. Pu'u Ku'ua Heiau was described by McAllister as:

> (Destroyed) The heiau was located on the ridge overlooking Nanakuli as well as Hono'uli'uli at the approximate height of 1800 feet. Most of the stones of the heiau were used for a cattle pen located on the sea side of the site. The portion of

> the heiau which has not been cleared for pineapple has been planted in ironwoods. (McAllister 1933:32)

The presence of Pu'u Ku'ua Heiau provides some archaeological evidence of the Pu'u Ku'ua settlement described in the Hawaiian Newspaper "*Ka Loea Kalaiaina*" (see Section V: Background Research).

Makaīwa Gulch, the next major gulch east of Waimānalo Gulch was surveyed as a potential landfill location (Bordner 1977a). The reconnaissance survey included lands within Makaīwa Gulch from Farrington Highway *mauka* to the approximately 1000 ft (305 m) elevation. One archaeological feature was identified, a complex of three concrete platforms that was interpreted to be a military related structure.

An archaeological inventory survey of the "Makaīwa Hills" development project located several traditional as well as post-contact archaeological sites (Hammatt et al. 1991). The project area included a 1,915-acre parcel in Hono'uli'uli Ahupua'a, located between the town of Makakilo and Waimānalo Gulch, and bounded to the south by Farrington Highway and to the north by Pālehua Road (immediately east of the current project area). 34 sites were located, including prehistoric habitation structures (temporary and permanent), agricultural features (terrace and mounds), rock shelters, petroglyphs, *ahu*, and various sugar cane cultivation infrastructure (Figure 16).

Within the "Makaīwa Hills" project area, habitation sites were found to be clustered in higher elevations above 1000 ft., and in lower elevations below 500 ft (Hammatt et al. 1991). The higher elevations would contain ample forest subsistence resources for gathering on both a continual basis, as well as during times of famine and drought. The lower elevations would be in close proximity to the shoreline and bountiful coastal resources.

> In sum, this site type and patterning sample suggests that prehistoric and historic Hawaiian populations utilized the present study area as a recurrent and temporary habitation area focused mainly on the gathering of specialized goods, such as wild forest plants from the upper elevations and the quarrying of lithic material within the lower elevations. (Hammatt et al. 1991:106)

Kalo'i Gulch, which borders the northern portion of the current project area, was also surveyed as a potential landfill location (Bordner 1977b). The survey included lands within Kalo'i Gulch and its smaller tributaries from the *makai* end of the gulch up to the 1,400 ft elevation. It was noted that bulldozing extensively modified lands at the base of the gulch, *makai* of an historic quarry. In the *mauka* portions of the project area, three sites, possibly prehistoric, were identified. The three sites (50-80-12-2600, -2601, -2602) consisted of low-stacked basalt boulder walls located along the north side of the Kalo'i Stream channel.

During the initial archaeological survey of the lower portions of Waimānalo Gulch (the future site of the Waimānalo Gulch Sanitary Landfill), up to the 430-foot elevation, no archaeological sites were identified (Bordner and Silva 1983). In 1989, three petroglyph units (Site 50-80-12-4110) were located within the previously surveyed parcel (Bath 1989). Site -4110 is located in the southwest corner of Waimānalo Gulch, at approximately 80 ft. elevation.

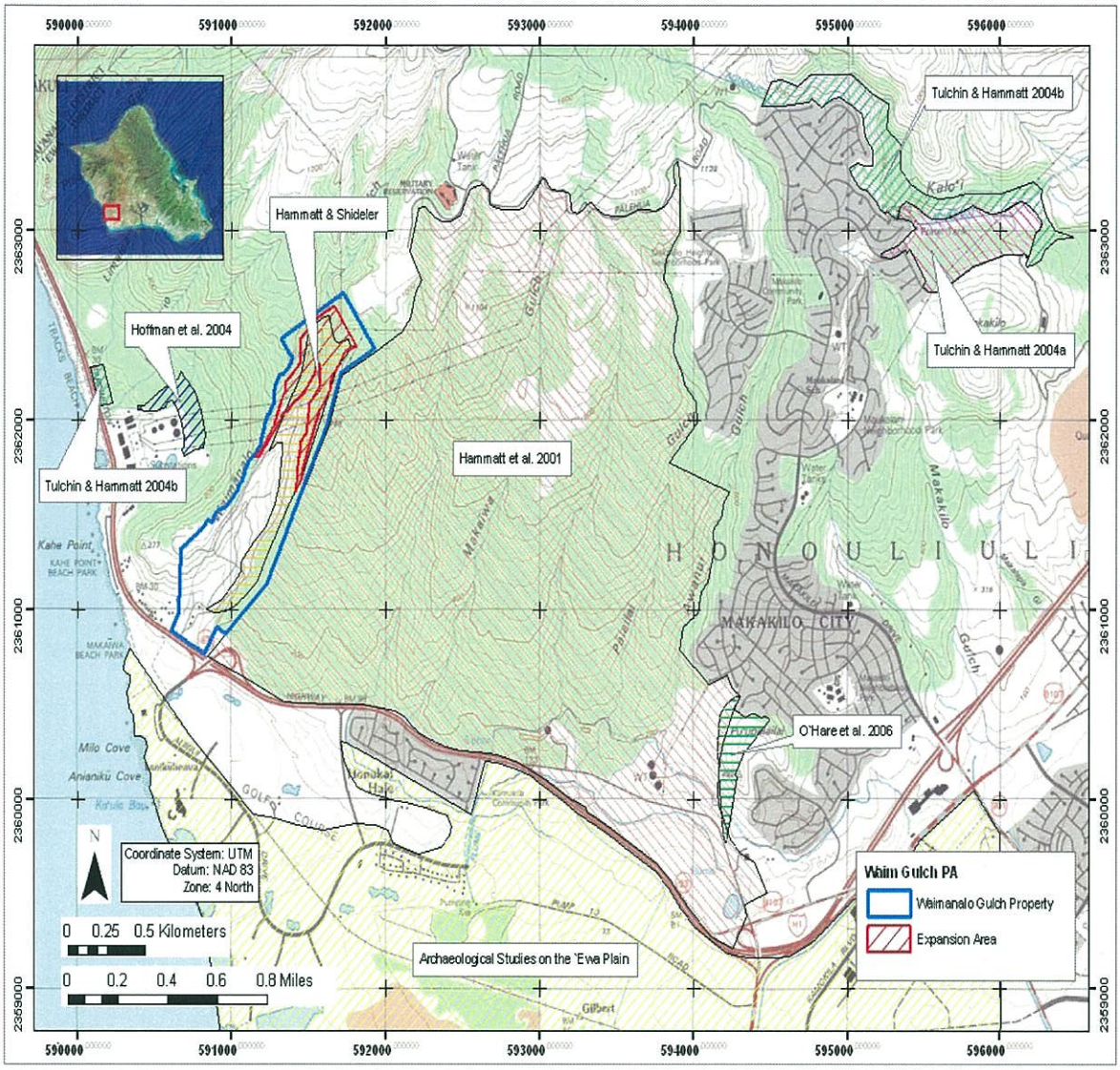

Figure 14. Previous archaeology work for the Waimānalo 'Ili

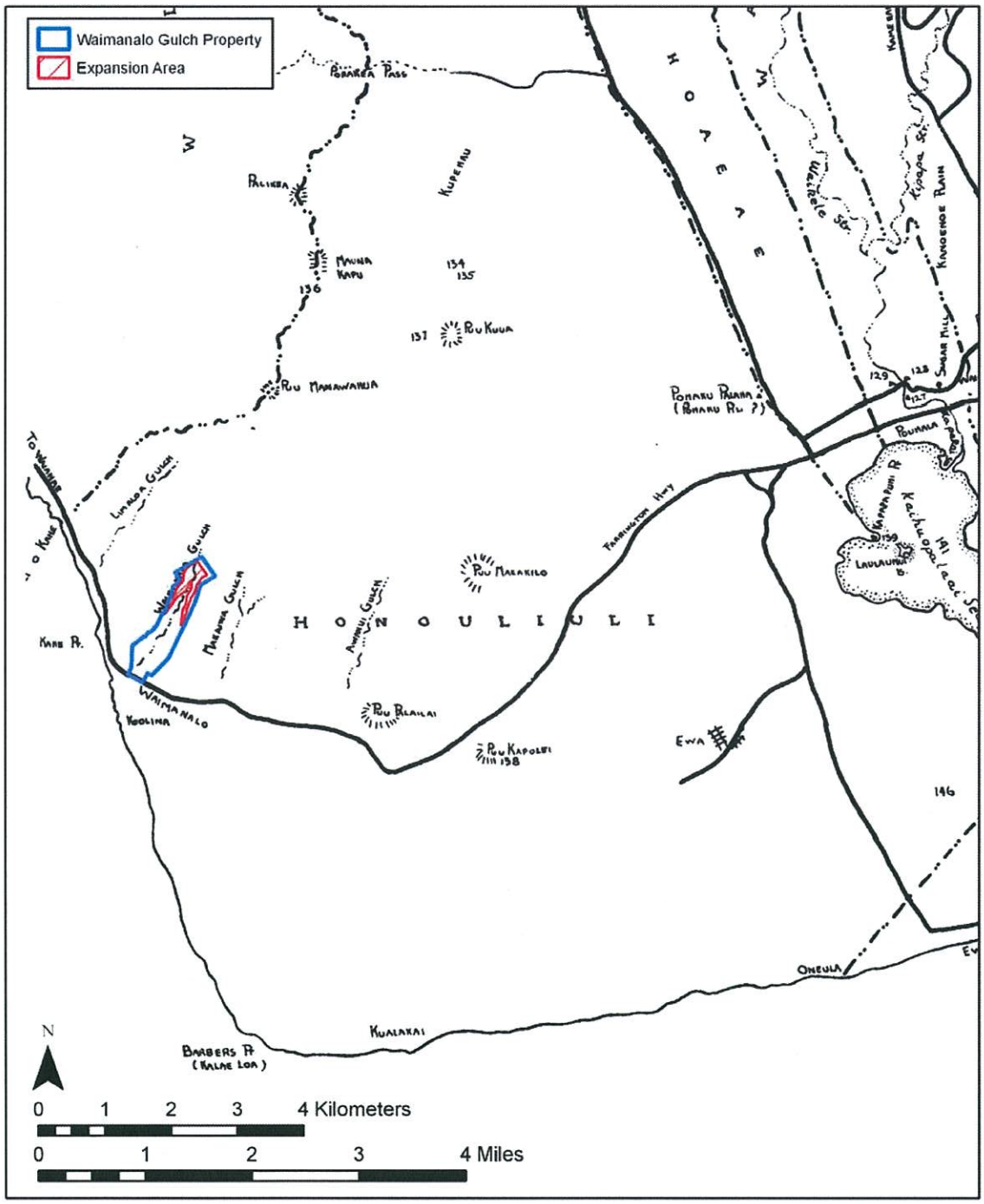

Figure 15. Portion of a 1930 map by archaeologist J. Gilbert McAllister showing Waimānalo Gulch property in relation to archaeological sites discussed in the text (base map from Sterling and Summers 1978)

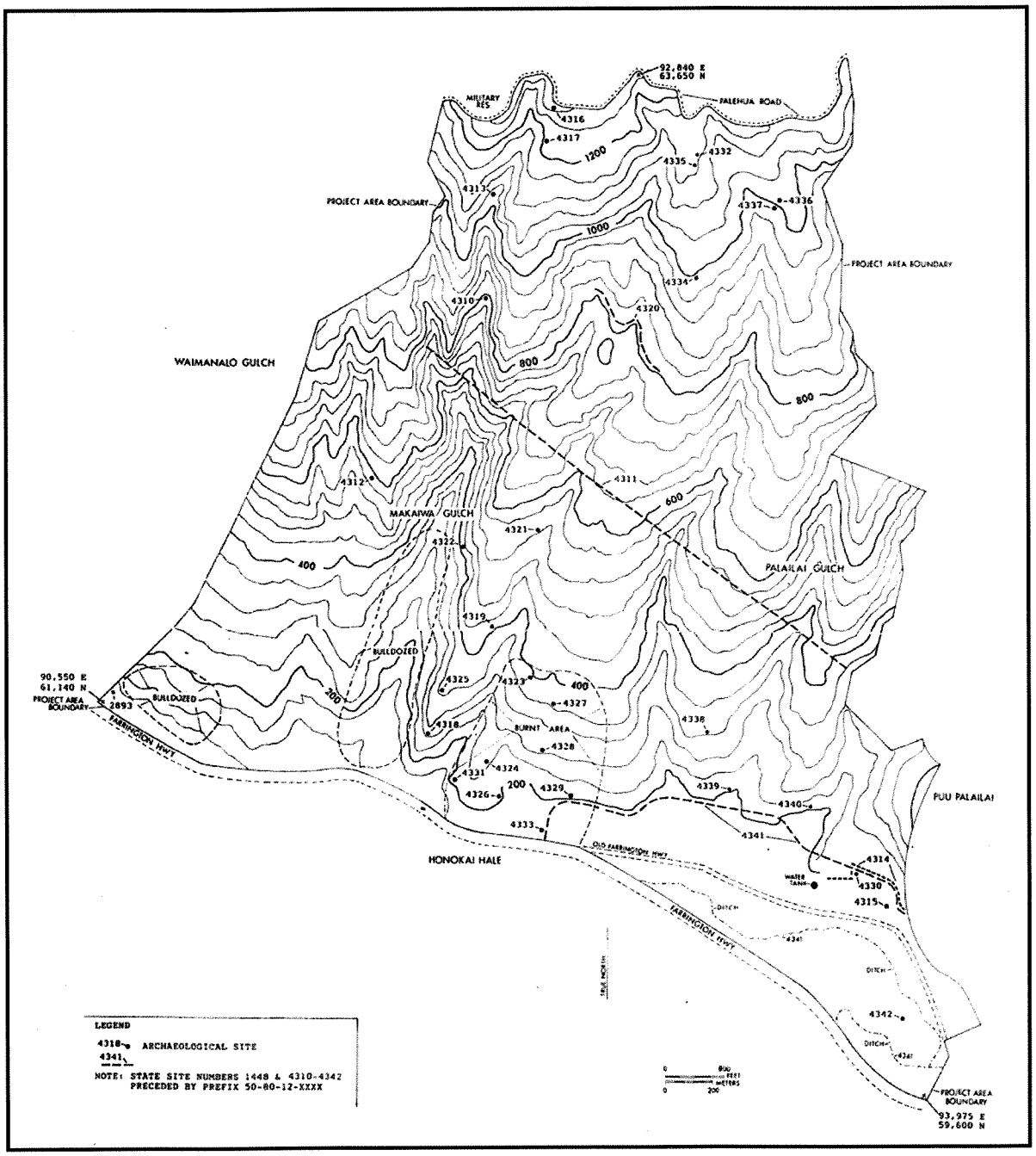

Figure 16. Makaīwa Hills project area showing the location of identified archaeological sites (Hammatt et al. 1991:7)

Further archaeological study within Waimānalo Gulch was conducted for the expansion of the sanitary landfill (Hammatt and Shideler 1998). No archaeological sites were located with the project area; however two sites, the Battery Arizona bunker complex and a modern "shrine" site, were observed along the northern ridge that separates Waimānalo Gulch from the HECO Kahe Power Plant property. The stones of the "shrine" site were believed to have been previously relocated from the central portion of Waimānalo Gulch circa 1988.

An archaeological inventory survey for the proposed University of Hawai'i-West O'ahu campus was conducted by Dega et al. (1998). The survey area included 991 acres in the vicinity of Pu'u Kapu'ai, northeast of the current project area. No traditional Hawaiian sites were located. The project area was noted to have undergone extensive land modification associated with commercial agriculture. Two historic site complexes (50-80-08-5593 historic irrigation system, 50-80-09-2268 Waiahole Ditch System) were documented. Identified features included flumes, aqueducts, ditches, pumps, and other irrigation infrastructure.

Two archaeological studies were made in the Pālehua area, *mauka* of Makakilo. An archaeological inventory survey of the proposed KAIM radio tower (Hammatt 1992), located northwest of the current project area identified no archaeological remains. An archaeological assessment for the proposed Ministry of Transportation Satellite Multi-Ranging Station project site (Borthwick 1997), which abuts the western perimeter of the Air Force Solar Observatory facility, identified no archaeological remains. In 2002, an informal survey conducted by SHPD/DLNR identified an enclosure site (50-80-08-6402) just off of Pālehua Road (SHPD personal communication 2004). The site consisted of two enclosures; one enclosure was determined to be of prehistoric origin, while the other was historic.

Archaeological studies associated with the proposed Makakilo Golf Course (Sinoto 1988) and the Makakilo D and D-1 Development Parcels (Nakamura et al. 1993) were conducted in the immediate vicinity of the current project area. Archaeological reconnaissance of the Makakilo Golf Course property included lands along the southern and eastern slopes of Pu'u Makakilo. Severe erosion was noted throughout the property. A single archaeological feature, a low stacked basalt boulder wall (50-80-12-1975), was identified (Sinoto 1988). Archaeological inventory survey of the Makakilo D and D-1 Development Parcels included lands on the southern and western slopes of Pu'u Makakilo, adjacent to the golf course property. A single historic property, a cement irrigation flume (50-80-12-4664), was located in the southern portion of the project area near the H-1 Freeway (Nakamura et al. 1993). No sites were located in the vicinity of Pu'u Makakilo.

Section 5 Results of the Community Contact Process

Throughout the course of this study, an effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about traditional cultural practices specifically related to the Waimānalo Gulch. This effort was made by letter, e-mail, telephone or in-person contact. In the majority of cases, letters – along with a map of the project area – were mailed with the following text:

> In collaboration with Waste Management of Hawai'i and the City & County of Honolulu Department of Environmental Services, Cultural Surveys Hawai'i is conducting a Cultural Impact Assessment for the expansion of approximately of the approximately 36-acre Waimānalo Gulch Sanitary Landfill Expansion Project, (TMK [1] 9-2-003:073 por) in Hono'uli'uli Ahupua'a, 'Ewa District, O'ahu. An overview of the historical and cultural literature background is provided for your convenience.
>
> The purpose of this assessment is to identify any traditional cultural practices associated with the project area, past or present. We are seeking your kōkua and guidance regarding the following aspects of our study:
>
> - General history and present and past land use of the study area.
> - Knowledge of cultural sites which may be impacted by the project – for example, historic sites, archaeological sites, and burials.
> - Knowledge of traditional gathering practices in the study area–both past and on-going.
> - Cultural associations with the study area through legends, traditional use or otherwise.
> - Referrals of kūpuna or anyone else who might be willing to share their general cultural knowledge of the study area.
> - Any other cultural concerns the community might have related to cultural practices in the Waimānalo area.

A total of twenty-one (21) individuals, organizations, and agencies were consulted for this CIA (Table 2). Four of these referred CSH to other individuals who were included in the study. Seventeen (17) individuals contributed specific and relevant information via formal interviews, informal "talk story" discussion and / or email. One person (Douglas McDonald Philpotts) was formally interviewed for this project (see transcription in Appendix B). One person (Shad Kane) was previously interviewed during a prior (2002) CIA for an earlier version of the subject project (see Appendix A for a transcription of the interview, used with permission from Shad Kane).

Table 2. Summary of consultation efforts

Name	Affiliation	Comments
Ailā , William	Hui Mālama I Nā Kūpuna o Hawai'i Nei	Mr. Ailā feels it is very important to preserve the sites of this area. See Section 6 below for response.
Amaral, Annelle	'Ahahui Siwila Hawai'i O Kapolei Hawaiian Civic Club	Made referral to Shad Kane.
Cope, Aggie	Hale O Na'auao Society	Mrs. Cope mentioned that that area was known for the night marchers trail from *mauka* to *makai*. See Section 6 below for response.
Desoto, Frenchy	Wai'anae Coast Archaeological Preservation Representative	Made referral to Gary Omori, William Ailā .
Eaton, Arline	*Kupuna* at Iroquois Elementary School	See Section 6 below for response.
Enos, Eric	Cultural practitioner and director of Ka'ala Farms	Mr. Enos visited Site 6903 to view *pōhaku* within the project area. He is concerned about the protection of this site.
Flanders, Judith	Granddaughter of Alice Kamōkila Campbell	See Section 6 below for response.
Greenwood, Alice	O'ahu Island Burial Council Member, Wai'anae District	Ms. Greenwood spoke of a village at Makaīwa. She recalls a story about a ceremony in the area that mentioned possible burials. She remembers the *mo'olelo* had the names of the unknown gulches. She also spoke about the *huaka'i pō* (procession of the night marchers) and *akua lele* (flying god, usually a poison god sent to destroy, sometimes in the form of fireballs). See Section 6 below for response.
Ho'ohuli, "Black" Jo	Wai'anae Neighborhood Board No. 24	Mr. Ho'ohuli is concerned about caves in the *mauka* area that may contain burials.
Rezentes, Cynthia	Wai'anae Neighborhood Board No. 24	Mrs. Rezentes suggested contacting Frenchy Desoto. She is very concerned about the view plane.
Johnson, Rubellite	Hawaiian scholar	Ms. Johnson recommended consulting people who are from the project area.
Josephides, Analu	O'ahu Island Burial Council Member, Wai'anae District	See Section 6 below for response.
Kanahele, Kamaki	President of Nānākuli Homestead	See Section 6 below for response.
Kane, Shad	Member of the Makakilo, Kapolei, Honokai Hale Neighborhood Board and 'Ahahui Siwila Hawai'i O Kapolei Hawaiian Civic Club	Mr. Kane made two site visits with CSH to the project area. Mr. Kane is very concerned about the cultural sites within the project area and wants to be involved in the preservation process. He is also concerned about the view plane. See Appendix A for complete interview conducted in 2002 in association with a previous CIA of portions of the project area (cf. Souza and Hammatt 2002)

Name	Affiliation	Comments
Makaiwi, Martha	Makakilo, Kapolei, Honokai Hale Neighborhood Board No. 34	Made referral to Maeda Timson and Shad Kane.
McKeague, Kawika	O'ahu Island Burial Council member 'Ewa District	See Section 6 below for response.
Momoa, Joseph	Kama'āina of Nānākuli and member of Kamo'i Canoe Club	Mr. Momoa mentioned the night marcher path in Waimānalo area and he feels the path needs to be kept clear of visual blockage.
Nāmu'o, Clyde	Administrator at Office of Hawaiian Affairs	OHA recommended: (1) Consultation with seven specifc individuals, all of whom CSH attempted to contact. (2) The project area be considered a portion of a larger traditional cultural landscape, and that the possible presence of one or more Traditional Cultural Properties be considered (See Appendix C for OHA letter).
Philpotts, Douglas McDonald	Cultural practitioner and long time resident of Waimānalo 'Ili	Mr. Philpotts made a site visit to view the uprights within the projet area. See Section 6 below for response and Appendix B for complete interview.
Tiffany, Nettie	Kahu of Lanikūhonua and Former O'ahu Island Burial Council member, 'Ewa District	See Section 6 below for response.
Timson, Maeda	Member of the Makakilo, Kapolei, Honokai Hale Neighborhood Board No. 34 and President of Ua Au O Kapolei	Mrs. Timson shared two stories told to her by her Tutu Defreitas. Her *tutu* would bless the *hale* with *tī* (or *kī*) leaf and Hawaiian salt because all the *keiki* would get *maka'u* (scared). They also had *tī* leaf on all four corners of the house for protection.

As described in Section 1(Introduction), when the expansion project's CIA consultation was initiated, communication with the project proponents indicated that the proposed expansion area would be 36 acres—the same 36 acres that the project proponents were having surveyed as part of the project's archaeological inventory survey of the expansion area. For this reason, the initial project consultation letters describe the expansion area as approximately 36 acres. It was only later that CSH learned that the expansion area was actually approximately 90 acres. The 36 acres corresponds with the actual foot print of the landfill cells that will be created and used for refuse. Portions of the remaining approximately 90-acre expansion area will be used for the aforementioned appurtenances. Therefore, although the foot print of the proposed area to be disturbed is larger than the 36 acres indicated in the initla CIA consultation, the actual portion of the gulch to be used specifically as a landfill (36 acres) has not changed.

The consultation results contained in this CIA, which refer specifically to the 36-acre area of the landfill proper, will be augmented and expanded prior to preparation of the Final Environmental Impact Statement. The individuals and agencies listed in Table 2 will be contacted again with the new information about the larger project area.

Section 6 Cultural Resources and Traditional Practices

The areas of Waimānalo Gulch, Makaīwa Gulch, Ko'olina, Lanikūhonua and the uplands of Pālehua and Pu'uku'ua are within the *'ili* of Waimānalo located in the *ahupua'a* of Hono'uli'uli, 'Ewa District (see Figure 11). 'Ili is defined as "a land section, next in importance to *ahupua'a* and usually a subdivision of an *ahupua'a*" (Pukui and Elbert 1971:91).

The current project area was a zone of less intensive land use between resource rich areas *mauka* and *makai.* The *makai* area has marine resources, a canoe landing, *ko'a* (fishing grounds) and *lo'i* (pondfield) that sustained a fishing village. The *mauka* area is considered a sacred place with many *heiau*, myths and legends.

Although this area has been placed in the district of 'Ewa and the *ahupua'a* of Hono'uli'uli, some Wai'anae community members feel a strong connection with this place as many traverse this area fequently to get in and out of Wai'anae. Participants also mentioned the many natural and cultural resources of the region.

Specific aspects of traditional Hawaiian culture mentioned during information gathering interviews and "talk story" sessions are incorporated throughout this section as they relate to the project area. Some interview material is excerpted from past CIAs conducted by CSH. Interviewees for the current project gave their permission for past interviews to be included in this report. Participants also provided new stories for Waimānalo Gulch for which we have found no previous written documentation. Some of these stories include Spirits *('Uhane*), the "Legend of the Slain Girl", the "Legend of Two Giants", and associations with the Pueo 'Aumakua.

Concerns for sacred sites in the area focused on the Pueo Stone which was relocated around 1988 for preservation. Nana Veary, a respected *kupuna*, relocated the *pōhaku*. Gary Omori asserts that after the Pueo Stone was moved to safe ground "the strange events stopped." Another concern of the area surrounds the tradition of "Night Marchers" (*huaka'i pō*); in particular, the passage in the *makai* region close to human habitation at Lanikūhonua. The *huaka'i pō* inland route is somewhat vague but appears to be up the southern ridge of Waimānalo Gulch.

6.1 Traditional Hawaiian Beliefs

A number of *kūpuna* and other community members spoke of beliefs associated with Waimānalo 'Ili of Hono'uli'uli and the surrounding valleys. While these beliefs and traditions are interrelated, they are discussed below in terms of the presence of *'uhane* (soul, spirit, ghost), traditions of *huaka'i pō* (procession of the night marchers), a legend of a slain girl, a legend of two giants, and a tradition of owl *'aumakua* (ancestor gods), in addition to accounts of other mysterious and strange incidents.

<u>Association with *'Uhane*</u>

Several people familiar with the area mentioned that Waimānalo Gulch and Makaīwa Gulch are associated with *'uhane*. In *Nānā i Ke Kumu*, a source book on Hawaiian cultural practices, concepts and beliefs, *'uhane* are introduced as follows:

> Says Mary Kawena Pukui of certain of her ancestral beliefs, "Some things are 'e'epa. Unexplainable. "Accept that, and it becomes easier to know about 'uhane. For in Hawai'i's religious mystic tenets, 'uhane was:
>
> The animating force which, present in the body, distinguished the quick from the dead. And so 'uhane can be called "spirit."
>
> The vital spark, that departed from the flesh, lived on through eternity, rewarded for virtue or punished for transgressions in life. Thus 'uhane is "spirit" in the immortal sense, and the "soul" of Christian concept.
>
> Or, as immortal spirit or soul, the 'uhane might return to visit the living and so be termed a "ghost". (Pukui et al. Vol. I, 1972:193)

The presence of *'uhane* at Waimānalo Gulch was mentioned previously in a CIA for Waimānalo Gulch Landfill by Black Ho'ohuli, who is a cultural practitioner and Nānākuli Hawaiian Homestead resource person; Gary Omori, who was the consultant for Ko Olina Resort at the time the Waimānalo Gulch landfill was proposed; Maylene Keamo, who is the Wai'anae Ahupua'a Council President; and Alice Greenwood a *kupuna* in the Wai'anae area (Souza and Hammatt 2002).

Often the perception seems to be more a matter of the person feeling the presence of the *'uhane* in the area rather than knowledge of transmitted lore. Mrs. Keamo also talked about the wandering spirits. Wandering *('auana)* spirits were particularly associated with desolate places in 'Ewa District. Samuel Kamakau (Mo'olelo Hawai'i, Vol. II, Chap. 12, p 23) associates them with the plain of Kama'oma'o, the rough country of Kaupe'a and Leilono - all in 'Ewa District. The belief was that these wandering souls were friendless and wandered in desolate places like the plain of Kaupe'a catching night moths (*pulelehua*) and spiders (*nanana*) for food (*Ke Au Hou*, July 12, 1911; *Ka Po'e Kahiko* 1964:49).

6.1.1 Huaka'i Pō or 'Oi'o (Procession of the Night Marchers)

There are Hawaiian beliefs regarding the presence of what are commonly known as "night marchers" and the *huaka'i pō* or the, "night procession or parade, especially the night procession of ghosts that is sometimes called *'oi'o*" (Pukui and Elbert 1986:84). The night marchers are the souls of those who have passed on. An *'ōlelo no'eau* (proverb) makes reference to this tradition: "*He pō Kāne kēia, he mā'au nei nā 'e'epa o ka pō.*" (This is the night of Kāne, for supernatural beings are wandering about in the night) (Pukui 1983:98).

> Family ties in the afterworld remain unbroken, and all Hawaiians believe in the power of sprits to return to the scenes they know on earth in the form in which they appeared while they were alive. Especially is this true of the processions of gods and spirits who come on certain sacred nights to visit the sacred places, or to welcome a dying relative and conduct him to the 'aumakua world. "Marchers of the night" (Hauaka'ipo) or "Spirit ranks" (Oi'o) they are called. Many Hawaiians and even some person of foreign blood have seen this spirit march or heard the "chanting voices, the high notes of the flute, and drummi8ng so loud as to seem beaten upon the side of the house." Always, if seen, the marchers are dressed according to ancient usage in the costume of chiefs or of gods. If the procession

> is one of gods, the marchers move five abreast, with five torches burning red between the ranks, and without music save that of the voice raised in chant. Processions of chiefs are accompanied by 'aumakua and march in silence, or to the accompaniment of drum, nose-flute, and chanting. They are seen on the sacred nights of Ku, Lono, Kane, or Kanaloa, or they may be seen by day if it is a procession to welcome the soul of a dying relative. To meet such a procession is very dangerous. "O-ia" (Let him be pierced) is the cry of the leader and if no relative among the dead or none of his 'aumakua is present to protect him, a ghostly spearsman will strike him dead. The wise thing to do is to "remove all clotting and turn face up and feign sleep." (Beckwith 1970:164).

Several of the participants in this cultural study talked about night marchers. Aunty Arline Eaton commented that there is a pathway for the night marchers that travel from the *mauka* area of Waimānalo 'Ili down to the special place of Lanikūhonua. She feels strongly that this pathway must be kept clear for them to continue their traditional passage.

Aunty Aggie Cope and Kamaki Kanahele both mentioned that the *'ili* of Waimānalo was well known for the pathway of the night marchers and they both feel it is of great importance to keep that pathway clear of visual impact.

Judith Flanders mentioned that her grandmother Kamōkila Campbell spoke about the night marchers' trail that came from the uplands to the ponds at Lanikūhonua.

Mrs. Nettie Armitage-Lapilio related a tradition that at certain times of the year night marchers would come down from the uplands to the vicinity of Kamōkila Campbell's place on the coast (Lanikūhonua). The procession route indicated was on the east ridge of Waimānalo Gulch which is the west ridge of Makaīwa Gulch (Souza and Hammatt 2002).

Analu Josephides recalls *mo 'oleo* told to him by his *kūpuna*:

> I grew up knowing about the land area known as Makaīwa. My mother, my Tutu Wahine, as well as, *kūpuna* within my *'ohana* had shared various stories about this area. One of the many stories shared and landscapes pointed out is both the path of the night marchers and of the night marchers themselves. One of the stories that Tutu Wahine related was that in the old days no homes were built in this particular area except for the *mauka* area of Makaīwa to the west, the *mauka* area to the east known as Makakilo, and the *makai* area below where in ancient time was the dwelling place of the Kamapua'a *'ohana*.
>
> We were told as children that one of the reasons that homes were not built on the path of the night marchers were that the night marchers and those who leaped from this world and taken to be with these clans were said to carry the burning *kapu* of Pihenakalani. This was a *kapu* that descends from Kaua'i from the ancient days of the Mū and the Menehune people. It was also known as the prostrating *kapu* of Kalanikauleleiaiwi.
>
> Tutu went on to state that if a *hale* was built upon the path of the night marchers that it would be destroyed by fire. A similar life story occurred in Opihali, South Kona, Hawaii where a grand-uncle of my Tutu Wahine named Ioane Kuahiwinui

> was said to have warned his brother not to build his home in a certain area in Opihali or else the night marchers would take it; and sure enough when the *hale* was finished, on the night of the night marchers, the new *hale* was burned to the ground. Not long after this home was built and burned did they build another home in a location off and away from the path of the marchers and till today that home is standing, *makai* of Mamalahoa highway near the 95 mile marker.
>
> Tutu spoke of how nothing should be on the path of the night marchers as when they came through they would destroy anything and everything in their way. It is also believed that if a person was on the path of the night marchers they would prostrate themselves and keep their face hidden lest they are succumbed to the marchers and join them in their realm. The story continues, that if the night marcher came upon you and you were not family nor the chief of the particular area they would take your soul and you would continue your spiritual life marching with them forever. It is believed that in this particular area called Makaīwa that Hi'iakaikapoliopele, the sister of Pele, would be the last one in the night marchers' line because of her back having been placed under *kapu*; therefore no one was allowed to walk behind her.
>
> For these historical reasons the path of the night marchers should be preserved so that the marchers who are the ancestors of many of our Kānaka Maoli [native born] can continue to travel.

Mrs. Nettie Tiffany discussed her childhood memories about what her aunty called the "bird catchers." They would come down from the Waimānalo and Makaīwa Gulch area through a trail that was marked by a large *pōhaku* (stone). The bird catchers would come down from the gulch to take a bath in the waters fronting Lanikūhonua.

The following excerpt is from the 'Ahahui Siwila Hawai'i O Kapolei letter regarding the Makaīwa Gulch project. They gave permission to reprint that letter for this project:

> There were many stories associated with night marchers walking from the area of Lanikuhonua mauka crossing Farrington Hwy in the area *makai* of Honokai Hale and walking mauka by way of Makaiwa Gulch. When Kamōkila Campbell lived at Lanikuhonua she had always left an opening in the Naupaka hedge that separated the beach from her property. This opening in the hedge was cut to allow night marchers to pass through the area on their way *mauka*. Members of the Campbell family have shared this story. There are many unexplained accidents that have occurred on Farrington Highway between Honokai Hale and the entrance to Ko Olina when drivers turned off the road in an effort to avoid something that they saw, or thought they saw, ahead of them.

The excerpt below is taken from an interview with the late Uncle Walter Kamanā (WK) who shared his *mana'o* (concerns) with CSH on the Pō Kāne (Souza and Hammatt 2003):

WK: Ok there is no such thing that *menehune* (legendary little people of old) and night marchers are different people. They are the same. Some people use the *menehune* to tell old stories the *menehune* get power like they translate the word from Kona you know! On that side that they when build the big stones to put in the water outside. But through the

menehune lazy work before they never complete that *loko* the pond. So here when they say night marchers the *menehune* coming down go *holoholo* [taking a walk] down the beach.

CSH: You said get one from here to there (looking on map)

WK: Yeah that's a trail way but now get houses. But now today many of the secret path are gone. So the night walkers they come out certain times, like pō kane night or certain Hawaiian nights they going march through. The nightwalkers got to come down to the ocean. There is something between the ocean and them and the mountain, you know! That's why when you see long trail like over here over here Waimānalo, Puko, (Ko'olina).

CSH: Yeah. I heard there is one over there too!

WK: Yeah goes from Ko'olina, goes to Nanikono come out I the only guy who knows the trail. Before certain time they use to come down you know where the red trail come over into Nānākuli, before they improve that road it come right from there come down. Where the guy call it Pahe or Kihei because it is house of the wind. Same like here they name it Ilimapapa the name of this place was called Hualilili house of the wind, same like here they name 'em Ilimapapa because of all the flat land. The twin sisters start from in here. The twin sisters was a whirlwind, that certain time of the year they like go down the beach and bath. So when they come they going come right through come spinning right down through Poku and come up. You know they bang this wall come over in Lualualei go down cross over you know that get Hakimo and Pa'akea and go down inside into Leihōkū area into Wai'anae into where Pōka'ī Bay and head out the ocean. So when it use to come in here it use to develop an air pocket. There were no coincidences except the rock in Kolekole Pass. The guy that bulldozed that he was living and he died. The son must remember, his name was David Kilikahua. The father was the one who pushed the rock over Kolekole Pass. He told the story and some old timers who died, they said had three of them who pushed the rock over the Pali. The next morning the rock was standing right back up there. So when their boss saw he said go move 'em again. He said how can a big boulder come back up? They figure the *menehune* when bring 'em up but nobody saw 'em they only saw the rock back. Later part of the year they made heads to tails to the rock in Nānākuli.

6.1.2 Legend of Two Giants

A legend told by Alice Greenwood mentions two giants who live in the Waimānalo and Makaīwa area. The legend indicates that when one giant opens his eyes it means the giant will take someone's life. There is concern that these legends may be connected with unexplained car accidents that have occurred on Farrington Highway in front of the two gulches. Few details of this legend were provided.

There are also several accounts of giants in the vicinity. The Hawaiian gods Kāne and Kanaloa, who are sometimes understood to attain supernatural size, are associated with the area of Piliokahe where stones they hurled from red hill landed (Simeon Nawa'a 1954 in Sterling and Summers 1978:1). Simeon Nawa'a related another account of Piliokahe associating two hills with a male and a female - seemingly of fabulous size. The demi-god Māui is associated with the

southern Wai'anae area (particularly Lualualei) and is often thought of as a giant in his superhuman efforts to snare the sun.

6.1.3 Legend of the Slain Girl

These *'uhane* may be explained by a few legends concerning the Waimānalo Gulch area. Mr. Omori tells about one legend of two lovers (Souza and Hammatt 2003):

> ...the girl is hunted down and killed in the Waimānalo Gulch. People say that the girl's 'uhane lingers in this gulch and an image of a white lady appears at times and strange things happen in the area. For example, unexplained car accidents happen on Farrington Highway.

This account has strong similarities with the famous legend of Kahalaopuna, the young woman of Mānoa who is murdered repeatedly (she revives repeatedly) by Kauhi, her jealous lover from Ko'olau. Enraged at accounts of her sleeping with various lovers, Kauhi leads Kahalaopuna through the uplands of south O'ahu traveling west from Mānoa Valley (with Kahala being slain repeatedly). While the many accounts differ in detail a common setting for the last of the beatings is Pōhākea Pass in Hono'uli'uli north of the project area. After being put to death, her *'uhane* flies up into an *'ōhi'a lehua* tree and calls out to travelers passing along the road asking them to inform her parents of her death. An interesting aspect of the story is:

> Kū iho lā ka huakai e ho'olohe, i kēia leo, e kanaka paha, he makani paha, he 'uwī lā'au paha. 'Elua oli ana o Kahalaopuna, maopopo ia lākou, he 'uhane ua make.

Translation:

> The travelers stood and listened, to this voice, was it a person or perhaps the wind, or the rubbing together of trees. The travelers are at first uncertain but when she cries a second time they know it is a spirit that has died. (Fornander 1919: Vol. V 192-193)

While it is certainly possible that Mr. Omori's account is unrelated, similarities include: a woman who is slain by her lover in the uplands of Hono'uli'uli, that the slain woman's spirit lingers in the vicinity of her death, and that the spirit causes unexpected events to travelers. The nature of the legend of Kahalaopuna, with events happening in many different places, lends itself to becoming incorporated in other settings - particularly desolate areas in which the wind or creaking trees might sound like a human voice.

6.1.4 'Aumakua Pueo of the 'Ili of Waimānalo

Many people consulted for this project mentioned the frequent sighting of *pueo* (owl) in the area. Gary Omori and William Ailā mentioned that the *pueo* was the *'aumakua* of the *'ohana* in the area (Souza and Hammatt 2002). In *Nānā i Ke Kumu*, a source book on Hawaiian cultural practices, concepts and beliefs, the concept of *'aumakua* is introduced as: "ancestor gods; the god spirits of those who were in life forebears of those now living; spiritual ancestors" (Vol. I, 1972:35). *'Aumakua* fall into the English category of totems and were typically animal or plant species. *'Aumakua* could be inherited bilaterally, from both the father's and mother's kin groups (*'ohana*). Each individual had the opportunity to retain multiple *'aumakua.* Mary Kawena

Pukui's childhood education included memorizing the names of fifty of her family *'aumakua* (Nānā i Ke Kumu Vol. I, 1972:356). Aunty Aggie Cope mentioned that there was a rock in Waimānalo Gulch that resembles a *pueo.* The presence of the Pueo Rock connects the traditions and beliefs directly to this area. The Waimānalo and Makaīwa Gulches are typical habitat for *pueo* and they are often seen hunting in the grasslands.

6.2 Burials

Most Hawaiians in the pre-Contact period belonged to the *maka'āinana* or commoner class and their bones were usually buried in their particular *'ili*. Burials are commonly reported from clean, consolidated sand deposits, which was clearly a common method of internment practiced by Hawaiians (Cleghorn 1987:42).

Commenting on the nature of burial areas and body positions used in burial, William Ellis (1827: 361-363) says: "The common people committed their dead to the earth in a most singular manner." The body was flexed, bound with cord, wrapped in a coarse mat, and buried one or two days after death. Graves were "...either simply pits dug in the earth, or large enclosures... Occasionally they buried their dead in sequestered places at a short distance from their habitations, but frequently in their gardens and sometimes in their houses. Their graves were not deep and the bodies were usually placed in them in a sitting posture.". Hawaiians placed significance on the *iwi* that were regarded as a lasting physical manifestation of the departed person and spirit. "The bones of the dead were guarded, respected, treasured, venerated, loved or even deified by relatives; coveted and despoiled by enemies" (Pukui et al. 1972:107).

No burials or *iwi kūpuna* (ancestral human remains) have been documented in two archaeological inventory surveys of the project area (Hammatt and Shideler 1998; Dalton and Hammatt 2008). The closest known burials were found in the Ko'olina and Lanikūhonua in caves, sand dunes and sinkholes. However, Dalton and Hammatt's (2008) report states it is possible that burials may be discovered during proposed construction activities; in particular, several small caves and overhangs in the northwest portion of the current project area may contain such evidence. Some participants strongly recommend that the project does not extend any further into the *mauka* region, which may contain burials.

Mrs. Nettie Tiffany urged caution in regards to burials in the project area; she feels although the land has been heavily altered by ranching and other activities there is still a possibility of finding *iwi kūpuna*. She also strongly suggests that there be a plan of action if there are burials found during the project.

Aunty Arline also mentioned that if people lived in the project area, there might be a possibility of finding burials:

> My only thought is that for every person that lives in that area, that's where they bury their people... We never said anything if people died, we'd go over there and they'd bury them right there where the house is. We'd never go four-hundred-million-miles away, it's right there. All your *'ohana* stay right in the same area. We never went afar, not in the rural areas.

6.3 Trails

Trails connected the settlements throughout the District of 'Ewa and Wai'anae. Based on nineteenth and twentieth century maps, the primary transportation routes correlated closely to the existing major roadways. John Papa 'I'ī describes a network of Leeward O'ahu trails that in later historic times encircled and crossed the Wai'anae Range, allowing passage from West Loch to the Hono'uli'uli lowlands, past Pu'uokapolei and Waimānalo Gulch to the Wai'anae coast and onward, circumscribing the shoreline of O'ahu ('Ī'ī 1959:96-98). Following 'I'ī's description, a portion of this trail network passed close to the current Farrington Highway.

It seems clear that a major east/west artery from 'Ewa and Kona O'ahu to Wai'anae ran just south of Makaīwa Gulch roughly along the Farrington Highway alignment. "As mentioned before, there were three trails to Wai'anae, one by way of Pu'u o Kapolei, another by way of Pōhākea, and the third by way of Kolekole" ('Ī'ī 1959:97).

'Ī'ī, who was born about 1800, also recounts an incident at Waimānalo that occurred when he was eight or nine years old. While the young 'Ī'ī was staying at Nānākuli, he learned:

> ...of the burning of the houses in Waimānalo. The overseer in charge of the burning told ['Ī'ī and his relatives] that it was so ordered by the royal court because the people there had given shelter to the chiefess, Kuwahine, who ran away from her husband Kalanimoku after associating wrongfully with someone. Kuwahine was the daughter of the Kaikioewa who reared Kamehameha III in his infancy. She had run away because she had been beaten for her offense and for other reasons, too, perhaps. She had remained hidden for about four or five days before she was found. Here we see the sadness that befell the people through the fault of the chiefs. The punishment fell on others, though they were not to blame. ('Ī'ī 1959:29)

Ī'ī's sad account reveals that the coastal Waimānalo portion of Hono'uli'uli Ahupua'a continued to be inhabited into the early 19th century.

The following on ancient trails is from the 'Ahahui Siwila Hawai'i O Kapolei letter:

> There may have once existed an intersection of 2 trails in the approximate location where the present entrance to Ko Olina exist today. In ancient times there were 3 ways to get to Wai'anae. One was by way of Kolekole, one was by way of Pohakea and the 3rd was by way of Pu'uokapolei. Farrington Highway follows the path of the ancient trail that passed Pu'uokapolei.
>
> Generally, petroglyphs are found on the high ground between Waimānalo and Makaiwa Gulches indicating that a trail may have once existed in this area, again confirming a *mauka-makai* path. The existence of this trail is supported by numerous amounts of cultural resources and structures built along this lineal *mauka-makai* relationship that follows the path of Waimānalo and Makaiwa Gulches.

Shad Kane has also expressed his knowledge in regards to the many trails in Hono'uli'uli. Below is an excerpt from a previous interview with Mr. Kane (Souza and Hammatt 2002):

> One of the most elementary relationships in ancient times was the *mauka-makai* relationship. And the reason why I bring this one up is because it plays a very important role in having an understanding of the area surrounding Waimānalo Gulch. It's not to say that it wasn't important elsewhere. It may have been. Or I would say it was important all over, that *mauka-makai* relationship. But what makes this area unique is the fact that we have evidence, we have structures that support that *mauka-makai* relationship. Most places most of these kinds of structures – stone walls, habitation structures, cultural resources – most places they've largely been disturbed or destroyed. But in this respect, this particular *mauka-makai* relationship, there's, I think, sufficient structures that still exist today that you and I can look, see, feel and touch, that supports that *mauka-makai* relationship. And I think if we had a map, if you were to draw a line from the approximate area that may today identify as Ko'olina – If we were to draw a straight line from Ko'olina to Mauna Kapu you'd find that that passes along the northern ridge of Waimānalo Gulch, goes straight up to the ridgeline at Pu'u Manawahua, and follows pretty much a straight line to Mauna Kapu.
>
> Okay, a lot of the information that I shared too are things that you can actually find from different resources. And this is one. In ancient times there were several trails that people would take to come from Honolulu to come to this side of the island. I think there were three ways to get to Wai'anae. One was by way of Kolekole Pass. One was by way of Pōhākea. Another was by way of Pu'u Kapolei. Three trails. Obviously, another one along the shoreline which was the longest way to travel. Farrington Highway is very obviously a trail. Now, in the context of Waimānalo Gulch, what makes this extremely interesting is the fact that there's a series of petroglyphs that was preserved by the developer of Ko'olina or West Beach Estates. When they first started developing – There were a number of archaeological surveys that were done early on. And one of the key persons was Aki Sinoto. I've read a lot of Aki's work. Very interesting cultural information that he found – that whole area over there. And several other people. The interesting thing is that the first archaeological survey that was done was 1930 by Gilbert MacAllister. Between 1930 up until the '70s nothing was done. So 1970 was the start of all this discussion in regards to building in this whole region. And because of the requirements for the EIS and doing a cultural assessment – All of a sudden, since the 1970s until now, and the development of the Campbell Industrial Park and Kapolei and the resort area, we had all these archaeological surveys that came up. So Aki Sinoto is one of them, amongst others. But one of the things they discovered is the fact, in addition to all the information in the lower plains, in addition to the sinkholes and the bird bones, they also found what I think they refer to as the alluvial level or the higher elevation up above the coral plains. And what they found, they found habitation structures, they found burials, and some petroglyphs. I think they actually found

> two. I think they found one that's actually inside Waimānalo Gulch, up on the higher ridge. I've never seen it.
>
> Another one they found that was preserved at the entrance to Ko'olina. Now the interesting thing about petroglyphs is that most of them are built identifying trails. And you find them along ancient trails. And the significance of these particular petroglyphs here is that it actually defines the intersection of two trails – Farrington Highway and the *mauka-makai* trail. That *mauka-makai* trail is supported by everything else that I've shared with you in respect to the cultural sites up above. We need to understand the significance of that *mauka-makai* relationship because that was one of the relationships in ancient times. In ancient times, it was matter of life-or-death resources. It was food. So it was establishing that relationship between the people up above and the people at the ocean. So these were your closest friends. These were the people – So you don't have to go dive for fish. You just go down and you take what you got to share. You get fish from people down below. So these were your neighbors. So obviously there would be *mauka-makai* trails all over the islands. The significance of this one is the fact that you have structures that supports that idea, that's still intact today. And the petroglyphs along Farrington Highway is one of those supporting pieces of information.

The petroglyph site mentioned above (State Inventory of Historic Properties [SIHP] # 50-80-12-2893) is located outside the southeast corner of the current project area (see Previous Archaeological Research section above). The *mauka/makai* trail mentioned above is probably the one depicted on the 1914 Fire Control Map (Figure 17). The trail starts at the area of the petroglyphs (SIHP # 2893) and goes up between the east end of Waimānalo Gulch and the west end of Makaīwa Gulch. This trail is most likely a pathway to the former village of Pu'u Ku'ua and the *heiau* in the *mauka* region of Hono'uli'uli. This *mauka/makai* trail would have also intersected the well known trails of upper Hono'uli'uli, Pōhākea Pass, Kolekole and Palikea which all lead to Kūkaniloko, the center or *piko* of the Island of O'ahu.

Douglas McDonald Philpotts also spoke about trails in the *'ili* of Waimānalo:

> The main trails from this community to *makai* were in both Waimānalo and Makaīwa. These trails had water and springs there and were probably used more for uphill travel. The ridge between them was faster but there was no water so it was more than likely used for downhill travel. Another was down by Awanui just west of Pu'u Palailai and another was on the up side of Kaloi. The main trails had a spring or two along the way and if there was enough water something was grown there.

Another *mauka/makai* trail is depicted on the 1873 Alexander map (Figure 18) of Hono'uli'uli. The trail went from the uplands of Pu'umanawahua, Palikea (shown on map as "wooded hill"), Kapuai and Pu'ukuua passing Pu'umakakilo straight to Pu'u Pālailai, then to the coast of Ko'olina where there was once a village.

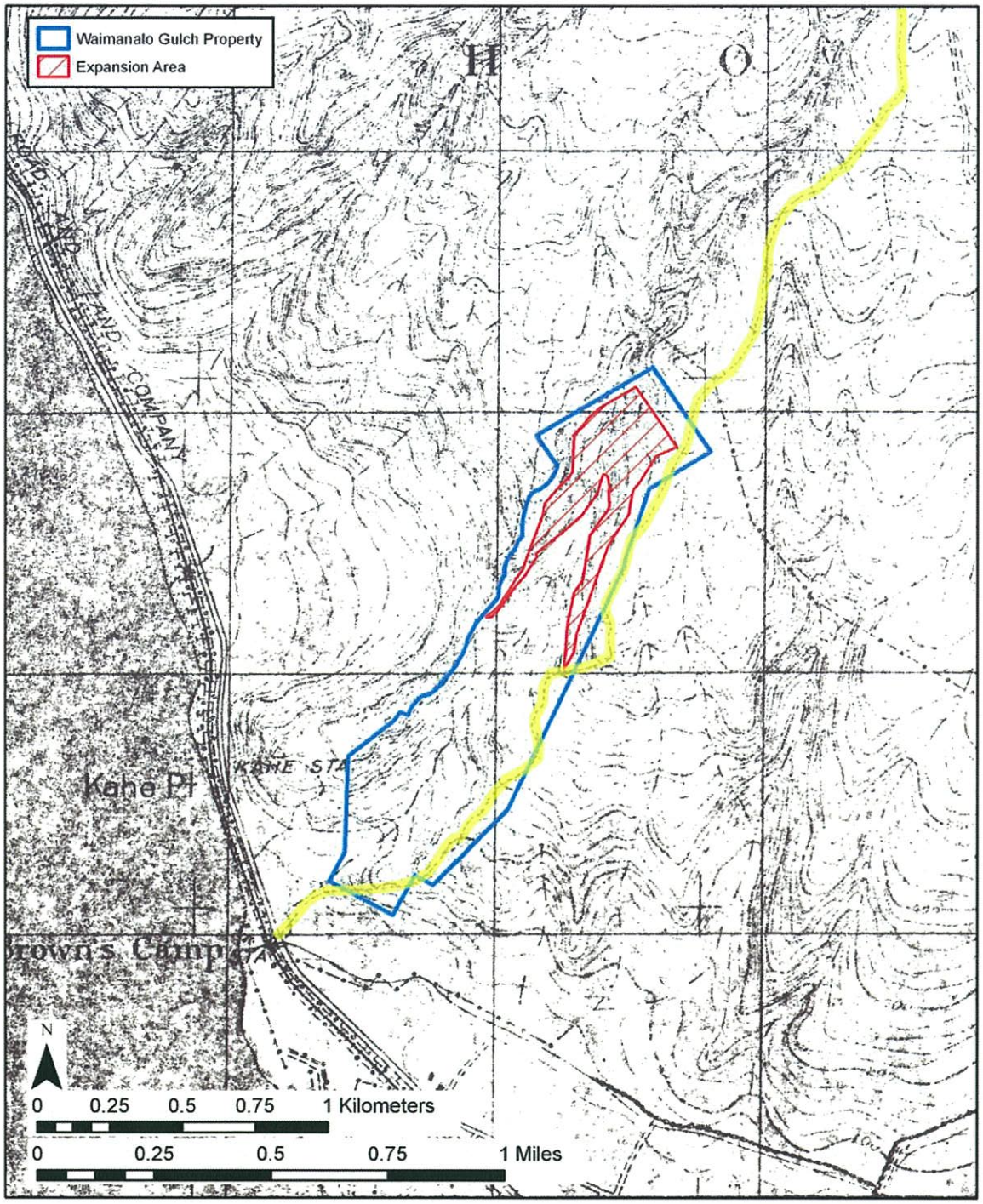

Figure 17. 1914 Fire control map showing *mauka/makai* trail from Brown's camp up to the *mauka* region of Hono'uli'uli

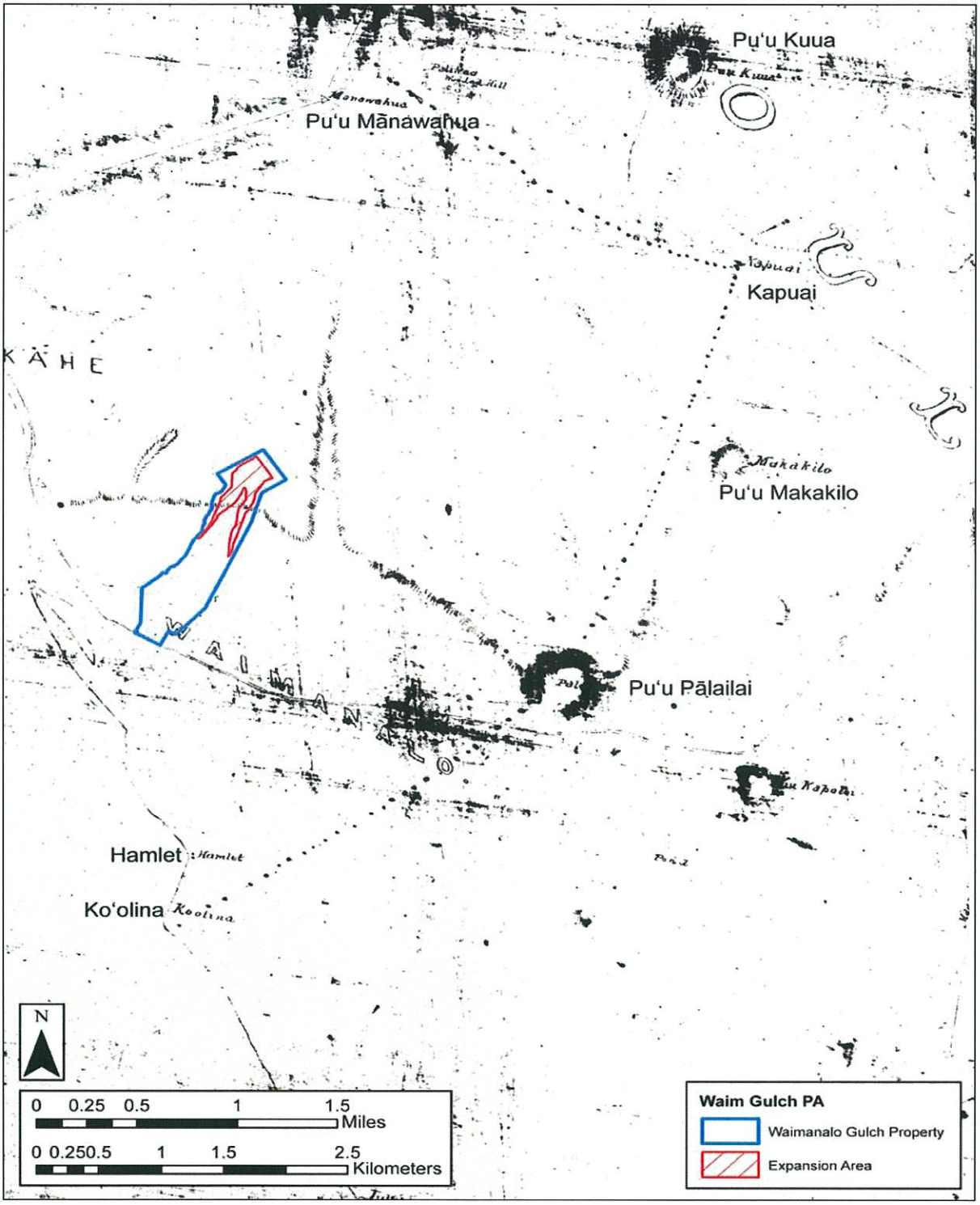

Figure 18. 1873 Alexander map showing *mauka/makai* trail from Pu'umanawahua to Ko'olina and a "Hamlet" (village)

6.4 Gathering of Plant Resources

Given the ecosystem diversity of coastal lowland, transition and upland forest zones in Hono'uli'uli Ahupua'a, it is likely that one of the primary traditional cultural practices associated with the present project area would have been the gathering of native plant resources. Table 3 lists Hono'uli'uli lowland plants and uses with columns for "common/Hawaiian name", "scientific name" and "use" based on research conducted by Barbara Frierson (1973) on native plant species present in Hono'uli'uli before 1790, in addition to plant use recorded by Isabella Abbott (1992).

Table 3. Native plants in Hono'uli'uli

Hawaiian/Common Name	Scientific Name	Use
Hala, pandanus	*Pandanus odoratissimus*	Weaving
Hau, hibiscus	*Hibiscus tiliaceus*	Cordage
Milo	*Thespesia paradisiaca*	Wood used for bowls
Neneleau, Sumac	*Rhus sandwicensis* *Rhus chinensis*	Unknown
'Ilima	*Sida cordifolia*	Leis, medicine
Kou	*Cordia subcordata*	Bowls
Makaloa, sedge	*Cyperus laevigatus*	Mats (Abbott)
Pili, grass	*Heteropogon contortus*	Thatch
Kakonakona, grass	*Panicum torridum*	Unknown
Honohonowai	*Commelina nudiflora*	Unknown
Ma'o, cotton	*Gossypium tomentosum* *Abutilon incanum*	Flowers used as dye for kapa (Abbott)
'Ūlei	*Osteomeles anthyllidifolia*	Branches used for fishing nets (Abbott)
'Uhaloa	*Waltheria americana*	Medicine (Abbott)
Koali'ai	*Ipomoea cairica*	Cordage (Abbott)
Pā'ū o Hiiaka	*Jacquemontia sandwicensis*	Unknown
Ko'oko'olau	*Bidens* sp.	Use as tea (Abbott)
'Ulu, breadfruit	*Artocarpus incisus*	Food
Kalo, taro	*Colocasia esculenta*	Food
Niu, coconut	*Cocos nucifera*	Food, liquid

The accessibility of Hono'uli'uli lands, including the present project area, to Hawaiians for gathering or other cultural purposes was radically curtailed during the second half of the nineteenth century. As noted above, by the 1870s, herds of cattle grazing across the 'Ewa Plain likely denuded the landscape of much of the native vegetation. Subsequently, during the last decade of the nineteenth century, the traditional Hawaiian landscape was further distorted by the introduction and rapid development of commercial sugar cane cultivation. Throughout the twentieth century sugar cane cultivation was the dominating land use activity within the project area. Cane cultivation – and the sense that the project area was private property – restricted access inside the project area to employees of Ewa Plantation.

6.5 Native Gathering Practices for Plant Resources

Mr. Hiram Kamanā indicated that he used to gather ingredients for a cleansing *lā'au lapa'au* (botanical medicine), including "*Kī Māmaki*" (*Māmaki, Pipturus* sp.), in the uplands. The bark, fruit and young leaves of the Māmaki were used medicinally (Wagner et al. 1990:1307). It is definitely understood that this was picked well *mauka* of the landfill (no *Māmaki* is known to grow in the immediate vicinity of the landfill). Mr. Kamanā also spoke of gathering Ha'uōwī (also known as Ha'uoi, Oī and Ōwī, *Verbena litoralis*) and Pānini (Prickly Pear cactus, *Pāpipi*; *Opuntia ficus-indica* aka *Opuntia megacantha*). Parts of the *Ha'uōwī* plant would be soaked in alcohol and the liniment would be used for arthritis. *Verbena litoralis* has been used medicinally as a mash applied to cuts and bruises and also to sprained and fractured areas (Wagner et al. 1990:1325). This exotic species is widely naturalized in Hawai'i (first documented in 1837) occurring in dry to wet habitats on all the major islands. The red fruit of the *Pānini* was used for sore stomachs. This exotic species was probably introduced to Hawai'i prior to 1809 and is naturalized in dry, disturbed habitats on the major islands (Wagner et al. 1990:420).

Ms. Nettie Armitage-Lapilio spoke of gathering plants for both medicine and ornament in the uplands. She spoke of gathering *Ēkoa* (also known as *Koa-haole* and *Lilikoa*; *Leucaena leucocephala* aka *Leucaena glauca*) seeds and or seedpods for *lei* which the *'ohana* would wear while performing *hula* and also sell to make extra money. She indicated the seeds/seedpods were gathered where the landfill is now. This exotic species (first collected on O'ahu in 1837) is very common, often forming the dominant element of the vegetation in low elevation, dry, disturbed habitats of all the major islands (Wagner et al. 1990:680).

Ms. Armitage-Lapilio mentioned gathering two species for *lā'au lapa'au*: *'Uhaloa* (*Waltheria indica* var. *americana*) and *Kīnehe* (Spanish Needle, *Bidens* spp.). According to Wagner et al. 1990:1280, '*Uhaloa*, which is known by many alternative names (e.g., *'Ala'ala, Pū loa, Hala uhaloa, Hi'aloa*, and *Kanakaloa*), is an indigenous pan-tropical plant, occurring in dry, often disturbed sites on all the major islands; it has been widely used medicinally by the Hawaiians as a painkiller especially for sore throat. *Kīnehe* (aka *Kī, Kī pipili* and *Nehe*) is a pan-tropical exotic weed widespread in disturbed areas (Wagner et al. 1990:279). Pukui and Elbert (1986:152) note for "*Kīnehe*" that: "The Spanish needle (*Bidens pilosa*) is a lowland weed; young fresh plants are still brewed for tea."

We are confident that *Māmaki* has not grown near the landfill in recent times as it prefers wetter environments found at higher elevations. *Ha'uōwī, Pānini, Ēkoa, Uhaloa*, and *Kīnehe* are all quite ubiquitous in similar dry, lowland areas. It is interesting to note in passing that four of

the six plant species used (*Ha'uōwī, Pānini, Ēkoa, Kīnehe*) are exotic species. We perceive no adverse impact on Hawaiian utilization of these species by the proposed landfill expansion action.

6.6 Taro in Hawaiian Culture

Taro cultivation was mentioned in two of the LCA testimonies for individual *kuleana* claims in the *'ili* of Waimānalo of Hono'uli'uli Ahupua'a. The testimonies indicated that these LCA's contained at least two *lo'i* as well as house lots, sweet potato, *kula*-at Pu'ukuua, ponds, streams and fishery. The taro cultivation here was not as intensive as the well known "Hono'uli'uli Taro Lands" near the mouth of Pear Harbor and the Hono'uli'uli Stream. Apparently Waimānalo 'Ili had sufficient water along with backshore swampy areas to provide personal *lo'i* on a small scale. Although these claims were not awarded they provide a wealth of information.

The area of Lanikūhonua south of the project area, once a marshy wetland fed by a natural springs, was an ideal place to cultivate taro. Davis et al. (1986) mapped the natural marshy area and spring (Figure 19). Many maps show water filtering down from the Waimānalo and Makaīwa Gulches as well as the unnamed gulches that could have also feed the *lo'i* of this area (Figure 20). There is no mention of taro grown in the project area but there were natural springs that could sustain a small patch. Aunty Nettie Tiffany, Aunty Arline Eaton and Douglas McDonald Philpotts all mentioned that the area of Waimānalo, Makaīwa, and Lanikūhonua had sources of fresh water.

Taro has an intimate connection to the Hawaiian culture. Taro (*kalo*; *Colocassia esculenta*) was probably brought to Hawai'i by the earliest Polynesian voyagers and has been a staple crop on the islands ever since. Taro is intimately connected through myth to the origins of Hawaiians as a people. There are different versions of this myth, but all of them make the connection between the first-born Hawaiian and the taro plant, according to Mary Kawena Pukui:

> The first Hāloa, born to Wākea and Ho'ohoku-ka-lani, became a taro plant. His younger brother, also named Hāloa, became the ancestor of the people. In this way, taro was the elder brother and man the younger-both being children of the same parents. (Pukui in Handy and Handy 1972:80)

The physical attributes, the growth patterns, and the propagation of taro all reflect the structure of Hawaiian kinship and an obvious relationship to the human body. The main plant in the center is the *makua* (parent), the smaller plants budding out of the *makua* are the *'ohā* (offspring). The center of the leaf where it connects to the stem is the growth center of the veins of the leaf and is called the *piko* (belly button). The stem is called *ha*, which is also a word for breath, the basis of life. The cycle of planting is a reflection of the human life cycle. When the taro is harvested the corm is cut right below the green top, the cut top is called the *huli* (turning, returning or transforming). The *huli* is replanted and the family of taro once again continues its growth cycle. The generations of taro are thought of interchangeably with the generations of Hawaiians as reflected in the saying "*Kalo kanu o ka 'āina*"-literally "taro planted on the land" but figuratively referring to successive generations of natives (Pukui 1983:157). Both the *'ohā* and the *makua* can be used as *huli,* but as in a family, the '*oha* (child) must be separated to become independent of the parent and – to become a parent itself. If it is not, it remains a

dependent attachment, overshadowed by the leaves of the *makua*. Another saying, *I makika'i kekalo i ka 'ohā*-"the goodness of the taro is judged by the young plant it produces" (Pukui 1983:133), is a metaphor for the parents being judged by the behavior of their children.

All parts of the taro plant are used for food: the corm is cooked and eaten as table taro or steamed and pounded into *poi*; the stem can be steamed and used in various soup and stew dishes; the young leaves are used for *laulau* and *lū'au* dishes mixed with fish, squid, pork, chicken or beef. Generally, the leaves are not harvested from the plants designated for corm production because continuous cutting makes the corms soft and tasteless (*loli*). Taro growers who grow leaf for home use or commercial purpose always have specially designated *lū'au* patches. It is traditional Hawaiian practice to use all the coarse green cuttings that are the by-product of the harvesting of the corms as food for the pigs. This green material, when cooked and fed to the animals, is highly nutritious. For this reason, raising pigs is traditionally is symbiotic relationship to taro production. In a traditional taro field, no space is wasted. The *lo'i* are used for the taro and any extra space on the banks is used for subsistence, utilitarian and medicinal plants, such as bananas, *noni*, and *tī* (also *kī*).

The practice of taro cultivation most resembles gardening in its scale and methods. Much of the work is undertaken by an individual or family, and is performed by hand. The *lo'i* and banks are beautifully manicured, and the result is aesthetically like a garden. Yet, taro production remains viable even on this small scale because of its high per-acre productivity.

Nowhere else in the world was taro cultivation more developed than in Hawai'i (Kirch 1985:215). It was the staple for the hundreds of thousands of Hawaiians before European contact. It was grown in areas with sufficient rainfall (above 30-50 inches per annum) or under dryland management. In areas of suitable water sources extensive and sophisticated irrigated systems were developed for its cultivation. The social requirement for the planning, development, and maintenance of theses irrigated systems was a stable political system and community cooperation. Although the cultivation and maintenance of individual fields could be the purview of single families or individuals, the maintenance of the water supply system, on which the entire system depended, had to be organized on a community level.

Although less than 100 varieties of taro survive today, there may have been, at one time, as many as 300 varieties in the islands, distinguished by leaf shape, corm, morphology, color and use. The labels of wetland and dryland taro do not refer to different taro varieties, but only to different cultivation practices. All varieties of taro can be grown in dryland fields and all but a few in *lo'i* (flooded fields). Today there are only a few widely grown commercial varieties. Mechanical devices are used, such as tillers and small tractors; in some cases PVC pipes have replaced earthen or stone lined *'auwai* or waterways, and commercial fertilizers are routinely used. A typical taro crop will take from 10 to 14 months to mature. With modern farming methods taro is one of the most productive per-acre staple crops in the world. However, in spite of these modern overlays, the bulk of the labor is done by hand in the context of the family and the essence of a traditional taro growing community. Cooperation in management of water and land resources remains an integral part of this lifestyle.

In pre-Contact Hawai'i, during the late prehistoric era, as documented by archaeological studies, taro cultivation was practiced in virtually every suitable locality, including floodplains in windward valleys with perennial streams, open lava and beach flats near stream systems, and

moist leeward slopes. Taro was such an important crop it was even grown in artificial microenvironments created by mulching pits in lava fields.

Since European contact there has been a slow but steady decline in taro cultivation. In the late nineteenth and early twentieth centuries, many of the large taro growing areas were given over to rice planting. Taro cultivation returned on a smaller scale to these areas after development of the California rice industry. Today, commercial Hawaiian taro cultivation is confined to a few areas in the islands: Hānalei/Waioli, Hanapēpē and Waimea on Kaua'i, Waikāne/Waiāhole and Haleiwa on O'ahu, Honokohau, Ke'anae/Wailuanui on Maui, and Waipi'o Valley on the island of Hawai'i. Although taro is not grown anymore near the project area there is documents that prove there once was taro cultivation west of Hono'uli'uli.

'Ewa was well known for its rare *kai* variety of taro that was very flavorful as well as the ability to reproduce itself over a ten year span. The *Kai O 'Ewa* was grown in mounds in marshy locations. The cultivation of this prized and delicious taro led to the saying:

> Ua 'ai i ke kāī-koi o 'Ewa.
>
> He has eaten the Kāī-koi taro of 'Ewa.
>
> Kāī is O'ahu's best eating taro; one who has eaten it will always like it. Said of a youth of a maiden of 'Ewa, who, like the Kāī taro, is not easily forgotten (Pukui 1983: #2770).

The taro of 'Ewa was poetically referred to a man's love for a 'Ewa women that was so strong he would never leave:

> The *kai* was native to 'Ewa and was often referred to as *kai o 'Ewa*. . . . An 'Ewa *kama'āina* described this in 1899: "When planted, it sends up shoots, more shoots and still more shoots. Again and again it will send up new shoots, filling the mounds until they mixed with the taro of other mounds." This description (*Ka Loea Kalani'āina*, June 3, 1899) indicates that in the flat, wet lowlands of 'Ewa this famous taro was grown in mounds (*pu'epu'e*) as in marshy localities. The article quoted above says that "*kai koi* multiplies itself over and over with one planting and often lasts as long as ten years." No other variety or locality can equal this. This fragrant taro was likened to a woman with whom a man falls in love. And it was said that anyone who married a native of 'Ewa would come and settle there and would never leave, because of the *kai koi* of 'Ewa. Our Hawaiian writer describes two other varieties of *kai*. *Kai 'ele'ele*, black *kai*, has a black stalk, with dark skin on stems and leaves; its corm was tough and hard to pound. *Kai kea*, white *kai*, had a light-colored stem and leaves; the skin (of the corm) was red, but the flesh was dark like that of black *kai*, the corm likewise tough. In 1931 we collected four varieties of *kai*: *kai koi*, whose corm was white, vase of stalk pink, petiole pink, with a pink edge on the leaf; *kai kea* or *keokeo* with white corm, white base, whitish stalk with red margin, and a leaf with white edge and white center and pinkish veins; *kai 'ula'ula* (red *kai*) with corm flesh purplish white, and cortex of corm reddish purple, base red, stalk green with black streaks becoming light green and pink above, and finally, *kai-uliuli* (dark-*kai*) with white

> corm and lavender cortex, red to pink base, whitish and dusky green petiole with red and white margin, and leaf with a slightly reddish center. It was the *kai keokeo* which was described as being fragrant (*'ala*). From this was made the poi reserved for the chiefs (*poi ali'i*). (Handy and Handy 1972:471)

Due to the dry conditions on the leeward side of O'ahu, taro wasn't as abundant in Waimānalo 'Ili as it was in some of the surrounding marshy areas. Though, there was a fair amount of water sources in the area if you knew where to find them. Douglas McDonald Pilpotts elaborates on the water sources in Waimānalo 'Ili and expalians why water was such a commodity here:

> By far the most important resource is always *wai*, freshwater, and with no year-round streams here it was definitely not an abundant resource. As you know *makai* there were sink holes with freshwater on the 'Ewa plane. Near Lanikuhonua, fresh water comes out right in the sand, between the rocks there. You can turn a gourd upside down in the ocean and get fresh water if you know where. Knowing where is the key, it's the same thing up *mauka*, there are no streams. There is what geologists call perched water. Places were water flows to the surface on top of impermeable layers of soil covered by a layer of fractured rock. A few of these at lower elevations still produced water today even in the driest times of the year. The greatest number of these springs are found between 1,200 and 1,800 foot elevations. However due to the reforestation efforts in the 1920s these springs no longer produce water year-round. This is also the elevation with the greatest concentration of archaeological sites. Most of these springs still have terraces and *lo'i* walls around them. The forests above also held substantial resources, but the ocean below by far had the most substantial resources and the leeward exposure provided the best conditions to exploit them. I believe when compared to other *ahupua'a* in ancient times this area was not seen as desirable for its abundant resources. With the commanding view from this place and the limited water resources on the 'Ewa plane this community was highly defendable.
>
> Many old maps show historic water tunnels and reforestation efforts also help to understand the water resources that were here to support pre-Contact populations.

6.7 Significant Cultural Sites within the Project Area

CSH previously performed an inventory survey of the project area in 1998 (Hammatt and Shideler 1998) and an additional assessment was conducted in 2007 (Dalton and Hammatt 2008). During the 2007 companion archaeological inventory survey, CSH identified one historic property within the project area: SIHP # 50-80-12-6903, three rock uprights, which were recommended eligible for the Hawai'i Register under Criteria D and E.

A culturally significant Pueo Stone was identified by Bath in 1989. This "Pueo Stone" eventually had to be relocated to the northwest ridge of the gulch. Due to the signifigance of this cultural site, it has been protected and cared for in a safe area by a cultural practitioner.

Douglas McDonald Philpotts has spent years hiking around Waimānalo 'Ili and he recalls coming across many Hawaiian cultural sites:

> So when hiking up here and going through the grass I feel things and I just turn right or left, or just open the grass in front of me and there's a huge *ahu* or a cave sometimes I think they led me right to it. So that's been the path, the journey about knowing, and learning and seeing different things and getting chicken skin many times. When I was younger I spent a lot of time out there in the woods at night just cruising, checking it out. I got spooked every so often out there, but then I get used to it.
>
> There are so many cultural sites here and all of these sites and their relationships between each other is what's valuable. It is in the collective relationship between all the sites. Studying this area gives us the opportunity to have a deeper understanding of those who lived here because it's still pretty clear. Their footprints are still right there. I think this place has revealed how much potential it has, and the value of how much it has yet to share. I really want to make sure that the cultural sites and what they tell us doesn't get erased.
>
> This area has great value in the collective because there is a window into the life of our culture pre-Contact. It's not just about how they built their house sites, what's important is where they built their houses in relationship to where the water was located. They built their houses out there, in the wind, with the risk of it blowing away in a big storm, because they wanted the view. The five brothers, the watchers, their house sites are still there. It's all about the view. How can we relate to these stories if the house sites are gone, or if you don't know where the spring is, or if you don't know where their food was? This is the whole picture, like that beautiful *ahupua'a* poster that Kamehameha Schools has, and it is right here you can walk on it! Due to the land use being limited to forestry, watershed and ranching, the area's pre-Contact archaeological sites have been preserved. For those who have an interest in really understanding or trying to step back in time, just for a moment, for a visit, they can. You can walk from the fishing *ko'a* to the *lo'i* or you can stop at the spring or the shelter cave or the *ahu*, the *heiau*, the *pā*. You can go a to the forest for lapaau and you can watch the sunset from the front of their *hale* and if you employ the right senses you can do all this with them, they are still here, that is why this place is so special.

Another signifigant site that Douglas McDonald spoke about was the *pā* (stone enclosure) that is located in the uplands of Waimānalo 'Ili:

> The center of this *mauka* community was here above Waimānalo and Makaīwa. Ida Von Holt writes that they were told the area was quite heavily populated before the smallpox epidemic of 1840 and that there was a school for over 40 children where the *pā* is now. This appears to be the case when compared to the size and number of structures in the area. Some of the adjacent pastors were cleared for pineapple years ago these pastors more than likely contained many sites and now they are lost forever.

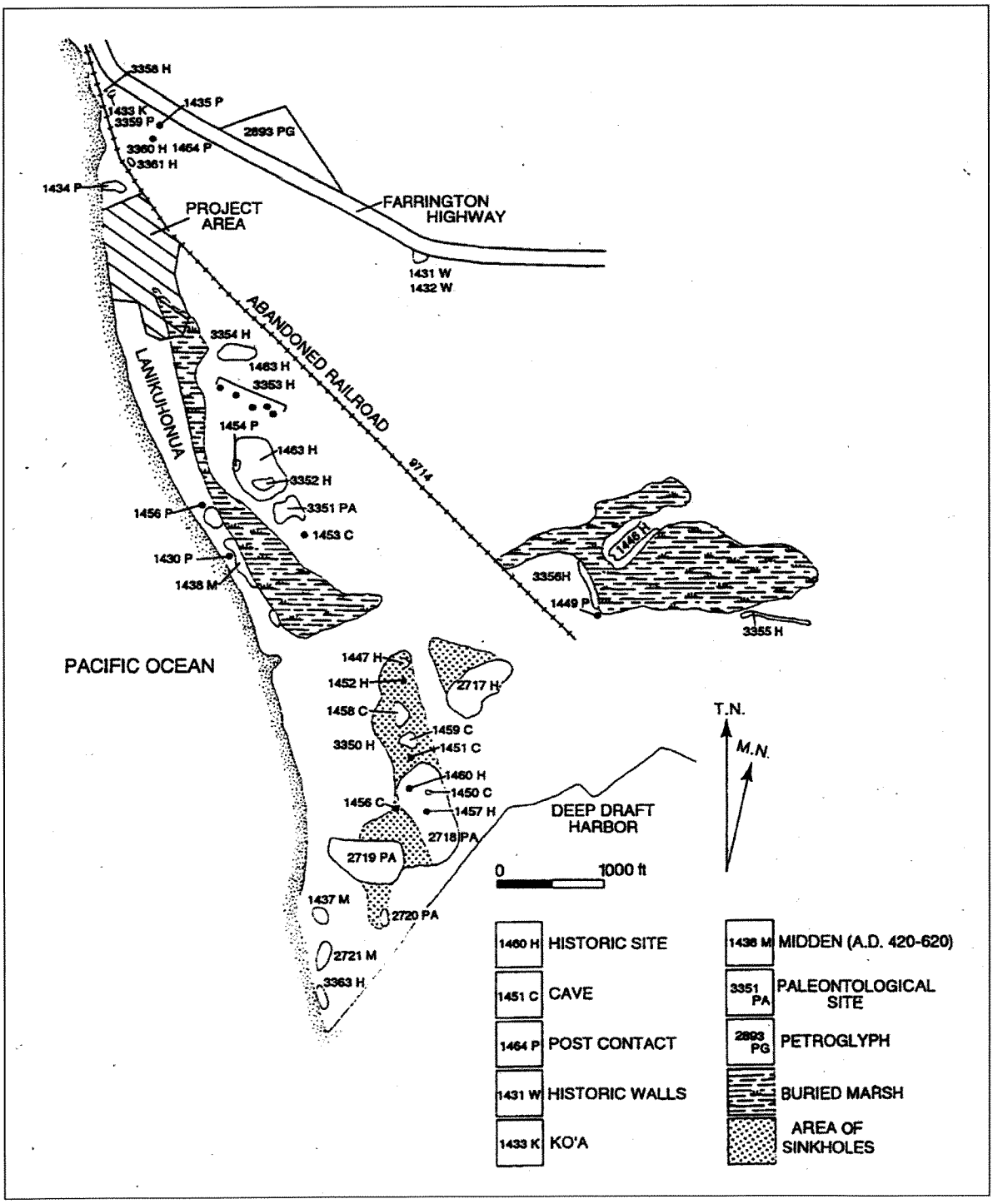

Figure 19. Pre-and post-Contact archaeological sites previously identified in Davis et al. (1986); south of the current project area (Lanikūhonua-Ko'olina-Waimānalo-Paradise Cove)

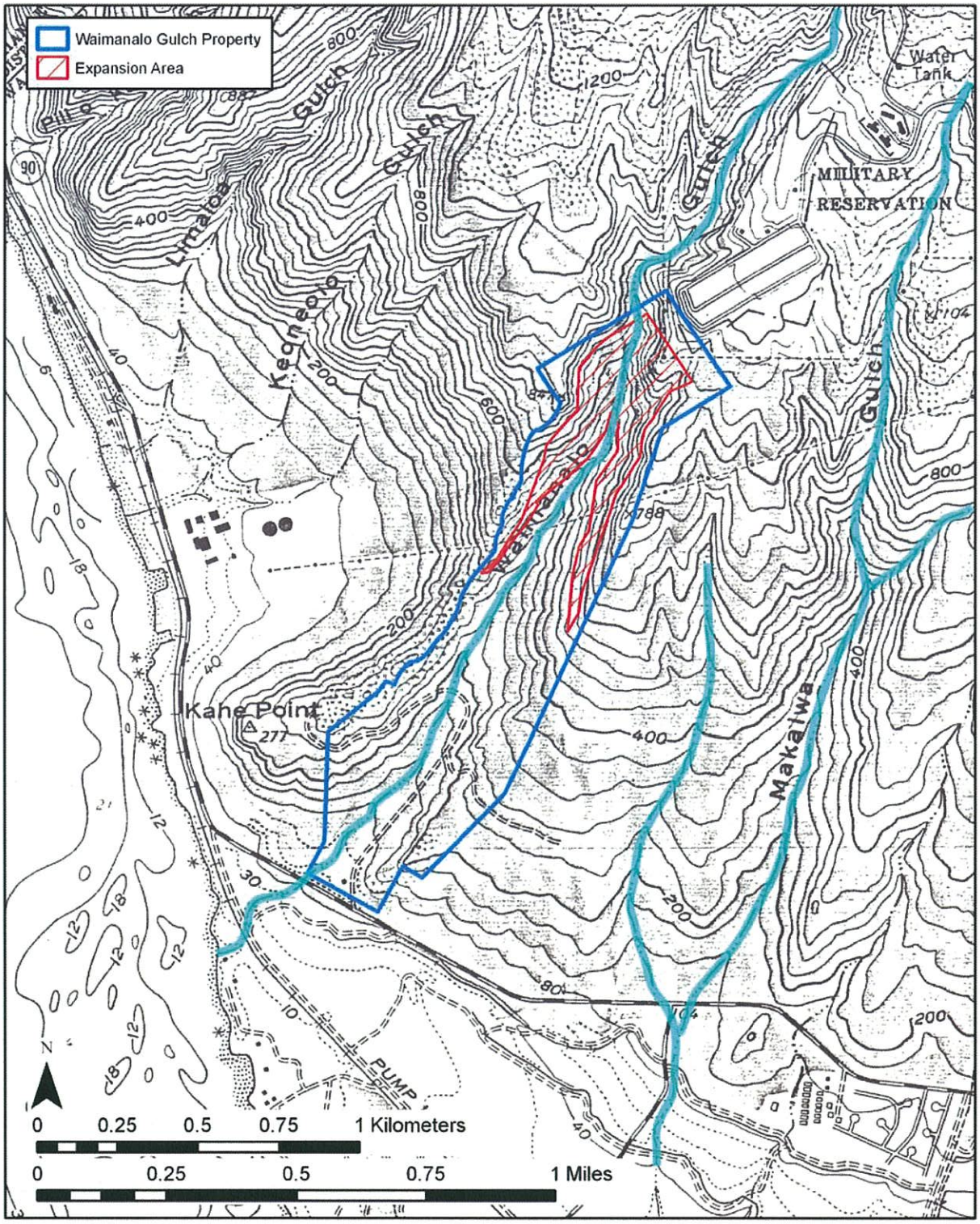

Figure 20. 1962 USGS Map showing seasonal streams

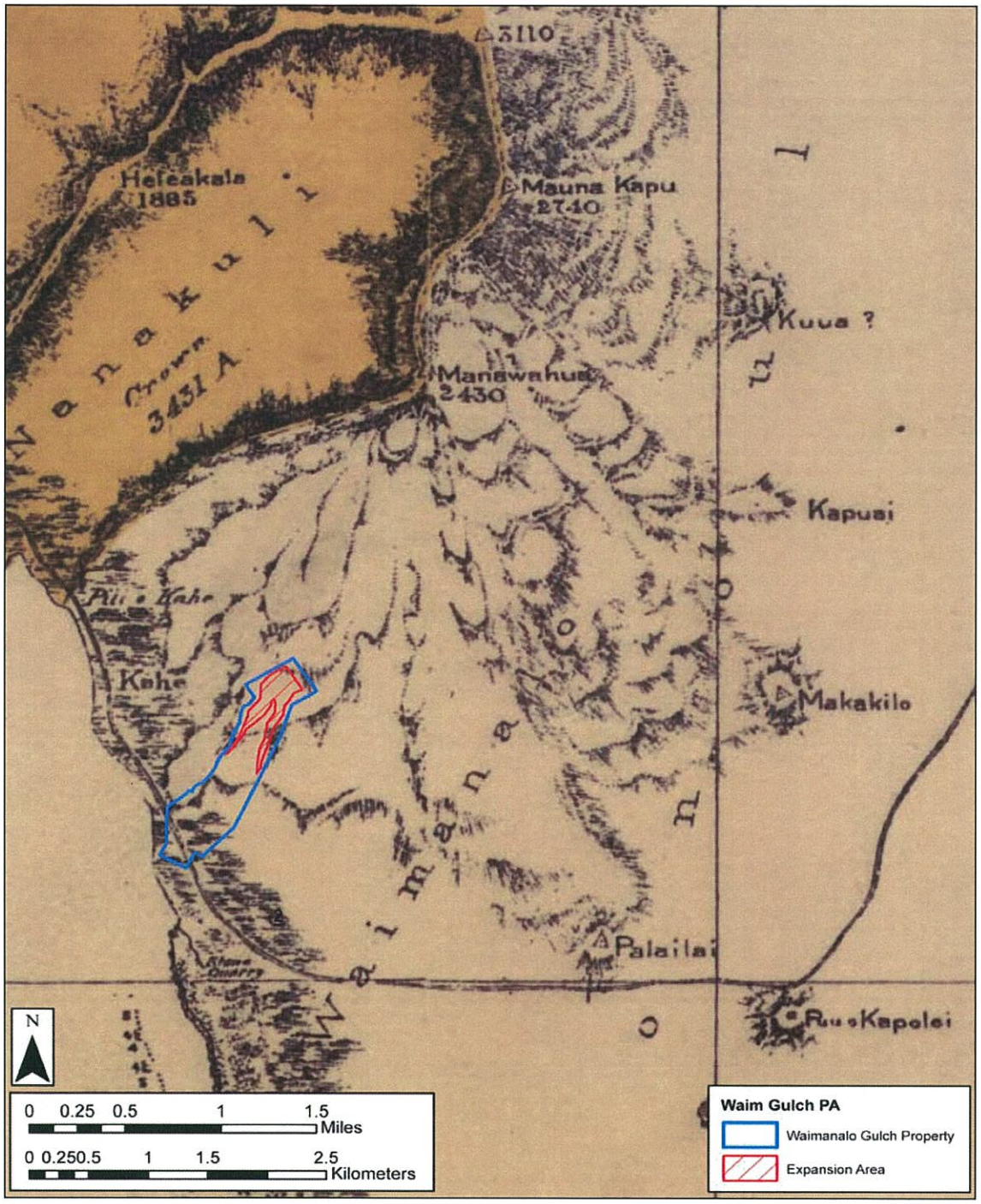

Figure 21. 1881 Hawaii Government Survey Map showing project area and the *'ili* of Waimānalo. Ko'olina is depicted south of the project area as well as a quarry. Also showing east/west trail

6.8 Marine Resources

The sea is a rich resource and the Hawaiian people were traditionally expert fishermen. Fish of all types supplied the Hawaiian diet with a rich source of protein. This source of food is a supplement to the things grown in the uplands. The LCA documents provide information that the people of Waimānalo area were utilizing the ocean resources as a fishery as well as the upland forest area for subsistence. This is a good example of the *ahupua'a* system that was once used.

Through the interview process, people mentioned a *ko'a* when asked about fishing south of the project area at Lanikūhonua. A *ko'a* is defined as "Fishing grounds, usually identified by lining up with marks on shore or shrine, often consisting of circular piles of coral or stone, built along the shore or by ponds or streams" (Pukui and Elbert 1971:144). Kamaki Kanahele is a *kama'āina* to the area and recalls his childhood memories of fishing the Wai'anae coast and using the many *ko'a* in the area to line up the fishing spots. Eddie Ka'anana was an avid fisherman and frequently fished for *'ōpelu* along the Wai'anae coast. He mentioned that he would fish using traditional methods on a canoe for *'ōpelu* as well as on a boat. Other types of fish that were caught were *u'u, akule*, and mullet. When asked about a *ko'a* he mentioned that he is aware of a *ko'a* along the Wai'anae coast and there was abundant fish in that area, which suggests that there may be a *ko'a* near by (Souza and Hammatt 2002). William Ailā also mentioned a *ko'a* and great *akule* fishing offshore fronting the project area. Nettie Tiffany also recalls the *ko'a* and her childhood memories of the shore fronting Lanikūhonua as having abundant fish such as mullet and reef fish.

Mr. George Ka'eliwai mentioned in a telephone interview in a recent report (Souza and Hammatt 2002):

> We all knew how to survive through our culture by the age of thirteen. The older boys would go up mountain and I had to know how to make the *palu* (bait) for fishing. You are not allowed to talk about fishing. You just get up early and go. I knew Tūtū (grandmother) Campbell on the ranch. She liked me and favored me. She gave me fishing rights as long as I gave her some fish.

Additionally Mr. Ka'eliwai confirms that there were activities related to early Hawaiian gathering practices from rich marine resources at Lanikūhonua. Mr. Ka'eiliwai spoke about the different types of fish that he and his uncle would gather; *manini, aweoweo, uhu,* and *menpachi.* This area was a great place for diving and throw net fishing.

Douglas McDonald Philpotts also refered to the plentiful marine resources at Lanikūhonua where he once lived, fished and threw net. He mentioned that Lanikūhonua was once a thriving fishing village, with a canoe landing and a fishing shrine.

> Our house was actually next to Lanikuhonua near the big banyan tree at Paradise Cove. Then there was my grandfather's coconut plantation where he had young coconut trees everywhere. The place was absolutely beautiful, and some of it still is. Some old maps have labeled hamlet on that spot and I'm sure there was a lot of *wa'a* on the beach there, this is the *makai* part of that *ahupua'a* poster. The fishing was great, and like I said earlier freshwater comes right out of the sand there.

> It really starts way back with Lanikuhonua and fishing. Uncle Sunny, Netty's father, kind of clued me in on throw netting. My Dad taught me how to get the net to open up but Uncle Sunny was the one that taught me how to use my senses to know where fish were. One night I was running out with my pole to set lines and he goes, "where's your throw net?" and I go, "it's dark now, you can't see the fish now." Then he said, "Go get your throw net." So I came back with my throw net and he said, "now where's your favorite spots?" And I said, "well its over there and over there and over there, but you can't see the fish" and he goes, "just go back to your favorite spots, you know every rock underneath there, you don't need to see the place to be able to know your way around." And I said, "yeah I can do that" and he said, "Just go to your favorite spot and stand there and wait until you feel the fish. When you feel the fish, you'll know, you'll feel them."

Hawaiians were very conservative when it came to marine resources. They set *kapu* on certain fish during their time of spawning and made sure that these fish had time to repopulate. The following exert is a passage from Hawaiian Fishing Traditions which talks about the *kapu* on *'ōpelu*:

> An important fishing *kapu* concerned the *'ōpelu* (mackerel) and the *aku* (bonito), two highly prized fish caught in great numbers in Hawaiian waters. *'Ōpelu* was netted from July through January. Walter Paulo and Eddie Ka'anana, two *'ōpelu* fishermen from Miloli'i, told me the best time for catching this fish is in October. 'Ōpelu was placed under *kapu* in February, until the end its spawning season, around July (Moku Manu and Others 1992:xii).

6.9 Wahi Pana (Storied Places)

The concept of *wahi pana*, a place with a story or legend attached to it, is very important in Hawaiian culture because it is a connection to the past and the ancestors. From place names, one can know intimate details about people who lived there, the environment, cultural practices and historical events that took occured. In Hawaiian culture, if a particular spot is given a name, it is because an event took place there that had meaning for the people of that time. Because Hawaiian culture was based on oral traditions, place names and their associated stories were an important way of remembering these traditions and ensuring these stories would be passed on to future generations. In Hawaiian thinking, the fact that a place has a name deems it important. Often, spiritual power or *mana* is attached to a place, which increases its importance. On the subject of *wahi pana*, Edward Kanahele writes:

> As a native Hawaiian, a place tells me who I am and who my extended family is. A place gives me my history, the history of my clan, and the history of my people. I am able to look at a place and tie in human events that affect me and my loved ones. A place gives me a feeling of stability and of belonging to my family, those living and dead. A place gives me a sense of well-being and of acceptance of all who have experienced that place. (Kanahele in James 1995:6)

Analu Kameeiamoku Josephides mentions a *mo'olelo* passed down to him by his *kūpuna* regarding some names of the Waimānalo 'Ili. The area was referred to as five brothers who protected and cared for the island of O'ahu; they were the "Eyes" of O'ahu:

> Another concern that I may have is the place names of this particular area. A story that has been passed down to me from my *kupuna* is that there were five brothers who were the watchers. Their names were Makaīwa, Maka'ike, Makaloa, Maka-Io, and Makakilo. It was known that Makaīwa was to the farthest west and that Makakilo was to the farthest east. That these five brothers were the eyes of the O'ahu people and were their protectors. They would watch for enemy intruders and relay messages to their *makulu* (runners). If enemy canoes were seen the *makulu* would run to the various districts and warn the chief and his/her people. This is why O'ahu was a hard island to conquer in the ancient times. By the time the war canoes of the enemies would reach the shores they would be greeted by the warriors of O'ahu, thus the enemies were never allowed to land upon the shores of O'ahu.

Douglas McDonald Philpotts also spoke about a connection between this area and the other islands through the path of the sun:

> Whether you're a spiritual person or not you will be impressed by the sheer beauty of this place, and the spectacular views from here. But many who come here are surprised by the sense of *mana* here. The view is special here, from the top of Pālehua between Pu'u Manawahua and Mauna Kapu you can see all the islands and all of the mountain tops on those islands, this is the only place in all the islands you can do this. Hermann von Holt showed me the trench that still remains on the Honolulu ridge of Mauna Kapu and said another one in the south was taken out when the road was put in. It was right where the big blockhouse is now. Herman said they were told by the Hawaiians in the ranch camp at Hono'uli'uli this was a most sacred place, and the place of great *mana*, and that is why I think the Hawaiians lived here and their spirits never left. This could be part of the meaning in the name Pālehua. In addition to the unique view of the islands I have observed the annual journey of *lā* (sun) from here. It starts on the first day of the celestial year on the winter solstice. At sunrise the sun can be seen rising from its house Haleakala as it begins its journey northward it rises from the west Maui Mountains and then from East Moloka'i. Reaching O'ahu it rises from Koko Head and moves from peak to valley north through the Ko'olau's reaching its destination Mokumanamana in exactly half a year. Then on June 21st, the summer solstice, the sun sets behind Kaua'i and starts its journey back home. On this solstice line connecting Haleakala, Pālehua and Mokumanamana are also several *heiau*. Twice a year on the equinox the sun sets over Pu'u Heleakala. To me these and many other things seem to be more than coincidence.
>
> I am just starting to understand that there is no other place like this when you add the layer of the winter and summer solstice; there is no other place that lines up like that. So I think the real resource is the view, and the power that comes from that.

6.9.1 Place Names

All place name translations were taken from Place Names of Hawai'i (Pukui et al. 1974) and the Hawaiian Dictionary (Pukui and Elbert 1986), in addition to being supplemented by other sources as well as community members (see Figure 6):

Aimea Name of fishpond in Hono'uli'uli (LCA 9037); Claimant, Kahakai claimed a right to *kalā* (fish) at this pond. The exact location of the pond is unknown.

Anianikū A small cove between Milo and Ka'ula at Lanikūhonua. *Lit.*, stand beckoning (Pukui et al. 1974:12).

Awanui Gulch Name of a gulch just west of Makakilo. The gulch name may pertain to the large *awa* or milkfish (*Chanos chanos*) or may be a reference to the impressive size of the *'awa* (kava) plants (*Piper methysticum*) growing at that location. Kawika McKeague gives another meaning "could reference the 'large passage,' indicative of birthing passage or 'outburst' (alluding to Papahanaumoku/Haumea's birth of the island- geologically one of the main outvents of Wai'anae volcanic eruption)."

Hapanui Name of a pond in Waimānalo, 'Ewa in which *kuleana* were claimed (LCA 9037 Kahakai); *Lit.,* greatest or largest portion.

Kalaipuawa Place name in Waimānalo, 'Ewa in which a taro patch was claimed (LCA 9037 Kahakai)

Kapua'i A high point in the uplands of Hono'uli'uli. Kapua'i is part of a traditional *mauka-makai* trail extending from near Pu'u Manawahua in the Hono'uli'uli uplands through Kapua'i and down to the coast at Kō'olina (1873 Alexander map). One meaning of *kapua'i* is footstep or footprint (Pukui and Elbert 1986: 133), a direct connection to the old trail. An alternative is suggested as "the flow (of water)" (Pukui et al. 1974:12:89) perhaps the source of spring water.

Ka'ula A small bay at Lanikūhonua. 'Ula suggests the sacred red color or perhaps, ghost or spirit (Pukui and Elbert 1986: 367).

Keone'ō'io Gulch in Nānākuli, O'ahu. *Lit.,* the sandy [place with] bonefish (Pukui et al. 1974:108).

Ko'olina Beaches, lagoons. *Lit.*, delightful, lovely; Ko'olina (Clark 2002:198) Ko'olina is also noted as a favorite vacationing spot of Kākuhihewa, with its sacred pools (Clark 1977:76). These pools are located near Kamokila's Lanikūhonua and are natural coves and limestone shelves.

Lanikūhonua An ocean retreat developed by Alice Kamokila Campbell in 1939. She named the spot after the beautiful sunsets, 'where heaven meets the earth' (Clark 2002:210). The rocky shoreline fronting this area is known for the *moi* (*Polydactus sexfilis*) fishing grounds (Clark 1977:76)

Limaloa Gulch in Hono'uli'uli, west of and adjacent to Waimānalo Gulch; *Lit.*, long arm (Pukui et al. 1974:133). Limaloa appears in legends of Kamapua'a as a star-crossed lover (Pukui et al. 1974:133). Known as the God of mirages (Pukui and Elbert 1986:207),. Limaloa appears in a chant offered by Maui's grandfather, Kuolokele, in Maui's attempt to rescue his wife who had been kidnapped by Pe'ape'amakawalu (eight-eyed bat) (Fornander v.5:458-463).

Makaike *Wahi pana* shared by Analu Kameeiamoku Josephides who told the story of five "Maka" brothers, the protectors who watched for enemy canoes from their high perches on the ridges above 'Ewa plains. As inferred by Analu's story, Makaike is assumed to be one of the ridges in between Makaīwa and Makakilo. Maka'ike: *Lit.*, seeing eye (Pukui and Elbert 1986:225). This type of observation is described as having the gift of "second sight" (Pukui and Elbert 1986:225).

Makaio One of the five "Maka" brothers, protectors of O'ahu, who watched for enemy canoes from the ridges above Hono'uli'uli (Personal communication Analu Kameeiamoku Josephides *in* Souza and Hammatt 2006). As inferred by Mr. Josephides' story, Makaio is assumed to be one of the ridges in between Makaīwa and Makakilo. May refer to the *'io*, the Hawaiian hawk (*Buteo solitarius*) (Pukui and Elbert 1986:102). Maka'io: *Lit.*, eyes of the hawk.

Makaīwa Gulch in Hono'uli'uli, east of and adjacent to Waimānalo Gulch; *Lit.*, mother-of-pearl eyes (as in an image) (Pukui et al. 1974:140). The westernmost of the five "Maka" brothers who helped protect O'ahu by serving as lookouts for enemy canoes (Analu Kameeiamoku Josephides). Makaīwa is inferred to be the westernmost ridge of the five ridges. Kawika McKeague gives alternate meaning "I think it's a shortened version of-Maka a aiwa, as in the face (essence) of complete mystery, incomprehensible (as in caught in a wake between two worlds- again transitional, balancing between two worlds)."

Makakilo Crater, land area, gulch, Wai'anae quad., O'ahu. *Lit.*, observing eyes (Pukui et al. 1974:140). Also *Pu'u Makakilo.* Hill above Kapolei; *Lit.*, observing eyes hill (Pukui et al. 1974:201).The easternmost of the five "Maka" brothers noted for their skill as lookouts for enemy invaders to O'ahu (Analu Kameeiamoku Josephides). Makakilo is inferred as the easternmost ridge of the five. Kilo is translated as "stargazer, reader of omens, astrologer; to watch closely, examine, spy" (Pukui and Elbert 1986:151). Kawika McKeague gives alternate meaning "any term with *kilo-* indicative of being able to read *ho'ailona*, second sighters, if you will."

Makaloa One of the five "Maka" brothers, shared in a story by (Analu Kameeiamoku Josephides). The Maka brothers were five brothers who were the watchers and protectors of O'ahu. They warned chiefs of

approaching enemy canoes and kept O'ahu's people safe. Makaloa is assumed to be one of the ridges in between Makaīwa and Makakilo. Makaloa suggests seeing great distances (*loa*).

Mauna Kapu Mountain at the border of Hono'uli'uli Reserve boundary; *Lit.*, sacred mountain (Pukui et al. 1974:148). Kawika McKeague gives alternate meaning "I know some say this is regards to Kakuhihewa's *kapu*. Could be- my *mana'o* is that this point clearly defines what is Wakea and what is Papa, my *mana'o* only...Papa giving birth- woman giving birth-probably the strongest period where Haumea thrives and is more "powerful" or omniscient than Wakea- *kapu* had to be established to protect both male/female sources of identity."

Milo Cove at Lanikūhonua. *Lit* to curl, twist or to whirl, as water; abortion. Possible reference to a common coastal shade tree, *milo* (*Thespesia populnea*).

Pālailai Gulch and hill above Kapolei to the east of Waimānalo Gulch; *Lit.*, the young *lai* fish (*Scomberoides spp.*) (Pukui et al. 1974:176). Kawika McKeague gives alternate meaning "I disagree with Pukui; I don't believe it's the "young of the lai fish"- my *hale* is on the northeast corner of its *kahua*- I believe it's to "experience or be in a state of being calm and clear"- again sensory; having clear vision or thought as something is born in thought through experience."

Pālehua Land division, hill and road in the Wai'anae area; "Lit., *lehua* flower enclosure" (Pukui et al. 1974:177). Kawika McKeague gives alternate meaning "I disagree with Pukui; I don't believe it's only meaning is the *lehua* enclosure; I see two other words prominent- *pale* and *hua*, the idea that this place is where the *hua* is protected or perhaps in another meaning one is protected by *hua*, by jealousy."

Palikea Peak above Lualualei in the Wai'anae mountains, O'ahu; *Lit.*, White cliff (Pukui et al. 1974:177). Kawika McKeague gives alternate meaning "- the cliff of Kea (Wakea)- he is detached from the processes of the childbearing activities that are evident with the form of these *pu'u*- this distinguished "setting aside" of place for Kea further support that the mountainscape down to Pu'uokapolei is female, is lifebearing, is transcending between this life and others yet to be or that have passed before."

Pu'ukuua Hill in the uplands of Waimānalo; "*Lit.*, relinquished hill"; In legend, Pu'uku'ua is famed for Kapo, Pele's sister, who once left her flying vagina here (Pukui et al. 1974:200); Māhele claimant and former *konohiki*, Kahakai, claims Puukuua as part of his *kula* land (LCA 9037).

Pu'u Manawahua Hill in upland of Hono'uli'uli. *Lit.*, swollen stomach (Pukui and Elbert 1986:237). Can also be a place to grieve summoning the deep emotions

that arise from the gut (Pukui and Elbert 1986:237). An 1873 map depicts a *mauka-makai* trail commencing near Pu'u Manawahua, extending through Kapua'i and ending at Ko'olina (1873 Alexander Map)

Waimānalo Name of land division, road and gulch in Hono'uli'uli, 'Ewa meaning "potable water"; also a famous resting place of Kākuhihewa (Pukui et al. 1974:225).

Wai-wanana Name of a place in Hono'uli'uli, 'Ewa in which *kuleana* were claimed (LCA 902); *wai* often pertains to water, though it may also refer to other liquids including liquids discharged from the body (Pukui and Elbert 1986:377). Wanana is indicative of a prophesy or foretelling (Pukui and Elbert 1986:382). The many references by interviewees to fresh water springs in the area, including springs used for family worship suggest a connection between the name and the place.

Kawika McKeague, a member of the O'ahu Island Burial Council and resident of Hono'uli'uli, shares his *mana'o* on the meaning of *wahi pana* and how Hawaiian culture is strongly rooted to their ancestors and *'āina*:

> 1) Spiritual transcendence imbued into physical landscape- there is a fine line of existence and being within the worlds of the ethereal and "reality" within the entire Hono'uli'uli Ahupua'a. This fine line between two worlds of knowing, perceiving, and attaining life essence creates a cultural/spiritual foundation for this area to provide the means for moments of revelation through various sensories. These *ho'ike* reveal themselves through *'ike papalua*, secondary sight/knowledge, *hihi'o, akaku*, and *ho'ike na ka po*.
>
> Even the name of the *ahupua'a* is suggestive of the deep well of knowledge and understanding that comes from the time of Po. Some of the supporting elements to this line of thought of extrasensory "enlightenment" to delve into different plains of being and existence include:
>
> a) Kapo'ulakina'u- (Kapo of the red streaked with dark) the female *akua* that provides inspiration and insight only through one's dreams- her presence demarked by the *ula* rays of the setting sun, which also belongs to Hina/Papa/Haumea;
>
> b) The area of Kaupe'a- the plains of the *ao auana*, where unsettled souls wander and dwell.
>
> c) Hoakalei- area near White Plains Beach- where it is said that Hi'iaka receives vision of the death of Hopoe and the burning groves of *lehua* on Hawai'i Island.
>
> e) Mo'olelo of Kamapua'a- foretells or gives Kamaunaaniho the *ho'ailona* that will reveal his death at Pu'uokapolei- the smelling burning bristles.

2) Sensory exploits of the female persona- you look at the natural landscape and you begin to understand some of the place names are related to physical, emotional, and spiritual cycles that are a natural part of a wahine's passage through and during childbirth. There's multiple loaded *kaona* [hidden meaning] in these place names but there is commonality again in sensory experiences that sustain the cyclic nature between life and death, ignorance and enlightenment, *pō* to *ao*.

c) Pu'umo'opuna- grandchild; offspring; relative or descendant two generations later.

e) Pu'upoulihale- again the reference to *uli*- any dark color, richness of vegetation, of seed banks; also female *akua* of certain sorcery; short for *'ouli*-study of omens; also the name for the developmental stage of a fetus, as the body begins to form. Pouli can mean darkness, sometimes ignorance (modern mental ascription to the night but a more traditional line of thinking could be that of Po, of knowledge beyond the sensory experiences of ao, of being awake, in the light; the knowledge that stems from such a time of antiquity).

f) Akupu- to sprout; germinate; supernatural.

Section 7 Summary and Conclusions

The Waimānalo Gulch Sanitary Landfill was established in 1987. The importation of landfill material over the past fifteen years has most likely eliminated any historic properties and plant resources related to Hawaiian cultural practices and beliefs that may have been present within the bounds of the landfill property. Additionally, the presence of the landfill over the last fifteen years has already precluded any traditionally established access to *mauka* areas through Waimānalo Gulch.

The accessibility of Hono'uli'uli lands, including the present project area, to the Hawaiians for gathering or other cultural purposes would be radically curtailed during the second half of the nineteenth century. As noted above in this evaluation, by the 1870s, herds of cattle grazing across the 'Ewa Plain likely denuded the landscape of much of the native vegetation. Subsequently, during the last decade of the nineteenth century, the traditional Hawaiian landscape was further distorted by the introduction and rapid development of commercial sugar cane cultivation. Throughout the twentieth century sugar cane cultivation was the dominating land use activity within the project area. Cane cultivation – and the sense that the project area was private property – restricted access inside the project area to employees of Ewa Plantation.

The *'ili* of Waimānalo including (Makaīwa, Lanikūhonua, Ko'olina, and the uplands) has been described by community participants in this assessment process as a sacred area of great cultural importance. Many of the individuals contacted or interviewed for this study have expressed concerns about cultural impacts within and beyond the boundaries of the proposed project area. These concerns are based on a traditional view of the Hawaiian landscape as a continuum, in which the *'ili* of Waimānalo is perceived in unbroken relationship between *mauka* and *makai* lands and to the ocean beyond. This relationship is reflected in the oral traditions mentioned by the people of this land, the sites documented within the project area, as well as the many sites *mauka* and *makai*. The current project area is located along an ancient pathway between the *mauka* and the *makai,* i.e., the uplands and the coast. Both of these two general areas contain diverse and abundant resources. This pathway is traversed by Hawaiian ancestors in both the physical and the spiritual form. The *makai* area was rich in estuarine and marine resources including a canoe landing, a *ko'a, ki'i pōhaku* as well as *lo'i* that sustained a thriving fishing village. The *mauka* area is covered with numerous religious cultural sites.

Community particpants have expressed great concern about the Huaka'i Pō Kāne, also known as the Night Marchers, a monthly procession of the spirits of the dead. According to *kūpuna*, the trail of the Night Marchers in this area runs from *mauka* to *makai*. Hawaiian cultural belief is that these trails are significant and must not be impeded for fear of retribution from spirits of the departed. This type of cultural tradition often goes unacknowledged because it is not an accepted part of the dominant Western culture; however it is very real for many people in Native Hawaiian communities. Hawaiian culture acknowledges a spiritual aspect to nature and interprets it in a way that has made certain Kānaka Maoli (native born) very sensitive to natural phenomena.

According to the state OEQC's guidelines for preparation of cultural impact studies, analysis must take into account culturally significant physical and natural features of the landscape. For example:

> Certain landmarks and physical features are used by Hawaiian navigators for sailing and the lines of sight from landmarks to the coast by fisherman to locate certain fishing spots. Blocking these features by the construction of buildings or tanks may constitute an adverse cultural impact. (Office of Environmental Quality Control 2004:47)

Based on the information gathered during the course of this study and presented in this report, the evidence indicates that the proposed project will affect traditional Native Hawaiian stone uprights (SIHP # 50-80-12-6903).

As described in Section 1(Introduction), when the expansion project's CIA consultation was initiated, communication with the project proponents indicated that the proposed expansion area would be 36 acres—the same 36 acres that the project proponents were having surveyed as part of the project's archaeological inventory survey of the expansion area. For this reason, the initial project consultation letters describe the expansion area as approximately 36 acres. It was only later that CSH learned that the expansion area was actually approximately 90 acres. The 36 acres corresponds with the actual foot print of the landfill cells that will be created and used for refuse. Portions of the remaining approximately 90-acre expansion area will be used for the aforementioned appurtenances. Therefore, although the foot print of the proposed area to be disturbed is larger than the 36 acres indicated in the initla CIA consultation, the actual portion of the gulch to be used specifically as a landfill (36 acres) has not changed.

The consultation results contained in this CIA, which refer specifically to the 36-acre area of the landfill proper, will be augmented and expanded prior to preparation of the Final Environmental Impact Statement. The individuals and agencies listed in Table 2 will be contacted again with the new information about the larger project area.

7.1 Recommendations

The following is a list of community concerns and recommendations based on the community consultation process for this CIA for the proposed Waimānalo Expansion Project:

1. If cultural site SIHP # 50-80-12-6903 needs to be removed, a cultural monitor should respectfully care it for. Douglas McDonald Philpotts, Shad Kane, William Ailā, and Eric Enos all agree that the upright *pōhaku* should be removed from its original place during construction, then reunited with its former space and preserved in place. The removal of the *pōhaku* should be conducted in a cultural manner with a cultural monitor and the proper protocols. There should be a preservation plan in place for future cultural access and these community members should be involved in the mitigation process.
2. The traditional view of the Hawaiian landscape as a continuum should be taken into consideration during the planning process. Waimānalo Gulch is perceived as an unbroken relationship between *mauka* and *makai* lands. This relationship is reflected in the traditions of the Waimānalo area mentioned by the community contacts. In this view, any future activity within the landfill property will further distort and diminish the traditional landscape.
3. The *huaka'i pō* (procession of the night marchers) view plane should be taken into account in the planning process. Several community participants in this study stated that

it is very important to keep the pathway clear of visual and structural blockage from *mauka* to *makai* on the east ridge of Waimānalo Gulch and the west ridge of Makaīwa Gulch, in order to allow the *huaka'i pō* to continue. Several participants in this study cited the establishment of visual and physical buffer zones to protect the *huaka'i pō*. CSH recommends this topic should be addressed in greater detail through further consultation with the community.

4. A series of six natural caves and rock overhangs located in the northwestern portion of the project area were examined and documented by CSH during archaeological inventory survey (Dalton and Hammatt 2008). Subsurface testing (excavation) was conducted at two of these features; most do not contain substantial sedimentary deposits. No significant cultural material was observed or discovered at any of these six caves and overhangs; thus, they have not been designated historic properties. However, at least one community participant (see Table 2) has voiced concerns about possible disturbances to burials in these caves. CSH recommends cultural monitoring of any proposed disturbance to these caves by qualified native Hawaiians familiar with the project area.
5. Although the land has been dramatically altered, there remains a possibility that burials and other archaeological sites may be present in and around the proposed project area Efforts need to be made to insure adequate archaeology and cultural monitoring are conducted at this project site. In addition to this cultural impact assessment, CSH is conducting an Archaeological Inventory Survey for this project area that was ongoing at the time of this report's completion (Dalton and Hammatt 2008); its findings and recommendations should be faithfully carried out in accordance with applicable laws and administrative rules governing historic preservation work in the State of Hawai'i.
6. CSH recommends that community members be further consulted about these and other concerns throughout the planning process. Addressing these cultural concerns is part of the City and County of Honolulu's "good faith" effort to minimize the impact of the proposed project on Hawaiian culture, its practices and traditions.
7. CSH recommends that the consultation results contained in this CIA, which refer specifically to the 36-acre area of the landfill proper, be augmented and expanded prior to preparation of the Final Environmental Impact Statement. The individuals and agencies listed in Table 2 (Section 5) will be contacted again with the new information about the larger project area.

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Appendix A Shad Kane

Mr. Shad Kane (SK) was interviewed by Cultural Surveys Hawai'i (CSH) at his residence on December 6, 2002. Mr. Kane has agreed to re-use his interview for this project.

CSH: Today is December 6th, 2002. Can you state your name and where you were born and what year?

SK: The name is Shad Kane and I was born on the island of O'ahu and my birth date is February 23rd, 1945. At that time my parents, Hattie Kane and Tazoni Crowningberg Kane, were living at Pearl City Peninsula. I think my mom gave birth to me at Kapi'olani Maternity Hospital in Honolulu.

CSH: We're going to talk about Waimānalo Gulch. What in your opinion is significant about the gulch?

SK: I think what you need to understand, anytime you have a discussion in regards to Hawaiian culture and trying to get an understanding of some of the things we talk about, their significance and the role that they play, one of the most elementary things you need to understand is that our history is a fragmented history. And it's unique in that sense. Our history is a fragmented one and in order to understand that, you need to understand that the ancient Hawaiian history was an oral one. It was a history that was passed on from generation to generation, from families to families. And so a lot of this information was memorized, almost held by certain individuals, whether it was someone important within that community or whether it's someone within a family structure whose responsibility was to preserve the genealogy of a family. But we need to remember that it was an oral history. When Cook first came there were a lot of people living here. And in a short amount of time, by 1920, I think there were only some 20,000 Hawaiians in the islands. The significance of that, the purpose of that, is that so many people died for different reasons. We know a lot of them simply died from smallpox. That's the situation in this area we're talking about – Waimānalo, Palehua, Kaupea, Ko'olina – this whole area. There were significant numbers of people who lived in this area that died for a number of reasons. The challenges they could not deal with, the western challenges. Plus a lot of them died as a result of invasions from outside islands – Kahekili, Kamehameha. So O'ahu's history is one that's almost totally annihilated.

The interesting thing about the O'ahu history is its close ties to Tahiti. Because of the many Tahitian associations with the island of O'ahu. Especially this area, the area we're talking about. After having said that, anytime there's a discussion in regards to the things we're going to talk about, in ancient Hawai'i a lot of things were explained in terms of relationships and that there's many different kinds of relationships. One, the most elementary relationship is the *mauka-makai* relationship. There's relationships between us living today, our relationship with our ancestors. Our relationship with the people, our children who are unborn. Today we don't think about these things but these things were important in ancient history. So, when things were done, when structures were built, or events were played out in ancient culture, it was done with an understanding of these many different relationships.

One of the most elementary relationships in ancient times was the *mauka-makai* relationship. And the reason why I bring this one up is because it plays a very important role in having an understanding of the area surrounding Waimānalo Gulch. It's not to say that it wasn't important elsewhere. It may have been. Or I would say it was important all over, that *mauka-makai* relationship. But what makes this area unique is the fact that we have evidence, we have structures that support that *mauka-makai* relationship. Most places most of these kinds of structures – stonewalls, habitation structures, cultural resources – most places they've largely been disturbed or destroyed. But in this respect, this particular *mauka-makai* relationship, there's, I think, sufficient structures that still exist today that you and I can look, see, feel and touch, that supports that *mauka-makai* relationship. And I think if we had a map, if you were to draw a line from the approximate area that may today identify as Ko'olina – If we were to draw a straight line from Ko'olina to Mauna Kapu you'd find that that passes along the northern ridge of Waimānalo Gulch, goes straight up to the ridgeline at Pu'u Manawahua, and follows pretty much a straight line to Mauna Kapu.

There's several events in ancient history that makes this discussion important. One was, with an understanding of the significance of the *mauka-makai* relationship. Some of the information I'm going to share with you, you've probably heard before from other people that you've come to, other informants. And one of this is Waimānalo o Ko'olina was considered one of Kākuhihewa's favorite vacation places. It's a place where he enjoyed coming to and spent a lot of time there. I think he also had a kahuna by the name of Napuaikamau who served as caretaker of Ko'olina. Now, he liked this place so much that he placed a *kapu* on it. And that's documented. We know that he did this. He placed a *kapu* on this place. Today we have difficulty understanding this kind of cultural information. And we've lost the ability to appreciate ancient Hawaiian thought. But the significance of what he did there is that during this period of time, when one places a *kapu* on a shoreline that *kapu* extends out into the ocean and that *kapu* extends up to the tallest mountain in that lineal relationship.

CSH: The whole *ahupua'a*.

SK: The whole *ahupua'a*, that lineal relationship. So the *kapu* is not one spot. We think of it in terms of this one beach but no, in ancient Hawai'i it was not just the beach. Because the ancient understood that all the things up above and everything out in the ocean, surrounding area, impacts this particular site. So when he placed the *kapu* on it that *kapu* preserves the landscape. So he did this. Don't hold me to dates but I think Kākuhihewa lived around the 1600s, around that time. So this particular *kapu* is that old. Now the *kapu* extends up to the tallest mountain in that area. The tallest mountain in this lineal relationship is Mauna Kapu. Now there was another documented site that myself and Nature Conservancy and a bunch of other people tried looking for a particular site or small *heiau* that was built on the slopes of Mauna Kapu. It's in Sterling and Summers' *Sites of O'ahu*. I think it's McAllister's – It's referred to as a *heiau* but it was a small one. I think it was four feet by six feet so it must have been something small, a small little platform. But perhaps they may have had a koa on it or a shrine. But the significance of

this particular structure is not so much its size but the location that it was built, and when it was built, when it was laid out. This particular *heiau* which is one of the few – and the only one that I know of – I don't know about any other this particular small little platform was built of both basalt and also coral. Which is unusual. Now to most of us today, that will go right by us. But the significance of the coral is the fact that it ties Ko'olina to this place. So what it does, it provides supporting evidence for the idea of the *mauka-makai* relationship in ancient Hawaiian times. Now, this lineal relationship, there's a number of documented sites and there's a whole bunch of undocumented sites within this lineal relationship between Mauna Kapu and Ko'olina. There's one undocumented *heiau* that's maybe a hundred feet by hundred feet. And its walls are probably, if you take into consideration the amount of erosion and the amount of soil that's been deposited within the *heiau*, it's about four feet – the walls sticking up above the surface. So depending on where the cultural layer may be within this structure, we suspect within this whole one hundred by hundred feet, the cultural layer may vary from perhaps just a few inches below the surface to maybe a foot to two feet below. That being the case, the walls and inner walls would be perhaps, it's probably like around five or six feet. So it's a substantial structure that exists today.

The only documented information up here is Mauna Kapu. Now between Mauna Kapu and Pu'u Manawahua there's a whole bunch of undocumented sites. But before we get to that, let me just share the information on this particular structure. It's about a hundred feet by hundred feet. The walls perhaps four to five, maybe six feet. The interesting thing about this particular structure is that it has enclosures on four of the corners. And there's also shrines. That's very obvious, even to someone who doesn't know anything about Hawaiian cultural resources. There's a central stone in this particular structure. The stone is facing almost due north. So, some of the people that I've shown this site to, there's several opinions about it. And the thing about Hawaiian stuff is that I don't think anybody can really say with certainty today what we're looking at. So what we try to do is to share the information. And we try to get each other's opinion in regards to what we may be looking at. And we try to come to some kind of consensus amongst ourselves where we can agree on with respect to what we're looking at. With respect to this particular *heiau* I think most of us agree on it serving two purposes. One, it may have been a navigational *heiau* because of the central stone. And there seems to be a lineal relationship, the way it's set up, in the rising and the setting sun. Now, in addition to that, that supports the fact that it may have been a navigational *heiau* is the fact that, when we think of all major islands, there's places on the south side that is referred to as a point of departure. For example, on the Big Island, South Point, Ka'ū, the shoreline and the rocks. Kaho'olawe. Kealaikahiki Channel. It's all on the south side. So, likewise, this is basically the same kind of location with respect to the other islands, when you compare all the other islands. Now what makes it interesting is the fact, again, is the Tahitian connection with the island of O'ahu. Kūkaniloko is built here, the island of O'ahu. I think Marion Kelly refers to 'Ewa as the celebrated land of our ancestors. And other people too make references to 'Ewa as the land of the ancestors. And when they use that term ancestors, they refer to our Tahitian ancestors. There's a lot of Tahitian associations, Tahitian stories that's associated with this region. There's also structures associated with this region. I'm just trying to give you some understanding of the connection with this

heiau, what it may be, and that it may have been a navigational *heiau*. In terms of pointing the way home. There's a number of structures in Kalaeloa, the former Naval Air Station Barbers Point, an area that we know had the ancient name Kanehili. But the interesting thing about all the structures in the former Naval Air Station is the fact that not only is it made entirely out of coral, but when you take a look at some of the structures – For example when you take a look at the habitation structures and you take a look at one particular *heiau*, you find differences in the construction. Most Hawaiian stone masonry, dry stone masonry, the stones are laid flat and they tend to lock in the corners. Tahitian stone masonry, what they simply do is they take upright stones and they stand them up on the outside and they fill them up. And this particular *heiau* and some of the structures in Kalaeloa, what you find is an integration of Hawaiian stone masonry and Tahitian stone masonry. So it supports the Tahitian idea that they're associated with this region. There's a number of *mo'olelo* that ties us to Tahiti. One that really makes it clear is the story about – Kahai is one of the Tahitian chiefs who's credited for bringing the first *ulu* tree to the island of O'ahu. There's different stories, different places where he may have planted. But nevertheless the stories are real stories. And there's one particular story that refers to – It's a story about Nāmakaokapāo'o, who's the son of Kahai. You also need to understand that Kahai is also the son of Mo'ikeha. And Mo'ikeha is the brother of Olopana, who was killed by Kamapua'a. So you got to feel of how everything fits together. So, in this particular story, apparently Nāmakaokapāo'o and his father Kahai were somehow separated when he was young, as a boy. And he goes off and he lives his own life. And the story is that Kahai takes his *'ahu'ula*, his feather cape, and some other items and buries it beneath the *ulu* tree somewhere in this particular area. And the story is, if Nāmakaokapāo'o wanted to know his father, he would need to seek out an ulu tree and look for the father's *'ahu'ula.* And if he finds it, then he would know who he is. Okay, Kahai's name is – Hawaiians in ancient times, their names were long. So Kahai is also referred to as Ka'ulu o Kahai, the ulu tree of Kahai. If you say that name quick enough it almost sounds like Kualaka'i. So Kualaka'i may be a corruption of the word Ka'ulu o Kahai. So Kahai is credited for going to Tahiti or to Samoa and getting that ulu tree and coming by way of Tahiti and planting it at a place called Kualaka'i in Barbers Point Naval Air Station, which we know of today as Nimitz Beach. Now the significance of this story is that Nāmakaokapāo'o needs to find out who he is. And the deeper meaning to this is not just Nāmakaokapāo'o to find out who he is, it's for all of us to find out who we are. The story is, he did not go to Tahiti to get the *ulu* tree. He went to Samoa to get the *ulu* tree. Now this story is not unique to just Hawai'i. It's a story you find all over the Pacific. The story may vary a little-bit. But the significance of the *ulu* is the fact that it's viewed as, it's symbolic of rebirth or renewal. That's the significance of this story. The significance of the story is that we may have come from Tahiti but if we go back farther, we came by way of Samoa. I think only recently are we beginning to realize that the migrations of the people into this region came by way of Samoa. There's actually two migrations I think. One from this region and one from further up north.

Getting back to the *heiau*, because of our oral tradition it's so important that our children – If we take ourselves back– three, four hundred years ago – it's so important that our children know where you came from. So we need to know – if you got to go home – where home is. So that's the significance of navigational *heiau(s)*. This particular *heiau*,

like others in our islands, is pointing the way back home. Within this *heiau*, in addition to enclosures of the four corners and the central stone, on one side there's a lot of stones that we feel we're looking at just the top of them. If you look at this particular *heiau*, at least for me and my friends who are close to me and who look at this kind of cultural resources, we try to look through what has been disturbed and look for undisturbed sections of the *heiau*. So, if the cultural layer is about a foot down, and we got a stone that's buried within a major portion of this *heiau*, and it's buried in that cultural layer, the first thing that comes to mind is it was put there. If it's on the surface, our best guess is that it doesn't belong there. It just somehow ended up there. But there's a whole row of stones. And they kind of run *mauka-makai* and they run, as you're standing from the top stone and you're looking *makai* at these stepping stones in the *heiau*, you're looking southwest, that general direction. Not that it may be accurate but in a symbolic term it's important. Because, if in fact these stones were placed there, they were placed there for a reason. Because everything else in this *heiau* is cleared with the exception of the central stone. But, if in fact, the central stone and you got this series of stones on one side, in a row – If it's a navigational *heiau* there would be a map there. So we were searching for a map. And one particular stone, initially we thought had represented the island of O'ahu but it would be an excellent stone to represent all of the islands because of similarities with all the islands. Similarity – Not so much Kaua'i, because Kaua'i is an older island. It's been further eroded. However, when you take a look at O'ahu, Maui, the Big Island –

Much of what I'm sharing with you I realize it's hard for you to get a picture of what I'm saying. There's one particular stone that's maybe two and a half feet by two and a half feet. And it's shaped like the island of O'ahu in a sense that what you have, you have two high points in the stone and you got a saddle in the middle. One high point, in our opinion, represents the Ko'olaus. The other high point represents Wai'anae. The saddle represents the central plains of O'ahu. You use the same thinking, the other islands. Maui – West Maui mountains and Haleakala. The central plains representing the center of the island. Same stone can represent the Big Island, representing Mauna Kea, Mauna Loa, Hualalai and the saddle. In a sense it could also be representative of Moloka'i, but perhaps maybe not as clear. Likewise, Kaua'i because Kaua'i has been much more eroded. But our opinion is we're looking at the best representation of the islands, of all the islands. And this if this is a navigational *heiau* a map would be important. Now, when we look at this particular stone, and we're standing on the island of O'ahu and we're looking south, behind us is several stones embedded in the cultural layer. As we're looking at the other stones in the cultural layer, the first thing comes to mind – And every one is interesting, when you look at it. One has a big hole in the center and, in our opinion, it perhaps represents an atoll somewhere south of us. And then there's other stones, in our opinion, represent way finders or voyagers that they used, places to pick up on their travels. In addition to using the stars, these were stops that they would use to find their way around. So, in our opinion, because of all of this – the stones, the central stone, and everything else – we feel this may be a navigational *heiau*. One of the other things that we think that this *heiau* was used for – as a place of sharing information, because of the enclosures, four enclosures on the outside corners. On these enclosures we have four walls, elevated platform with upright stones that's a part of the elevated platform.

CSH: Did you say the walls were four feet high?

SK: The main structure – about a hundred feet by hundred feet – it's almost a perfect square. That particular wall, in some areas right now it's about four feet. But our thinking is that a couple hundred years of erosion – Our thinking is that some of that the walls are buried. So our best guess is that maybe this structure is about four feet from the inside. But the corners is what makes it extremely interesting because in the corners we have enclosures that's built onto the outside corner. And it's a very obvious enclosure. It's not a habitation structure. There's an elevated portion on it. We suspect if were to clean it out we'd probably find smaller stones on the top. There's very obvious shrines and *koas* that's associated with elevated platforms. But one of the other things we feel it may have been used for was a place for passing on information. Whatever that may be. That may simply be somebody sharing navigational information. Or it may be somebody sharing medicinal information. Or it may be somebody sharing religious or genealogical information. Whatever that might be. But it's very obvious that it's a place for sharing important information. Elevated platform, the *koas*. In our opinion the *koas* obviously serve as a podium. The *koas*, in our opinion, because it's oral history, it's very important that when you speak, you're heard. So you want the people you're talking to, you want their attention. If you're going to say something, they need to hear what you're saying and they're going to have to remember it because you're not going to say it again. These structures were built in a manner to get one's attention. So, in other words, when that person, whoever he is, who's standing on this elevated platform and speaking, is not speaking alone. He has others with him. He has a *koa*. He has his ancestors and everyone else. People know that in ancient time. We don't understand this kind of thinking today. We're getting lost but our *kupunas* knew this. So they understand how important it is to remember, how important it is to speak that's what the Niho Palaoa is. It gives one the authority to speak. Something so simple yet we don't understand how important it is to speak and be heard. These simple things was so important to our *kupunas*. So when they built these kinds of places, unless you have that kind of understanding you don't know what you're looking at. If you look at it in scientific terms, it's just a bunch of stones sitting there. And if you can understand the thinking three hundred years ago, all of a sudden the bunch of stones become – Oh, it's very interesting, all of a sudden. And you see that if you have that kind of understanding and you go to this place. And you look at these stone structures. It shouts out to you what these are. So these four enclosures, in our opinion – It's not Shad Kane's but a bunch of other people who've sat down and talked about – It's very obvious it was a place of sharing information. What makes it very special and this ties it to Waimānalo Gulch – If you take a look at this map, take a look at this photograph, all these gulches here, you think of this place as a barren region. As a matter of fact, one of the reasons why they chose Waimānalo Gulch is because of water. Right? Today the most obvious thing when I look at this is that there was water here. In order to gouge this thing out, there had to be substantial amount of water. Okay, getting back to the *heiau*, there's many – You read *Sites of O'ahu* or you read a lot of the other stories with respect to this region, you find out there's a lot of stories with respect to water, a lot of stories with respect to springs. This *heiau* – Two of the *makai* – This structure is kind of – It's not perfect flat. One portion, the *mauka* portion, there's an entrance on the *mauka* portion and there's an entrance on the *makai* portion. The two

enclosures on the *makai* portion, they have *tī* leaves growing in them, full-grown *tī* leaves. So we know they've been there for a long time. Another thing about *tī* leaves, the significance of *tī* leaves, is the fact that we know it's difficult to propagate from seeds. So somebody had to stick them in the ground. And we know it wasn't a cowboy. And we know it wasn't anybody recent who did that. So we suspect it had to be one of the *kūpuna* that planted it. Now, on one of them, the one on the Wai'anae side, there's the full-grown *tī* leaf and there's a whole series of boulders on the *makai* side of this enclosure. Now, most people, most of our *kupunas* in ancient times, when they built structures, from our experience in looking at them, they were basically geometrically shaped. We find them like square, rectangle, or triangle sometimes. They were basically geometrically shaped. In some cases you might find something that's round. But not very often. Normally square, rectangular kind of stuff. But not very often you're going to find an irregularly shaped one. Amongst those boulders, where this old-grown *tī* leaf is, there's an irregular-shaped wall. And we've had several people come up and take a look and try to figure out what the heck is this irregular-shaped wall. Because we know they don't generally build something like this. And one of the people that came up was a lady by the name of Mikilani Ho. She's a Hawaiian archaeologist and she has a number of publications out. But she's considered an expert in petroglyphs. So she came up and took a look at it. But she was there to look at petroglyphs. Because our thinking was, this *heiau* is on a trail, *mauka-makai*, so we're looking for petroglyphs to support the trail idea. So she came up there and she came up with something totally different. And when she brought this up, everybody seemed to understand exactly what she said. And when she took a look at this irregular shape wall, she said it was used to contain water. It was not necessarily used to stop it, but it was used to slow it down. But she was saying that was the beginning of a spring. And when you walk through the grass below the spring, this wall, was a riverbed. It's a riverbed that went all the way down and dropped off on the side of the wall that drops down into the valley. Not to say that's the only spring. There may have been hundreds. But what she said is that this *heiau* was built on a series of springs. And we tried to understand – When we first started looking at the amount of effort – It took apparently a lot of effort to build this one structure. We can't imagine people putting in that amount of effort and not having water. So the feeling is that this particular place is built on several springs. On the opposite side, the other enclosure on the Honolulu side, similar situation. Series of boulders, no wall, old-grown *tī*. But when we started walking through the grass there's a dry riverbed that goes all the way down. Stones all over. On the sides it's dirt but as you come into the lower area depression it's all stones – river-worn stones. So, the feeling is that this particular area was built on water, built on several springs which supports the fact that at one time there might have been a substantial amount of water that actually created Waimānalo Gulch. I've shared a whole lot of information on only one structure. I don't know how much time you have but that's only one. There's some other *heiaus* up there. Now you might be wondering how come it's not documented. We don't know. We don't know why it's been hidden. But what we do know is that it has been hidden for a long time and it's only been recently that it's been found. And it's buried under California grass and weeds for the longest time. There's a whole story on how we found this but that's another whole story, how it was found. Now the big question mark is what happened? Why is this a place that was totally disappeared.

And what makes this whole place up above the landfill important is the fact that nowhere else can you find a place in all the islands where you find so much cultural structures that supports that *mauka-makai* relationship. Below this *heiau* there's other enclosures. Marion Kelly referred to one as a *heiau* – two of them she referred to as a *heiau*. They're small. One I would say is about thirty by thirty feet. It's a terraced structure – a lower portion, upper portion. The lower portion is all paved with stones. The upper portion is paved with small stones, *'ili'ili* stones. And the lower portion, there's an upright stone that's actually laying on its side but we suspect it may have been standing up at one time. There's another *heiau* further down the valley, directly in line with Waimānalo Gulch that's set up – This particular structure – We got the opinion of *kumu hula* John Kaimikaua because John Kaimikaua – He's not too familiar with the O'ahu tradition but he's very familiar with the Moloka'i tradition. So when he speaks, he speaks in terms of what he knows of Moloka'i. But our thinking is that there may have been similarities here. Now, Moloka'i, they have several *hula heiaus* that are still in place up there. And, in any case, the *hula heiau* is built on a slope. It's built on a hill. So there is one *heiau* that's up above Waimānalo Gulch that's built on a slope. And I would say it's about fifty feet long and then it goes into the hillside, because it's a slope. So it has a high wall. In one portion the wall, I would say, is maybe about twelve, fifteen feet, on the slope side. Then the paved portion actually disappears into the hill. We suspect that because of the amount of erosion, we suspect that the paved area may be a little bit bigger. The actual exposed portion of this paved area is maybe about twelve feet. Maybe a little bit more than that. But we suspect it may go further in. The actual length of this particular structure is about forty, fifty feet long. And what makes it interesting is it looks like they gave up building it because we can see a portion of it that they did not finish. So we're actually looking at the inside, not the finished wall. Which makes it interesting because I can't think of anyplace else where you actually have a *heiau* that stopped being built while it was under construction. They decided to stop. Why they stopped, we don't know. But John Kaimikaua's opinion is that this is a *hula heiau* we're looking at. And Marion Kelly said the same thing. Marion Kelly looked at it. She supported that it's a *hula heiau*. Simply because it's on a slope. And both Marion and *kumu* said that in ancient times what they used to do, is that so that everybody has an unobstructed view, they go on a hill. And you watch across the hill to watch the performance, whatever the performance might be. So it's that kind of place. That's one. And there's a whole bunch of other structures in this particular area. And anyway, is that enough? This is just supporting information with respect to that *mauka-makai* relationship. And these are structures that are there today, to be seen. I'm sure that in time more people will be able to have a chance to take a look at it.

CSH: Can we talk about the trail that goes from here to the ridge?

SK: Okay, a lot of the information that I shared too are things that you can actually find from different resources. And this is one. In ancient times there were several trails that people would take to come from Honolulu to come to this side of the island. I think there were three ways to get to Wai'anae. One was by way of Kolekole Pass. One was by way of Pohakea. Another was by way of Pu'u Kapolei. Three trails. Obviously, another one along the shoreline which was the longest way to travel. Farrington Highway is very

obviously a trail. Now, in the context of Waimānalo Gulch, what makes this extremely interesting is the fact that there's a series of petroglyphs that was preserved by the developer of Ko'olina or West Beach Estates. When they first started developing – There were a number of archaeological surveys that were done early on. And one of the key persons was Aki Sinoto. I've read a lot of Aki's work. Very interesting cultural information that he found – that whole area over there. And several other people. The interesting thing is that the first archaeological survey that was done was 1930 by Gilbert MacAllister. Between 1930 up until the '70s nothing was done. So 1970 was the start of all this discussion in regards to building in this whole region. And because of the requirements for the EIS and doing a cultural assessment – All of a sudden, since the 1970s until now, and the development of the Campbell Industrial Park and Kapolei and the resort area, we had all these archaeological surveys that came up. So Aki Sinoto is one of them, amongst others. But one of the things they discovered is the fact, in addition to all the information in the lower plains, in addition to the sinkholes and the bird bones, they also found what I think they refer to as the alluvial level or the higher elevation up above the coral plains. And what they found, they found habitation structures, they found burials, and some petroglyphs. I think they actually found two. I think they found one that's actually inside Waimānalo Gulch, up on the higher ridge. I've never seen it. Another one they found that was preserved at the entrance to Ko'olina. Now the interesting thing about petroglyphs is that most of them are built identifying trails. And you find them along ancient trails. And the significance of these particular petroglyphs here is that it actually defines the intersection of two trails – Farrington Highway and the *mauka-makai* trail. That *mauka-makai* trail is supported by everything else that I've shared with you in respect to the cultural sites up above. We need to understand the significance of that *mauka-makai* relationship because that was one of the relationships in ancient times. In ancient times, it was matter of life-or-death resources. It was food. So it was establishing that relationship between the people up above and the people at the ocean. So these were your closest friends. These were the people – So you don't have to go dive for fish. You just go down and you take what you got to share. You get fish from people down below. So these were your neighbors. So obviously there would be *mauka-makai* trails all over the islands. The significance of this one is the fact that you have structures that supports that idea, that's still intact today. And the petroglyphs along Farrington Highway is one of those supporting pieces of information.

CSH: We need to document access. So when you guys go up there, which way do you guys go?

SK: In terms of gathering resources today?

CSH: Or to go up to these places up here, up to the *heiau* that are undocumented?

SK: We go through Palehua. That's why I say I've hiked most of it. The only area I haven't hiked was actually the stretch from Farrington Highway up to the Timberline intersection – of the Palehua and Timberline.

Sometimes when you've seen a lot of different structures, and you have something to compare it to, a lot of time all you need is two or three stones to get an idea of what might have been there, that might still be intact. So a lot of times we just look at the surrounding area. If we find two or three stones that seems to be aligned and then we look down slope

and we start seeing stones scattered all over the place down below – And if it looks like a place that may have stopped some erosion or it may have been a place where soil might have come down and then hit an obstruction that caused soil to deposit, then there may be cultural information buried there. But then when you look at a slope, you look at an area, you can tell whether the soil passed over it and went further down. Or may have stopped up against an obstruction. But you can only get a feeling for this by actually walking up and looking around.

CSH: Did night marchers come up in any of the stories?

SK: No. I know a lot of stories associated with that. Especially this area right here. And the significance of this area in terms of night marchers – You want me to share a little bit about that? One of the things we've done and we're still trying to do, we're trying to get support for restoring the ancient Hawaiian names. And I think that's happening all over the place right now. We've been able to restore one name so far. We've been able to change the name of Barbers Point to Kalaeloa. We did that. We changed that. But there's other names we want to change, to restore. There's a lot of them in this area. The significance of ancient names is the fact that – There's a lot of stories, mo'olelo, there's a lot of resources, legends, all these stories refer to different places by name. When you read these stories you don't know what they're talking about unless you know where the places are. So the thing is that we do have a history but it's hidden in ancient names. So in order to get people to understand that every area of this island, of all the islands, there are stories and histories of that place. But it's hidden. So one of the names of this region is Kaupea. And there's actually two ways of defining Kaupea. In order to understand the significance of Kaupea is kind of understanding how ancient Hawaiians thought in terms of life, death and sleep. Our *kupunas*, the ancient Hawaiians, believed that life, death and sleep overlap. The thing is, trying to explain this in western terms is hard because there's no real word to explain it. The words may be confusing so try to see through the words. In ancient Hawaiian there's two energies in all of us. One was defined in terms of the dream spirit. So when you go to sleep, when you dream, our *kupunas* felt that that dream was something real. In other words, you had actually visited – Your dream spirit would leave your body and travel. And you had an opportunity to visit different people. You may have an opportunity to visit a departed loved one, a grandmother. So if you were a pregnant lady and you woke up in the morning and you had a dream about your grandmother or your great-grandmother and she shared a name with you, you took that seriously. You actually visited her. She's telling you this is what you should name your child. And, likewise, if you were a *kahuna la'au lapa'au* and you dreamt about someone sharing thought with you in regards to using a particular plant to serve a particular purpose, you took that seriously. That was real to you. Somebody's giving you good information. Now, in order for you to wake up from your sleep, that dream spirit got to come back. Because the other energy within you is the energy that supports all your life functions – your breathing, your heart, your circulation. Without that dream spirit coming back – That simply defines death. You die. So that's why in ancient times when the first sailors came over here, they would come across a family, they would be chanting over the body. What they're doing, they're trying to get the spirit to come back. We refer to it as spirit but it could also be – We could also look at it in terms of one's spirituality. In a

Christian sense – I hate comparing Christian with Hawaiian thought but sometimes in order to help some of us today to understand, sometimes we need to do this. But we all as Christians today know that we all got souls. Is this what they're talking about? Now, what they also believe is – Say your dream spirit would not come back and you're basically dead, the ancient Hawaiians felt that if you were respectful of your *'aumakua*, you were respectful of your parents, you were basically a good Hawaiian, you had the benefit of your *'aumakua* to carry you somewhere. Take you to a place that is referred to as Laina Kauhane. Every island has it. On this island, the one that I know of for sure is the leina stone of Ka'ena Point leinaaka'uhane. The interesting thing about that stone is that it follows the ridge line of the Wai'anae Mountains. If you look at the map and you follow the ridge, the peaks all the way, and you come down Ka'ena Point, right down the slope, you land right on the *leina* stone. Now if you follow that same ridge line back up the mountain range and you come all the way across these mountains over here, you come straight down, you come right down to Kaupea. Pu'u o Kapolei sits right at the bottom of this hill. Kekuapo'i, when she wrote a kanikau with her husband Kahahana, one of the things she said in this very lengthy kanikau, she said that her husband's spirit entered that *milo* by way of Pu'u o Kapolei. Us trying to understand what she said, and having talked to a number of different people, she was saying that perhaps Pu'u o Kapolei is a conduit to another world, right in the middle of Kaupea. Okay, so on one end you got the leina stone and on the other end you got Pu'u o Kapolei that may have served as a conduit also, surrounded by Kaupea. Now, if you're respectful of your *'aumakua*, you will have the benefit of them taking you to a *leinaaka'uhane* and helping you leap into the next realm, a better place. If however, you were not respectful of your *'aumakua*, you were not a good person, you were a sinful person, you would not have that advantage. So our *kūpuna* felt that in that case you would be banned to barren and deserted places such as an Aokuewa . Aokuewa is a place of wandering spirits. Aokuewa is Kaupea. So, if you did not have the advantage of getting to the next realm, you would be doomed to live at Kaupea right back here. In a Christian sense, you got heaven, hell – You got one more place. The third place is purgatory. Okay, in Christian thought, purgatory is somewhere else. We don't know where but somewhere else. Our *kūpuna* said purgatory is here. Kaupea. Is Kaupea purgatory? So a lot of the stories that's associated with night marchers, most of them are associated with Aokuewa. These are the places that these kinds of things happen. To make it more real for you, in the context of what we're talking about here, I just retired from the police department a couple of years ago. So I've read all the police reports. That was my job – reading all these kinds of police reports. More than anyplace else on the island of O'ahu, the police reports over here were the accidents. We had so many unexplained accidents right along this intersection, passing through Kaupea, where we can't explain why the guy decided to make a ninety degree turn – No alcohol, the guy's okay, not a wacko, an average citizen, he just decides to make a right turn and drive off and hit the telephone pole and kill himself. So many. In addition to that, some of the recent information is that when they first started building the Kapolei Middle School, they spent I don't know how much money – Because the Kapolei Middle School is a high-tech school, it's all air conditioned, and every classroom has computers. So they spent a lot of money on a security alarm system in certain rooms because of the amount of computers, the amount

of stuff in there. They got audio, they got video monitors in the rooms. Not just sensors. Not just motion detectors. Not just that. But they also got audio that triggers, and they got video monitors that kick on in certain rooms. When they first opened up they had an incident – one o'clock, two o'clock in the morning – where it's monitored by somebody at the main office in Sand Island. This particular lady was watching this monitor. All of a sudden this red light comes on and she checks and it's an indication that someone is breaking into a room at Kapolei Middle School. She puts on some equipment and then video comes on. And then audio comes on. And she hears kids having a good time in the room. Lot of noise of kids yelling and screaming. And when she puts the video on she sees figures moving around. It's dark in the room but she can see little figures moving around. So she calls the principal. She calls 911. She calls everybody, the custodian. The principal lives in Kailua, drives all the way out there. The custodian gets there. They go in the room. They open the door. Nothing in that room. Everybody's upset. Check with the lady. The lady says "I got the video." They go into town. She switches everything on. Guess what? Nothing. That's typical of these kinds of places. Now, when they first shut down Barbers Point Naval Air Station they had to hire private security guards. And they had a hard time keeping them. Because the security guards – When the Navy moved out, they had a lot of abandoned buildings. The security guards were chasing children around in these abandoned buildings. And then the kids would disappear in the locked room. They go in the room, open them up, nothing. I mean, these guys were so scared, upset about it, that they actually called the police department. Most people, when that happens to you, you just – and don't call the cops. But these guys took it so seriously, that they were certain the kids were there that they called the police department up. Similar stories happened at the water park. The new building they just built, Kapolei Hale, they must have blessed it two or three times already. There are stories about that place – about drawers being left open and stuff like that. But, anyway, these stories that I've shared with you are recent stories that go way back. But they're typical of Aokuewa's around the island. That's what Kaupea is.

The next thing about Kaupea. The name Kaupea, if you take it literally, refers to the Southern Cross. One of the constellations that the Polynesian voyagers used in their travels, both north and south, is the Southern Cross. The Southern Cross is a very important constellation. It didn't necessarily tell them what to look for but it told them if they're going in the same general direction. So, in other words, the higher latitude you go, the Southern Cross is lower on the horizon. The farther south you go, the Southern Cross is higher up above you. So it basically tells you whether you're moving in the right direction. If you're going south, then you should see the Southern Cross. It should get higher up in the heavens. So, the ancient Hawaiians, when they did things they lined everything up. Not only did they line up heiaus, the *mauka-makai* relationship, the rising sun, the setting sun, structures – They're all connected. And what they also did, the *ahupua'a* lines, the *'ili* lines, also had a significance. We suspect – and not just me but I think I talked to Marion Kelly and a bunch of other people – These are things that we lost. Agriculture came in and they started bulldozing they destroyed all the boundary markers and things like that. So we have no idea where Kaupea may have been. But because of the name, because of the name Kaupea, we suspect that it may have been a marker pointing to the Southern Cross. So these are the places that surround Waimānalo

Gulch. So I'm talking about this because it's important to us. It's important to us as Hawaiians. And it's important for us to have a sense of direction in our lives. And it's important to us in terms of connecting with our *kupunas* and being able to share this information with our children. It's not about us. It's not about you and me. It's about everybody after us.

CSH: Thank you.

Appendix B Douglas McDonald Philpotts

Interview took place on August 12, 2007 at Douglas McDonald Phillpott's *hale* in the *ahupua'a* of Hono'uli'uli and the *'ili* of Waimānalo. Interview conducted by CSH staff Kēhaulani Souza and K. Lehuakeaopuna Uyeoka.

CSH: Can you please tell us your full name and your connection to this area?

McD: My name is Douglas McDonald Philipotts, but I go by McD. I live in Pālehua and I've been here since 1970, July 1st, which happens to be my 12th birthday. Prior to that we lived at what's now Paradise Cove next to Lanikuhonua. This is where I learned to swim and took my first steps. Lanikuhonua was my great grandmother Kamakila's house; her parents James and Abigail also had their ranch house in Hono'uli'uli so my children are now the sixth generation here. I also believe are Hawaiian genealogy from Kauai comes back here many generations earlier.

CSH: What are some of the sources or who are some of the people that have shared knowledge with you about this place?

McD: I've gotten most of what I know from just being here, and having an intense interest in the place and its history. I think compared to most places very little has been written about this area. Ida Von Holt's *Stories of Long Ago* is probably the best historic material I've read about this area. *Sites of Oahu* contains some material on this specific area - however it's also self-contradictory and very fractured. Kehau, the land claims you have provided me along with *mo'olelo* from Kupuna like Analu's, stories of the five brothers and the night marchers are also very insightful. Many old maps showing historic water tunnels and reforestation efforts also help to understand the water resources that were here to support pre-Contact populations. Ida's son Herman Von Holt also shared many stories of this place with me; he also spent most of his life on this land and like his father became manager of the Campbell estate for some years. Jimmy Greenwell who was the manager for Hawaii Meat Company, the ranch here in the 1930s and 40s, also had lots of good information as well as building its ranch house that we live in. But by far the greatest resource to share with me has been this place and to have the great fortune to spend a lifetime and now raise my children here.

CSH: Can you share with us your *mana'o* about why this place is so special?

McD: Whether you're a spiritual person or not you will be impressed by the sheer beauty of this place, and the spectacular views from here. But many who come here are surprised by the sense of mana here. The view is special here, from the top of Pālehua between Pu'u Manawahua and Mauna Kapu you can see all the islands and all of the mountain tops on those islands, this is the only place in all the islands you can do this. Hermann von Holt showed me the trench that still remains on the Honolulu ridge of Mauna Kapu and said another one in the south was taken out when the road was put in. It was right where the big blockhouse is now. Herman said they were told by the Hawaiians in the ranch camp

at Hono'uli'uli this was a most sacred place, and the place of great mana, and that is why I think the Hawaiians lived here and their spirits never left. This could be part of the meaning in the name Pālehua. In addition to the unique view of the islands I have observed the annual journey of *lā* from here. It starts on the first day of the celestial year on the winter solstice. At sunrise the sun can be seen rising from its house Haleakala as it begins its journey northward it rises from the west Maui Mountains and then from East Moloka'i. Reaching O'ahu it rises from Koko Head and moves from peak to valley north through the Ko'olau's reaching its destination Mokumanamana in exactly half a year. Then on June 21st, the summer solstice, the sun sets behind Kaua'i and starts its journey back home. On this solstice line connecting Haleakala, Pālehua and Mokumanamana are also several *heiau*. Twice a year on the equinox the sun sets over Pu'u Heleakala. To me these and many other things seem to be more than coincidence.

This area has great value in the collective because there is a window into the life of our culture pre-Contact. It's not just about how they built their house sites, what's important is where they built their houses in relationship to where the water was located. They built their houses out there, in the wind, with the risk of it blowing away in a big storm, because they wanted the view. The five brothers, the watchers, their house sites are still there. It's all about the view. How can we relate to these stories if the house sites are gone, or if you don't know where the spring is, or if you don't know where their food was? This is the whole picture, like that beautiful *ahupua'a* poster that Kamehameha Schools has, and it is right here you can walk on it! Due to the land use being limited to forestry, watershed and ranching, the area's pre-Contact archaeological sites have been preserved. For those who have an interest in really understanding or trying to step back in time, just for a moment, for a visit, they can. You can walk from the fishing ko'a to the lo'i or you can stop at the spring or the shelter cave or the ahu the *heiau* the *pā*. You can go a to the forest for lapaau and you can watch the sunset from the front of their hale and if you employ the right senses you can do all this with them, they are still here, that is why this place is so special.

CSH: Can you talk about when you were younger and some of the things you learned from the people and the resources here?

McD: It really starts way back with Lanikuhonua and fishing. Uncle Sunny, Netty's father, kind of clued me in on throw netting. My Dad taught me how to get the net to open up but Uncle Sunny was the one that taught me how to use my senses to know where fish were. One night I was running out with my pole to set lines and he goes, "where's your throw net?" and I go, "it's dark now, you can't see the fish now." Then he said, "Go get your throw net." So I came back with my throw net and he said, "now where's your favorite spots?" And I said, "well its over there and over there and over there, but you can't see the fish" and he goes, "just go back to your favorite spots, you know every rock underneath there, you don't need to see the place to be able to know your way around." And I said, "yeah I can do that" and he said, "Just go to your favorite spot and stand there and wait until you feel the fish. When you feel the fish, you'll know, you'll feel them."

So I think that was the first thing that clued me into knowing that we have this other sense. So when hiking up here and going through the grass I feel things and I just turn

right or left, or just open the grass in front of me and there's a huge ahu or a cave sometimes I think they led me right to it. So that's been the path, the journey about knowing, and learning and seeing different things and getting chicken skin many times. When I was younger I spent a lot of time out there in the woods at night just cruising, checking it out. I got spooked every so often out there, but then I get used to it.

CSH: What were some of the most abundant and important resources for this area?

McD: By far the most important resource is always wai, freshwater, and with no year-round streams here it was definitely not an abundant resource. As you know *makai* there were sink holes with freshwater on the 'Ewa plane. Near Lanikuhonua, fresh water comes out right in the sand, between the rocks there. You can turn a gourd upside down in the ocean and get fresh water if you know where. Knowing where is the key, it's the same thing up *mauka,* there are no streams. There is what geologists call perched water. Places were water flows to the surface on top of impermeable layers of soil covered by a layer of fractured rock. A few of these at lower elevations still produced water today even in the driest times of the year. The greatest number of these springs are found between 1,200 and 1,800 foot elevations. However due to the reforestation efforts in the 1920s these springs no longer produce water year-round. This is also the elevation with the greatest concentration of archaeological sites. Most of these springs still have terraces and loi' walls around them. The forests above also held substantial resources, but the ocean below by far had the most substantial resources and the leeward exposure provided the best conditions to exploit them. I believe when compared to other ahupua'a in ancient times this area was not seen as desirable for its abundant resources. With the commanding view from this place and the limited water resources on the 'Ewa plane this community was highly defendable.

I am just starting to understand that there is no other place like this when you add the layer of the winter and summer solstice; there is no other place that lines up like that. So I think the real resource is the view, and the power that comes from that.

CSH: Can you share any of your knowledge about cultural sites you have come across or heard about in this area?

McD: There are so many cultural sites here and all of these sites and their relationships between each other is what's valuable. It is in the collective relationship between all the sites. Studying this area gives us the opportunity to have a deeper understanding of those who lived here because it's still pretty clear. Their footprints are still right there. I think this place has revealed how much potential it has, and the value of how much it has yet to share. I really want to make sure that the cultural sites and what they tell us doesn't get erased.

CSH: Can you talk about the sights and trails above Waimānalo gulch?

McD: The center of this *mauka* community was here above Waimānalo and Makaiwa. Ida Von Holt writes that they were told the area was quite heavily populated before the smallpox epidemic of 1840 and that there was a school for over 40 children where the pā is now. This appears to be the case when compared to the size and number of structures in the area. Some of the adjacent pastors were cleared for pineapple years ago these pastors

more than likely contained many sites and now they are lost forever. The main trails from this community to *makai* were in both Waimānalo and Makaiwa. These trails had water and springs there and were probably used more for uphill travel. The ridge between them was faster but there was no water so it was more than likely used for downhill travel. Another was down by Awanui just west of Pu'u Palailai and another was on the up side of Kaloi. The main trails had a spring or two along the way and if there was enough water something was grown there.

CSH: Can you talk about your house at Lanikuhonua?

McD: Our house was actually next to Lanikuhonua near the big banyan tree at Paradise Cove. The house was surrounded by a big field which is basically the whole area that is now Paradise Cove. Then there was my grandfather's coconut plantation where he had young coconut trees everywhere. We were hidden from the view of Farrington Highway by sugarcane fields. The place was absolutely beautiful, and some of it still is. Some old maps have labeled hamlet on that spot and I'm sure there was a lot of wa'a on the beach there, this is the *makai* part of that ahupua'a poster. The fishing was great, and like I said earlier freshwater comes right out of the sand there.

CSH: Do you know of any *mo 'olelo* or *wahi pana* about this area?

McD: You have the *mo 'olelo* about the night marchers and I've heard several people say they've heard children or at least their voices in the forest in the *pā* area where the school was. Observing all of the house sites and everything that I know collectively, I have an opinion about how these people left this place and how it went down, and a lot of it is supported by historical records. Ida wrote that the *pā* was a school and you know we'll never know because she's not here nor the people that told her this. I think that when you give the collective, cooperative existence to the community up here, you understand that they all had to participate. 'Ōlelo supports this by hinting that there really wasn't a strong caste system of *ali 'i* hierarchy up here. Everybody had to have a specialty here, everybody had to contribute here to exist and they all did it because this place had the *mana* that kept everybody in line. We had two systems, we had a spiritual system and we had an *ali 'i* system. So these people all had to be close together and once some started to perish from the plagues, small pox and all the others, their system collapsed. The farmer was gone, the *kahuna lapa 'au* was tending to so many people, he got it. This community was pretty much erased, and those who survived probably left, but the spirits of those who didn't along with all those who came before the Lehua, are still here, the watchers, in the watching place, Pālehua the place of *mana*... look at all the clues they left in the place names here, and those you see from here. Do you feel *mana*? Are you a watcher too?

Place names of the area given by Douglas McDonald Philpotts:

Pa lehua	Mauna Loa
Mauna Kapu	Mauna Kea
Puu Manawahua	Hualalai
Puu Moopuna	Haleakala
Puu Heleakala	Puu Kukui
Puu Hapapa	Kamakou
Puu Kaua	Puu Konahuanui
Puu Kuua	Kukaniloko
Puu Poulihali	Kaala
Puu Makakilo	Waialeale
Puu Kapolei	Niihau
Makaiwa	Kaula
Waiwanana	Lehua
Moku Manamana	

Appendix C Office of Hawaiian Affairs

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HRD06/2765

November 2, 2006

Kēhaulani Souza
Cultural Surveys of Hawai'i, Inc.
P.O. Box 1114
Kailua, HI 96734

RE: Request for Information on a Cultural Impact Assessment for Waimānalo Gulch Sanitary Landfill Expansion Project, 'Ewa, O'ahu; TMK: 9-2-003:073

Dear Kēhaulani Souza,

The Office of Hawaiian Affairs (OHA) is in receipt of your October 16, 2006, request for comments on the above-referenced project, which would allow for an approximate expansion of the Waimānalo Gulch Sanitary Landfill by 36 acres. OHA offers the following comments.

OHA recommends that the applicant contact Alika Silva and Glen Kila (Koa Mana), Tom Lenchanko (Kukaniloko), Alice Greenwood (O'ahu Burial Council), William Ailā (Wai'anae Harbormaster), Nettie Tiffany, and Micah Kane (DHHL) to improve the consultation component of your Cultural Impact Assessment (CIA). We also recommend that you conceive of the project area as a portion of a larger traditional cultural landscape; and, that the possible presence of one or more Traditional Cultural Properties (TCPs) is considered in your CIA.

OHA further requests that if this project goes forward, should iwi kūpuna or Native Hawaiian cultural or traditional deposits be found during ground disturbance, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

Thank you for the opportunity to comment. If you have further questions, please contact Kai Markell, Lead Advocate – Culture, at (808) 594-1945 or kaim@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

Appendix I

Traffic Impact Report
Waimānalo Gulch Sanitary Landfill Expansion, 2007

TRAFFIC IMPACT REPORT

FOR THE

WAIMANALO GULCH SANITARY LANDFILL EXPANSION

Prepared for:

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March 2007

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APPENDIX C	Capacity Analysis Calculations Existing Peak Hour Traffic Analysis
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I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to identify and assess the traffic impacts resulting from the expansion of the Waimanalo Gulch Sanitary Landfill located near Koolina on the island of Oahu. The project entails the expansion of the existing landfill site to include an additional 92.5acres.

B. Scope of Study

This report presents the findings and conclusions of the traffic study, the scope of which includes:

1. Description of the proposed project.
2. Evaluation of existing roadway and traffic operations in the vicinity.
3. Analysis of future roadway and traffic conditions without the proposed project.
4. Analysis and development of trip generation characteristics for the proposed project.
5. Superimposing site-generated traffic over future traffic conditions.
6. The identification and analysis of traffic impacts resulting from the proposed project.
7. Recommendations of improvements, if appropriate, that would mitigate the traffic impacts resulting from the proposed project.

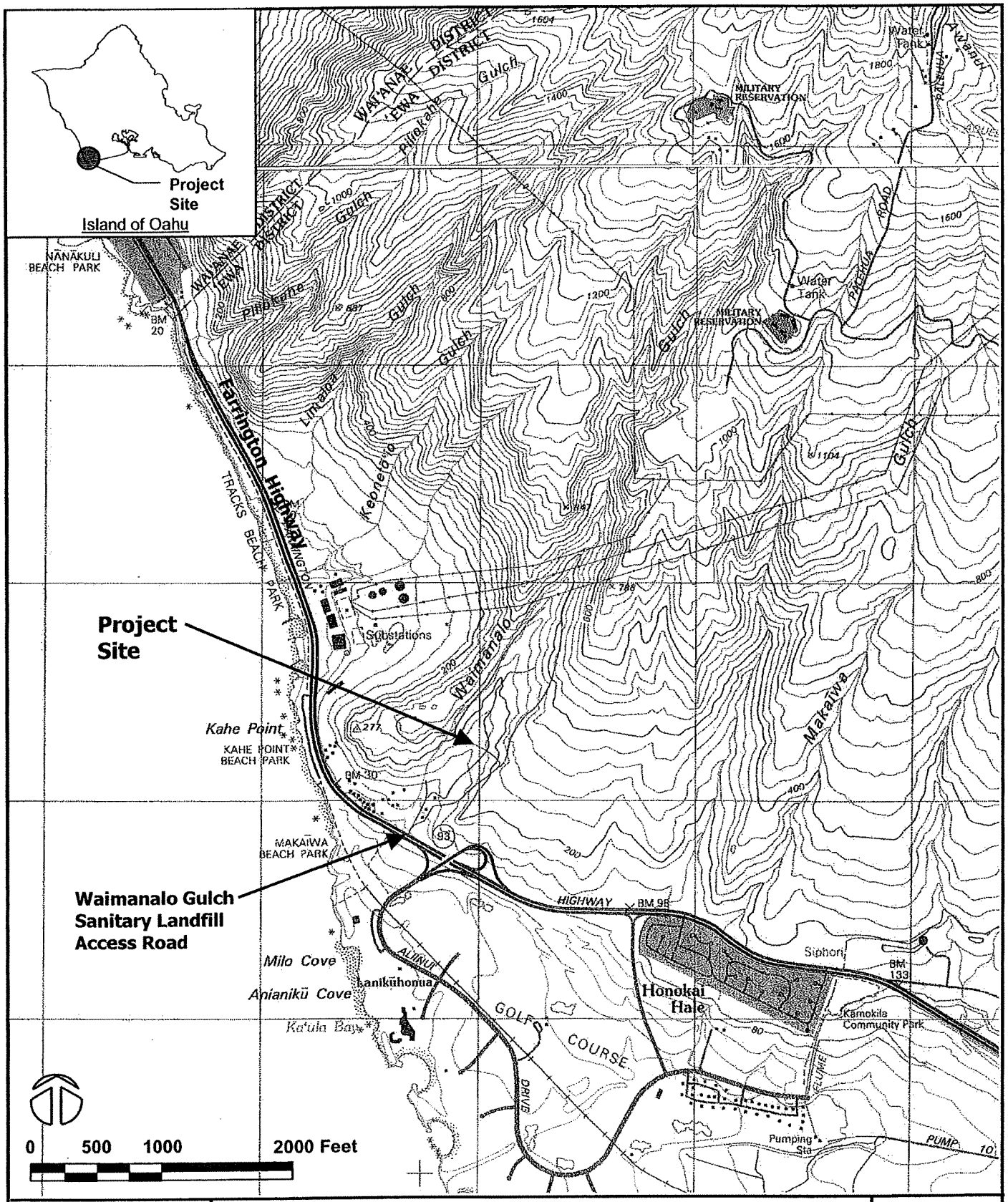
II. PROJECT DESCRIPTION

A. Location

The existing Waimanalo Gulch Sanitary Landfill is located adjacent to Farrington Highway northwest of Ko Olina on the island of Oahu (See Figure 1) and is further identified as Tax Map Keys: 9-2-3: 72 and 73. Access to the landfill is currently provided via an access road off Farrington Highway.

B. Project Characteristics

The existing Waimanalo Gulch Sanitary Landfill is located on an approximately 200-acre site along the north side of Farrington Highway just east of the westbound off-ramp to Ko Olina Resort. Currently, only 107.5 acres of the



WILSON OKAMOTO CORPORATION
ENGINEERS - PLANNERS

WAIMANALO GULCH SANITARY LANDFILL EXPANSION

LOCATION MAP AND VICINITY MAP

FIGURE 1

existing site is used for landfill operations. However, 60.5 acres of the existing landfill is scheduled for closure in the near future and, as such, an expansion of the existing facilities is proposed to increase the capacity and lifespan of the landfill. The proposed project would result in a net increase in space used for landfill of 32 acres. Access to the landfill would continue to be provided via the existing access road off Farrington Highway. Figure 2 shows the project site plan.

III. EXISTING TRAFFIC CONDITIONS

A. Area Roadway System

The existing Waimanalo Gulch Sanitary Landfill is located adjacent to Farrington Highway. In the vicinity of the landfill, Farrington Highway is a predominantly four-lane, two-way divided State of Hawaii roadway generally oriented in the east-west direction that serves as the primary access road along the southwest coastline of Oahu. At the unsignalized intersection of the highway with the access road to the landfill, the eastbound approach of Farrington Highway has an exclusive, left-turn lane and two through lanes. There is also an additional lane along the south side of the highway that serves as the eastbound off-ramp to Ko Olina Resort. The westbound approach of the highway has an exclusive right-turn lane and two through lanes. In addition, a median storage lane has been provided along Farrington Highway for vehicles turning left from the landfill access road.

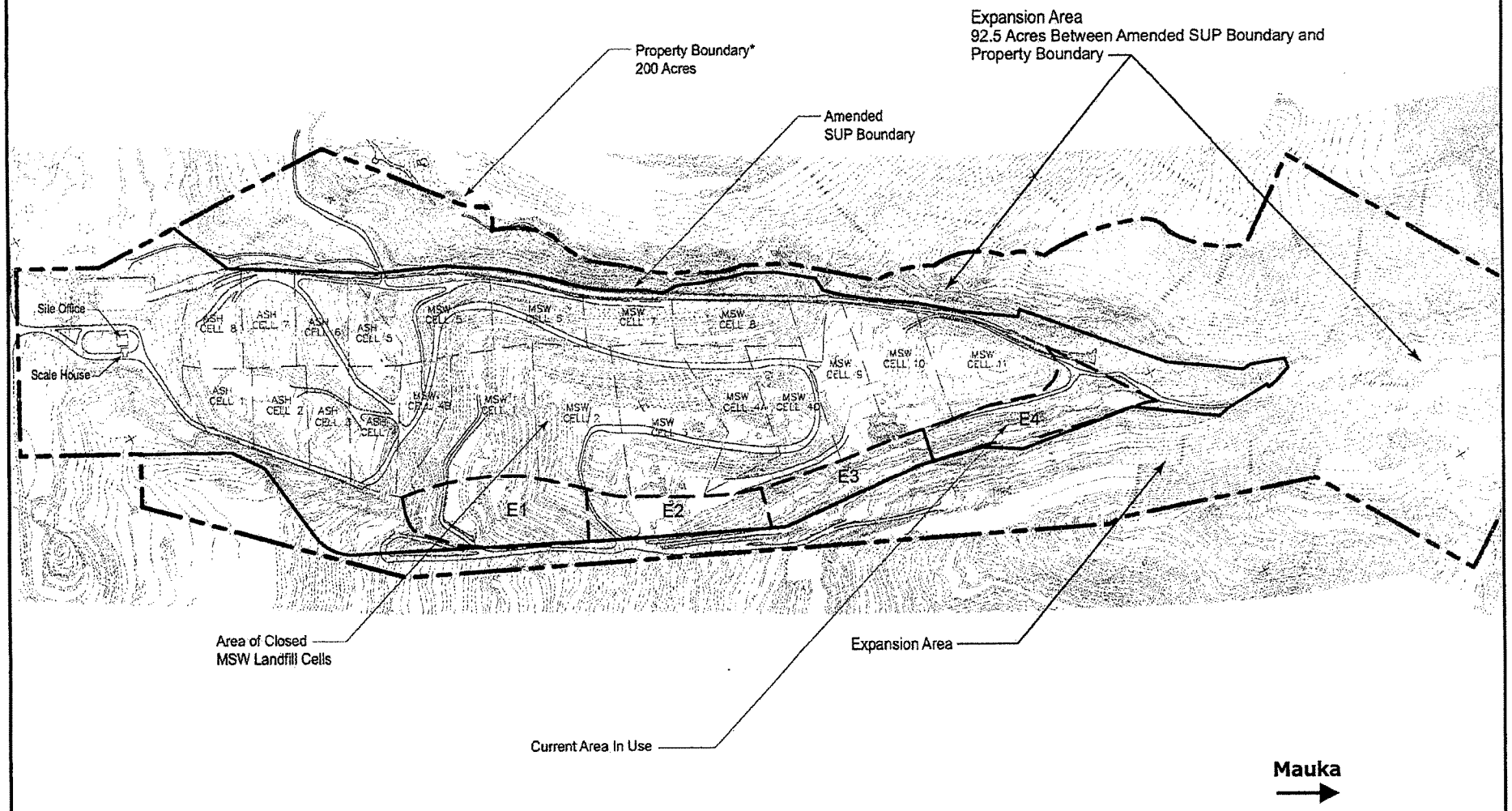
The Waimanalo Gulch Sanitary Landfill access road approach of the intersection has one channelized lane that serves left-turn and right-turn traffic movements. Vehicles turning left from the access road are channelized into the median storage lane along Farrington Highway.

B. Traffic Volumes and Conditions

1. General

a. Field Investigation

The field investigation was conducted on January 17, 2007 and consisted of manual turning movement count surveys and traffic flow assessments at the intersection of Farrington Highway with the access



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WAIMANALO GULCH SANITARY LANDFILL EXPANSION

PROPOSED SITE PLAN

FIGURE 2

road to the Waimanalo Gulch Sanitary Landfill. The turning movement count surveys were conducted during the morning commuter traffic peak hours of 6:00 AM and 8:00 AM, and the afternoon commuter traffic peak hours of 3:00 PM and 6:00 PM. Appendix A includes the existing traffic count data.

b. Capacity Analysis Methodology

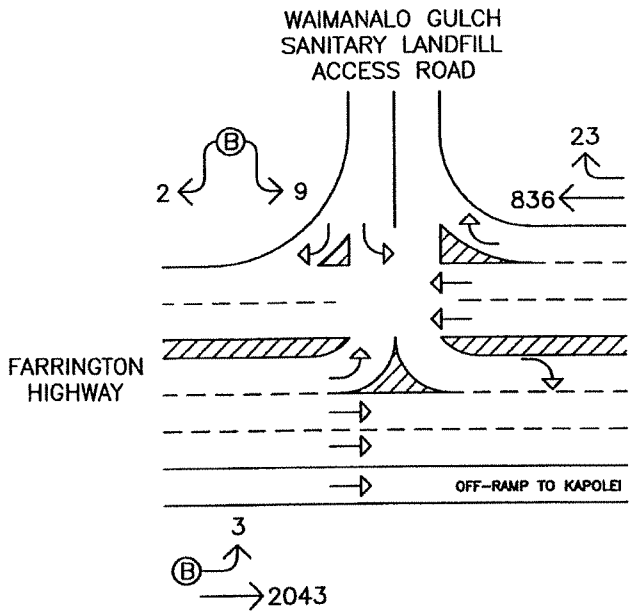
The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2000, and the "Highway Capacity Software", developed by the Federal Highway Administration. The analysis is based on the concept of Level of Service (LOS) to identify the traffic impacts associated with traffic demands during the peak hours of traffic.

LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F"; LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" unacceptable or potentially congested traffic operating conditions.

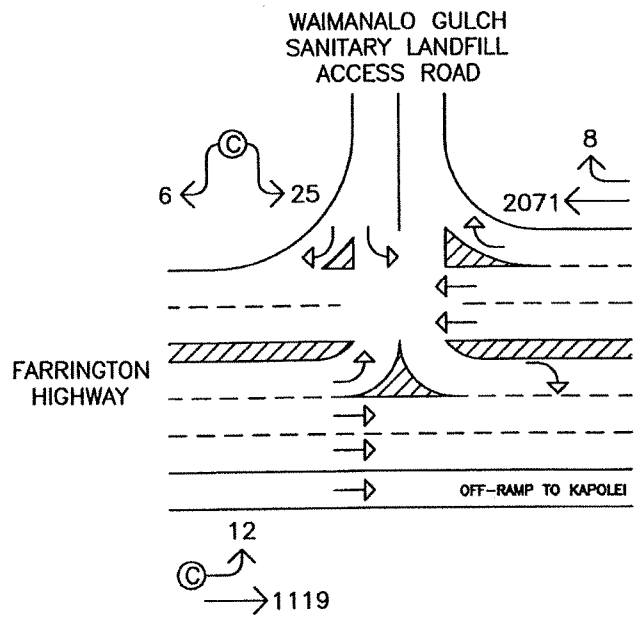
"Volume-to-Capacity" (v/c) ratio is another measure indicating the relative traffic demand to the road carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or near capacity. A v/c ratio of greater than 1.00 indicates that the traffic demand exceeds the road's carrying capacity. The LOS definitions are included in Appendix B.

2. Existing Peak Hour Traffic

Figure 3 shows the existing AM and PM peak hour traffic volumes and operating traffic conditions. The AM peak hour of traffic generally occurs between 6:15 AM and 7:15 AM in the vicinity of the existing landfill. In the afternoon, the PM peak hour of traffic generally occurs between the hours of 3:45 PM and 4:45 PM. The analysis is based on these peak hour time periods



AM PEAK



PM PEAK

LEGEND

90 TRAFFIC MOVEMENT VOLUME (VPH)

LANE USAGE

Ⓐ LANE GROUP LEVEL OF SERVICE

DATE OF COUNT: January 17, 2007

NOT TO SCALE

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WAIMANALO GULCH SANITARY LANDFILL EXPANSION

EXISTING PEAK HOURS OF TRAFFIC

FIGURE 3

to identify the traffic impacts resulting from the proposed project. LOS calculations are included in Appendix C.

At the intersection with the existing landfill access road, Farrington Highway carries 2,046 vehicles eastbound and 859 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 1,131 vehicles traveling eastbound and 2,079 vehicles traveling westbound. The critical movement on the Farrington Highway approaches of the intersection is the eastbound left-turn traffic movement which operates at LOS "B" during both peak periods.

The Waimanalo Gulch Sanitary Landfill access road approach of the intersection carries 11 vehicles southbound during the AM peak hour of traffic. During the PM peak hour of traffic, the traffic volume is slightly higher with 31 vehicles traveling southbound. The access road approach of the intersection operates at LOS "C" during both peak periods. Traffic queues occasionally formed on this approach of the intersection with average queue lengths of 2-3 vehicles observed during both peak periods.

IV. PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

The expansion of the Waimanalo Gulch Sanitary Landfill is being proposed to increase the capacity and extend the current lifespan of the landfill. As such, the expansion itself is not expected to generate additional trips to and from the facility. However, increased development throughout Oahu may result in an increase in site-generated trips to the landfill since additional refuse vehicles may be required to service these areas. As such, additional trips were conservatively assumed to be generated by the proposed landfill expansion.

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 7th Edition," 2003. The

trip generation rates were developed empirically by correlating the existing vehicle trip generation data with the acres of development. These rates were then utilized to determine the number of additional vehicle trips that would be generated by the expansion of the existing landfill. Table 1 summarizes the trip generation characteristics applied to the AM and PM peak hours of traffic to measure the impact resulting from the proposed Waimanalo Gulch Sanitary Landfill expansion.

Table 1: Peak Hour Trip Generation

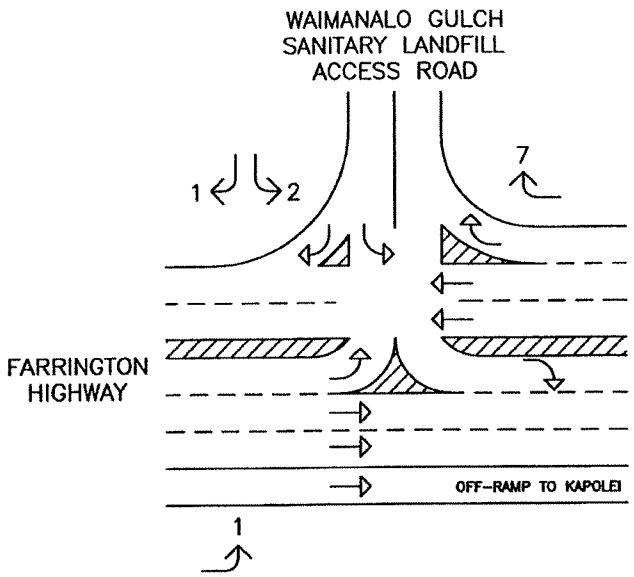
SANITARY LANDFILL INDEPENDENT VARIABLE: Net Increase in Acres of Dev = 32			
		RATE	PROJECTED TRIP ENDS
AM PEAK	ENTER	0.242	8
	EXIT	0.102	3
	TOTAL	0.344	11
PM PEAK	ENTER	0.186	6
	EXIT	0.288	9
	TOTAL	0.474	15

2. Trip Distribution

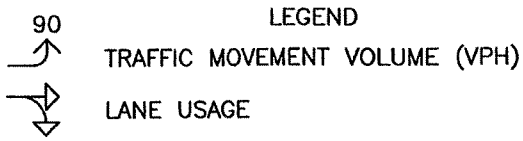
Figure 4 shows the distribution of site-generated traffic during the AM and PM peak hours of traffic. Access to the Waimanalo Gulch Sanitary Landfill will continue to be provided by the existing access road off Farrington Highway. The directional distribution of site-generated traffic at the intersection of Farrington Highway with the access road was assumed to remain similar to existing conditions.

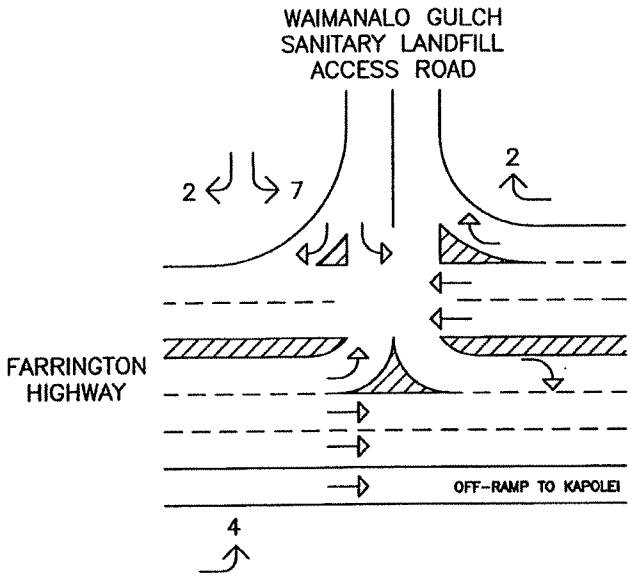
B. Traffic Signal Warrant

As a result of the proposed expansion of the Waimanalo Gulch Sanitary Landfill, a traffic signal system may be warranted at the intersection of Farrington Highway and the Waimanalo Gulch Sanitary Landfill access road. The installation of a traffic signal at an intersection may be justified by one or more of the eight warrants outlined in the "Manual on Uniform Traffic Control Devices for Streets and Highways," 2003 Edition (MUTCD). These warrants take into account factors such



AM PEAK





PM PEAK

NOT TO SCALE

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WAIMANALO GULCH SANITARY LANDFILL EXPANSION

DISTRIBUTION OF ADDITIONAL SITE-GENERATED VEHICLES

FIGURE 4

as eight-hour vehicular volumes (Warrant 1), four-hour vehicular volumes (Warrant 2), peak hour volumes (Warrant 3), pedestrian volumes (Warrant 4), the presence of a school crossing or coordinated signal system (Warrants 5 and 6), crash experience (Warrant 7), and other characteristics of the roadway network (Warrant 8). Since traffic data was collected at the subject intersection during the peak periods of traffic and the traffic projections do not extend beyond these periods, only Warrant 3 was applied to the intersection to determine whether or not a traffic signal system might be justified.

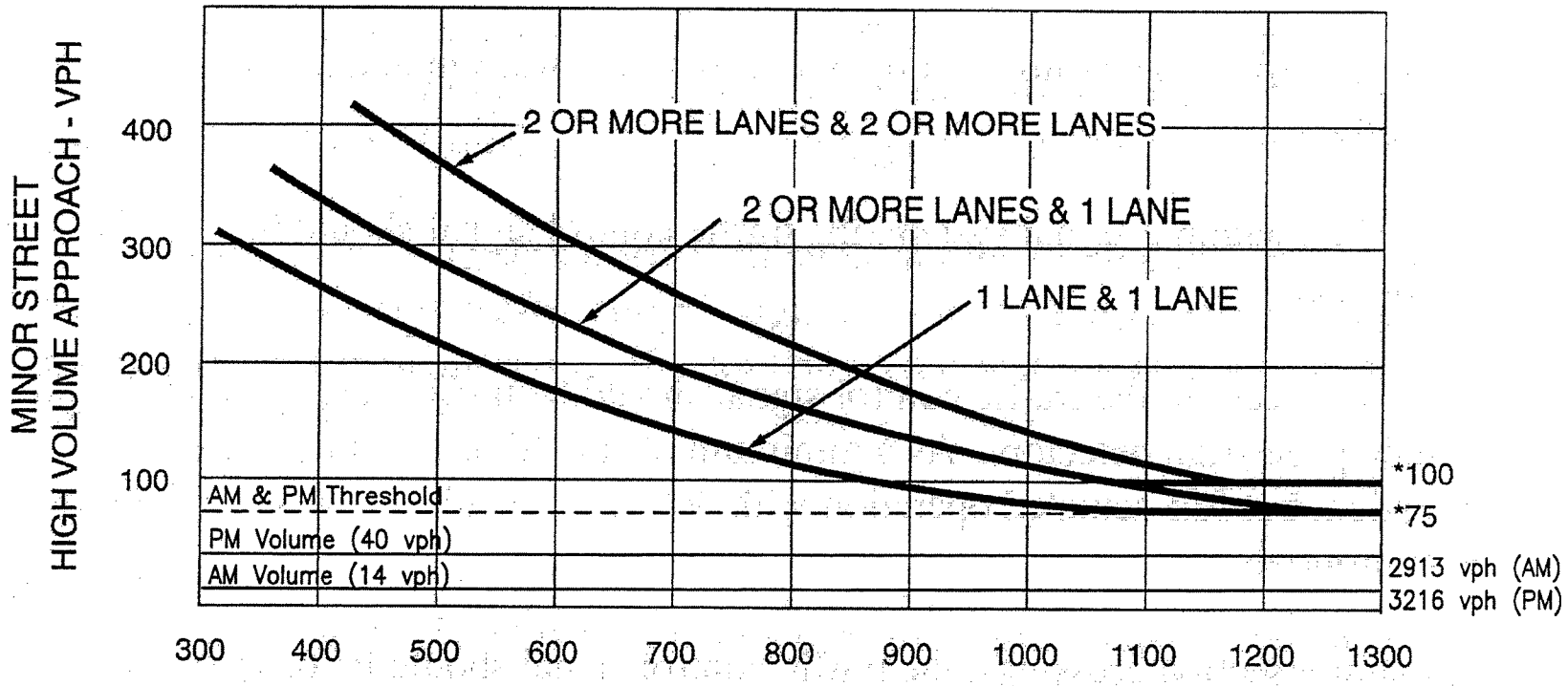
Warrant 3, the "Peak Hour Warrant," consists of several conditions that may justify the installation of a traffic signal at an intersection where vehicles experience high traffic delay due to large volumes of intersecting traffic during the peak hour periods. One of the conditions is based upon the relationship between the traffic volumes along the major and minor street. If the traffic volumes along the minor street exceed the thresholds shown in the MUTCD, a traffic signal system may be warranted. Since the intersection lies within an isolated community with a population less than 10,000, Figure 4C-4 "Warrant 3, Peak Hour (70% Factor)" was used to determine if a traffic signal system is warranted at this intersection. Under with project conditions, the traffic volumes entering the subject intersection are below the thresholds during both peak hours of traffic and, as such, do not satisfy Warrant 3 for minor street approaches with one lane for high traffic volumes on the major street (see Figure 5). Therefore, the intersection of Farrington Highway and the Waimanalo Gulch Sanitary Landfill access road is assumed to remain unsignalized.

C. Total Traffic Volumes With Project

The projected AM and PM peak period traffic volumes and operating conditions with the proposed expansion of the existing Waimanalo Gulch Sanitary Landfill are shown in Figure 6. The cumulative volumes consist of additional site-generated traffic superimposed over existing traffic demands. The traffic impacts resulting from the proposed expansion are addressed in the following section.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



MAJOR STREET—TOTAL OF BOTH APPROACHES—
VEHICLES PER HOUR (VPH)

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: MUTCD

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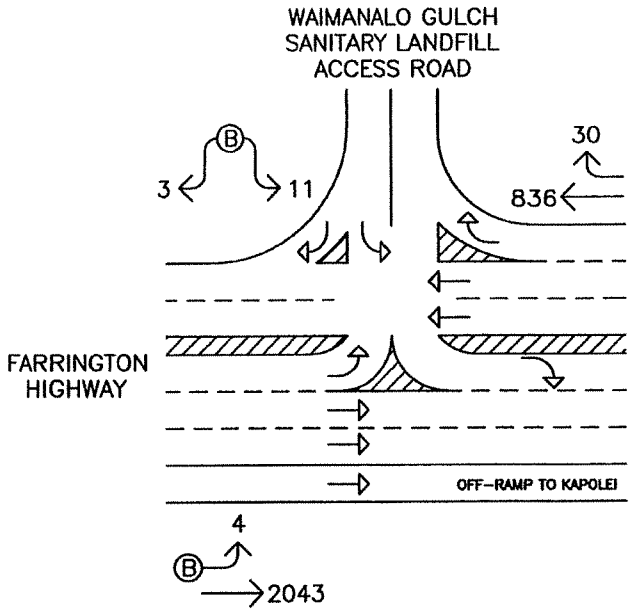
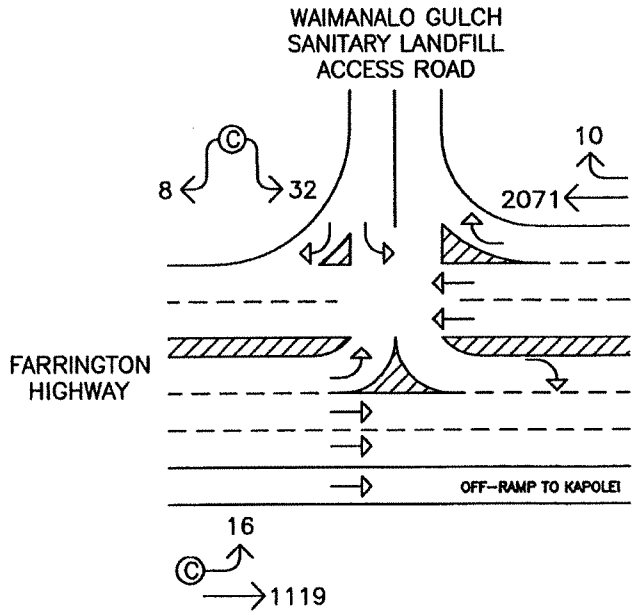
WAIMANALO GULCH SANITARY LANDFILL EXPANSION

TRAFFIC SIGNAL WARRANT NO. 3
FARRINGTON HIGHWAY AND LANDFILL ACCESS ROAD

FIGURE
5



AM PEAK



PM PEAK

LEGEND

90 TRAFFIC MOVEMENT VOLUME (VPH)

LANE USAGE

Ⓐ LANE GROUP LEVEL OF SERVICE

NOT TO SCALE

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WAIMANALO GULCH SANITARY LANDFILL EXPANSION

PROJECTED PEAK HOURS OF TRAFFIC WITH PROJECT

FIGURE 6

V. TRAFFIC IMPACT ANALYSIS

The cumulative AM and PM peak hour traffic conditions with the proposed expansion of the existing Waimanalo Gulch Sanitary Landfill are summarized in Table 2. The existing operating conditions are provided for comparison purposes. LOS calculations are included in Appendix D.

Table 2: Existing and Projected With Project LOS Traffic Operating Conditions

Intersection	Critical Movement		AM		PM	
			Exist	w/ Proj	Exist	w/ Proj
Farrington Hwy/ Waimanalo Gulch Sanitary Landfill Access Rd	Eastbound	LT	B	B	C	C
	Southbound	LT-RT	B	B	C	C

Traffic operations in the vicinity of the landfill are expected to remain similar to existing conditions during both peak hours of traffic despite the anticipated increases in traffic along Farrington Highway due to the proposed expansion. The critical traffic movements at the intersection of Farrington Highway with the Waimanalo Gulch Sanitary Landfill access road are expected to continue operating at LOS "B" and LOS "C" during the AM and PM peak periods, respectively. The total traffic volumes entering the intersection are expected to increase by less than 1% during both peak hours of traffic with proposed expansion. These increases in the total traffic volumes are in the range of daily volume fluctuations along Farrington Highway and represent a minimal increase in the overall traffic volumes.

VI. RECOMMENDATIONS

Based on the analysis of the traffic data and projected traffic conditions, the following are the recommendations of the study:

1. Maintain sufficient roadway width to accommodate safe vehicle ingress and egress.

2. Maintain adequate turning radii at all project roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.

3. Maintain adequate sight distances for motorists to safely enter and exit all project roadways.

4. Maintain adequate on-site loading and off-loading service areas to ensure that vehicular queues do not extend onto the highway.

VII. CONCLUSION

The proposed expansion of the existing Waimanalo Gulch Sanitary Landfill is not expected to have a significant impact on traffic operations in the vicinity. Although the expansion of the Waimanalo Gulch Sanitary Landfill is not expected to generate additional trips to and from the facility, additional trips were conservatively assumed to be generated by the proposed expansion to account for additional refuse vehicles generated by on-going development throughout Oahu. However, traffic operations in the vicinity of the landfill are expected to remain similar to existing conditions during both peak hours of traffic despite the anticipated increases in traffic. The critical traffic movements at the intersection of Farrington Highway with the Waimanalo Gulch Sanitary Landfill access road are expected to continue operating at levels of service similar to existing conditions. In addition, the total traffic volumes entering the intersection are expected to increase by less than 1% during both peak hours of traffic with proposed expansion. These increases in the total traffic volumes are in the range of daily volume fluctuations along Farrington Highway and represent a minimal increase in the overall traffic volumes.

APPENDIX A

EXISTING TRAFFIC COUNT DATA

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D4-3888/D4-3889
Counted: ZW/ER
Weather: Clear

File Name : farwaia
Site Code : 00000001
Start Date : 1/17/2007
Page No : 1

Groups Printed- Unshifted

	Waimanalo Gulch Dwy Southbound				Farrington Hwy Westbound				Northbound	Farrington Hwy Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	2	0	0	2	0	60	8	68	0	2	558	0	560	630
06:15 AM	2	0	1	3	0	152	5	157	0	1	607	0	608	768
06:30 AM	2	0	0	2	0	190	3	193	0	2	491	0	493	688
06:45 AM	0	0	1	1	0	245	5	250	0	0	519	0	519	770
Total	6	0	2	8	0	647	21	668	0	5	2175	0	2180	2856
07:00 AM	5	0	0	5	0	249	10	259	0	0	426	0	426	690
07:15 AM	5	0	0	5	0	188	5	193	0	2	415	0	417	615
07:30 AM	8	0	0	8	0	209	9	218	0	0	394	0	394	620
07:45 AM	9	0	0	9	0	191	3	194	0	1	382	0	383	586
Total	27	0	0	27	0	837	27	864	0	3	1617	0	1620	2511
Grand Total	33	0	2	35	0	1484	48	1532	0	8	3792	0	3800	5367
Apprch %	94.3	0	5.7		0	96.9	3.1			0.2	99.8	0		
Total %	0.6	0	0	0.7	0	27.7	0.9	28.5	0	0.1	70.7	0	70.8	

	Waimanalo Gulch Dwy Southbound				Farrington Hwy Westbound				Northbound	Farrington Hwy Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 06:15 AM														
06:15 AM	2	0	**1**	3	0	152	5	157	0	1	**607**	0	**608**	768
06:30 AM	2	0	0	2	0	190	3	193	0	**2**	491	0	493	688
06:45 AM	0	0	1	1	0	245	5	250	0	0	519	0	519	**770**
07:00 AM	**5**	0	0	**5**	0	**249**	**10**	**259**	0	0	426	0	426	690
Total Volume	9	0	2	11	0	836	23	859	0	3	2043	0	2046	2916
% App. Total	81.8	0	18.2		0	97.3	2.7			0.1	99.9	0		
PHF	.450	.000	.500	.550	.000	.839	.575	.829	.000	.375	.841	.000	.841	.947

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D4-3888/D4-3889
Counted: ZW/ER
Weather: Clear

File Name : farwaip
Site Code : 00000001
Start Date : 1/17/2007
Page No : 1

Groups Printed- Unshifted

	Waimanalo Gulch Dwy Southbound				Farrington Hwy Westbound				Northbound	Farrington Hwy Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Left	Thru	Right	App. Total	Int. Total
03:00 PM	14	0	4	18	0	331	8	339	0	1	321	0	322	679
03:15 PM	10	0	2	12	0	409	9	418	0	1	321	0	322	752
03:30 PM	12	0	1	13	0	439	2	441	0	1	290	0	291	745
03:45 PM	8	0	1	9	0	532	3	535	0	3	351	0	354	898
Total	44	0	8	52	0	1711	22	1733	0	6	1283	0	1289	3074
04:00 PM	7	0	2	9	0	474	3	477	0	6	260	0	266	752
04:15 PM	5	0	3	8	0	561	1	562	0	3	257	0	260	830
04:30 PM	5	0	0	5	0	504	1	505	0	0	251	0	251	761
04:45 PM	4	0	0	4	0	464	0	464	0	0	300	0	300	768
Total	21	0	5	26	0	2003	5	2008	0	9	1068	0	1077	3111
05:00 PM	1	0	0	1	0	433	0	433	0	0	228	0	228	662
05:15 PM	10	0	1	11	0	430	0	430	0	0	254	0	254	695
05:30 PM	1	0	0	1	0	395	0	395	0	0	234	0	234	630
05:45 PM	1	0	0	1	0	266	0	266	0	0	216	0	216	483
Total	13	0	1	14	0	1524	0	1524	0	0	932	0	932	2470
Grand Total	78	0	14	92	0	5238	27	5265	0	15	3283	0	3298	8655
Apprch %	84.8	0	15.2		0	99.5	0.5			0.5	99.5	0		
Total %	0.9	0	0.2	1.1	0	60.5	0.3	60.8	0	0.2	37.9	0	38.1	

	Waimanalo Gulch Dwy Southbound				Farrington Hwy Westbound				Northbound	Farrington Hwy Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 03:45 PM														
03:45 PM	**8**	0	1	**9**	0	532	**3**	535	0	3	**351**	0	**354**	**898**
04:00 PM	7	0	2	9	0	474	3	477	0	**6**	260	0	266	752
04:15 PM	5	0	**3**	8	0	**561**	1	**562**	0	3	257	0	260	830
04:30 PM	5	0	0	5	0	504	1	505	0	0	251	0	251	761
Total Volume	25	0	6	31	0	2071	8	2079	0	12	1119	0	1131	3241
% App. Total	80.6	0	19.4		0	99.6	0.4			1.1	98.9	0		
PHF	.781	.000	.500	.861	.000	.923	.667	.925	.000	.500	.797	.000	.799	.902

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Level of Service (LOS) criteria are given in Table 1. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. If the degree of saturation is greater than about 0.9, average control delay is significantly affected by the length of the analysis period.

Table 1: Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (Sec/Veh)
A	≤10.0
B	>10.0 and ≤15.0
C	>15.0 and ≤25.0
D	>25.0 and ≤35.0
E	>35.0 and ≤50.0
F	>50.0

"Highway Capacity Manual," Transportation Research Board, 2000.

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS
EXISTING PEAK HOUR TRAFFIC ANALYSIS

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 1/19/2007
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Existing
Project ID:
East/West Street: Waimanalo Gulch Dwy
North/South Street: Farrington Hwy
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	3				836	23
Peak-Hour Factor, PHF	0.84				0.83	0.83
Hourly Flow Rate, HFR	3				1007	27
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Raised curb			/ 2		
RT Channelized?						No
Lanes	1				2	1
Configuration	L				T	R
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				9		2
Peak Hour Factor, PHF				0.55		0.55
Hourly Flow Rate, HFR				16		3
Percent Heavy Vehicles				90		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage				/		Yes /1
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L						LR	
v (vph)	3						19	
C(m) (vph)	676						560	
v/c	0.00						0.03	
95% queue length	0.01						0.11	
Control Delay	10.3						12.3	
LOS	B						B	
Approach Delay							12.3	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 1/19/2007
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Existing
Project ID:
East/West Street: Waimanalo Gulch Dwy
North/South Street: Farrington Hwy
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	12				2071	8
Peak-Hour Factor, PHF	0.80				0.93	0.93
Hourly Flow Rate, HFR	14				2226	8
Percent Heavy Vehicles	15	--	--		--	--
Median Type/Storage	Raised curb			/ 2		
RT Channelized?						No
Lanes	1				2	1
Configuration	L				T	R
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				25		6
Peak Hour Factor, PHF				0.86		0.86
Hourly Flow Rate, HFR				29		6
Percent Heavy Vehicles				30		15
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage				/		Yes /1
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L						LR	
v (vph)	14						35	
C(m) (vph)	209						314	
v/c	0.07						0.11	
95% queue length	0.21						0.38	
Control Delay	23.5						19.5	
LOS	C						C	
Approach Delay							19.5	
Approach LOS							C	

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS
PROJECTED PEAK HOUR TRAFFIC
ANALYSIS WITH PROJECT

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 1/19/2007
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: w/ Proj
Project ID:
East/West Street: Waimanalo Gulch Dwy
North/South Street: Farrington Hwy
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	4				836	30
Peak-Hour Factor, PHF	0.84				0.83	0.83
Hourly Flow Rate, HFR	4				1007	36
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Raised curb			/ 2		
RT Channelized?						No
Lanes	1				2	1
Configuration	L				T	R
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				11		3
Peak Hour Factor, PHF				0.55		0.55
Hourly Flow Rate, HFR				19		5
Percent Heavy Vehicles				90		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		Yes	/1
Lanes				0	0	
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L						LR	
v (vph)	4						24	
C(m) (vph)	667						596	
v/c	0.01						0.04	
95% queue length	0.02						0.13	
Control Delay	10.4						12.2	
LOS	B						B	
Approach Delay							12.2	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 1/19/2007
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: w/ Proj
Project ID:
East/West Street: Waimanalo Gulch Dwy
North/South Street: Farrington Hwy
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	16				2071	10
Peak-Hour Factor, PHF	0.80				0.93	0.93
Hourly Flow Rate, HFR	19				2226	10
Percent Heavy Vehicles	15	--	--		--	--
Median Type/Storage	Raised curb			/ 2		
RT Channelized?						No
Lanes	1				2	1
Configuration	L				T	R
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				32		8
Peak Hour Factor, PHF				0.86		0.86
Hourly Flow Rate, HFR				37		9
Percent Heavy Vehicles				30		15
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			Yes /1
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L						LR	
v (vph)	19						46	
C(m) (vph)	209						323	
v/c	0.09						0.14	
95% queue length	0.30						0.50	
Control Delay	23.9						19.8	
LOS	C						C	
Approach Delay							19.8	
Approach LOS							C	

Appendix J

Socioeconomic Impact Assessment
Waimānalo Gulch Sanitary Landfill Expansion, 2008

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SOCIO-ECONOMIC IMPACT ASSESSMENT WAIMĀNALO GULCH SANITARY LANDFILL LATERAL EXPANSION, CITY AND COUNTY OF HONOLULU

March 24, 2008

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Prepared for:

Environmental Services Department, City and County of Honolulu

R.M. Towill Corporation

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EXECUTIVE SUMMARY

The Proposed Action

The Waimanalo Gulch Sanitary Landfill (WGCL) is the only permitted municipal solid waste (MSW) landfill on Oahu. The City and City of Honolulu (City) proposes to expand the footprint and to extend the permitted use of the WGCL for a minimum period of 15 years.

The proposed project will extend the use of the site beyond November 1, 2009, the date the State Special Use permit calls for the closure of the landfill from the acceptance of MSW. Two main alternatives to the expansion and extension of WGSL have been considered:

1. Develop alternate methods or technologies to the present use of a landfill for the disposal of MSW and ash/residue from the City's H-POWER facility. This alternative includes the use of advanced technology methods as well as transshipment of Honolulu's waste off-island to decrease the need for a landfill.
2. Select an alternative landfill site. This alternative is based on the selection, acquisition and development of another location for a City landfill.

While the City has committed to the investigation and development of alternatives to landfilling, they contend that they have not yet found any technology or method (including the use of waste transshipment) that will themselves completely eliminate the need for a landfill operation. All known processes and methods result in the generation of some waste that cannot be feasibly processed, reused or recycled. For this waste, the City contends that a municipal sanitary landfill must continue to be provided.

The City currently uses the landfill as one of a mix of strategies to deal with MSW; the mix also includes the use of H-POWER, the City's waste-to-energy facility, increasing the island-wide rate of recycling, and technologies that transform MSW to new product materials such as fertilizer pellets. The City proposes that other strategies be employed based on feasibility and demonstrated capacity for the handling of waste on Oahu.

Socio-Economic Context

Oahu is home to approximately three quarters of Hawaii's residents, and is the economic hub of the State. Most of the major industries – tourism, military support, construction, government, and finance – are concentrated on Oahu. Oahu is enjoying a strong economy and, as a result, continues to experience population increases and a significant level of development.

Although officials forecast slower economic growth on the island in the foreseeable future, one of the few areas of exception is the Ewa Development Plan Area, within which the WGSL is located. For the last 30-years the Ewa Development Plan area has nearly tripled its population, making it the fastest growing area of the island. As the second city of Oahu has not yet been fully realized, officials expect that significant growth will continue.

Landfills have been a part of the MSW disposal solution since the 1800's and have always been located on the edge of urban development. When WGSL was established in 1989, it was selected, in part, because of its proximity to the H-POWER plant and its distance from heavy urbanization. Since then, Kapolei has experienced significant growth and the resort community of Ko 'Olina has developed, both within proximity to WGSL.

Community Concerns

For most of Oahu's people, as long as the landfill stays in Ewa, landfills have not been a topic of great concern. Those who have expressed an opinion favoring the extension believe the City has already made an investment in the landfill, that there is room for expansion, and that there is no better site on Oahu.

Residents in areas surrounding WGSL on the other hand are very concerned. Among other issues, community members most often cite the following irritants from current operations as significant impacts on their communities: litter, views of operation, odor, and highway safety. They are concerned that continuation and expansion of the landfill will only exacerbate the problems. They feel they have done their share and other solutions should be found.

These same community members also point out that a promise is not being kept (the previous administration had committed to closing the landfill after the current extension) thereby reducing the trust between the Administration and their communities.

Others along the Leeward coast claim that they are victims of environmental injustice. Residents argue that within a 10-mile stretch along Farrington Highway there are two separate landfills handling construction and municipal waste, as well as an existing electrical plant, a proposed electrical plant, a deep draft harbor and a major industrial park, all of which service the entire Island of Oahu -- all of which adversely impact the environment of their communities.

Impacts of Proposed Action

Expanding use of the WGSL for landfilling on Oahu has few expected impacts beyond those that currently exist.

> *Economic Impacts* Very little change can be expected with the expansion of WGSL. A small number of jobs will be created for ongoing construction of new cells in the Gulch.
>
> *Public Services* Expansion of WGSL will not have a significant impact on public safety, medical services, education or recreation.
>
> *Social Impacts* Release of dust, debris, and odors could affect the quality of life for people living near WGSL. Debris from trucks and congestion due to truck traffic could add to regional traffic problems, affecting both regional quality of life and residents' sense of their part of the island as a valuable and safe community.

Implications of Alternative Approaches to Waimanalo Gulch Sanitary Landfill

With a landfill available, the City, its residents, and businesses have assurance that solid waste services can be provided at a known cost for the foreseeable future. This is a guarantee of stability for the island economy.

To date no alternative technology has been found to adequately process the level of MSW that the island's communities generate. Other technologies exist that can complement the current H-POWER/WGSL solution, but there is no technology available that completely negates the need for a landfill on Oahu.

Transshipment is a serious alternative to handling a portion of MSW, but it has externalities that must be considered, including a negative impact on the feasibility of H-POWER and, in turn, a negative impact on the inexpensive production of alternative energy; a heightened sense of uncertainty around the management of MSW; and greater pressure on Oahu's already crowded harbor facilities.

Should a new technology become more viable, or should adjustments to the transshipment solution make it more acceptable, a landfill will still be needed in case of emergencies, in case of disruptions, and to manage material that cannot be handled by the alternative technologies or transshipment.

There does not appear to be an alternative site available to replace WGSL as a landfill. Nothing has significantly changed in the circumstances surrounding the four most viable alternatives since the last review of alternatives; a review in which WGSL was deemed to be the optimal site by the Mayor's Advisory Committee.

Taking no action, thereby allowing WGSL's permit to expire without a viable alternative, will result in serious health and economic challenges to Oahu's communities and its taxpayers.

Mitigation Measures

Suggested mitigations to social-economic impacts can be grouped into three categories: improving the management practices of the current landfill operation; improving community involvement and communications; and committing City resources to finding alternative sites and alternative technologies/management of MSW disposal.

Specific recommendations include the following:

- Improving current operations:
  - Continue to implement on-site landscaping plans that have begun, especially for those areas facing south toward Ko 'Olina.
  - Design and implement landscaping screens along the berm and the access road that is visible from Farrington Highway, fronting Kahe Power Plant.
  - Continue to be vigilant in processing sludge upon delivery and take all means to reduce any odor impacts;
  - Aggressively enforce the anti-littering regulations and fines; and
  - Improve communication between WM, ENV and the Police in response to odor and littering complaints.

- Improving community involvement and communications:
  - Continue to work with the Community Oversight committee and invite any expanded participation, including representatives from the police;
  - Continue to contribute to a community benefits package for as long as the landfill exists;
  - Ensure that all affected communities are represented on the Committee that determines the benefits package; and
  - Use the WM/ENV websites aggressively as education and communication tools.

- Committing City resources to the development of alternatives:
  - Continue to invest in Research and Development into alternative technologies; and
  - Continue to seek an alternative landfill site.

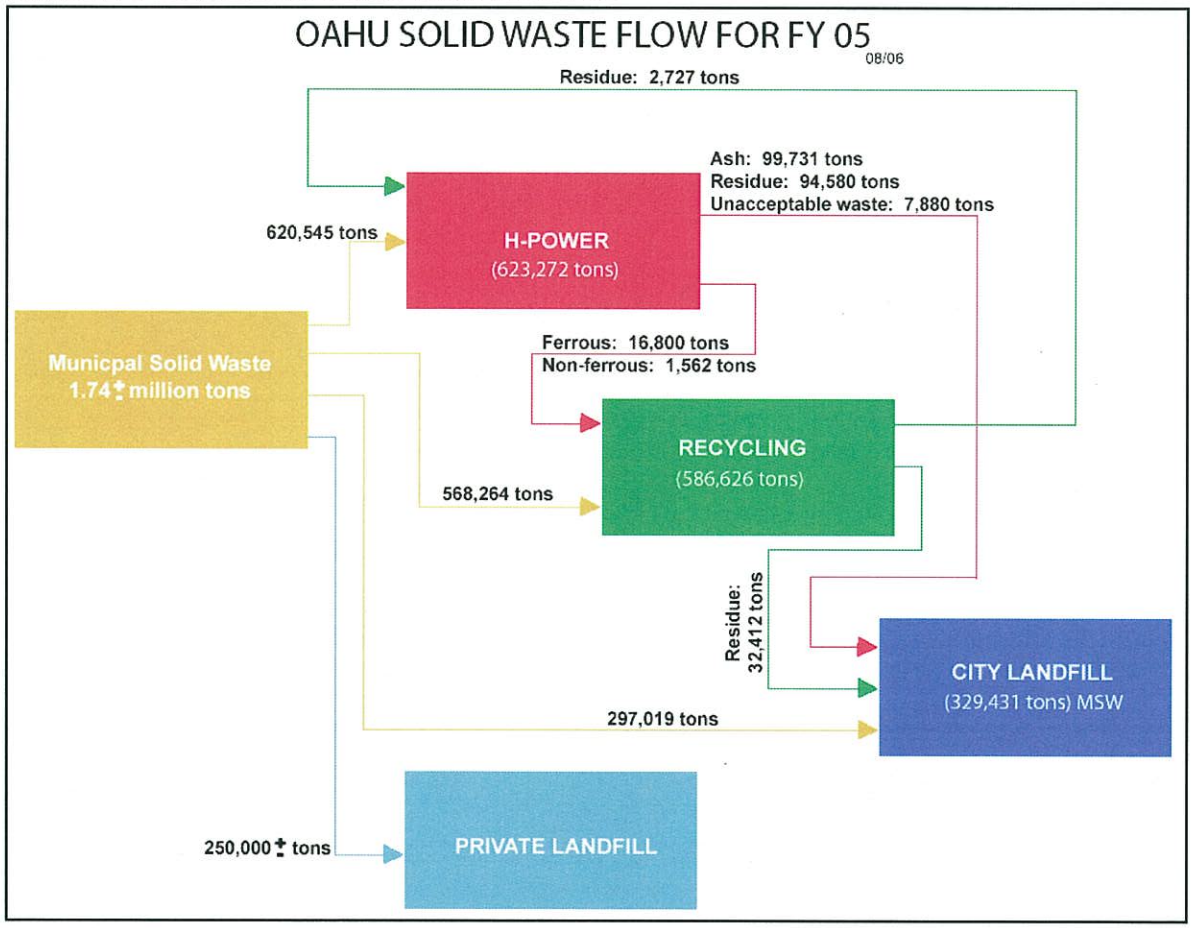
1. INTRODUCTION

1.1 PROPOSED ACTIONS AND ALTERNATIVES

The Waimanalo Gulch Sanitary Landfill is on a site of about 200 acres near the southwest corner of Oahu, owned by the City and operated by Waste Management of Hawaii Inc. The landfill opened in 1989. It is now Oahu's only permitted landfill for municipal solid waste (MSW).[1]

In 2005, the landfill received approximately 562,983 tons of waste annually. This includes 329,431 tons of direct MSW, 31,361 tons of recycling residue, and 202,191 tons of ash, residue, and unacceptable waste from H-POWER.

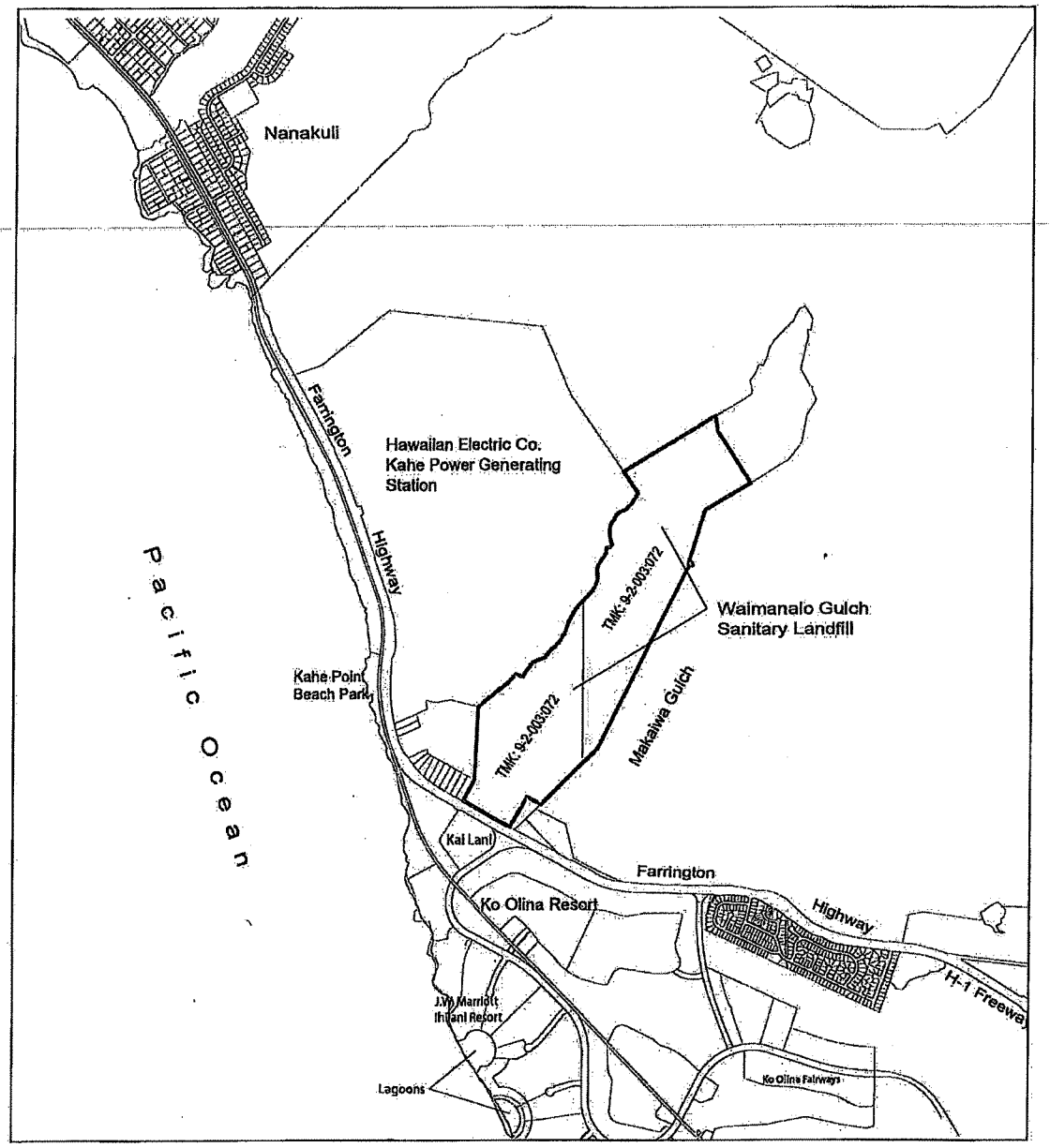
Exhibit 1-A: Oahu Solid Waste Flow for FY 05



Originally intending to close the landfill in 2008, the City has since preliminarily determined that the continuation and expansion of operations at WGSL is a necessary part of the City's solid waste management program. The City is now proposing to expand the landfill footprint by 92.5 acres, which will utilize the total 200 acres available. This is expected to extend the use of the landfill through at least the year 2022. Exhibit 1-B shows the proposed expansion. In order to effectuate that action, the City must prepare an Environmental Impact Statement. This report identifies and analyzes the socio-economic impacts of that decision within the context of the full EIS.

[1] Another landfill in Nanakuli, handles construction and demolition waste.

Exhibit 1-B: Waimānalo Gulch Landfill Property Map



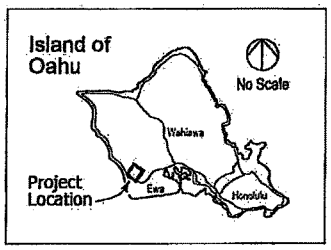


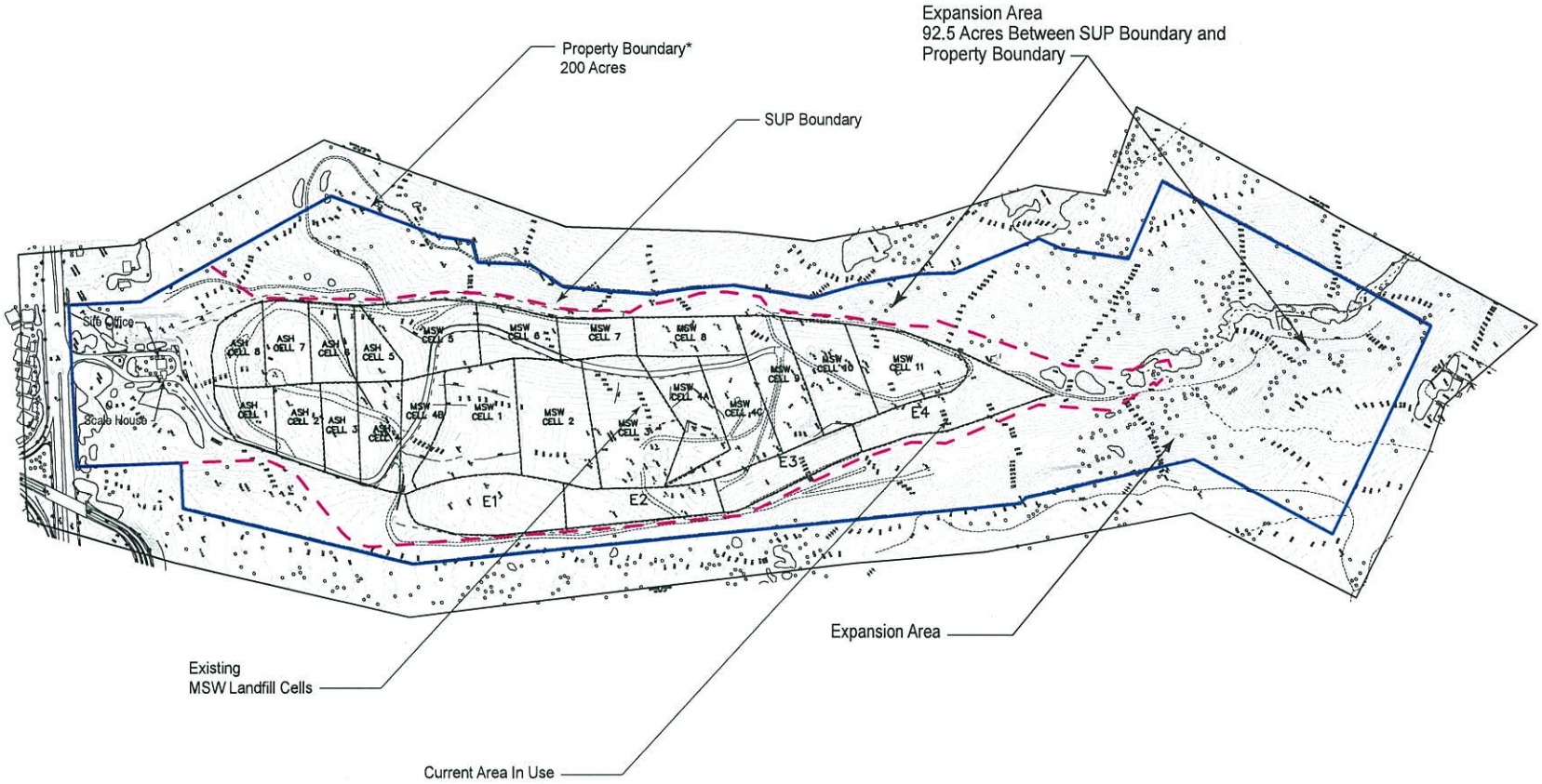
Figure 3-1
Waimanalo Gulch Landfill Property
Waimanalo Gulch Sanitary Landfill Expansion
Department of Environmental Services

0 2000 Feet 4000

R.M. TOWILL CORPORATION March 2008

Page 3-2

Exhibit 1-C: Waimanalo Gulch Sanitary Landfill Expansion Site



Note: *Proposed expansion project is subject to a 100 foot buffer from the property boundary.

Source: Base Drawing - GeoSyntec Consultants, Site Plan and Topography, Waimanalo Gulch Landfill, Ewa Beach Oahu, Hawaii, April 2007

Waimanalo Gulch Santiary Landfill Lateral Expansion Site

Waimanalo Gulch Sanitary Landfill Expansion
Department of Environmental Services

0 1000 Feet 2000

R.M. TOWILL CORPORATION March 2008

Landfilling has been a part of the mix of strategies used by the City to deal with MSW since at least as far back as 1905. Official *dumpsites* on Oahu have been located at Ala Moana Dump, present day Ala Moana Park, Waipahu, Kapaa and Kaneohe Bay Drive. Originally used to backfill swampy areas and other low spots intended for development, previous *dumpsites* now also include parks, parking areas, and other low intensity uses.

In 1963, ten years after originally opening as a *dump*, Kawainui Swamp became the first *landfill* on Oahu. *Landfills* differ from *dumps* in that *landfills* are lined, have a variety of engineering features that protect the landfill and the surrounding environment, and their operations significantly reduce exposure of MSW and its resultant externalities. *Landfills* continue to evolve as technology allows for improved operations. Although *landfills* are always expected to be a part of the mix of strategies used to dispose of MSW, the City explains that it is committed to investigating all proven methods or technologies with the potential to reduce the City's dependence on landfills. The City is actively: 1) analyzing the option of adding a third boiler at the H-POWER waste-to-energy plant; 2) researching alternative, new waste reduction technologies; and 3) exploring transshipment as a viable alternative. Where a method or technology can be demonstrated to be feasible, the City contends that it will be proposed and developed.

1.2 PURPOSE AND ORGANIZATION OF THIS REPORT

A socio-economic impact assessment is conducted to establish, for the use of policy-makers and the public at large, information about a proposed project and its socio-economic consequences. The report is used, with other aspects of the EIS, to inform decision-makers, and to ensure that consequences are taken into account. Where appropriate, this report points to other technical studies for more detailed examination of related topics.

This report is presented in six sections:

- Section 1 provides an introductory account of the proposed action;
- Section 2 discusses the socio-economic context of the proposed action;
- Section 3 briefly discusses alternative potential actions;
- Section 4 details the concerns of stakeholders with regard to the proposed action, and places those concerns in relation to more general issues and concerns of Oahu communities;
- Section 5 deals with potential impacts of the proposed action. Economic and demographic impacts are estimated first. Impacts on public facilities are established in relation to existing and planned local facilities. Other social impacts, which are less easily quantified, are then discussed; and
- Section 6 suggests mitigation activities for potentially adverse social/economic impacts, both ongoing processes and individual actions.

2. SOCIO-ECONOMIC CONTEXT

2.1 THE STUDY AREAS

A landfill on Oahu affects the entire island by providing a key element of Honolulu's solid waste system. All of Oahu's people and businesses are affected by the proposed action.

The Ewa Development Plan Area (EDPA), within which the landfill is located, is considered the area most affected by day-to-day operations of WGSL. The Waianae Development Plan Area (WDPA) is also noted as the residents of WDPA are users of major roads on which municipal solid waste is hauled to the WGSL and the only route in and out of WDPA runs by the WGSL.

2.1.1 Island of Oahu

Oahu has been the political and economic center of Hawaii since the time of Kamehameha I. It is the most urbanized and populated of the Hawaiian Islands. After World War II, Hawaii residents moved to Oahu in record numbers. According to the 2000 US Census, Oahu's resident population was 836,231, representing 72% of the State's population. By 2006, that population had risen to approximately 909,900.[2]

Since Statehood, Hawaii has witnessed rapid growth in tourism, supplanting agriculture and military spending as the major source of jobs and income. Because of their relative smaller economies on the neighbor islands, tourism has had and continues to have a greater impact on the neighbor islands. But even in tourism, Oahu dominates the industry. In 2006, Oahu had nearly twice as many visitors as any neighbor island with 4,606,400.

For the most part, Oahu's tourism has been centered in Waikiki (87% of Oahu's hotel units are located in Waikiki). In recent years, however, Ko Olina in Ewa has begun to shape itself into a visitor destination area, and Kuilima has resurrected plans to dramatically increase its hotel room count on the North Shore of Oahu.

During this same period Oahu also has reinforced its role as the financial and shipping center of the State. Oahu's more diverse economy has also resulted in less economic fluctuation, lower unemployment and higher average income than has been experienced on other islands (See Exhibits 2-A – 2-F).

[2] State of Hawaii DBED&T, State Data Book 2005 and American Community Survey, US Census Bureau, 2006.

Exhibit 2-A: Demographic Changes, Oahu, 1990-2000

Subject	1990	2000	2006 (ACS)	Change	
				Number	Percent
Total Population	**836,231**	**876,156**	**909,863**	**33,707**	**3.8%**
Male	425,994	440,518	455,051	14,533	3.3%
Female	410,237	435,638	454,812	19,174	4.4%
				-	
Under 5 years	61,931	56,849	63,084	6,235	11.0%
5 to 9 years	58,558	60,425	55,969	(4,456)	-7.4%
10 to 14 years	53,191	57,574	55,336	(2,238)	-3.9%
15 to 19 years	54,992	57,176	59,347	2,171	3.8%
20 to 24 years	75,418	65,376	68,052	2,676	4.1%
25 to 34 years	156,619	130,624	125,646	(4,978)	-3.8%
35 to 44 years	130,573	137,278	130,466	(6,812)	-5.0%
45 to 54 years	81,899	117,239	123,278	6,039	5.2%
55 to 59 years	34,560	42,705	52,456	9,751	22.8%
60 to 64 years	36,658	33,173	45,291	12,118	36.5%
65 to 74 years	58,279	62,474	60,962	(1,512)	-2.4%
75 to 84 years	25,939	42,504	51,422	8,918	21.0%
85 years and over	7,614	12,759	18,554	5,795	45.4%
				-	
Median age (years)	32	35.7	36.9	1	3.4%
				-	
18 years and over	631,618	667,398	700,359	32,961	4.9%
21 years and over	592,601	631,039	661,891	30,852	4.9%
62 years and over	113,889	136,945	156,602	19,657	14.4%
65 years and over	91,832	117,737	130,938	13,201	11.2%
				-	
18 years and over	631,618	667,398	700,359	32,961	4.9%
Male	320,656	333,139	346,193	13,054	3.9%
Female	310,962	334,259	354,166	19,907	6.0%
				-	
65 years and over	91,832	117,737	130,938	13,201	11.2%
Male	42,867	51,694	55,577	3,883	7.5%
Female	48,956	66,043	75,361	9,318	14.1%
				-	
RELATIONSHIP				-	
Household population	**802,338**	**845,211**	**877,485**	**32,274**	**3.8%**
Householder	264,304	286,450	299,217	12,767	4.5%
Spouse	158,438	156,195	157,567	1,372	0.9%
Child	259,193	253,694	257,391	3,697	1.5%
Other relatives	74,876	96,718	114,636	17,918	18.5%
Nonrelatives	44,527	52,199	48,674	(3,525)	-6.8%
Unmarried partner	10,436	14,420	14,245	(175)	-1.2%

Exhibit 2-A (Cont.): Demographic Changes, Oahu, 1990- 2000

Subject	1990	2000	2006 (ACS)	Change	
				Number	Percent
HOUSEHOLDS BY TYPE					
Total households	**265,304**	**286,450**	**299,217**	**12,767**	**4.5%**
Family households (families)	197,294	205,672	209,890	4,218	2.1%
With own children under 18 years	92,583	91,022	84,046	(6,976)	-7.7%
Married-couple families	158,438	156,195	157,578	1,383	0.9%
With own children under 18 years	76,217	70,442	64,824	(5,618)	-8.0%
Female householder, no husband present	27,773	35,138	36,659	1,521	4.3%
With own children under 18 years	12,479	15,235	14,187	(1,048)	-6.9%
Nonfamily households	68,010	80,778	89,327	8,549	10.6%
Householder living alone	51,006	61,963	74,425	12,462	20.1%
65 years and over	14,868	20,021	21,955	1,934	9.7%
				-	
Households with one or more people under 18 years	NA	108,247	103,107	(5,140)	-4.7%
Households with one or more people 65 years and over	NA	80,464	87,107	6,643	8.3%
				-	
Average household size	3.02	2.95	2.93	(0.02)	-0.7%
Average family size	3.50	3.46	3.52	0.06	1.7%
				-	
HOUSING OCCUPANCY				-	
Total housing units	**281,683**	**315,988**	**332,718**	**16,730**	**5.3%**
Occupied housing units	265,304	286,450	299,217	12,767	4.5%
Vacant housing units	16,379	29,538	33,501	3,963	13.4%
				-	
Homeowner vacancy rate	0.6	1.6	0.9	(0.7)	-43.8%
Rental vacancy rate	4.3	8.6	4.7	(3.9)	-45.3%
				-	
HOUSING TENURE				-	
Occupied housing units	**265,304**	**286,450**	**299,217**	**12,767**	**4.5%**
Owner-occupied	137,910	156,290	173,806	17,516	11.2%
Renter-occupied	127,394	130,160	125,411	(4,749)	-3.6%
				-	
Average household size of owner-occupied unit	3.23	3.13	3.11	(0.02)	-0.6%
Average household size of renter-occupied unit	2.80	2.74	2.69	(0.05)	-1.8%

Exhibit 2-B: Demographic Characteristics, Island and Selected Areas, 2000

	City & County of Honolulu	Ewa DP	Waianae DP	Makakilo CDP	Kapolei	Ko Olina/ Honokai Hale	Nanakuli
Population	876,156	57,265	42,259	13,156	17,441	1,680	10,814
Male	50.3%	50.4%	50.0%	50.3%	50.3%	50.9%	49.8%
Female	49.7%	49.6%	50.0%	49.7%	49.7%	49.1%	50.2%
Age							
Under 5	6.5%	9.2%	8.9%	8.6%	8.4%	6.2%	8.8%
5 to 9	6.9%	10.0%	9.7%	9.2%	10.2%	6.9%	9.9%
10 to 14	8.6%	8.3%	10.0%	8.4%	9.2%	6.8%	10.7%
15 to 19	6.5%	6.6%	9.5%	6.7%	7.1%	5.8%	10.4%
20 to 24	7.5%	6.0%	7.4%	6.0%	5.1%	5.1%	7.5%
25 to 34	14.9%	17.8%	13.0%	15.6%	15.8%	17.6%	12.7%
35 to 44	15.7%	18.0%	14.3%	18.0%	18.8%	16.3%	14.7%
45 to 54	13.4%	10.3%	11.9%	13.2%	11.3%	14.8%	10.9%
55 to 59	4.9%	3.6%	4.2%	4.7%	3.4%	5.9%	4.4%
60 to 64	3.8%	3.0%	3.1%	3.6%	2.8%	5.1%	3.2%
65 to 74	7.1%	4.6%	5.0%	4.3%	4.5%	5.9%	4.4%
75 to 84	4.9%	2.1%	2.4%	1.5%	2.7%	2.9%	2.0%
85 and over	1.5%	0.6%	0.7%	0.3%	0.9%	0.7%	0.4%
Median Age	35.7	30.9	28.5	32.4	31.4	36.8	27.2
Education							
Population 25 years or over	579,998	34,596	23,193	8,097	10,419	1,266	5,541
Less than 9th grade	7.3%	8.2%	6.4%	2.7%	10.4%	6.3%	7.1%
9-12 grade, no diploma	7.9%	9.3%	15.7%	7.2%	8.8%	7.3%	17.5%
High School graduate	27.8%	28.3%	45.3%	27.7%	27.1%	31.7%	49.0%
Some college/Associate degree	29.2%	34.5%	24.4%	36.2%	32.4%	30.2%	19.8%
Bachelor degree	18.9%	15.3%	6.1%	19.5%	16.7%	14.8%	4.9%
Graduate/Professional degree	9.0%	4.5%	2.1%	6.8%	4.6%	9.6%	1.7%
School Enrollment							
Population 3 years or older in:	234,038	17,143	13,283	4,148	5,644	345	2,188
Preschool	5.5%	5.7%	5.3%	7.9%	6.1%	2.6%	4.1%
Grades K through 8	45.7%	54.8%	56.0%	51.4%	55.6%	41.7%	58.8%
Grades 9 through 12	20.6%	20.9%	58.9%	17.8%	20.3%	25.2%	27.3%
College or Graduate School	28.0%	18.6%	11.8%	22.9%	18.2%	28.7%	9.8%

SOURCE: US Census of Population and Housing, 2000. Tables developed by SMS from SF1 and SF3 data available for download from www.census.gov.

Exhibit 2-C: Households, Island and Selected Areas, 2000

	City & County of Honolulu	Ewa DP	Waianae DP	Makakilo CDP	Kapolei	Ko Olina/ Honokai Hale	Nanakuli
Household Type							
Family HH	71.8%	84.9%	83.6%	82.7%	86.1%	78.8%	90.2%
With Own Children Under 18	31.8%	49.3%	43.3%	44.2%	52.5%	26.9%	46.0%
Non-family HH	28.2%	15.1%	16.4%	17.3%	13.9%	21.0%	9.8%
Householder living alone	21.6%	10.6%	11.9%	11.3%	10.8%	15.7%	6.7%
HH with members under 18	37.8%	57.5%	57.6%	51.4%	59.2%	37.1%	64.8%
HH with members 65 years and over	28.1%	18.1%	23.2%	15.1%	21.2%	21.0%	24.0%
Grandparents in HH							
Grandparent(s), grandchildren under 18 in same HH	36,868	3,145	3,182	554	895	77	750
Grandparent(s) responsible for grandchildren	28.1%	26.3%	36.3%	22.0%	24.0%	0.0%	46.5%

NOTE: "HH" = household.
SOURCE: US Census of Population and Housing, 2000. Tables developed by SMS from SF1 and SF3 data available for download from www.census.gov.

Exhibit 2-D: Household Income, Island and Selected Areas, 1999

	City & County of Honolulu	Ewa DP	Waianae DP	Makakilo CDP	Kapolei	Ko Olina/ Honokai Hale	Nanakuli
Household Income Distribution	286,731	15,498	10,532	3,913	4,623	561	2,249
Less than $10,000	7.3%	3.0%	11.6%	2.8%	3.9%	2.1%	7.2%
$10000 to $14,999	4.1%	2.4%	6.8%	0.5%	2.6%	3.2%	9.9%
$15,000 to $24,999	9.9%	6.9%	12.7%	6.4%	8.2%	5.7%	11.3%
$25,000 to $34,999	11.1%	9.8%	10.8%	7.6%	8.7%	2.5%	11.3%
$35,000 to $49,999	15.4%	15.0%	15.2%	17.1%	13.6%	10.9%	18.7%
$50,000 to $74,999	20.6%	29.5%	22.0%	27.8%	30.8%	27.1%	22.3%
$75,000 to $99,999	13.4%	18.9%	10.8%	18.9%	19.7%	25.0%	11.4%
$100,000 to $149,999	12.3%	11.6%	7.8%	15.6%	10.7%	18.5%	7.8%
$150,000 to $199,999	3.3%	1.7%	1.3%	2.6%	2.4%	1.6%	1.2%
$200,000 or more	2.5%	1.2%	1.3%	0.8%	1.4%	3.4%	0.8%
Median Income	$51,914	$59,583	$42,451	$66,515	$80,585	$74,063	$42,388
HH: Selected Income Sources							
Social Security Income	27.5%	18.7%	25.7%	17.9%	21.0%	29.7%	24.5%
Retirement Income	21.9%	18.1%	20.5%	6.5%	6.1%	27.0%	23.5%
Public Assistance Income	6.8%	7.7%	25.5%	22.6%	21.8%	10.1%	23.0%
Individuals Below Poverty Level	83,937	3,103	9,146	663	809	170	2,251
% of Persons under 18	12.9%	7.7%	29.1%	7.3%	7.3%	30.4%	27.0%
Children under 18 rel'd to household hd.	12.4%	9.3%	28.7%	7.1%	4.9%	29.1%	24.5%
Persons ages 18 to 64	9.0%	14.9%	18.1%	4.1%	5.1%	9.3%	18.9%
Persons ages 65 or more	7.4%	8.1%	10.3%	3.6%	24.3%	4.5%	8.7%
Unrelated Individuals	23.8%	41.2%	40.5%	12.4%	22.0%	3.7%	45.4%

NOTE: "HH" = household.
SOURCE: US Census of Population and Housing, 2000. Tables developed by SMS from SF1 and SF3 data available for download from www.census.gov.

Exhibit 2-E: Labor Force Characteristics, Island and Selected Areas, 2000

	City & County of Honolulu	Ewa DP	Waianae DP	Makakilo CDP	Kapolei	Ko Olina/ Honokai Hale	Nanakuli
Labor Force							
Population aged 16 or over	691,015	40,945	29,444	9,523	12,233	1,410	4,752
In Armed Forces	38,682	2,434	216	316	271	27	20
Potential Labor Force	652,333	38,511	29,228	9,207	11,962	1,383	4,732
% Actually in Civilian Labor Force	62.6%	63.1%	58.6%	72.7%	69.1%	66.0%	87.5%
Actual CLF	408,638	24,298	17,137	6,698	8,267	913	4,139
Male CLF	209,959	12,406	9068	3,389	4,296	438	2,154
Female CLF	198,679	11,892	8069	3,309	3,971	475	1,985
Labor Force Participation							
Male CLF	67.5%	68.0%	64.7%	76.2%	67.6%	78.8%	63.4%
Female CLF	58.2%	61.8%	53.1%	70.0%	65.1%	69.6%	51.8%
Unemployed							
Male CLF	6.9%	5.8%	15.2%	5.8%	5.7%	0.0%	18.2%
Female CLF	5.6%	5.5%	14.6%	4.6%	5.1%	2.5%	12.3%
Employed CLF							
By Selected Industry							
Agriculture, forestry, fishing	1.1%	0.5%	2.8%	0.5%	0.4%	0.0%	0.8%
Construction	5.4%	6.5%	8.6%	8.5%	6.2%	16.2%	7.9%
Manufacturing	3.8%	5.2%	4.5%	4.3%	4.9%	3.4%	4.3%
Wholesale Trade	3.4%	3.1%	4.3%	2.8%	3.2%	2.6%	4.0%
Retail Trade	12.2%	13.0%	13.2%	13.7%	12.0%	6.2%	9.6%
Transportation and utilities	6.5%	6.7%	8.9%	8.8%	7.2%	5.3%	13.1%
Information	2.7%	2.1%	1.3%	2.6%	2.2%	0.6%	1.7%
Finance, Insurance, Real Estate	7.5%	7.7%	5.3%	8.8%	9.2%	6.9%	6.1%
Professional, Mgmt, Admin.	9.9%	8.8%	9.1%	9.1%	8.8%	11.0%	9.5%
Education, Health, Social Services	19.9%	19.1%	17.7%	16.9%	16.6%	19.2%	17.3%
Recreation, Lodging, Food Services	13.8%	12.7%	12.3%	8.4%	13.9%	10.1%	10.9%
Other Services	4.5%	4.4%	4.7%	3.2%	4.8%	6.0%	5.5%
Public Administration	9.3%	10.1%	7.2%	12.5%	10.4%	12.5%	9.4%
By Occupation							
Management and Profesional	33.8%	26.6%	21.8%	30.5%	28.1%	30.8%	17.5%
Service	19.6%	23.4%	22.0%	15.8%	24.5%	18.9%	20.0%
Sales and Office	29.1%	28.8%	28.7%	30.8%	29.0%	26.6%	29.8%
Farming, Forestry, and Fishing	0.7%	0.3%	1.5%	0.4%	0.1%	0.0%	0.8%
Construction, Mining, Maintenance	8.1%	9.5%	13.0%	12.5%	9.5%	17.0%	9.5%
Production, Transportation	8.8%	11.4%	15.0%	10.0%	8.8%	6.9%	22.5%
Commute to Work	412,250	25782	14,314	6525	7853	928	2,271
Drove Alone or Carpooled	80.8%	86.0%	83.7%	91.6%	86.3%	92.0%	82.4%
Other Transp. (Public, Walked, Other)	16.3%	12.2%	15.2%	6.4%	11.0%	3.4%	14.7%
Worked at Home	2.9%	1.9%	2.1%	2.1%	1.7%	4.6%	2.8%
Travel Time More than 45 Minutes	8.9%	34.2%	45.8%	31.8%	35.1%	24.9%	33.7%
Mean travel time (in minutes)	27.3	36.5	41.9	35.3	39	29.2	35.8

NOTE: "CLF" = Civilian Labor Force.
SOURCE: US Census of Population and Housing, 2000. Tables developed by SMS from SF1 and SF3 data available for download from www.census.gov.

2.1.2 Ewa Development Plan Area

WGSL sits in the region officially known as the "Ewa Development Plan Area" (EDPA). The EDPA stretches from Waipahu to Ko 'Olina, from Ewa Beach to Makakilo. Without a doubt, the EDPA has been the fastest growing region on the island, nearly tripling its population over the 30-year period 1970 to 2000[3]. This compares to a 39 percent growth for the island as a whole during that same period (See Exhibit 2-F).

[3] Population figures were not available by DPA in the American Communities Surveys, 2006.

Exhibit 2-F: Historical Population

Resident Population						
	1960	1970	1980	1990	2000	
County	500,409	630,528	762,565	836,231	876,156	
Waianae	16,452	24,077	31,487	37,411	42,259	
Ewa		24,235	35,523	42,931	68,696	
Central Oahu			101,685	130,526	148,208	
PUC			417,240	432,023	419,422	
East Honolulu			43,213	45,654	46,735	
North Shore			13,061	15,729	18,380	
Koolauloa			10,983	14,263	14,546	
Koolaupoko	60,238	92,219	109,373	117,694	117,910	
Average Annual Growth Rates						
	Ten-year Intervals					1980-2000
County		2.6%	2.1%	1.0%	0.5%	1.5%
Waianae		4.6%	3.1%	1.9%	1.3%	3.4%
Ewa			4.7%	2.1%	6.0%	9.3%
Central Oahu				2.8%	1.4%	4.6%
PUC				0.4%	-0.3%	0.1%
East Honolulu				0.6%	0.2%	0.8%
North Shore				2.0%	1.7%	4.1%
Koolauloa				3.0%	0.2%	3.2%
Koolaupoko		5.3%	1.9%	0.8%	0.0%	0.8%

Sources: DBEDT (2004a) and earlier years; City of Honolulu website (http://www.honoluludpp.org/Planning/ResearchStats.asp)

Exhibit 2-G: 2030 Socioeconomic Projections

	2005		2025		2030	
	Population	Share of Island	Population	Share of Island	Population	Share of Island
Waianae	44,004	5%	49,682	5%	50,616	5%
Ewa	84,154	9%	164,136	15%	184,612	17%
Central Oahu	157,250	17%	180,687	17%	189,599	17%
Primary Urban Center	424,183	46%	478,430	44%	489,389	44%
East Honolulu	50,377	6%	51,713	5%	51,059	5%
North Shore	18,703	2%	20,074	2%	19,945	2%
Koolauloa	15,099	2%	16,563	2%	16,725	1%
Koolaupoko	119,132	13%	116,766	11%	115,357	10%
Total	912,902	100%	1,078,051	101%	1,117,302	101%

Source: http://honoluludpp.org/planning/demographics2/Projections/2030byDP.pdf

Geographically, Ewa consists of what was once an arid and barren plain at the foothills of the Waianae Mountains. With the advent of irrigation, much of the eastern side of the plain was dedicated to sugar until Oahu Sugar Company closed in the mid-1990's, while the western side was ranch lands. The US Navy had land at both Puuloa (Iroquois Point and Puuloa) to the east, and Kalaeloa (Barbers Point Naval Air Station) to the west.

Barbers Point NAS ("Kalaeloa"), with some 3,709 acres, was a major land use for the area until the Naval Air Station closed in 1999. Its airfield is now operated by the State Department of Transportation for general aviation, while the remainder of the Kalaeloa land is parceled among public and private users, including among others, the City, the Hawaii National Guard, the State Department of Hawaiian Home Lands, the US Coast Guard, and the US Navy.

Honolulu has long been Oahu's commercial and transportation center. Squeezed between the Koolau Mountain Range and the ocean, growth has vertical and sprawled out, southeast toward Koko Head, and northwest toward Central Oahu and the Leeward communities. Concentration of activities in Honolulu has also created the expected problems of traffic congestion, overtaxed infrastructure, and deteriorating urban spaces.

Plans to develop a "Second City" at Kapolei on the Ewa Plain responded in part to these problems. Planning began in 1955, when Harland Bartholomew and Associates prepared the first Ewa region master plan for the Estate of James Campbell, the major landowner. The concept of a separate city emerged in 1974, and was officially sanctioned in 1977 when the City Council approved the new General Plan with a Secondary Urban Center for Oahu centered on the Ewa Plain. In 1986, the Estate proposed a detailed implementation plan for a city center, naming it the City of Kapolei. Since breaking ground in 1990, Kapolei, and for that matter all of the EDPA, has been bustling.

Kapolei land uses include a large industrial complex, with areas for both heavy industry (in the 1,367-acre James Campbell Industrial Park) and light industry plus new technologies (in Kapolei Business Park) and areas for commercial and office development in the City of Kapolei urban center. As Oahu's largest industrial area, Campbell Industrial Park has been developed over decades, having originally broken ground in 1958. A 2006 inventory showed that 251 businesses were located in the industrial park, with about 4,500 workers. Approximately 85 percent of the parcels in the park are owned in fee by its tenants.[4]

At Campbell Industrial Park's northern edge, Kalaeloa Harbor was created as a second harbor for Oahu in 1961. To the south of the industrial area, about a mile offshore, are a buoy and pipeline designed to allow oil tankers to off-load their cargo without docking in harbor. Steps are currently being taken by The Campbell Estate to construct a second industrial park at Kalaeloa Harbor. This industrial park would be built on a 332-acre parcel and construction is expected to begin in 2008 or 2009.

Over the years, residential areas developed along Farrington Highway and, as of 1962, uphill in Makakilo. At Kapolei, new residential development has been led by the State, as master developer of the Villages of Kapolei, beginning in the 1980's with Village One, Kumu Iki. The Villages and adjoining developments have rivaled developments along Fort Weaver Road, to the east, and Mililani in Central Oahu as new residential areas emerged with aggressive growth through the last decade.

While industrial and residential development proceeded over recent years, many of Kapolei's residents still commute to Honolulu. Growth in the center of Kapolei has been spurred by relocation of banking activities and both State and City offices; and the Campbell Estate stresses Kapolei's advantages as a wired community, with direct access to satellite and fiber-optic network communications.

[4] Personal communication, Jeannie Schultz, Kapolei Property Development LLC

Ko Olina is being developed as a resort complementing the rest of Kapolei. Its innovative man-made coves provide recreational areas and frontage for hotels, and a 430-acre privately owned marina offers 330 full service slips for boats. Plans have called for as many as 8,700 housing units. These were planned with vacation markets in mind. Projects to date include a hotel, a time-share resort, and townhouse condominiums. One project, The Fairways at Ko Olina, was sold to the resident market, and newer projects have aimed at both second- and first-time home buyers (The Coconut Plantation, Kai Lani, Ko 'Oliina Kai). The newest project, the Beach Villas at Ko 'Olina, with 247 luxury units in beachside towers is expected to open in the spring of 2008.

When first opened in 1989, WGSL was surrounded by vacant land and agriculture. Although Makakilo had begun to be settled by homes 27 years earlier, it was still a significant distance from the landfill. The resort of Ko Olina was still a dream to its developer's mind and Kapolei's Second City had only just begun. Today, urbanization in the EDPA is creeping up on the landfill, the second City is a becoming a reality and the resort of Ko Olina is a growing vacation and residential community.

2.1.2.1 Demographics and Housing

The EDPA has a young population; the median age of its residents is 31.2 vs. Oahu's residents' median age of 35.7. Households are significantly larger than the average (3.69 persons per household, vs. 2.95 persons in the average household for Oahu as a whole). Of the 20,804 units in Ewa in 2000, 63.7 percent are owner occupied.

Within the EDPA, the Ko Olina sub-region (Census Tract 86.09) stands out as having an older median age, a large proportion of vacant homes held for seasonal or recreational use, and, among occupied homes, a low proportion of renters (26.1%).

2.1.2.2 Economic Characteristics

In general, the average per capita income over the entire EDPA is lower than the island's average. In the two census tracts abutting the landfill however, incomes tend to be higher. In the Kahe Census Tract, per capita incomes nearly at the Oahu average level; in Ko Olina Census Tract incomes are much higher.

Workers living in the EDPA area are diverse in occupation, and, despite their long history in sugar cane, a lower percentage of workers are in agriculture than the percentage island wide. Commuting times are long, and a third of the workforce normally drives over 45 minutes to work, characteristic of a suburban community.

Among the EDPA communities, Ko Olina/Honokai Hale[5] stands out in several ways. In this sub-region, population tends to be older, with a median age of 36.8, slightly higher than the island median. Most households do not have members younger than 18. The median household income level is much higher than in the other communities studied. However, the share of children under 18 living with family who are below the poverty level is comparable to that found in the Waianae Coast, suggesting that those families that do have children in this sub-region face an economic situation very different from that of their older neighbors.

[5] In the Census tables, "Ko Olina" consists of Census Tracts 86.09 and 86.10, and includes Honokai Hale as well as Ko Olina.

Despite the intention to develop Kapolei into the second major Oahu city, Kapolei is today not much more than a significant suburban community. The same can be said of the neighboring communities along Fort Weaver Road, in Ewa and Makakilo. Outside of Campbell Industrial Park and the Kalaeloa Harbor, the commercial activity of the region is primarily designed to service a suburban community.

2.1.2.3 Ewa: Emerging and Anticipated Trends

Although the business core has not yet emerged, the building blocks being laid today forecast a very strong future growth in the EDPA. As noted in Exhibit 2-G, the EDPA is the ***only*** Development Plan Area on the island that is expected to increase its share of the City's population between 2005 and 2030.

The suburban residential areas that experienced vigorous growth through the last 15 years continue to fill in with projects by HASEKO, the Department of Hawaiian Home Lands, Gentry and others; and plans for accompanying major retail projects have progressed beyond the talking stages. If anything is missing to complete the City, it is the maturing of an intense, downtown core characteristic of other cities: home to the finance and professional services, upscale restaurants, specialty retail, medical services and other office tenants that make a downtown viable.

On February 9, 2005, ground was broken to begin construction on Ewa's North-South Road. This major roadway will connect H-1 with Kapolei Parkway and extend into Kalaeloa. That project is in full construction today and it completion later in 2008 will signal the start of construction on the new University of Hawaii West Oahu Campus, will provide a primary access to the underdeveloped lands of Kalaeloa and will make available the largely vacant lands of West Kapolei. The confluence of activity along the North-South Road will have significant impact on the shape and development timing of the entire EDPA.

On the industrial front, Campbell Industrial Park is full and employment has remained stable for the past few years. Light industrial space in the City of Kapolei and Kapolei Business Park is likely to attract office and light industry jobs from other parts of Oahu as the region's residential population continues to grow.

Kalaeloa Harbor is currently very busy. Sause Brothers barge operations have been shifted to this port from Honolulu. The harbor also handles several bulk cargo operations and metals recycling. With coral dredged from the harbor now placed on the harbor's land area, space for expansion will remain tight for the next few years.

A key to understanding the future of industrial/commercial uses in the Ewa region may lie with the Barber's Point Naval Air Station, now simply called "Kalaeloa". Because of its sheer size (nearly 3,700 acres) and the undeveloped nature of much of its lands, Kalaeloa offers business, commercial opportunities that no other part of the island can duplicate.

Finally, as noted earlier, Ko Olina continues to grow and to move toward a critical mass sufficient to fully support a resort community.

If anything will slow down the emergence of a true Second City at Kapolei, it is the capacity of the infrastructure. Despite building the North-South Road and widening Fort Weaver Road, the roadways of the Ewa region are significantly under capacity and deficient in connectivity. And the school systems, finished park space, liquid and solid waste disposal, drainage capacity must all be supplemented to accommodate the projected growth.

2.1.3 Waianae Development Plan Area

The Waianae Development Plan Area (WDPA) is the fifth largest of the City Development Plan Areas. A long corridor, the WDPA stretches 18 miles from Nanakuli to Kaena Point, and is confined by the Waianae Mountain Range to the east and the ocean to the west. With ten percent of Oahu's landmass, but less than five percent of the island's population, the WDPA is still rural, though it is becoming increasingly suburban.

The mountain range is a dominant feature and creates distinct valleys that line the corridor, linked by a single roadway and coastal beach parks. Nanakuli, about three miles from WGSL, includes the largest Hawaiian Homes community in the State, and is completely suburban in nature. Lualualei, home to large Navy munitions storage and communication facilities, as well as small residential communities along the highway is next. Maili and Waianae are home to large residential communities, as well as to many small farms. Waianae is also the urban core of the WDPA with shopping and civic services. Makaha has a small resort, but is essentially the last of the suburban housing communities along the coast. Makua is occupied by the US Army for military training, while Kaena is in conservation and nearly inaccessible to vehicular traffic.

The WDPA has experienced modest growth over the last 20 years (3.4%) and this has allowed the communities to retain the "small-town" values of the residents. But the isolation of these communities, and its rural character has had its downside. Average incomes in the WDPA ($42,451) are significantly below the City averages ($51,914) and the number of people living in poverty is nearly triple the number living in the EDPA. Unemployment is very high and a host of social concerns threaten the region. Of equal concern, the WDPA is seen by many of its residents as the "dumping" ground for problems that no one on Oahu wants, including two construction and debris landfills, a very large portion of the island's homeless population, a major power plant, and firing ranges and military dumping (over 32% of the region is controlled by the military).

The entire region is at the "end of the road" and there is, except in times of emergencies, only one road in and one road out of the WDPA. It is this road that runs by the WGSL.

2.1.2.3 Waianae: Emerging and Anticipated Trends

In recent years, the official City planning document that guides the growth of this region has migrated from a "development plan" to a "sustainable community plan", reflecting the intention of the City government and of the community to retain the rural nature of the region. The plan's vision and supporting provisions are oriented "to maintaining and enhancing the region's ability to sustain its unique character, current population, growing families, rural lifestyle, and economic livelihood . . . "[6]

With the exception of significantly upgrading the infrastructure servicing the region, and protecting and enhancing the lifestyle, not much is projected to change. And although there have been on-going discussion for many years about adding a new highway through the Waianae Mountain Range or completing the highway around Kaena Point, plans have not been developed for such a project. Till then, the only access in and out of the WDPA is along H-1/Farrington Highway.

[6] Waianae Sustainable Communities Plan, City Department of Planning and Permitting, 2000

2.2 LANDFILLS

2.2.1 History of Landfills on Oahu

Since as early as the 1850's, Oahu is documented as providing its residents with some form of Public Service for solid waste disposal; however, locations, collection and disposal processes have varied greatly. The City's waste disposal methods have included "garbage crematoriums", dumps, landfills, swamp filling, incinerators and ocean dumping, just to name a few. Locations have also differed greatly, from downtown (at present Ala Moana Boulevard), to Kaneohe Bay Drive (Aikahi Dump), Kawainui Swamp (Kawainui Dump which became the first landfill on Oahu), Kapaa Quarry and most recently WGSL. Landfills were located in Windward Oahu from 1940 until 1997 when the Kapaa Quarry landfill location was closed.[7]

2.2.2 History of WGSL Site

Site selection for a Leeward Sanitary Landfill began in 1977 with studies of 26 potential sites. In 1978 an EIS was prepared listing three sites, Nanakuli A and B, Makaiwa Gulch and Kaloi as the best possible landfill locations. Community concerns about groundwater protection caused the reexamination of these three options.

In 1984 an REIS declared Waimanalo Gulch and Ohikilolo (below the 200-foot contour) the best locations for Leeward landfills. Acceptance of H-POWER eliminated the need for having two landfills; Ohikilolo was declared unnecessary at that time and Waimanalo Gulch emerged as the preferred location. In the 1984 REIS report, the Department of Public Works stated that their objectives for solid waste disposal on Oahu were to operate landfills on both Windward and Leeward sides of Oahu and to implement H-POWER as quickly as possible.

The landfill in Waimanalo Gulch has been in operation since 1989 and since 1997 has remained the only municipal sanitary landfill on Oahu. Residents were previously assured that WGSL would close in 2004, or when the landfill had reached its full capacity. In 2001 a proposal for a 60.5-acre expansion was submitted. A 14.9-acre expansion was approved with the closure date of 2008. At the time, residents were subsequently assured that the landfill would close in 2008. The City today believes that no feasible or timely alternative to the landfill is currently available and that an extension and expansion of the use of WGSL is again necessary.

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[7] Young, Robert, *Garbage in Paradise,* 2005
http://envhonolulu.org/solid_waste/archive/History%20_Garbage_in_paradise.html

3. ALTERNATIVE ACTIONS

The City's Preferred Action is to expand and continue to use the Waimanalo Gulch Sanitary landfill beyond its intended closure on November 1, 2009. Presented below are the most seriously considered alternatives to the Preferred Action. They include alternative technologies and methods of disposal, and alternative landfill sites.

3.1 ALTERNATIVES TECHNOLOGIES AND OTHER MEANS OF DISPOSAL

3.1.1 H-POWER

H-POWER is a major element in the reduction of MSW requiring landfilling on Oahu. In 2005, H-POWER processed 625,877 tons of waste and recycling residue. The H-POWER process consists of shredding, separating recyclable materials, and waste combustion, all leading to steam generation, which drives a turbine to create electricity for over 45,000 homes on Oahu.

Plans are to add a third boiler to H-POWER, which would significantly reduce the MSW being sent directly to the landfill. A landfill, however, would still be necessary for down periods in the operation of the H-POWER Plant, for processing materials that cannot be handled by H-POWER, and for periods of emergency caused by natural disasters (e.g. hurricanes, tsunami).

3.1.2 Conversion of Sludge into Fertilizer

In 2006, the design-build-operator Synagro-WWT, under contract to the City, completed an In-Vessel Bioconversion facility where it takes sludge from the Sand Island Wastewater Treatment Plant and converts it into commercial, high grade fertilizer pellets, which is planned to be sold on the market to landscapers and others.

Previous to this facility, as much as 26,000 tons of sludge annually was trucked from the Treatment Plant and landfilled at WGSL. Delays in processing would sometimes result in odor problems for surrounding communities, especially for residents in Honokai Hale and Ko Olina.

Although initially slowed by some equipment issues, the facility began full operation in September of 2007. With this diversion, the delivery of sludge to WGSL has dropped over 25 percent from two years ago, from a high of 2,240 tons in January, 2006 to a low of 1,670 tons in December, 2007. ENV is also attempting to expand bio-solid/green waste composting to help recycling and to further divert sludge from WGSL.

WM notes that today it processes the sludge immediately upon delivery. In order to further reduce odors emanating from the landfill, WM also uses a system that emits an odor neutralizing mist every half hour of every day, from early in the morning to early in the evening, along the fence line fronting the landfill.

3.1.3 Other Alternative Technologies

Anaerobic digestion, hydrolysis and gasification are forms of alternative technologies that could reduce the amount of waste processed at WGSL. These forms, however, would not eliminate the need for a landfill as they deal solely with organic materials leaving all other forms of waste for alternate disposal. Equally important, the apparent capacities of these facilities are not sufficient to replace the burden borne by WGSL.

Anaerobic digestion is the naturally occurring bacterial breakdown of organic material in a controlled, oxygen free environment. Anaerobic digestion creates three byproducts, biogas, which in turn can be used for electricity generation, stable organic material that can be used for low grade building products such as fiberboard, and a liquid rich in nutrients, which dependant on the quality of material digested, can be used as fertilizer.

Hydrolysis is the use of water to split chemical bonds of substances.

Gasification is the decomposition of organic waste by exposing it to high temperatures. This process, unlike anaerobic digestion, allows a small amount of oxygen to be present during decomposition. Byproducts include solid ash and slag, liquid spyrolysis oil, and synthesis gas, or syngas. Gasification reduces solid waste by 85% to 92%. The remainder must be disposed of in landfills. Gas created through this process can be used for electricity generation.

For anaerobic digestion and gasification, markets need to be found to use the gas fuel and the fertilizer materials, and proven applications have not been shown on Oahu.

The Plasma Arc technology creates an electrical arc between two electrodes, which in turn produces extremely high temperatures. The heat breaks down the waste into organic molecules leaving gases, including syngas that can be used to generate electricity. Byproducts include materials such as glass and metal, and a lava-like hardened material.

3.1.4 Recycling

In 2006, a total of 542,747 tons of material, including auto bodies and other ferrous material, paper, metals, glass, plastic, tires, auto batteries, electronic scrap, green waste, wood waste/pallets, construction & demolition, food waste, sewage sludge, and other reuse material (Goodwill, Salvation Army, Helping Hands) were recycled on Oahu. Over the course of the last twenty years in which the City has maintained recycle data, the amount of waste recycled by the City has grown from 73,992 tons in 1988 to over 600,000 tons in 2007 (precise 2007 totals are not yet available).

There are currently over 70 recycle bin locations at schools for public use, with plans to expand the program by 40 locations in the coming years. All money acquired from the sales of recycled materials goes directly to the school. The State also maintains over 50 redemption locations on the island that accept HI5 bottles and cans only.

In the fall of 2007, the City began curbside collection of mixed recyclables (e.g. glass, cardboard, newspapers, plastics, green waste) in Hawaii Kai and Mililani. The program has proven very successful and the Mayor has announced plans to expand the program island wide in staged increments, beginning sometime in the fall of 2008. The City is also considering ways to assist high rise complexes, which are not part of the curbside collection program, in collecting their recyclables.

Items that are restricted from recycling centers include business/commercial/agricultural refuse, liquids, oils, grease, wet kitchen garbage, animal carcasses, large auto parts, some of which can be landfilled after processing. (Other items such as explosives and weapons, toxic/poison waste, wet paint and solvents, and medical waste are disposed in more specialized, highly controlled ways). There remains a quantity of nonrecyclable and noncombustible refuse that will require landfill disposal even after recycling efforts and waste-to-energy capacity have been increased significantly.

3.1.5 Transshipment

Transshipment involves packaging Oahu's waste and shipping it off the island. This alternative has been discussed at least as far back as the 2001 EIS and today is a more realistic alternative than ever before. Transshipment would significantly reduce the need for daily landfill capacity. Currently, proposals call for the use of sites in Washington State or Idaho; where landfill capacity is readily available.

Transshipment is a serious alternative to handling a portion of MSW, but it has externalities that must be considered. These include the following:

- The tipping fees received from H-POWER and WGSL provide the resources necessary to run H-POWER and to collect residential solid waste at no additional fee to tax payers. Diverting a significant level of solid waste to the mainland diverts those fees and may force the City to find other revenue to offset the subsidies required to run H-POWER and to collect residential solid waste.
- H-POWER supplies the power for over 45,000 homes on Oahu. Reducing the solid waste input into H-POWER reduces its alternative energy output.
- Transshipment creates a level of uncertainty that is not apparent in today's technology of H-POWER and landfilling. Transshipment is more vulnerable to freight and vendor price increases (e.g. those tied to the price of oil), to shipping disruptions (e.g. strikes, weather, regulations in the receiving states) and to the loss of control at the out-of-state landfill site.
- Because of the amount of fuel needed to process and to ship MSW to its ultimate location and the reduction of alternate energy, it is likely that the carbon footprint of this alternative exceeds the processing of MSW on Oahu.
- Industrial area space and wharf space would be needed to process and to store solid waste to be transshipped off-island. Wharf space is limited.

The City has recently advertised an Invitation for Bid regarding the transshipment of MSW. A pre-bid conference on February 14, 2008 attracted about 10 interested parties. A decision to procure those services will depend on the bids that are received later this year, with the expectation that if successful, transshipment will probably not occur until sometime in 2009.

It should be noted that the City believes that even if transshipment is deemed economically viable and politically acceptable, limited landfill capacity will still be required for material that cannot be processed or shipped (e.g. agricultural waste, bulky waste/white goods, brown waste/furniture), for downtimes at the H-POWER Plant and for emergencies caused by natural disasters.

3.2 ALTERNATIVE SITES

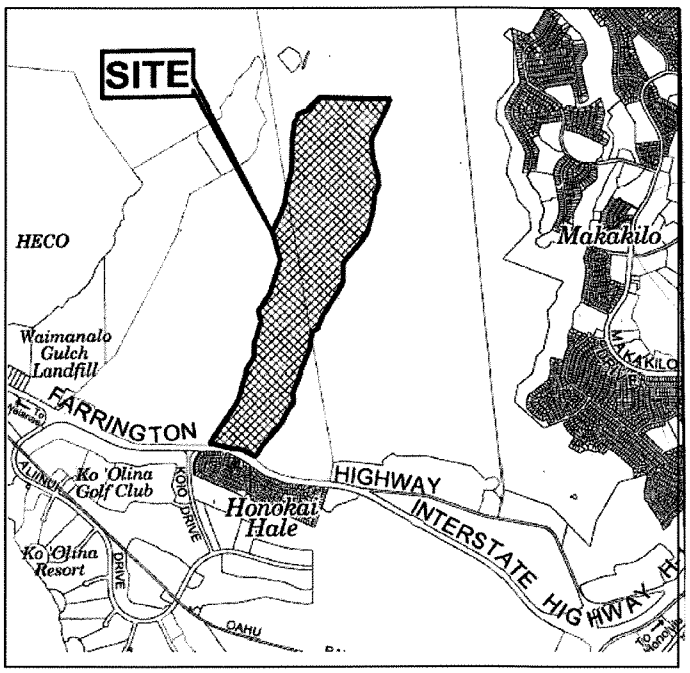
Since 2000, many alternative sites have been analyzed for potential as landfill candidates. After serious study by the City, four sites emerge as possible replacements for the WGSL. These include sites in Makaiwa Gulch, Maili, Nanakuli B, and the Ameron Quarry in Kailua. All four sites are privately owned: two are in active use and one is targeted by its landowner for partial residential development. Like WGSL, three of the four sites are in Leeward Oahu. All four alternative sites have a landfill life expectancy of at least 15 years. In 2001, in 2003 and in reviews since, the City has consistently found WGSL to be the optimal site based on a number of landfill siting criteria.

3.2.1 Makaiwa

The Makaiwa site is a gently sloping valley of more than 1,200 acres. The next valley to the west is Waimanalo Gulch, where the current MSW landfill is in operation. Part of the property has been classified as Urban by the State Land Use Commission, in response to a petition by the owner. Current plans for the property include residential development extending from Makakilo (above the site and to the east). To the south of the site is the residential community of Honokai Hale and, further seaward, Ko Olina.

The Makaiwa Gulch site consists of 338 acres with an anticipated landfill life of 25 years. There is currently only one building located on the site that would be displaced. There are two residences located 118 feet from the property line and the nearest school, Mauka Lani, is a little over a mile away. Although parts of the site are very visible from H-1 Highway, the landfill may not be if carefully located and screened. Traffic issues that affect WGSL may be apparent with Makaiwa as well since both have similar alignments with Farrington Highway.

Exhibit 3-A: Makaiwa Site



Source: Honolulu Department of Permitting and Planning
http://www.honoluludpp.org/Planning/PublicInfrastructureMap.asp

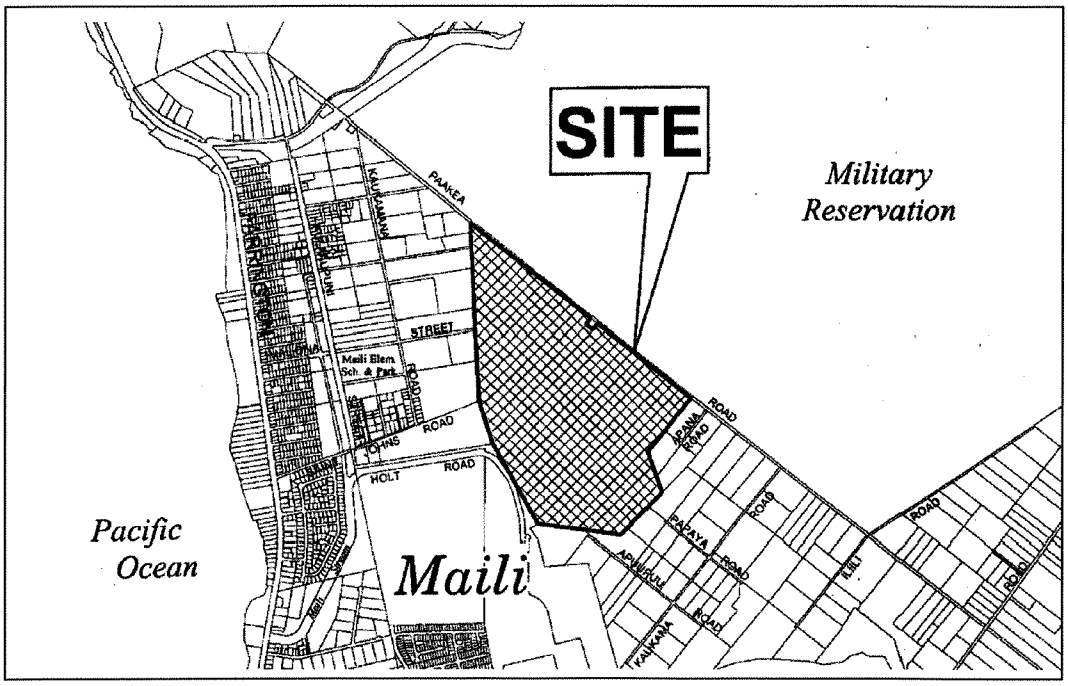
3.2.2 Maili

The Maili site can be reached by Paakea Road, which runs along the boundary between civilian and military areas in the Lualualei region. On the makai side of the road, its immediate neighbors include an egg farm. At slightly greater distance are a school and the Waianae Coast's major health clinic. Operations at the site would likely be visible from the Maili Kai residential area to the south.

The Maili site includes one dwelling and another building on 200 acres of land. The anticipated landfill life of this site is 15.33 years. There is a distance of 875 feet between the property line and the nearest residence and 1/5 of a mile between the property line and the nearest school, Maili Elementary. The site is located in an area that has low visibility from Farrington Highway, the closest general use public road.

The Maili property is currently being used as a coral quarry. Its operators have been mining the site since 1998 and project use of the site for another "40 to 50 years". Sphere LLC is accepting asphalt on site, and has a contract to take ash from AES Hawaii[8]. Sphere LLC applied to the State Land Use Commission for a Special Use Permit to operate a construction and debris landfill; the petition was denied in June 2004 due to insufficient information concerning the planned use of the site. The petition was denied again in March 2006 when the project was met with much more opposition from the community than in 2004.

Exhibit 3-B: Maili Site



Source: Honolulu Department of Permitting and Planning http://www.honoluludpp.org/Planning/PublicInfrastructureMap.asp

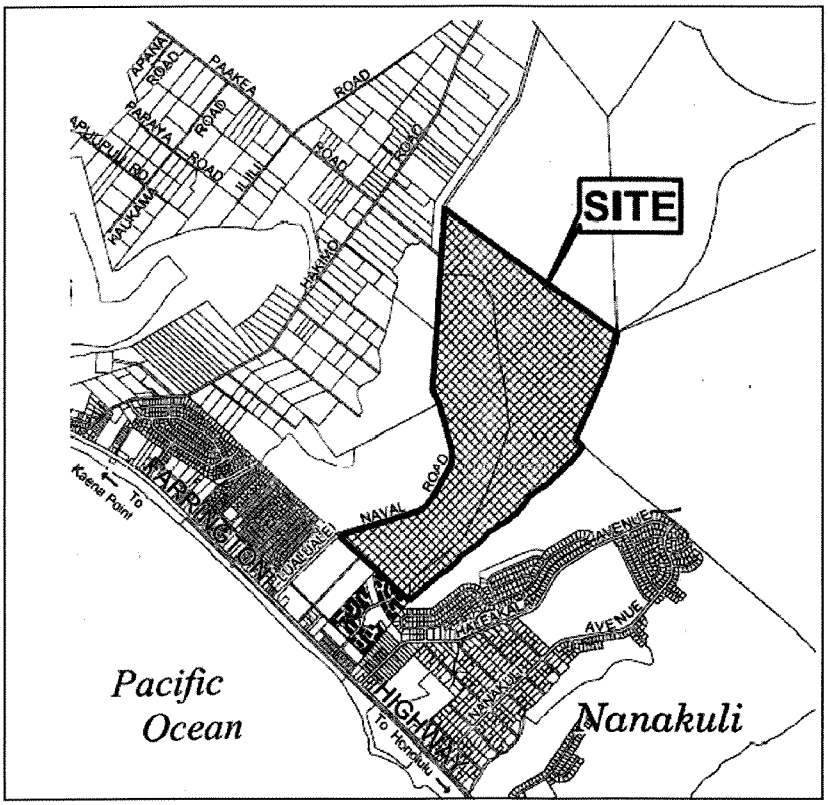
3.2.3 Nanakuli B

Although labeled as being in Nanakuli, some would argue that this site actually sits in Maili. The site itself nestles between a volcanic ridge and Lualualei Naval Road. The ridge separates the site from the bulk of developed land in Nanakuli Valley. Neighbors on the Naval Road include the existing construction and demolition debris landfill and acreage where the owner once proposed developing a golf course (Hida, Okamoto, 1991). The owners note that the site has plans and permits for the existing construction landfill located across the Naval Road.[9] An EIS has been in preparation for a municipal solid waste landfill at this site. Also across the road is the old Kaiser Cement plant. Seaward is a commercial area, including a large grocery store.

[8] Letter, L. Wilderman to W. Namumnart, August 25, 2004
[9] Letter, S. Joseph to W. Namumnart, August 19, 2004.

The Nanakuli B site is 432.3 acres with an anticipated landfill life of 15.63 years. The nearest residence is adjacent to the property line, while the nearest school, Nanakuli Elementary School is ¼ mile from the property line. There are currently no buildings or dwellings located on the site. The Nanakuli B site is visible from Farrington Highway.

Exhibit 3-C: Nanakuli "B"



Source: Honolulu Department of Permitting and Planning
http://www.honoluludpp.org/Planning/PublicInfrastructureMap.asp

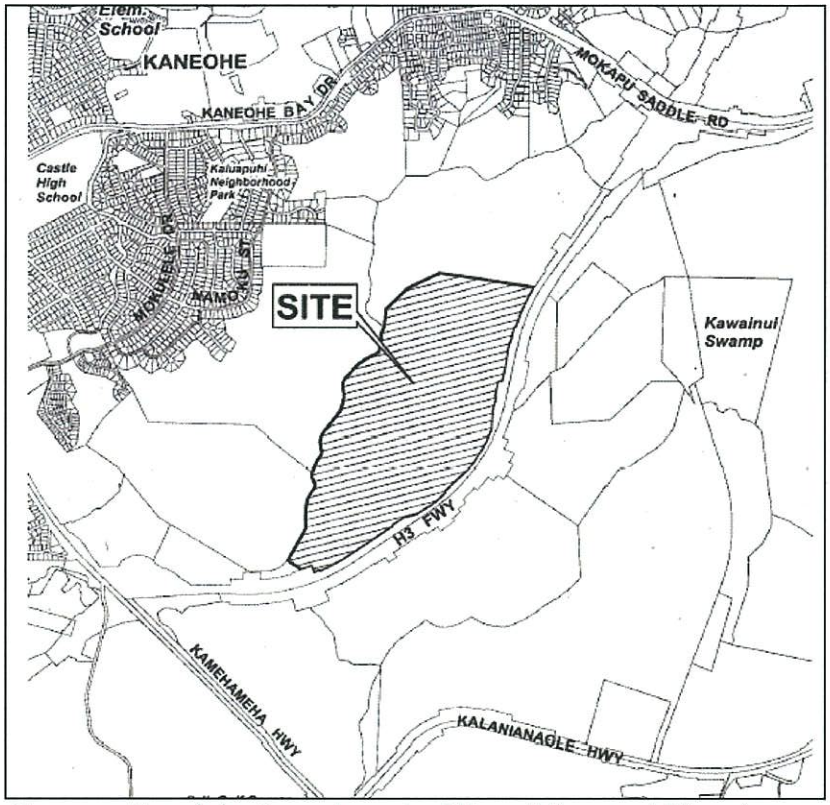
3.2.4 Ameron Quarry

This site is in Kapaa valley on the Kaneohe side of the Koolau's, an unpopulated area through which runs the H-3 Freeway. From the freeway it is possible to see structures in the Ameron site (notably crushers) but not the pits. To the north is the Veterans Cemetery. To the west, Kaneohe neighborhoods extend to the ridge that forms the back wall of the quarry. The nearest neighbor to the south is an industrial area, to which the Ameron supplies water for non-potable use. Further to the south is the Kawainui Marsh, a basin that has been identified as the State's largest wetland.

Current operations on-site include Ameron's rock quarrying and crushing activities and a Grace Pacific plant. The site includes stockpiles and water detention basins. To the east, on the other side of the freeway, Ameron is developing a second phase of its Kapaa operations. Current plans call for use of both sites, and a gradual transition to dependence on phase II. Even when quarrying in the existing pit ends, the owners claim that much of the area will still be needed for stockpiles and water detention.

The Ameron Quarry site consists of 391 acres with an anticipated landfill life of 15 years. There are presently 8 building located on site. The nearest residence, Pohai Nani – Elderly Development and the nearest school, Le Jardin Academy, are located 1/5 of a mile and 2/3 of a mile, respectively, from the property line.

Exhibit 3-D: Ameron Quarry Site



Source: Honolulu Department of Permitting and Planning
http://www.honoluludpp.org/Planning/PublicInfrastructureMap.asp

3.3 TAKE NO ACTION

Currently nearly 563,000 tons of MSW is sent annually to WGSL. There appears to be no single alternative, nor any combination of alternatives that can viably be expected to process that level of waste. And if there were, with each alternative a landfill is required to handle product that cannot be processed or to serve as a backup in case of downtimes or emergencies.

Closure of WGSL without a viable replacement that meets State and Federal requirements would mean that the City and its residents would be faced with some of the following challenges:

- The incidence of illegal dumping, with serious health and safety impacts and high costs of clean up, would greatly increase.
- An alternative site would have to be quickly activated for landfill requirements. Regulatory, construction and other start-up costs, which have already been incurred at WGSL, would have to be assumed.
- For commercial haulers, transshipment may become a greater reality, significantly cutting into the waste levels needed to operate H-POWER, thereby threatening its economic viability. A reduction in H-POWER usage will also result in a significant reduction of power generated on Oahu from alternate energy sources.
- Ash and residue from H-POWER and any residue from alternative waste disposal technologies may have to be exported elsewhere. If so, ENV will have to ensure proper process (autoclaving) of MSW, sludge, and non-incinerated residue from H-POWER to make sure these meet Federal and State requirements.

4. COMMUNITY ISSUES AND CONCERNS

This section identifies those landfill issues that are of concern to the communities of Oahu. As was echoed through numerous sources, waste disposal and WGSL specifically are of concern to all of Oahu's residents. This section helps to better understand the underlying causes of concern.

4.1 SOURCES AND METHODOLOGY

Major sources for the account of issues and concerns were:

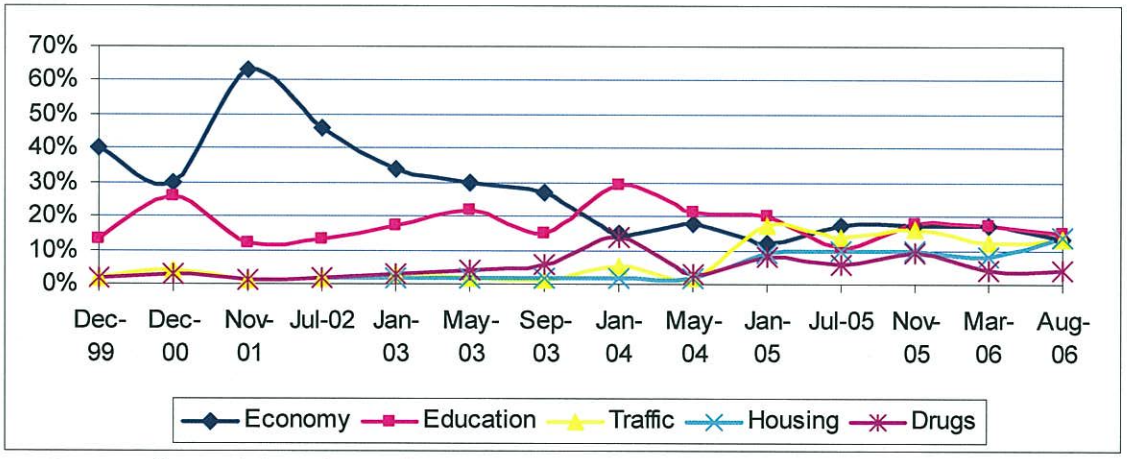
- Interviews with selected persons who SMS knew to be knowledgeable about the affected communities and activities relating to the proposed action;
- Neighborhood Board resolutions and summaries of discussions of the issues during the years 2005, 2006 and 2007; and
- 2005, 2006 and 2007 local newspaper articles.

The objective of data gathering for this section of the report is to understand the range of concerns and some of the linkages among them. The methodology was designed to cover a wide range of opinions, not to assess the relative importance of particular viewpoints.

4.2 COMMUNITY ISSUE AND CONCERNS INDEPENDENT OF THE PROPOSED ACTION

For several years, Hawaii residents have responded to polls on the major issues facing the community by pointing to the economy and education as the most important issues for the state of Hawaii (as shown in Exhibit 3-A). Environmental issues (e.g., environmental protection, recycling) do not achieve the same salience.

Exhibit 4-A: Major Public Issues, State of Hawaii, 1999-2006



Source: "People's Pulse Poll – OmniTrak Group Inc."

4.3 COMMUNITY ISSUES WITH REGARDS TO THE WGSL

4.3.1 Neighborhood Board Topics of Discussion

On the island of Oahu there are a total of 32 Neighborhood Boards; they meet monthly. Over the course of the last two years, discussions regarding WGSL arose in the Waianae, Makakilo/Kapolei/Honokai Hale, and Kailua neighborhood board meetings.

The Leeward Communities were mostly interested in closing the WGSL and in ensuring that following the 2008 closure of WGSL, the next landfill would not be located in Leeward Oahu. Among their specific concerns were the following:

1. Is the State Department of Health monitoring and conducting its own landfill investigations or are they relying on the operator?
2. What violations are outstanding and what is being done about them?
3. Is anyone, but in particular the military, being allowed to dump hazardous material in the landfill?
4. What is the present situation with transshipment? Is it a viable option to keeping WGSL open and at what cost?
5. What are the specific elements of the community benefits package and who benefits? Why? Who is represented in decision-making? Are there any features that are merely a substitute of City services that should be provided anyway?
6. What assurances are there that if WGSL is closed that another landfill is not opened on the Leeward Coast and what enforcement is available to prevent rogue trash dumping.
7. What is being done about the hazardous dump truck drivers and the dangerous traffic conditions caused by crossing the freeway without a light, by trucks lining up on the side of the highway waiting to enter the landfill area, by the airborne and highway trash left behind by trucks and the landfill operation?
8. What is the situation with the leachates? What is the stability of the landfill walls?
9. How is the landfill affecting the for-profit businesses in the area or the decisions of businesses that would like to locate in the Leeward area?

The Kailua Neighborhood Board, over the course of 2005 and 2006, had numerous mentions of WGSL Sanitary Landfill. A majority of their concerns were around the EIS, when the preparation process would begin, and expected completion date. The board was also notified monthly of any news or decisions surrounding the landfill. More specifically, among their mentions were:

1. Questions were raised numerous times in 2005 and 2006 regarding the status of the EIS. It was believed that there was no movement on this due to a face-off between the City Council and the Mayor's promise to Leeward not to extend the landfill.
2. Concern was expressed that if the EIS process did not begin soon the City would run into similar problems to what Maui was facing with their permit process.
3. Credit was given to the Mayor for vetoing Bill 37 that would have closed WGSL by May 1, 2008. They understood that it was not an easy decision.

4.3.2 Individual Community Responses

Interviews with community leaders, individuals and community groups solicited strong and wide ranging reactions on WGSL. A sampling of the most often mentioned reactions, slightly edited for grammar, without analysis as to their legitimacy, are presented below in italics.[10] Information from ENV and WM are also presented.

4.3.2.1 People Who Favor Closing the WGSL

4.3.2.1.1 On the City's Commitment to Close the Landfill

When it opened, the City committed to a short-term usage of WGSL. They extended it under the Harris Administration with a strong commitment that it would close in 2008. If we can't trust the City Administration to stand by the commitments of previous administrations, how can we trust anything they say?

The commitment to close the WGSL is reflected in the deeds of buyers in Ko'Olina. We were told it would close in 2008. I'm not sure people would have bought units without that commitment by the Administration.

It's not like we have NO choices to using WGSL. We can expand H-POWER, we can ship waste to Washington State, we can landfill elsewhere on the island. So, if we have options, how do we justify going back on a commitment given in good faith?

It seems to me that if one reads the last EIS, there was absolutely no intention of keeping the timetable to five years. Remember, Harris started with an extension for 15 years, then cut it to five years after all the protest. There was no plan for what to do after five years. The City doesn't care; it takes the community for granted.

Where's the transparency necessary to deal honorably with the community? It robs the community and the larger Oahu community of the opportunity to make reasoned judgments and it breeds distrust.

Does the Administration pay attention to its citizens; does it feel an obligation to keep its word. This is overwhelmingly the stuff that drives the response to ideas and fuels the energy behind the opposition to WGSL.

Discussions with ENV indicate that the City is continuously seeking ways to find relief for the landfill, but thus far with limited success. They have had or are seeking proposals for alternate technologies, for expanding to a 3rd boiler at H-POWER, and for transshipment. They keep open the option of an alternate site if one can be found. But they contend that despite assurances given by a previous administration, it is not practical to close WGSL at this time.

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[10] In the course of the interviews, interviewees were assured anonymity and confidentiality. This allowed for free and frank conversations. As such, the names of interviewees are not presented within this report

4.3.2.1.2 On Management of the Operation

Despite numerous complaints over the years, we continue to have litter on the roads, we continue to have dangerous truck situations where merging into and crossing traffic occurs; we continue to have smells coming from the landfill; and we continue to have deliveries at off-hours. There may have been some improvements, but these issues are not being adequately addressed by Waste Management.

Waste Management is very secretive. They don't answer our questions; they subtly harass people who come to the site; they make the community suspicious.

Discussions with WM indicate that they are trying to be more transparent on their operations. They participate in the Mayor's Oversight Advisory Committee and they give tours of the landfill upon request. In 2006, more than 1,600 individuals toured the landfill. There is a website that posts pertinent information and contact information for questions or complaints.

4.3.2.1.3 On Traffic

It is very dangerous when trucks line up on the highway waiting to turn mauka. It doesn't happen often, but when it does, it's very dangerous.

When trucks merge back onto the highway going toward town, they have to cut across traffic, sometimes very heavy traffic, without the benefit of a light. I'm surprised there haven't been any major accidents caused by these trucks.

The individual household deliveries, in cars and trucks, may be even more problematic than commercial trucks. These aren't professional drivers and they often don't cover the trash. These people are more likely to litter the road and to cause traffic hazards.

WM notes that they are not aware of any major accidents involving trucks entering and exiting the landfill site. They continue to monitor the intersection and to counsel truck drivers on appropriate driving practices.

4.3.2.1.4 On Odors

The State Department of Health has done tests and they tell us that "yes, under certain conditions, odor is a very real problem." It is not our imagination. This is especially a problem for Honokai Hale and Ko'Olina residents and guests.

The odor problem is most noticeable when they deliver sludge material from the Sewage Treatment Plant and it is not immediately buried. It happens often.

Sometimes it gets so bad, you can't come out of your house. I feel sorry for those people in Honokai Hale who may not have air conditioning.

Following numerous complaints a few years ago, WM indicates it instituted a practice to immediately process sludge material upon delivery. WM also improved the operation of their odor neutralizing misting system that functions during landfilling operations. And the successful operation of the Synagro-WWT facility has reduced sludge delivery to the landfill by 25 percent. Taken together WM believes that they are actively addressing this issue. Their records indicate a drop in odor complaints from seven different instances in 2006 to one complaint in 2007.

4.3.2.1.5 On Litter

This is the most visible problem. It was worse before, but the problem has certainly not gone away. Trucks litter because the load is not properly covered on the way to the landfill or because they do not clean the truck out completely before leaving.

Litter occurs sometimes because of the winds blowing over the landfill. Some days one can see paper and plastics hovering over the landfill, kicked up by the wind. And sometimes, that trash is blown down the mountain to the areas around the landfill and out to the ocean. There is a reason that wind farm people have looked seriously at sites above the landfill; the wind is very strong there.

Discussion with WM indicate that it is their current practice to continuously process and cover the trash as it arrives, thereby limiting its exposure to wind. They also cover the trash everyday, as is indicated by photos that are sent to the State Department of Health at the end of each day. WM also employs people to pick up litter along the extremities of the landfill before it can blow off of the property. They appreciate that they are not always successful, but they believe they have greatly reduced the problem.

As to trucks not properly covering their load or not completely emptying their load, WM contends that they monitor the trucks entering and leaving and are very aggressive about employing a system of counseling and fines. It is their position that anyone seeing violations of littering should call them and call the police with information on licenses and time/date of occurrence.

4.3.2.1.6 On Views

The landfill is visible from Ko'Olina and from the highway. It is most visible from Farrington Highway as you drive by the Kahe Power Plant.

If operations are visible now, how much more visible will it be if they expand operations? They are not supposed to excavate, so I don't understand how it will not be more visible?

The visibility of the landfill has a direct impact on the development of Ko'Olina; on the largest single economic engine on the Leeward Coast. Hotel developers are very reluctant to buy parcels because all mauka view units will be looking at an operating landfill. One can say that the current landowners knew it was there when they bought the project, but they believed the City when the City committed to close the landfill in 2003 and then in 2008. The landfill is not the only reason these sites are difficult to sell, but it is a major reason.

People keep saying the view will improve as they plant cover and put in view screens. But it's been a long time and I don't see any trees or view screens.

Discussions and site visits indicate that Norfolk pines and monkey pod trees have been planted along a berm fronting the landfilling operation. These trees have yet to mature to a level to adequately screen views. Most of the finished surfaces have been hydro mulched, but grass has not yet taken hold. Berms have been erected in such a manner that views of the operation from the highway fronting the landfill and from much of Ko 'Olina have been partially obscured. WM contends that if the operation is allowed to expand deeper into the valley, the finished heights of the berms and additional planting will almost totally obscure any views of operation for most of the neighbors.

4.3.2.1.7 On the Safety of the Site

Is the site safe? I worry about the plastic linings since they have had some recent fires.

I worry about the fill coming down the hillside. When the recent earthquakes happened, my first thought was how we would handle the toxic materials if the walls of the landfill breeched.

WM contends that the landfill was never unstable and that the site has always been safe. However, to address the small area of ash monofill that had a factor of safety less than permitted by the DOH, a berm was constructed and completed in 2005. The basis for WM's contention are geotechnical studies and analyses that have been performed by third party professional firms whose work has been reviewed by independent, nationally recognized engineering professionals.

4.3.2.1.8 On the Community Benefits Package

If the package is going to have elements that merely replace funds that should have been spent in the community anyway (e.g. park maintenance), then it's a farce.

Leave the decision to the community as to how the money is spent. People who don't have to live with the problem should not control those decisions.

There is absolutely no reason not to include Makakilo as a recipient. They live next to the landfill. How does the WGSL affect the people living Ewa? Yet, they are recipients and the community of Makakilo is not.

If truth be told, the only communities that are directly affected by WGSL are Honokai Hale and Ko 'Olina; the communities indirectly affected are Makakilo, Kapolei, and the residents who pass by going further out Leeward.

I'm not sure I even want to discuss a "better" community package. As soon as we start "negotiating" a community package, we will surely have to keep the landfill. We'll get bought off. There's too much money being made by the City at the landfill.

ENV notes that the benefit package thus far has been $2.7 million in 2007 and will be $2.0 million in 2008. They expect that participation and benefits will continue to evolve as they gain experience in working with the community.

4.3.2.2 People Who Favor Extending the WGSL Landfill Operation

4.3.2.2.1 On the City's Decision

We need a landfill on the island, even if we have other successful alternative technologies. WGSL has more room for expansion; the investment is already made there. Honolulu town has had its share of landfills as has Windward Oahu. It's just logical to extend the use of WGSL.

I support the full use of the Waimanalo site before any other site is considered. Anything else would be a terrible waste of money and resources.

Discussions with people opposed to the continuing operation of WGSL indicates that they believe the financial investment is not sufficient to offset the burden placed on the communities of Ewa and the Leeward Coast. They further indicate that this investment might have been more aggressively fought if they did not believe the previous administrations that indicated that the WGSL would be closed.

5. SOCIAL-ECONOMIC IMPACTS

5.1 IMPACTS ON PUBLIC FACILITIES AND SERVICES

In this section, the social impacts expected from the Preferred Alternative are presented for consideration in decision-making. The sources of information were the published annual reports and direct discussions with agency personnel.

5.1.1 Police Protection

5.1.1.1 Existing Conditions

Honolulu Police Department (HPD) District 8 encompasses the Waianae Coast, Makakilo, Ewa Plains, and the City of Kapolei. District 8 has 19 beats, shown in Exhibit 4-B. The district headquarters is in Kapolei, while a substation in Waianae provides a base of operations for officers patrolling the Waianae Coast.

5.1.1.2 Future without Proposed Action

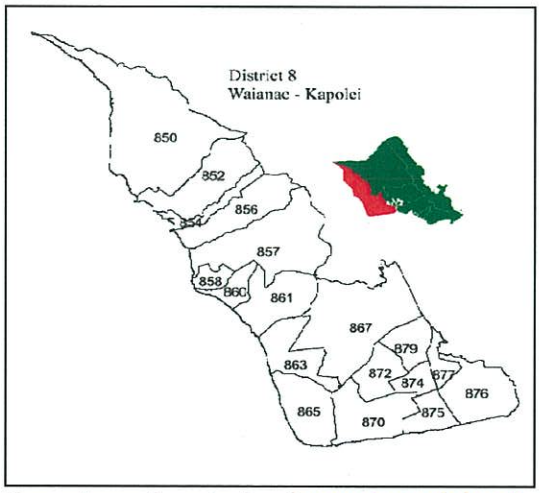
The Honolulu Police Department has found it difficult to fill its ranks in the face of budgetary limits. This situation seems unlikely to change greatly.

5.1.1.3 Future with Project

During a one year time period, April 2006 – April 2007, in the area immediately surrounding WGSL, there were a total of 41 documented nuisance complaints received by HPD, but they could not be specific on what types of complaints nor to whom they were attributable. Since April of 2007, HPD's records show only one complaint in the area. This is consistent with WM complaints logs, which indicate 14 complaints in 2006 and only 4 complaints in 2007. Complaints made to WM may not be made to the police and vice versa.

Extension of the landfill operations should not result in any additional burden to the Honolulu Police Department.

Exhibit 5-A: Honolulu Police District 8



SOURCE: Honolulu Police Department website (www.honolulupd.org/).

5.1.2 Fire Protection

5.1.2.1 Existing Conditions

The Honolulu Fire Department's Fourth Battalion, as shown in Exhibit 5-B, serves leeward Oahu. The Kapolei Fire Station, Station 40, also serves as the headquarters for Battalion 4. The headquarters building houses an engine and a ladder truck. Station 28, in Nanakuli, has an engine and a tanker. Station 26, the Waianae Fire Station, has an engine, a quint truck (with pump and ladder), and tanker. Also housed in this fire station are the Waianae EMS units. The Makakilo Fire Station (No. 35) has a single engine.

The Fire Department has worked successfully with WM in the past supplying equipment to help fight area brush fires outside of the landfill property (no fires have occurred from within the landfill itself).

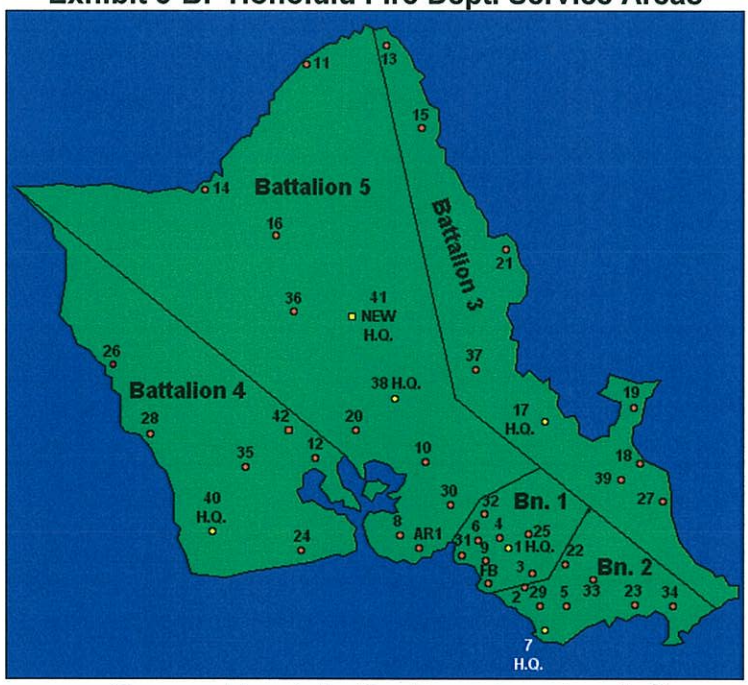
5.1.2.2 Future without Proposed Action

No change in services is expected over the course of the next few years.

5.1.2.3 Future with Proposed Action

The Honolulu Fire Department has asked that WM maintain adequate access for fire apparatus and indicates that WM is complying. As long as WM continues to provide adequate access, the Fire Department foresees no necessary additions as a result of the WGSL expansion.

Exhibit 5-B: Honolulu Fire Dept. Service Areas



Source: Honolulu Fire Department website (http://www.honolulu.gov/hfd/index.htm)

5.1.3 Emergency Services

5.1.3.1 Existing Conditions

In Leeward Oahu there are currently three EMS locations as well as one of the island's two Rapid Response locations. EMS is found at Waianae Fire Station, in Nanakuli along Farrington Highway, and Makakilo in Kapolei. The island's first rapid response location is at St. Francis West Hospital.

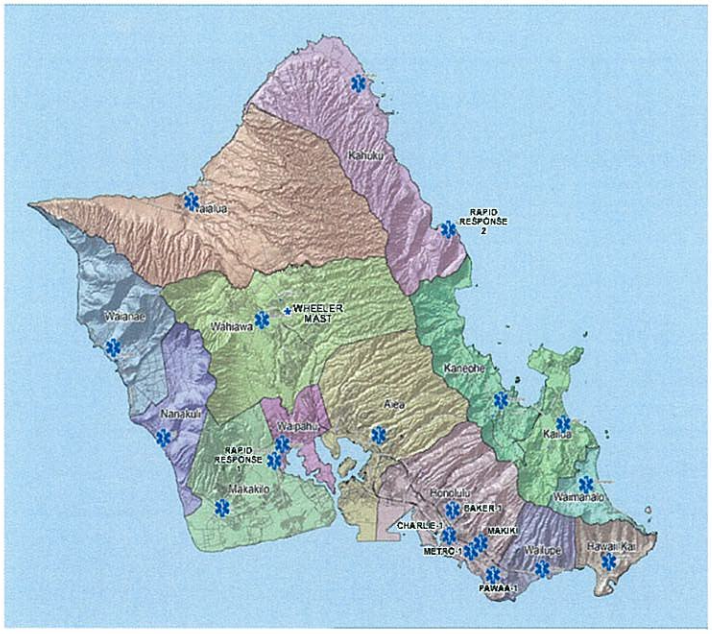
5.1.3.2 Future without Proposed Action

The landfill and its surrounding communities are adequately serviced by EMS services.

5.1.3.3 Future with Proposed Action

Expansion of the WGSL will not add new residents and, according to Waste Management, only 5 – 12 additional contract workers to the site. This will not significantly impact the quality of service currently available for those on the Leeward Coast.

Exhibit 5-C: Oahu EMS Locations



Source: Department of Emergency Services website (http://www.honolulu.gov/esd/ems/emsorg.htm)

5.1.4 Education

5.1.4.1 Existing Conditions

Leeward Oahu has seen growth in school populations and schools in recent years, notably in Kapolei where new middle and high schools have opened. Availability of primary school space remains a problem. Two schools are located in the landfill site vicinity, Makakilo Elementary and Mauka Lani School.

Mauka Lani School having no complaints or staff concerns about WGSL nor do they report any incidences of odor or children feeling ill at school.

5.1.4.2 Future without Proposed Action

Development in the Kapolei area will lead to an increase in population, eventually causing the need for additional school locations.

5.1.4.3 Future with Proposed Action

Expansion of the WGSL Sanitary Landfill will not create a need for additional elementary schools, nor will it affect existing elementary schools differently than they are affected at the present time.

5.1.5 Library Services

5.1.5.1 Existing Conditions

Hawaii's public libraries are operated by the State Department of Education. Libraries are open in Waianae, Ewa Beach and Kapolei.

5.1.5.2 Future without Proposed Action

Due to limited funds, hours at libraries throughout Hawaii have been reduced in recent years. No additional libraries have been announced as planned.

5.1.5.3 Future with Proposed Action

No impact on library services is anticipated.

5.1.6 Parks and Recreation

5.1.6.1 Existing Conditions

There are parks situated in Waianae, Maili, and Nanakuli, and throughout the major residential zones of Ewa. Also, beach parks are located along the Waianae Coast at the tip of Barbers Point (in the Campbell Industrial Park) and in Ewa Beach. Odor issues and occasional airborn trash at nearby beach parks are the only reported issues caused by the current operations of the landfill. In the past, outdoor recreation at Ko Olina has been limited during occasions when odor was a problem.

Long-term WGSL may one day be used as a reclaimed recreational facility much like Ala Moana Park and Honolulu Waterfront Park.

5.1.6.2 Future without Proposed Action

After the closure of Barbers Point, much of the Navy land was conveyed to the City of Honolulu for eventual redevelopment as recreation and sports facility. Funds for significant new developments have not been allocated, so major changes are not likely in the next few years.

5.1.6.3 Future with Proposed Action

An expanded WGSL does not generate any additional demand on area parks. If odor issues and litter issues are adequately addressed, expansion and continued use of WGSL will have no impact on the use of nearby parks.

5.1.7 Medical Services

5.1.7.1 Existing Conditions

Leeward Oahu is served by St. Francis West, a 100-bed hospital with 24 Emergency Service located outside Waipahu, the Waianae Coast Comprehensive Health Clinic between Nakakuli and Waianae and clinics in Kapolei maintained by other health care providers.

5.1.7.2 Future without Proposed Action

SMS knows of no major changes in medical services planned for the study area.

5.1.7.3 Future with Proposed Action

No impact is anticipated.

5.2 OTHER SOCIAL IMPACTS OF NOTE

5.2.1 Positive Social Impacts

5.2.1.1 Reduced Impact on Other Oahu Communities

Unless a package of alternatives can feasibly process MSW and refuse currently handled by the WGSL, a landfill will still be needed. Without it, the health, sanitation and aesthetic issues associated with unprocessed waste or uncontrolled dumping will burden the entire island.

In addition, moving the current landfill operation to another Oahu location, merely shifts the adverse impacts to another community, still requiring that the issues of litter, traffic, odors, and visual pollution be addressed and managed.

5.2.2 Negative Social Impacts

5.2.2.1 Department of Health Issues

In February 2006, the Department of Health proposed one of the largest environmental fines ever against the City: Eighteen violations were identified in DOH's six-month investigation. According to WM, all but two violations were corrected in 2006. The final two, 1) failing to measure leachate levels and to maintain these records and 2) exceeding permitted grades were deemed corrected as of September 26, 2007 and February 20, 2008 respectively. The violations included:

Exhibit 5-D: DOH Notices & Finding of Violations

Count	*Alleged Violation*	*Dates of Last Alleged Violation*	*Compliance Status*
1	Exceeding Permitted Grades	2/20/08*	In compliance
2	Failure to submit Annual Operating Reports in a Timely Manner	2/22/2005	In compliance
3	Failure to Place Daily Cover on the Active Face of MSW Landfill	6/9/2005	In compliance
4	Failure to Place Intervediate cover Material on the Ash Monofil	6/29/2005	In compliance
5	Exceeding Leachate Head on th4e Liner in Ash Monofill	6/15/2005	In compliance
6	Exceeding Leachate Head on Liner in MSW Cell E-1 Sump	6/22/2005	In compliance
7	Failure to Measure Leachate Levels and to Maintain Records on Leachate Levels in Cell 4B Sump	9/26/07*	In compliance
8	Failure to Measure Leachate Levels and to Maintain Records on Leachate Levels in Ash Monofill Sump	2/9/2005	In compliance
9	Failure to notify DOH of Noncompliance on Equipment Blockage in MSW Cell 4B Leachate Lateral line and inability to Measure Leachate Levels	6/22/2005	In compliance
10	Failure to Notify DOH of Noncompliance in a Timely Manner on the Exceedances of Permitted Grades and submission of the annual Operating Reports (AOR's)	2/22/2005	In compliance
11	Unauthorized Storage of Material on the Ash Monofill	3/2005	In compliance
12	Failure to Manage and Ban the Acceptance of Special Waste	5/19/2005	In compliance
13	Failure to Maintain Records and Record Location of Asbestos Disposal at the Landfill	7/2/2005	In compliance
14	Failure to Cover a Dead Animal	2/17/2005	In compliance
15	Failure to Submit annual Surface Water Management Plan	9/1/2005	In compliance
16	Failure to Control the Generation of Dust from Vehicular Traffic	2/17/2005	In compliance
17	Failure to Minimize Free Litter Generation in the Landfill	6/24/2005	In compliance
18	Failure to Monitor Explosive Gasses and Maintain Monitoring Records	2004	In compliance

* Date that DOH deemed WGSL in compliance.

5.2.2.2 Property Values

The 2002 Socio-Economic Impact Assessment of WGSL Sanitary Landfill Expansion presented property value results that were not necessarily in line with what experts and the public at large would have expected.

Research found that single-family homes fit the hypothesis that property values increase with distance from the landfill up to a distance of about three miles. However, the condominium analysis shows a significant correlation of increased value and proximity to the landfill – the opposite result.

Condominium property values are higher near WGSL due to the location of the condominiums, Ko Olina. According to the Ko Olina website, "Ko Olina Resort & Marina's residential development will be Hawaii premier location for homebuyers across the word and for local residents…Ko Olina will provide a feeling of luxury in a private community…"

5.2.2.3 Diminishing Community Trust

The failure to follow through on commitments from the City to close WGSL may be having an impact in eroding public trust and increasing cynicism toward City government. This is happening in the fastest growing community on the island where private-public partnerships are necessary to ensure sensible and well-managed growth.

The problem is being complicated by a "community-benefits package" proposal with which both proponents and opponents of the landfill who were interviewed expressed some hesitation. There appears to be general agreement among them that there has been insufficient community involvement in questions surrounding "who should benefit?", "what impacts are being addressed?", and "what services are appropriate?"

5.2.2.4 Environmental Injustice

"Environmental Injustice: An environmental injustice exists when members of disadvantaged, ethnic, minority or other groups suffer disproportionately at the local, regional (sub-national), or national levels from environmental risks or hazards, and/or suffer disproportionately from violations of fundamental human rights as a result of environmental factors, and/or denied access to environmental investments, benefits, and/or natural resources, and/or are denied access to information; and/or participation in decision making; and/or access to justice in environment-related matters." [11]

A number of interviewees point out that Leeward Oahu has been and continues to remain on the receiving end of many of Oahu's burdens. They argue that within a 10-mile stretch along Farrington Highway there are two separate landfills handling hazardous[12], construction and municipal waste, as well as an two existing electrical plants, a proposed new generator unit at the Campbell plant, a deep draft harbor and a major industrial park, all of which service the entire Island of Oahu -- all of which adversely impact the environment of these communities. Further, Leeward Oahu is now the home of thousands of homeless people, many of whom were driven out of other communities only to be "welcomed" and "tolerated" on the Leeward Coast. They argue that the continued use and expansion of WGSL will only increase the imbalance of those impacts on Leeward Oahu.

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[11] Wikipedia *Environmental Justice* http://en.wikipedia.org/wiki/Environmental_justice

[12] Note: WGSL does not accept hazardous waste for disposal.

Proponents of keeping the landfill in operation point out that the siting of the landfill occurred long before the siting of the other examples noted above and had nothing to do with the demographics of the people in surrounding communities. Furthermore, the surrounding communities also accommodate one of the most beautiful resort complexes on Oahu, abutting the ever-expanding Second City of Kapolei. This is the fastest growing region on Oahu and WGSL does not appear to have stymied its growth. They believe that this is not indicative of a community suffering from environmental injustice.

Data from Exhibit 2-D would appear to support this position. Although the median household income in the Waianae DPA ($42,451) is below the island average ($51,194), the median household income in the Ewa DPA ($59,583), in which the WGSL is located, exceeds the island average. Additionally, the median household incomes for the two communities immediately surrounding the landfill all significantly exceed the island averages. These are Makakilo ($88,515) and Ko 'Olina/Honokai Hale ($74,083).

Finally, Windward Oahu residents note that for the last 40 years most of the active landfills were on the Windward side of the island. It is only recently that WGSL has been the only major landfill for MSW on Oahu.

These arguments are all worth taking into account as decision-making proceeds.

5.3 Economic Impact

5.3.1 Approach and Terminology

This economic impact section reviews the impacts that this project will contribute to the economic environment. Technical terms are used here to distinguish impacts of several sorts. First, in economic analysis, a distinction is made between impacts of the actual construction and operations of a project, and the effects of project-related spending throughout the local economy. In discussions of jobs, earnings, and taxes, three broad types are distinguished:

- *Direct* jobs/earnings/taxes are immediately involved with construction of a project or with its operations. It is important to note that direct jobs are not necessarily on-site: construction supports company personnel in offices and base yards, as well as on-site.
- *Indirect* jobs/earnings/taxes are created as <u>businesses</u> directly involved with a project purchase goods and services in the local economy.
- *Induced* jobs/earnings/taxes are created as <u>workers</u> spend their income for goods and services.

Direct, Indirect and induced economic impacts in Hawaii can be estimated using multipliers from a model of input-output relations developed and refined by State researchers.

It is also important to understand that although construction has a positive impact on the state economy, funds for this expansion will be generated from the tipping fees assessed to haulers for the use of the landfill. These tipping fees are translated to the consumers and business through maintenance fees and collection fees. As a result, financial resources for this construction will come from a reallocation of funds that are already a part of the Hawaii State economy rather than out-of-state investment. The reallocation of state monies results in a negative impact on jobs, earnings and taxes. These positive and negative impacts must be considered, in order to gain a clear picture of the economic impact of the WGSL expansion.

5.3.2 Employment And Earnings

5.3.2.1 Construction

Expansion of WGSL is expected to take 10 years to complete. This expansion will result in an increase in the capacity of the landfill and is expected to increase the life expectancy of the landfill by 15 or more years.

Pending the receipt of final engineering figures, the construction of the expansion has been estimated at $86,000,000 over ten years, with expenditures spread consistently over those ten years. The construction estimates were determined through discussions with officials from Waste Management of Hawaii Inc., the current operator of WGSL. The expansion is planned in several stages. Each stage and year of construction will result in approximately the same level of construction spending.

5.3.2.2 Employment

Construction spending will create jobs and spending in related industries. Exhibit 5-E shows that the direct jobs created as a result of this project will include some 746 person-years of employment[3] over the ten-year construction period. Direct jobs are not necessarily located on-site. As a rule of thumb, about 20% of direct construction jobs are off-site (in base yards, offices, and the like).

Indirect and induced jobs are also created throughout the state. These are likely to be concentrated in commercial and/or industrial centers, rather than near a job site. In addition, this project will support some 328 indirect and 720 induced person-years of employment. In total, approximately 1,795 person-years of employment will be created as a result of the WGSL expansion.

Exhibit 5-E: Economic Impact – Positive Impact on Jobs

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative
Infrastructure											
Construction spending 1	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	86.0
Direct Jobs 2	85	82	79	77	74	72	69	69	69	69	746
Indirect Jobs	37	36	35	34	33	32	31	31	31	31	328
Induced Jobs	82	79	77	74	72	69	67	67	67	67	720
Total Jobs	**204**	**197**	**191**	**184**	**178**	**172**	**167**	**167**	**167**	**167**	**1,795**

[1] In millions of 2006 constant $, [2] person-years of employment

Source: DBEDT: State Input – Output Study 2002

[3] Person years of employment is the number of full time equivalent positions required to complete the work defined by the estimated cost of construction during the specific period of time.

This, however, is not the net impact of this project. Remember that this project will result in a reallocation of funds that could be otherwise spent in other areas of the economy. The cost of construction is generated by revenue received from tipping fees and these fees are translated to Hawaii consumers; therefore, one must account for the negative impact associated with this project. Since tipping fees are translated to consumers, it can be inferred that this expansion will have a negative impact on personal consumer expenditures. A reduction in personal consumer expenditures results in a negative impact on jobs, earnings, and tax revenues. Exhibit 5-F shows the negative impact on jobs associated with this project.

Exhibit 5-F: Economic Impact – Negative Impact on Jobs

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative
Direct Jobs Lost [1]	72	72	72	72	72	72	72	72	72	72	721
Indirect Jobs Lost	15	15	15	15	15	15	15	15	15	15	147
Induced Jobs Lost	31	30	29	28	27	27	26	26	26	26	275
Total Jobs Lost	**117**	**117**	**116**	**115**	**114**	**113**	**113**	**113**	**113**	**113**	**1,143**

[1] person-years of employment

Source: DBEDT: State Input – Output Study 2002

As shown in Exhibit 5-G, the WGSL expansion will result in a net positive impact. Despite the negative impact associated with the expansion some 651 direct, indirect and induced person-years of employment will be created as a result of this project.

Exhibit 5-G: Economic Impact – Net Impact on Jobs

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative
Direct Jobs Net	13	10	7	5	2	(0)	(3)	(3)	(3)	(3)	25
Indirect Jobs Net	23	21	20	19	18	17	16	16	16	16	181
Induced Jobs Net	51	49	48	46	44	43	41	41	41	41	445
Total Jobs Net	**87**	**81**	**75**	**70**	**64**	**59**	**54**	**54**	**54**	**54**	**651**

Source: DBEDT: State Input – Output Study 2002

5.3.2.3 Earnings

Positive workforce earnings associated with the project's construction will amount to $59.6 million in direct earnings and $40.1 million indirect and induced earnings (as shown in Exhibit 5-H). The total positive impact on direct, indirect, and induced earnings associated with all construction will be about $99.8 million.

As with employment, this project will also have negative impacts on earnings. As shown in Exhibit 5-I a total negative impact on earnings of approximately $36.5 million can be expected.

This project will result in an overall positive impact on earnings. In total approximately $63.3 million in earnings will be generated as a result of this project. See Exhibit 5-J.

Exhibit 5-H: Economic Impact – Positive Impact on Earnings

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative
Construction Earnings [1]											
Direct earnings	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	59.6
Indirect earnings	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	14.3
Induced earnings	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	25.8
Total	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**	**99.8**

[1] in millions of 2006 constant $

Source: DBEDT, State Input - Output Study, 2002

Exhibit 5-I: Economic Impact – Negative Impact on Earnings

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative
Earnings											
Direct earnings lost	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	19.3
Indirect earnings lost	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	7.7
Induced earnings lost	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	9.4
Total Lost	**3.6**	**3.6**	**3.6**	**3.6**	**3.6**	**3.6**	**3.6**	**3.6**	**3.6**	**3.6**	**36.5**

Source: DBEDT, State Input - Output Study, 2002

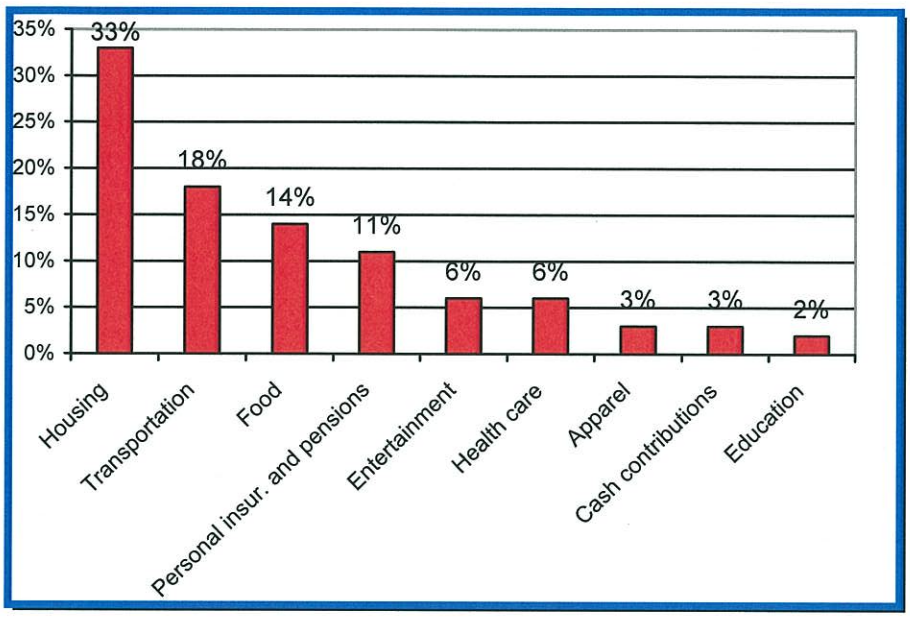
Exhibit 5-J: Economic Impact – Net Impact on Earnings

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative
Earnings											
Direct earnings - Net	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	40.3
Indirect earnings - Net	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	6.6
Induced earnings - Net	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	16.4
Total Net	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**63.3**

These earnings will boost the local economy, as many of these dollars will be used to purchase goods and services from other industries. Exhibit 5-K shows Honolulu consumer spending patterns to illustrate how earnings may be used.

Housing costs such as shelter payments and utilities account for more than 33 percent of consumer expenditures. Food and transportation also account for a large amount of consumer spending (14 and 18 percent respectively). It can be expected that these patterns will continue in the future creating economic growth in several industries as a result of this project.

Exhibit 5-K: Consumer Spending Patterns by Industry – 2003-2004



Source: US Census 2000, State of Hawaii Data Book 2005

5.3.3 Fiscal Impacts

5.2.3.1 State Of Hawaii

Construction spending has an impact on state tax revenues. Exhibit 5-L displays estimated positive impact on state tax revenues as a result of the WGSL Expansion.

Exhibit 5-L: Positive Impact on State Tax Revenues

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative
State Taxes [1]											
Direct	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	3.18
Indirect	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	2.34
Induced	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	4.90
Total	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**10.42**

[1] in millions of 2006 constant $

Source: DBEDT, State Input – Output Study, 2002

The expansion cost is estimated at $86 million and this construction will result in $3.2 million in direct state tax revenues. The indirect and induced impact of this project will result in $6.2 million in state tax revenues. In total, this project will result in an estimated positive impact of $10.4 million in state tax revenues.

As shown in Exhibits 5-M and 5-N, the total impact on state tax revenues will be positive. Approximately $6.6 million in state tax revenue will be lost as a result of this project. In total, there will be a small **positive** impact in state tax revenues of approximately $3.8 million during the 10 years of construction.

Exhibit 5-M: Negative Impact on State Tax Revenues

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative
State Taxes [1]											
Direct lost	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	3.84
Indirect lost	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.98
Induced lost	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	1.79
Total Lost	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**6.61**

[1] in millions of 2006 constant $

Source: DBEDT, State Input – Output Study, 2002

Exhibit 5-N: Net Impact on State Tax Revenues

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative
State Taxes [1]											
Direct Net	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.67)
Indirect Net	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	1.36
Induced Net	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	3.11
Total Net	**0.38**	**0.38**	**0.38**	**0.38**	**0.38**	**0.38**	**0.38**	**0.38**	**0.38**	**0.38**	**3.80**

[1] in millions of 2006 constant $

Source: DBEDT, State Input – Output Study, 2002

In sum, the economic impacts of the expansion appear to be net positive with approximately $63.3 million net flowing directly and indirectly through the economy and $3.8 million of net tax revenues being raised. All of the income is a result of the 10-year construction period. Waste Management does not believe the expansion will result in the need for new hires or other increased operating costs.

This socioeconomic analysis did not take into account any indirect or induced economic effects of the landfill operation on surrounding businesses. There was insufficient, verifiable information available at the time of the compilation of the report. As noted, the residential sales program at Ko Olina has been successful. If it could have been more successful without the landfill is speculative.

6. MITIGATIONS

Mitigation measures are normally considered in anticipation of potential impacts. In the case of the WGSL, where there is history, as well as existing practices, one can observe the current impacts, and propose measures that go beyond mitigation measures already practiced by Waste Management, Inc. (WM) and the City.

The measures proposed below can be grouped into three areas: improving the measures currently practiced regarding irritants and safety; improving community involvement and communication; and committing to funding the necessary research and development into alternative solutions.

6.1 IMPROVING CURRENT PRACTICES

6.1.1 Views

- *WM should continue to implement the on-site landscaping plans that have already been developed and begun; especially for those areas facing south toward Ko-Olina.*

  Because of its elevation, the most obvious views of the landfill are from a distance. Berms obscure much of the operations, but the face of the berms are exposed dirt (hydro seeding has occurred, but the grass has not yet taken), and aspects of the operation are still visible. Plans have been developed to landscape the exposed areas and to shield the view of operation, and initial plantings have already begun in earnest. These should continue.

- *WM should design and implement landscape screens (e.g. pines, tall hedges) along the berm and the access road that is visible from Farrington Highway, fronting the Kahe Power Plant. As an alternative, WM might also consider entering into a partnership with HECO to plant an effective screen of trees along Farrington Highway, which would have the dual purpose of screening the landfill operations and the power plant from passing vehicles.*

  The west-facing stability berm along the upper access road shields some of the operations, but not all of it. Selected plantings, consistent with the areas natural growth (e.g. keawe) could effectively complete the visual buffer. If that is not feasible, consider plantings right along the highway that would serve the dual purpose.

6.1.2 Odors

- *WM and the City should continue to be vigilant in processing the sludge from the sewage treatment plants upon delivery and to take all means to reduce any odor impacts.*

  In recent months, the combined impact of immediate processing, diversion of some of the sludge to the Synagro-WTT facility, and the improved operation of the odor neutralizing mist system appear to have had a significant impact. Continued vigilance is required. In addition, any successful expansion of the composting or fertilizer conversion efforts will also reduce the amount of sludge delivered to the landfill, and reduce the possibility of odor problems.

6.1.3 Litter

- *WM must continue to monitor the egress and ingress of vehicles and continue to aggressively enforce the anti-littering regulations and fines.*

  WM has instituted inspection practices that monitor commercial trucks upon entering and leaving the landfill area, to ensure that their loads are secured upon entry and that the trucks are free of debris before exiting. WM policy prohibits repeat violators from entry to the landfill. These inspections are beneficial and must continue aggressively.

  The greater problem may be with ordinary citizens who are personally delivering their trash, and who are not adequately securing their loads. An aggressive education program by ENV and WM should be implemented to supplement the inspections.

- *ENV and WM should maintain a direct communication link with the HPD; in the case of littering, it will lead to faster, more effective response.*

  In a general sense, for all types of complaints, a good communication link between HPD and WM/ENV will only increase the responsiveness to the problem and reduce public anxiety with the operation. This could simply take the form of exchanging key telephone or email contacts. An important first step would be the participation of HPD on the Oversight Advisory Committee.

  On the specific problem of littering, before truck drivers enter the landfill and after they leave, WM has no control over the actions of the truck drivers. Although WM educates and informs the drivers that they will enforce the covered load policy, the issue becomes a public one once the truck is on the roadway. If complaints are received by WM or ENV and quickly reported to HPD, the offenders may be more effectively identified and prosecuted.

6.2 IMPROVING COMMUNITY INVOLVEMENT AND COMMUNICATIONS

6.2.1 Community Involvement

- *The City must find a way to effectively use the Oversight Advisory Committee.*

  The Oversight Advisory Committee allows for building relationships that are so important in addressing community concerns. But it takes time and a commitment of people to the effort. Websites and telephone communication are important complements, but face-to-face meetings build community bonds. In 2007, the Oversight Advisory Committee went through a period of having difficulty getting a quorum for its meetings. The City must find ways to stimulate attendance and participation; some ideas include rotating membership, more tours and education of the members, and so forth.

- *The City should continue to contribute to a community benefits package for as long as the landfill exists.*

  The impacts that lead to a benefit package are evident as long as the WGSL exists. The package can vary in size and content over time as the community and the City determine. The City might also consider using a variety of means to establish the priorities of the benefits package, including open communicy forums, surveys, and maintaining a suggestion link on the website.

- *Ensure that all directly affected communities are represented on the Committee that determines the benefits package.*

  There is a perception that the Committee that determines the benefits package does not include representation from all neighboring communities. If that is already the case, then this needs to be made known. Consider placing the names of the Committee members on the web site.

6.2.2 Web-site

- *WM/ENV should use its web sites aggressively as educational and communication tools..*

  Uncertainty is often the cause of increasing community concern; communication is usually the most effective remedy. Many of the people interviewed were unfamiliar with the Waimanalo Gulch location on the WM website and did not know that there was an avenue for electronic communication, a staple in today's world of communication. Slight improvements on what is basically a good web site and greater education as to its availability will help maximize its use as a communication tool.

6.3 COMMITTING TO ALTERNATIVES

6.3.1 Alternatives to Landfills

- *The City should continue to invest in Research and Development, and where feasible, implement alternative technologies that will result in a reduction in the City's dependency on a landfill.*

  Although the short term would appear to require a continual dependence on H-POWER and landfills, the long-term future will likely involve a mix of these elements together with transshipment, recycling and other waste processing technologies. The sooner the City brings these alternatives on line, the sooner the dependency on landfills will be reduced.

6.3.2 Alternative Locations

- *The City should continue to seek an alternative site to WGSL as the primary landfill location on Oahu.*

  Regardless of the technologies involved, everyone anticipates that a landfill will always be needed. Every viable process that has been proposed to reduce dependency on a landfill has excluded waste that cannot be recycled or further process; additionally, a landfill will always be required for process residue and for emergencies.

The history of landfills on Oahu teaches that landfills have worked best on the edge of urbanization. Urbanization is quickly catching up with WGSL as the second city grows and Ko' Olina expands.

Prior commitments to close WGSL will weigh heavily on the relations between the City and the communities of Ewa and the Leeward Coast. The City should make every effort to initiate the plan for selectioin of Oahu's next landfill site as soon as possible. Participation in this effort should include not only the potentially affected community in which the site is proposed, but all the communities of Oahu. In addition to safety and design issues, details on mitigation to address nuisance concerns like odor, litter, and visual aesthetics should be actively discussed and the solutions offered made a part of the record.

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Appendix K

Alternatives Analysis
Waimānalo Gulch Sanitary Landfill Expansion, 2008

Alternatives Analysis for Disposal of Municipal Refuse

Submitted to the Department of Environmental Services (ENV),
City and County of Honolulu

Pacific Waste
CONSULTING GROUP

April 2008

Alternatives Analysis for Disposal of Municipal Refuse

Submitted to the City and County of Honolulu
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Abbreviations & Acronyms

APHIS	US Department of Agriculture Animal and Plant Health Inspection Services
BWS	City and County Board of Water Supply
C&C	City and County of Honolulu
DOH	Department of Health
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparation Notice
ENV	Department of Environmental Services
HIS	Hawaii Information Systems
HI5	Beverage containers subject to State's recycling law
HWS	Hawaii Waste Systems, LLC
IDS	Information Decision Systems
LUC	Land Use Commission
MFD	Multi–family dwelling
MSL	Mean sea level
MSW	Municipal solid waste
OEQC	Office of Environmental Quality Control
OIP	Office of Information Practices
PPQ	Local office of USDA, APHIS
PRER	Pacific Rim Environmental Resources, Inc.
PWED	Public Works & Economic Development Committee

RCRA	Resource Conservation and Recovery Act
RDF	Refuse Derived Fuel
RFP	Request for Proposal
SUP	Special use permit
SWIMP	Solid Waste Integrated Management Plan
TCLP	Toxicity Characteristic Leaching Procedure
TMK	Tax map key
TPD	Tons per day
TPY	Tons per year
UIC	Underground Injection Control
USEPA (or EPA)	Unites States Environmental Protection Agency
WTE	Waste-to-energy

Executive Summary

This analysis reviews the alternatives for replacing the Waimanalo Gulch Sanitary Landfill before November 1, 2009 when the Special Use Permit (SUP) issued by the State Land Use Commission (LUC) to operate the landfill expires. On January 16, 2008 the Planning Commission extended the date of permit expiration to May 2010 to allow time for processing the permit request supported by this *Waimanalo Gulch Sanitary Landfill Expansion Environmental Impact Statement* (EIS). A request for extension was approved by the LUC on March 7, 2008 to allow operation of the landfill until November 1, 2009.

The "Project," for EIS purposes, is to "... provide information and evaluation of the potential for environmental impacts on the natural and built environment associated with the planned 92.5-acre expansion of the Waimanalo Gulch Sanitary Landfill...."[1] when the landfill receives the expansion permit.

1.1 Alternatives to the Proposed Project

The alternatives evaluated were:

- No action — Landfilling at the Waimanalo Gulch Sanitary Landfill would cease on November 1, 2009, with no alternative site or technology available.
- Delayed action — The action on the permit would be delayed. Given the time needed to process the permits, the delayed and no action alternatives have the same effect.
- Transshipment — Oahu's MSW would be baled and transported to a mainland landfill for disposal.

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1 *Environmental Impact Statement Preparation Notice, Waimanalo Gulch Sanitary Landfill Expansion, Waimanalo Gulch, Oahu, Hawaii, TMKs: (1) 9-2-003: 072 and 073,* November 2006.

- Alternative technologies — Technologies other than landfilling that could reduce the amount of material requiring disposal and generate electricity or another beneficial reuse product. Alternative technologies considered here include:
    - Thermal and non-thermal technologies;
    - Enhanced recycling;
    - Addition of a third boiler to H–POWER; and
    - Alternative methods of landfilling, such as co-disposal of ash and MSW and use of a bioreactor landfill.
- Alternative sites — Alternative locations on Oahu for the landfill. The five alternative landfill sites considered in this analysis were:
    - Ameron Quarry;
    - Maili Quarry;
    - Makaiwa Gulch;
    - Nanakuli B; and
    - Waimanalo Gulch Sanitary Landfill.

An analysis is provided for each of the alternatives. With the alternative technologies, some operating examples are used to provide information describing the technologies. Much of the analysis was taken from the December 2003 report of the Mayor's Advisory Committee on Landfill Site Selection. That report provided details of the process to identify a future landfill site to disposes of the waste. Since completion of the report several factors have changed (e.g., updated estimate of the cost of two of the sites, current construction on one site) but the order of the four of the sites with respect to their suitability of the land for use as a landfill did not change. The fifth site, the Makaiwa Gulch site, is under construction for another use and, as a result, it might not be included on a future list of potential landfill site.

All of the alternatives were compared to criteria the City and County of Honolulu (C&C or City) had established for the alternative technologies, the alternative landfill sites, or transshipment. In the case of the alternative sites, the requirements were established by the Mayor's Advisory Committee report in December 2003, which was an independent panel comprised of citizens and legislators from several areas of the island. The requirements for alternative technologies were established in the City's

January 16, 2007 Notice to Bidders.[2] The transshipment alternative requirements were established in the City's January 22, 2008, Notice to Bidders.[3]

1.2 Preferred Alternative

The preferred alternative is the Waimanalo Gulch Sanitary Landfill. However, the City is immediately pursuing another alternative, the expansion of H–POWER, by adding another boiler. [4]

> "I have said that my administration recognizes the need to reduce the amount of opala that goes to our landfill at Waimanalo Gulch. Adding a third boiler at H-POWER is one of the best ways to help us achieve that goal and is certainly a form of energy recycling," Hannemann said.[5]

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2 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.

3 City and County of Honolulu, Notice to Bidders, Shipping of City Provided MSW. January 22, 2008.

4 Johnny Brannon, City to Expand H-POWER Capacity, Honolulu Advertiser, January 18, 1008.

5 January 18, 2008 Mayor's press release regarding the City's decision to proceed with the third boiler at H–POWER.

2 Introduction

This Appendix details the analysis of alternative sites and technologies that could be used in lieu of the expansion of the Waimanalo Gulch Sanitary Landfill and is part of the EIS.

This analysis reviews the alternatives for replacing the Waimanalo Gulch Sanitary Landfill before November 1, 2009, when the SUP issued by the LUC to operate the landfill expires. As such, the alternative technologies and sites considered must be in operation by November 2009. It will be difficult to get an alternative in operation in 18 months (except possibly an expansion of H–POWER) given the time needed for environmental review, permitting, contracting, and construction.

At the same time, many of the alternatives discussed in this analysis hold great potential in helping to reduce the existing need for a municipal solid waste (MSW) landfill. However, while it is possible to reduce the use of landfill space through the adoption of alternative technologies or transshipment, there are no alternatives that will completely eliminate the need for an MSW landfill on the Island of Oahu. All waste reduction technologies generate by-products that cannot be further recycled. Even with the alternative of transshipment, there is concern over the need to maintain a self-sufficient facility to protect the public welfare in the event of a shipping strike, natural disaster, or other event not in the control of the City and County of Honolulu (C&C or City).

The "Project," for EIS purposes, is to "... provide information and evaluation of the potential for environmental impacts on the natural and built environment associated with the planned 92.5-acre expansion of the Waimanalo Gulch Sanitary Landfill...."[6] when the landfill receives the expansion permit.

The alternatives evaluated were: no action, delayed action, transshipment, alternative technologies, and alternative sites.

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6 *Environmental Impact Statement Preparation Notice, Waimanalo Gulch Sanitary Landfill Expansion, Waimanalo Gulch, Oahu, Hawaii, TMKs: (1) 9-2-003: 072 and 073,* November 2006.

2.1 City Requirements

This section discusses the City's requirements for a disposal system to manage its MSW. The disposal system needs to meet minimum criteria to be considered before the City will direct waste to it.

Examples of the criteria include; operations at the capacity needed to dispose the amount of MSW the proponents plan to accept, a record of compliance with environmental laws and regulations, and the necessary financial strength.

2.1.1 Transshipment of Waste

Transshipment is the packaging of Oahu's waste for shipment to a disposal site located off-island. The transshipment alternative requirements were established in the City's January 22, 2008, bid documents[7] and the C&C has received offers from transshipment firms. These firms propose sending Oahu's waste to Washington State to be landfilled at the Roosevelt Landfill (one firm) and to a landfill in Idaho. If the C&C were to begin transshipping Oahu's waste, requirements for the handling and storage may need to be modified if the Compliance Orders established by the federal government with one of the proposers is determined to be inadequate. The C&C would also need to look at the effects of transshipment on the H-POWER facility. With the shipment of Oahu's waste off-island, waste disposed in H-POWER may be reduced and revenue from the energy sold would diminish. Also, the MSW needed to fuel the new boiler could be inadequate.

2.1.2 Alternative Technology

The requirements for alternative technologies are identified in the City's Invitation for Bid issued to vendors of potential technologies on October 2, 2006. The requirements are detailed in Section 5.1 of this document and are summarized below. This Alternatives Analysis also uses these requirements as these are the minimum a vendor must meet for its technology to be considered by the C&C.

- "There is at least one operational facility that has been processing 500 tons per day (TPD) of municipal solid waste (MSW) for the past two years, and the vendor has been substantially involved in its design and operations.

- The facility has been fully operational and has met all performance and environmental compliance requirements 85 percent of the time during the two years of operation.

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7 City and County of Honolulu, Notice to Bidders, Shipping of City Provided MSW. January 22, 2008.

- The facility would substantially represent the system proposed for Honolulu without major modification or equipment changes, other than those needed for the scale up or scale down.

- The product produced at the facility has been marketed and resulted in the beneficial reuse of processed materials and/or production of energy.

- The vendor must demonstrate that it has power purchase contracts ongoing to be able to claim an ability to contract for sale of electric power to a utility.

- 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 has operated successfully at a minimum of 85 percent of rated capacity for at least 85 percent of the time during the past two years;

  (3) The equipment is regarded as being reliable and is not subject to excessive maintenance or operational problems and does not require major re-designs; and

  (4) The facility has processed a minimum of 500 TPD of MSW 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."

2.1.3 Landfill Site

The C&C has the following requirements that must be satisfied for an alternative landfill site to be acceptable:

- "The site must provide equal or better environmental protection than the Waimanalo Gulch Sanitary Landfill.

- The site must have the capacity to dispose of at least 15 years of refuse, considering the current disposal tonnage at Waimanalo Gulch Sanitary Landfill as the starting point and an assumed rate of growth in waste generation.

- The site must be convenient to the H-POWER plant to allow for cost-effective disposal of the ash, bypassed materials, and unacceptable waste.

- Development and operating costs must be reasonable when compared to other options."

These requirements were developed by the Mayor's Landfill Site Selection Committee in December 2003. The requirements were developed by the Mayor's Committee based primarily on local considerations and on federal and state criteria.

3 Oahu Refuse Disposal

Information about the system used by the C&C to manage waste and recyclables is needed as general background. Due to the preparation schedule for this EIS and the schedule for the C&C Solid Waste Integrated Management Plan Update (SWIMP), data from the November 2007 draft update was used for this document.

Information about the composition of the disposed waste is needed to analyze some of the programs and provide background to other discussions. The C&C studied the composition of the waste and the results are presented later. The final report was published with the November 2007 Draft SWIMP update.

3.1 Composition of Waste Stream

The composition of the disposed waste is based on hand-sorting randomly selected samples of the waste from garbage trucks. In 2006, the C&C studied the composition of the waste at H-POWER, the Waimanalo Gulch Sanitary Landfill, and the Keehi Transfer Station. Sampling took place at the Landfill on September 11–14, 2006, at Keehi Transfer Station on September 15–16, 2006, and at H-POWER on September 18–21, 2006.

Table 1 shows the composition of Oahu's waste from H-POWER and the Waimanalo Gulch Sanitary Landfill combined.

Table 1, Aggregate Overall Waste Characterization Results - 2006

Material	Mean	+/-	Mean (tons)	+/- (tons)
Total Paper	**30.2%**	**1.8%**	**284,082**	**17,040**
OCC (Recyclable)/Kraft	5.2%	1.1%	49,166	10,747
Newspaper	4.3%	1.1%	40,757	10,589
High-Grade Paper	2.6%	0.9%	24,420	7,993
Low-Grade Paper	5.1%	0.9%	48,151	8,012
Other Compostable Paper	11.7%	1.8%	110,142	16,582
Other Paper	1.2%	0.2%	11,446	1,896
Total Plastics	**12.1%**	**1.3%**	**113,821**	**11,808**
PET Bottles/Containers (Deposit)	0.3%	0.1%	2,843	578
PET Bottles/Containers (Non-Deposit)	0.3%	0.1%	2,449	646
HDPE Bottles/Containers	1.0%	0.3%	9,128	2,562
Other Bottles/Containers	1.1%	0.2%	10,142	1,818
Mixed Rigid Plastics	1.1%	0.4%	10,479	3,431
Plastic Film/Wrap	5.1%	0.7%	47,989	6,654
Polystyrene	0.8%	0.1%	7,056	1,371
Other Plastics	2.5%	0.4%	23,734	4,156
Total Metals	**4.8%**	**0.8%**	**45,448**	**7,151**
Aluminum Cans (Deposit)	0.3%	0.1%	2,626	632
Aluminum Cans (Non-Deposit)	0.3%	0.1%	2,630	1,351
Tin Cans	0.6%	0.2%	5,830	1,467
Other Ferrous	1.5%	0.4%	14,103	4,160
Other Non-Ferrous	0.4%	0.1%	4,148	1,020
Mixed Metals/Other Metals	1.7%	0.5%	16,111	4,660
Total Glass	**1.7%**	**0.4%**	**16,089**	**4,039**
HI5 Glass Bottles/Containers	0.4%	0.2%	4,158	1,589
Other Glass	1.3%	0.3%	11,930	3,102
Total Other Inorganics	**3.1%**	**1.2%**	**29,370**	**11,020**
Gypsum Board	0.3%	0.1%	2,760	1,280
Asphalt Roofing	0.5%	0.3%	4,261	2,609
Asphalt Paving	0.0%	0.0%	38	27
Concrete	0.3%	0.2%	3,078	1,535
Sand/Soil/Rock/Dirt	1.3%	0.8%	12,525	7,811
Ceramics	0.4%	0.2%	4,214	1,772
Miscellaneous Inorganics	0.3%	0.2%	2,496	1,445
Total Other Waste	**9.8%**	**1.6%**	**91,946**	**15,278**
Batteries	0.0%	0.0%	381	156
Furniture	3.4%	1.0%	31,555	9,795
Appliances	1.1%	0.7%	10,728	6,734
E-Waste	2.0%	0.7%	18,820	6,161
Auto Fluff*	3.2%	NA	30,462	NA
Total Green Waste	**8.7%**	**2.8%**	**82,041**	**26,182**
Total Wood	**4.5%**	**2.3%**	**42,273**	**21,884**
Untreated Wood	1.4%	0.5%	13,017	5,004
Treated Wood	2.1%	0.6%	19,428	5,371
Pallets	0.3%	0.1%	2,644	1,248
Stumps	0.8%	0.4%	7,185	3,473
Total Other Organics	**24.8%**	**2.1%**	**232,874**	**19,621**
Food	12.7%	1.9%	119,645	17,575
Textiles	3.1%	1.0%	28,726	9,136
Carpet	0.7%	0.3%	6,650	2,454
Tires	0.2%	0.1%	1,540	1,090
Miscellaneous Organics	3.7%	0.8%	34,569	7,578
Sludge	4.4%	NA	41,744	NA
Total HHW	**0.2%**	**0.1%**	**2,234**	**1,399**
Pesticides/Herbicides	0.0%	0.0%	0	0
Paints/Adhesives/Solvents	0.0%	0.0%	256	172
Household Cleaners	0.0%	0.0%	0	0
Automotive Products	0.2%	0.1%	1,711	1,221
Other HHW	0.0%	0.0%	277	147
TOTAL	**100.00%**		**940,187**	

* There was no auto fluff or sludge in the samples sorted for this study. As such, the standard deviation and the lower and upper bounds of the confidence interval are not applicable. The Waimanalo Gulch Sanitary Landfill is known to accept auto fluff and sludge and therefore the average composition for these materials was obtained from sources outside this study.

Table 2 shows the composition of waste being disposed at the Waimanalo Gulch Sanitary Landfill. The majority of the waste going into the landfill is from commercial and self-haul sources, rather than residential sources. 90 percent of the residential waste goes to H–POWER.

The results in *Table 2* are adjusted because the samples of waste for the waste characterization report were taken when H–POWER was in full operation and not diverting waste to the landfill. Waste from H–POWER is diverted to the landfill when H-POWER is unable to accept waste due to maintenance or capacity limitations. Because no waste was diverted, the composition at the landfill would have overstated the amount of some types of material. For example, if the landfill had 100 tons of material coming in and 50 tons were widgets, the waste would be 50 percent widgets. If an additional 30 tons of material were diverted from H–POWER, the total tonnage would have been 130 tons and the widgets would have been 38 percent. The annual amount of waste received at the landfill was reduced by the amount of the material diverted from H–POWER so the relative proportion of the remaining material was correct.

Table 3 shows the composition of waste being disposed at H-POWER. About half of the waste going into H–POWER is from residential sources and about half is commercial waste. The types and amounts of material shown in this table reflect potential material for recycling programs.

Table 2, Waimanalo Gulch Landfill Waste Characterization Results - 2006

Material	Mean	+/-	Mean (tons)	+/- (tons)
Total Paper	**4.3%**	**1.6%**	**7,864**	**3,020**
OCC (Recyclable)/Kraft	1.6%	0.6%	2,993	1,110
Newspaper	0.3%	0.2%	504	307
High-Grade Paper	0.1%	0.1%	161	96
Low-Grade Paper	1.0%	0.5%	1,902	963
Other Compostable Paper	0.7%	0.4%	1,347	817
Other Paper	0.6%	0.3%	1,057	627
Total Plastics	**4.6%**	**1.7%**	**8,463**	**3,155**
PET Bottles/Containers (Deposit)	0.1%	0.1%	166	102
PET Bottles/Containers (Non-Deposit)	0.0%	0.0%	87	55
HDPE Bottles/Containers	0.2%	0.1%	426	248
Other Bottles/Containers	0.1%	0.0%	154	89
Mixed Rigid Plastics	1.5%	0.9%	2,811	1,664
Plastic Film/Wrap	0.7%	0.3%	1,195	632
Polystyrene	0.2%	0.1%	326	197
Other Plastics	1.8%	0.8%	3,298	1,468
Total Metals	**10.1%**	**2.8%**	**18,654**	**5,212**
Aluminum Cans (Deposit)	0.0%	0.0%	90	54
Aluminum Cans (Non-Deposit)	0.0%	0.0%	2	1
Tin Cans	0.1%	0.1%	152	96
Other Ferrous	4.6%	1.7%	8,377	3,099
Other Non-Ferrous	0.3%	0.2%	570	346
Mixed Metals/Other Metals	5.1%	2.0%	9,463	3,619
Total Glass	**0.5%**	**0.3%**	**950**	**547**
HI5 Glass Bottles/Containers	0.2%	0.1%	413	261
Other Glass	0.3%	0.2%	537	329
Total Other Inorganics	**4.9%**	**2.4%**	**8,957**	**4,452**
Gypsum Board	0.8%	0.5%	1,477	933
Asphalt Roofing	2.3%	1.4%	4,166	2,585
Asphalt Paving	0.0%	0.0%	0	0
Concrete	0.5%	0.3%	965	637
Sand/Soil/Rock/Dirt	0.0%	0.0%	0	0
Ceramics	1.2%	0.7%	2,209	1,363
Miscellaneous Inorganics	0.1%	0.1%	141	100
Total Other Waste	**33.9%**	**4.0%**	**62,267**	**7,436**
Batteries	0.0%	0.0%	62	39
Furniture	12.6%	4.4%	23,194	8,054
Appliances	1.0%	0.6%	1,832	1,164
E-Waste	4.0%	1.9%	7,393	3,582
Auto Fluff*	16.2%	NA	29,786	NA
Total Green Waste	**3.4%**	**1.5%**	**6,270**	**2,833**
Total Wood	**10.7%**	**3.3%**	**19,589**	**6,020**
Untreated Wood	2.2%	1.2%	4,053	2,148
Treated Wood	5.9%	2.1%	10,806	3,877
Pallets	0.8%	0.5%	1,381	867
Stumps	1.8%	1.2%	3,349	2,231
Total Other Organics	**27.6%**	**1.8%**	**50,788**	**3,243**
Food	1.1%	0.7%	2,075	1,206
Textiles	1.6%	0.8%	2,975	1,549
Carpet	1.6%	0.9%	2,908	1,618
Tires	0.0%	0.0%	33	23
Miscellaneous Organics	1.1%	0.6%	1,978	1,149
Sludge	22.2%	NA	40,818	NA
Total HHW	**0.0%**	**0.0%**	**64**	**44**
Pesticides/Herbicides	0.0%	0.0%	0	0
Paints/Adhesives/Solvents	0.0%	0.0%	0	0
Household Cleaners	0.0%	0.0%	0	0
Automotive Products	0.0%	0.0%	0	0
Other HHW	0.0%	0.0%	64	44
TOTAL	**100.00%**		**183,866**	

* There was no auto fluff or sludge in the samples sorted for this study. As such, standard deviation and the lower and upper bounds of the confidence interval are not applicable. The Waimanalo Gulch Sanitary Landfill is known to accept auto fluff and sludge. The average composition for these materials was obtained from sources outside this study.

Table 3, H-POWER Waste Characterization Results - 2006

Material	Mean	+/-	Mean (tons)	+/- (tons)
Total Paper	**36.7%**	**2.3%**	**277,570**	**17,082**
OCC (Recyclable)/Kraft	6.1%	1.4%	46,463	10,889
Newspaper	5.4%	1.4%	40,465	10,784
High-Grade Paper	3.2%	1.1%	24,390	8,143
Low-Grade Paper	6.1%	1.1%	46,462	8,103
Other Compostable Paper	14.5%	2.2%	109,368	16,874
Other Paper	1.4%	0.2%	10,423	1,821
Total Plastics	**14.0%**	**1.5%**	**150,749**	**11,585**
PET Bottles/Containers (Deposit)	0.4%	0.1%	2,689	579
PET Bottles/Containers (Non-Deposit)	0.3%	0.1%	2,373	655
HDPE Bottles/Containers	1.2%	0.3%	8,741	2,598
Other Bottles/Containers	1.3%	0.2%	10,039	1,851
Mixed Rigid Plastics	1.0%	0.4%	7,647	3,048
Plastic Film/Wrap	6.2%	0.9%	47,026	6,749
Polystyrene	0.9%	0.2%	6,760	1,382
Other Plastics	2.7%	0.5%	20,474	3,956
Total Metals	**3.5%**	**0.7%**	**26,517**	**4,936**
Aluminum Cans (Deposit)	0.3%	0.1%	2,548	642
Aluminum Cans (Non-Deposit)	0.3%	0.2%	2,642	1,377
Tin Cans	0.8%	0.2%	5,706	1,491
Other Ferrous	0.7%	0.4%	5,566	2,794
Other Non-Ferrous	0.5%	0.1%	3,585	977
Mixed Metals/Other Metals	0.9%	0.4%	6,470	2,948
Total Glass	**2.0%**	**0.5%**	**15,201**	**4,077**
HI5 Glass Bottles/Containers	0.5%	0.3%	3,756	1,597
Other Glass	1.5%	0.4%	11,445	3,142
Total Other Inorganics	**2.7%**	**1.4%**	**20,322**	**10,251**
Gypsum Board	0.2%	0.1%	1,256	884
Asphalt Roofing	0.0%	0.0%	0	0
Asphalt Paving	0.0%	0.0%	38	27
Concrete	0.3%	0.2%	2,103	1,420
Sand/Soil/Rock/Dirt	1.7%	1.1%	12,594	7,959
Ceramics	0.3%	0.2%	1,966	1,138
Miscellaneous Inorganics	0.3%	0.2%	2,365	1,469
Total Other Waste	**3.8%**	**1.8%**	**28,424**	**13,558**
Batteries	0.0%	0.0%	319	154
Furniture	1.0%	0.7%	7,879	5,568
Appliances	1.2%	0.9%	8,904	6,755
E-Waste	1.5%	0.7%	11,322	5,083
Auto Fluff	0.0%	0.0%	0	0
Total Green Waste	**10.1%**	**3.5%**	**76,048**	**26,516**
Total Wood	**3.0%**	**1.3%**	**22,363**	**9,557**
Untreated Wood	1.2%	0.6%	8,921	4,594
Treated Wood	1.1%	0.5%	8,423	3,749
Pallets	0.2%	0.1%	1,238	906
Stumps	0.5%	0.4%	3,781	2,693
Total Other Organics	**24.1%**	**2.6%**	**181,937**	**19,711**
Food	15.6%	2.4%	118,175	17,863
Textiles	3.4%	1.2%	25,825	9,172
Carpet	0.5%	0.2%	3,696	1,866
Tires	0.2%	1.0%	1,515	1,111
Miscellaneous Organics	4.3%	1.0%	32,726	7,630
Sludge	0.0%	0.0%	0	0
Total HHW	**0.3%**	**0.2%**	**2,190**	**1,425**
Pesticides/Herbicides	0.0%	0.0%	0	0
Paints/Adhesives/Solvents	0.0%	0.0%	257	176
Household Cleaners	0.0%	0.0%	0	0
Automotive Products	0.2%	0.2%	1,720	1,244
Other HHW	0.0%	0.0%	212	142
TOTAL	**100.00%**		**756,321**	

3.2 Collection

Residential waste from single-family dwellings is collected by the Refuse Division. The Refuse Division also collects from some multifamily units and small commercial accounts. Private haulers collect from a majority of the high-rise condominiums, multifamily units, and commercial facilities.

The Refuse Division uses both automated and manual trucks for single-family residential waste collection. Nearly all of the routes are collected by automated trucks. Collection areas not accessible by automated trucks (e.g., one-way, narrow streets, or steep roads) are served by manual collection vehicles.

Most City-serviced multifamily units are collected with front loader trucks.

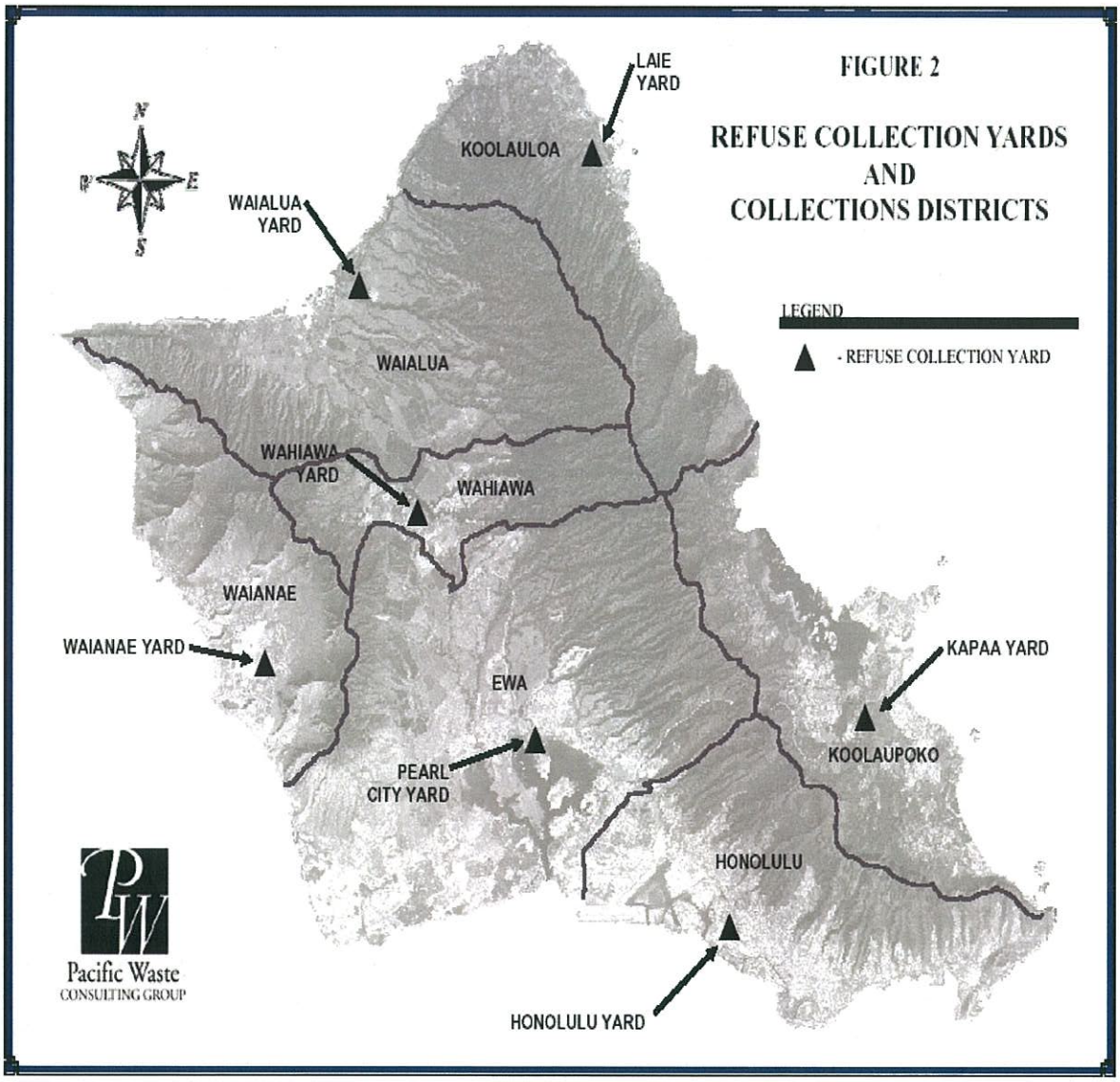
The City has seven collection districts. The dispatch yard for the collection vehicles is located in these districts near the waste generation area, which reduces the cost of collection. *Figure 1, Refuse Collection Yards and Collection Districts*, is a map showing the seven collection districts.

In districts with automated collection services, green waste is collected separately twice per month. In areas with manual collection, green waste is commingled with garbage. Residential garbage is collected twice per week. Collections are a free service to Oahu's communities. The cost of collecting Oahu's green waste and garbage is covered by property tax and tip fees at H–POWER and the landfill.

The C&C has three transfer stations for consolidating waste from small waste collection loads (six to eight tons) into large loads (20 to 22 tons) for transport to the recycling/disposal site. The use of a transfer station allows for less costly and more efficient transportation, since the contents of three collection trucks can be transported for disposal by one transfer trailer. The City owns and operates transfer stations located at Keehi, Kapaa, and Kawailoa. They service City collection vehicles and private individuals. Commercial collection vehicles; however, are restricted. There are two privately owned and operated transfer stations for commercial collection vehicles.

The City also operates six convenience centers where residents can drop-off garbage, recyclables, and green waste. Depending on the material, waste from convenience centers is recycled, composted, combusted, or disposed in a landfill. Some recyclable materials accepted at convenience centers include white goods (appliances), tires, and auto batteries.

Figure 1, Refuse Collection Yards and Collection Districts



3.3 Recycling

Current recycling infrastructure consists of a pilot program to evaluate weekly MSW collection with weekly curbside recycling and green waste collection, community recycling bins, recycling support for schools, HI5 redemption sites, and curbside green waste recycling. The overall goal is to reduce the amount of waste disposed at the Waimanalo Gulch Sanitary Landfill. The community recycling bin program is supported by participating schools. The program uses a 40 cubic-yard recycling roll-off bin, divided into sections for mixed containers and paper. Students, their family members, community members, and the school employees drop-off their recyclable materials. The host school receives revenues for the recycled materials collected in their bin(s). Since the program began in 1990, more than $1,000,000 has been paid to the participating schools.

Schools are also receiving additional support through assistance programs, in which the C&C offer 96-gallon wheeled toters labeled for aluminum, glass, plastic, and newspaper. Fundraising materials, such as banners, graphics, lists of recycling companies, collection services, and redemption centers are also provided to help advertise a recycling event. The schools use these events as fundraisers. Currently, there are 75 to 80 schools and 35 non-profit organizations participating in this program. A new contract that began in March 2008 will add 40 additional sites for multi-material recycling.

The C&C also provides, through the contract, 10 HI5 event bins. These 40-cubic-yard bins are used at special school or community events for recyclables. The City's contractor removes the bin after the event and the school or community group receives the redemption value from the materials in the HI5 containers.

Another current effort is the expansion of the number of HI5 redemption sites in the C&C. The HI5 redemption sites are privately-operated for residents to drop-off their recyclable cans, plastic, aluminum, and glass HI5 containers for a 5 cent cash refund. The C&C also provides curbside green waste pick-up to its residents. The City picks up green waste twice a month on the day following garbage collection days. Approximately 10,000 tons of green waste is collected annually from residences. The collected green waste is turned into mulch and offered to residents at no cost.[8]

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8 Department of Environmental Services www.opala.org, March 11, 2008.

The City established a pilot curbside recycling/green waste collection program in the fall of 2007 to evaluate the efficacy of waste collection once per week (rather than the current twice-per-week schedule) and collect either containers and paper, or green wastes on the second collection day (that is green waste one week and containers and paper the next). That program is to be expanded island-wide starting in the fall of 2008.

Recycling alone does not replace the need for a landfill on Oahu. Recycling is just one step to reducing the amount of waste going to the Waimanalo Gulch Sanitary Landfill.

3.4 Disposal

The disposal facilities used by the C&C are discussed in this section. This discussion was taken from the November 2007 draft SWIMP update.[9]

3.4.1 Waimanalo Gulch Sanitary Landfill

"The Landfill is located in Kapolei on the leeward side of Oahu in Waimanalo Gulch, Kahe Valley. The Landfill property is 200 plus acres. About half of the property is permitted for landfilling and support operations. It is the intent of the City that the Landfill accept two types of MSW: 1) noncombustible MSW and 2) ash and residue from the H-POWER facility. In FY 2006 (July 1, 2005 to June 30, 2006), the Landfill received 337,667 tons of MSW. However, nearly half of this was combustible MSW diverted from H-POWER, as shown in Table 1-7 (Note, this table is not included in this document as the same information is presented in Section 4). Additionally, the Landfill received 88,380 tons of ash and 79,443 tons of residue from the H-POWER waste-to-energy facility. Per the permit renewal issued by the State in April 2003, the peak daily disposal rate can not exceed 3,300 tons per day of MSW and 800 tons per day of ash and residue. In FY 2006, the landfill averaged 930 tons per day of MSW and 460 tons per day of ash and residue."

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9 City and County of Honolulu Draft Integrated Solid Waste Management Plan Update, November 2007.

3.4.2 H-POWER

"H-POWER is a waste-to-energy (WTE) facility owned by DFO Partners, Bank of America, Inc., and the Ford Credit Corporation and operated via contract with a full service vendor since 1990. The facility, located in Campbell Industrial Park, uses combustion technology to recycle combustible solid waste materials into energy. The MSW is processed into refuse derived fuel (RDF) that is used as fuel to generate electricity. Approximately 90 percent of the volume and 70 to 75 percent of the weight of the MSW received at H-POWER is diverted from the landfill. The ash and residue from H-POWER is delivered to the Waimanalo Gulch Landfill.

The City has a waste supply contract with the facility operator to deliver 561,600 tons of solid waste per year to H-POWER. The majority of residential and commercial MSW collected on the island is delivered here. In FY 2006, 602,520 tons of waste was recycled for energy at H-POWER. An additional 153,801 tons was characterized as suitable for energy recycling at H-POWER, but was redirected from the H-POWER facility to the Landfill because the facility was closed for maintenance or because of capacity limitations. A total of 71,381 vehicles delivered waste (or would have delivered waste, if not diverted, to the Landfill at facility closure) to H-POWER in 2006. Nearly half of these were Refuse Division vehicles. The other half was private haulers delivering waste from commercial generators. The current tipping fee paid by the private haulers and other commercial vehicles at the H-POWER is $91 per ton (includes $0.35 state surcharge and 12 percent City recycling surcharge).

The City has an agreement with Hawaiian Electric Company (HECO) to purchase the electricity generated at H-POWER. Over 320 million kilowatt hours of electricity were generated in FY 2006. The sale of this electricity generated nearly $35 million in revenues.

H-POWER extracts ferrous metals from the waste using magnets and non-ferrous metals from the ash using an eddy current. Approximately 18,600 tons of ferrous metals and 2,100 tons of non-ferrous metals were recycled in FY 2006 from H-POWER per information reported by the City. The sale of ferrous and non-ferrous metal generated approximately $1.5 million per year.

As previously discussed, H-POWER is presently operating beyond its design capacity. To attempt to address this situation, the City has issued a Request for Proposals for alternative energy facility to increase overall capacity."[10]

3.4.3 C&D Disposal

"In addition to the Waimanalo Gulch Landfill, a private landfill (PVT) is located in Nanakuli and is permitted to accept C&D waste and petroleum contaminated soils. Information on the exact quantity of material received at this facility was not available, but is estimated at approximately 200,000 tons per year. This estimate is used for planning purposes only."

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10 Since publication of the draft Solid Waste Integrated Management Plan in November 2007, the City has announced that it will proceed with expansion of H–POWER by adding a third boiler.

4 Alternatives Considered

4.1 No Action

Under this alternative, landfilling at the Waimanalo Gulch Sanitary Landfill would cease on November 1, 2009, with no alternative site or technology available. Several actions would result:

- There would be no landfill to accept the waste currently going to the Waimanalo Gulch Sanitary Landfill, leaving about 800 TPD of MSW requiring disposal.
- Because the garbage could not be disposed, it could not be collected, requiring people to hold it at their homes and residences; resulting in health and safety problems.
- Ash disposal from H-POWER would cease as no other landfill on the island is permitted to accept that material.
- Eliminating ash disposal would stop the operation of H-POWER.
- Businesses would be closed to avoid health issues with improperly managed garbage.

Taken together, these actions can result in a health, safety, and economic catastrophe.

4.2 Delayed Action

The *Delayed Action* and *No Action Alternatives* would have similar results. Given the complexity of the landfill permitting process in Hawaii and the limited time until November 2009, it is possible that delaying action will prevent the C&C from receiving an updated SUP before November 2009, forcing the closure of the Waimanalo Gulch Sanitary Landfill.

Neither the *No Action* or the *Delayed Action* alternatives are changed by the City Planning Commission action on January 16, 2008, or the State LUC action on March 7, 2008, at which point the LUC extended the operation of the landfill until November 2009 to allow time to complete the documents to request an extension of the permits for 15 additional years from 2010.

4.3 Transshipment Off-Island

Transshipment off-island would require a landfill owner/operator on the mainland to accept Oahu's MSW for disposal. Facilities would be needed to process the MSW into shrink-wrapped bales, store the bales while awaiting shipment, and load bales onto barges. Some materials cannot be transshipped. The federal government approval to export precludes more than three percent of the bale being green or agricultural waste. In addition, there are certain materials that must be disposed either in a landfill or by incineration, such as expired food, drugs, and cigarettes. Household hazardous waste is shipped separately and white goods could not be commingled with MSW for transshipment. The lost revenue from transshipment is anticipated to reduce tipping fee revenue that currently helps support the cost of the C&C's refuse management system.

At the time this EIS was prepared, the City had issued a request for proposal to transship waste while a third boiler of H–POWER was being constructed.

4.4 Alternative Technologies

Alternative technologies could reduce the amount of material requiring disposal and generate electricity or another beneficial reuse product. Alternative technology is not expected to eliminate Oahu's need for a landfill as bulky, hard-to-handle items and disaster debris are expected to require landfill disposal. Any technology considered must meet the City's requirements for investing in a new approach to managing MSW.

Alternative technologies considered here include thermal and non-thermal technologies, enhanced recycling, addition of a third unit to H–POWER, and alternative methods of landfilling, such as co-disposal of ash and MSW and use of a bioreactor landfill.

At the time of this EIS, alternative technologies are not viable alternatives to eliminating Oahu's need for a landfill. Further recycling of the by-products produced from these technologies is impossible and requires a landfill for disposal. Alternative technologies do, however, hold great potential in reducing the existing need for MSW landfills in the future.

4.5 Alternative Sites

The five alternative landfill sites considered in this analysis are:

- Ameron Quarry
- Maili Quarry
- Makaiwa Gulch
- Nanakuli B
- Waimanalo Gulch Sanitary Landfill

The preferred alternative is the Waimanalo Gulch Sanitary Landfill.

5 Transshipment Off-Island

On August 23, 2006, the US Department of Agriculture (USDA) through its US Animal and Plant Health Inspection Services (APHIS) announced its decision to allow the transshipment of MSW to the continental United States from Hawaii.[11] Transshipment will be allowed only under certain circumstances. Wastes by federal regulation that would be restricted from transshipment are, hard-to-handle wastes, such as white goods, sewage sludge, auto fluff, and precluded materials such as green and agricultural wastes (more than three percent of the bale weight). The announcement is attached as Attachment A.

Three transshipment firms have shown interest in shipping Oahu's waste to the Roosevelt Landfill in Washington State. Two of the three have submitted proposals to the C&C to ship a portion of Oahu's MSW to the mainland for disposal. Both proposals would shrink-wrap the waste prior to shipping.

On January 22, 2008 the City provided a notice to bidders that it would entertain proposals for transshipping waste to the mainland for disposal. [3]

5.1 City Requirements for Transshipment

In the January 22, 2008 notice to bidders, the C&C established requirements for the transshipment of MSW:

(1) Permits, compliance letters, certifications, environmental assessments, and other documents, related to services needed to carry out the contract, must be current for the transshipment contractor.

(2) The proposed methods and measures to fulfill each requirement of the contract must be identified.

(3) A site plan displaying existing facilities, equipment, traffic conditions, and a description of operations must be provided.

(4) A back-up plan for equipment maintenance, failure, or other disruption, to minimize landfill disposal must be provided.

(5) A back-up plan for barge-loading obstruction or other disruptions of exporting operations to minimize landfill disposal must be provided.

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11 Federal Register volume 71, number 163, published August 23, 2006.

(6) A copy of facility agreements between the bidder and facility, barging, or disposal operators must be provided if the bidder is not the director/operator of each.

(7) The bidder must provide a property easement for the placement of a City-owned scale, scale house, and associated equipment.

5.2 How It Works

Two of three interested transshipment firms have submitted applications to the State for modifications to the transfer stations they currently have permitted to handle MSW. Modifications include adding the equipment needed to transship MSW to the Roosevelt Landfill in Washington State or a landfill in Idaho.

The transshipment vendors would shrink-wrap the waste to avoid shipment of pests and control nuisance impacts. The approach is described in the risk assessment prepared by APHIS for its regulatory action.[12]

The process for handling the waste in Honolulu is specified in the final Compliance Agreement between the USDA and Hawaii Waste Systems, LLC (HWS). The procedures for handling the waste and transporting it to the landfill for disposal are detailed[13] as follows:

> "...Garbage and Regulated (domestic) Garbage collected by refuse trucks shall be delivered to the HWS facility at HWS Transfer Station ...Trucks of agricultural waste shall not be accepted. Waste materials, containers, and bins associated with Foreign Garbage are strictly prohibited and shall not be accepted. The ground surface of the all areas for handling the Garbage and Regulated (domestic) Garbage should be level, solid, and impervious surface of asphalt or cement.

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12 *The Risk of Introduction of Pests to the Continental United States via Plastic-Baled Municipal Solid Waste from Hawaii,* United States Department of Agriculture, Animal and Plant Health Inspection Service, March 2006.

13 Final Compliance Agreement between Hawaiian Waste Systems, LLC, and the United States Department of Agriculture relating to the Regulated Article "Garbage and Regulated (domestic) Garbage from Honolulu, Hawaii." January 19, 2007. Pages 4-7.

The risk assessments for the movement of Garbage and Regulated (domestic) Garbage were conducted based on the specific details provided by HWS. These details included the removal of all hazardous and liquid waste prior to baling. HWS will notify PPQ (USDA, APHIS local office) if the company plans change to include such materials so that the proper risk assessments can be conducted...

The waste transfer station will receive only household and commercial waste acceptable for disposal at Roosevelt Regional Landfill. Collection trucks will deliver waste picked up from existing collection routes. After waste is tipped onto the tipping floor it will be inspected for unacceptable waste including yard waste, (other than incidental amounts not to exceed 3% of the total waste stream pursuant to 7 CFR Part 330), agricultural waste, industrial waste, infections waste, loads of predominantly of [C&D] waste and regulated hazardous waste. Any segregated unacceptable waste will be separated for further processing. Loads consisting predominately of [C&D] waste will be transferred to a C&D handling facility. Other waste will be drummed or otherwise contained and arrangements made for its proper transportation and disposal. Notwithstanding the foregoing, it is acknowledged and agreed that follow-up inspection of the route that was the source of the unacceptable waste will be conducted to try to locate the source and correct the waste handling process that allowed unacceptable waste to be collected.

Each load of waste received at the facility will be weighed and the date, time, company, driver name, truck number (i.e., company fleet number), weight (loaded), weight (empty), and origin of load, will be recorded. Records will be kept for a minimum of three years.

Step-by-step waste receiving and processing description is as follows:

1. Waste is delivered by collection truck to the HWS Transfer Station. The truck is weighed and then proceeds to the baling facility where it tips its waste onto the tipping floor. The collection truck is weighed again as it exits the site and continues on its collection routes. A weigh ticket is generated and kept on file.

2. A loader operator inspects the waste and segregates any non-household or on-commercial waste. Household and commercial waste is pushed onto the in-feed conveyor by the loader. Segregated waste is set aside and handled separately as described previously.

3. Garbage and Regulated (domestic) Garbage moves along the conveyor to the intake feed of the baler. The baler operator introduces waste into the baler where it is compressed using a compactor that produces bale densities of approximately 1000 kg per cubic meter for the most waste materials. The same force compaction will be used regardless of the material in the processing line. Companies will provide documentation of the equipment used and compactor specifications…

4. The compacted bale moves from the baler via conveyor belt to the plastic wrapper. The plastic wrapper automatically wraps the bale with a minimum of 4 layers of pre-stretched, mastic-backed polyethylene plastic, of at least 16 micrometers thickness, and extrudes it onto a roller conveyor. The baler operator or loader operator will inspect each bale for integrity of the plastic wrap. Any bale with unsatisfactory wrapping will be re-sent through the wrapper.

5. The wrapped bale moves down the roller conveyor and is removed by a loader with a special attachment that picks up the bale by squeezing it between two hydraulically operated smooth faced arms, or another piece of equipment designed to handle the bales without tearing or damaging them in any way. The smooth faced arms prevent damage to the plastic wrap.

6. The loader moves the bale onto the bale storage area – which has a solid, impervious (concrete or asphalt) surface that is kept free of soil or other contaminants – or directly onto a flat bed truck, if one is available. The loader then returns to pick up another bale from the roller conveyor.

7. Bales that are placed onto the bale storage area will be loaded onto flat bed trucks as they become available.

8. Flat bed trucks will haul the bales to Barber's Point where they will be unloaded and stacked in the Staging Area. The same type of loader attachment (or equivalent equipment) will be used for unloading to prevent damage to the plastic wrap. The loader operator will inspect each bale for damage to the plastic wrap. If damage is found it will be returned to a wrapping area for rewrapping.

9. Bales cannot be loaded onto the barge until they have been staged for at least five days. After five days, the bales are considered ready for transport and the area will be designated the Transport Area. HWS will maintain a clear separation between those bales ready for transport and those bales in the staging process.

10. Bales at the Barbers Point Harbor facility will be stored until a barge is ready to be loaded. Barge loading will occur approximately monthly. When a barge is ready for loading, the bales in the Transport Area will be transferred onto the barge, again using squeeze-arm hydraulic equipment or other comparable, appropriate lifting equipment to prevent damage to the plastic wrap. The loading supervisor will inspect each bale once the bale is loaded onto the barge. Any damaged bale will be returned to the Transfer Station for rewrapping and restaging or be rewrapped and restaged on site at Barber's Point

11. When the barge is fully loaded it will proceed to its destination at the Roosevelt Regional Landfill in Washington State.

The compression settings on the baler shall be 1,000 kg per cubic meter or more.

Records indicating the size and weigh to each bale shall be maintained.

Garbage and Regulated (domestic) Garbage which has fallen apart from an unwrapped compressed bale, or has been otherwise improperly compressed shall be set aside for a subsequent compression cycle.

The unwrapped, compressed bales shall be bound with plastic or metal clamps, netting, or strapping devices to retain its shape.

Compressed bales that do not hold together shall be rejected and set aside for a subsequent compression cycle. Records of re-compressed bales shall be maintained by HWS and available for monitoring by PPQ…"

5.3 Other Jurisdictions Using Transshipment

Shipment of MSW using shrink-wrap has been used in New Jersey and other areas of the US. It has been used in Europe for as long as 10 years. The Roosevelt Landfill in Washington receives MSW, not only from Washington State, but also from Oregon, Canada, Idaho, and Alaska.[14] Canada has transshipped its MSW to Michigan landfills for many years, while New York is in the process of transshipping its MSW to North Carolina. Most of these operations do not use the shrink-wrap technology.

APHIS determined, with its acceptance of transshipment of MSW stateside from Hawaii, that transshipment could occur from both Oahu and the island of Hawaii once contracts and compliance agreements have been set up in Hawaii.

5.4 Physical, Regulatory, and Environmental Requirements

The limitations on shipping waste from Hawaii to the mainland are established in federal regulations[15] with approval of the specific requirements promulgated in the Federal Register.[16]

Garbage subject to these regulations (Regulated Garbage) is defined as waste on—or removed from—a transport that has been in any non-U.S. or Canadian port within the past two years. The garbage is also regulated if that transport has either directly or indirectly moved in the past year between the United States and its territories and non-U.S. territories.

Any garbage commingled with regulated garbage is considered Regulated Garbage and would have to be shrink-wrapped and handled according to the Compliance Agreement.

The primary regulator of transshipment is the U.S. federal government through APHIS.

Regarding flow control of the waste, it has been determined that if the City controls the scale house, it can direct the flow of the waste to the disposal location. The January 22, 2008 Notice to Bidders requires that the successful bidder provide an easement at their site for the City's scale house and supporting equipment.

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14 Washington State Department of Ecology, Solid Waste and Financial Assistance Program, "Solid Waste in Washington State Fifteenth Annual Status Report", December 2006.

15 7CFR 330.400 and 9CFR 94.5.

16 Federal Register volume 71, number 163, published August 23, 2006.

5.4.1 Compliance Agreement

Before any waste can be transshipped, all parties involved with the export must enter into a Compliance Agreement with the USDA. All parties must comply with conditions within the Compliance Agreement, as well as, all provisions in 7CFR 330.400–403 and 9CFR 94.5.

5.4.2 Transshipment Regulations

The requirements for shipping the waste are in the Compliance Agreement and in other federal rules and regulations relating to transportation of materials by barge.

5.4.2.1 Receptacles

MSW transported from Hawaii to the mainland must be stored in specified receptacles. If the MSW is to be sent by watercraft, the receptacles must be contained within the guard rails of that watercraft. Receptacles must be tight, leak-proof, and covered while being transported.[15] Removal of receptacles must be under the direction and supervision of an inspector from APHIS and taken to an approved facility.

An approved facility is a facility certified by an appropriate government official as complying with environmental protection laws. The Administrator of APHIS must deem the equipment and procedures adequate to prevent the widespread contamination of plants and livestock.

The shrink-wrap technology used to contain the MSW before it is transshipped uses plastic film wrapping material. The wrapping material is to be impermeable and made of low density polyethylene at least 16 micrometers in thickness. It is to be coated on one side with a non-hardening mastic/adhesive. Bales are mechanically wrapped to achieve airtight seals. The film anoxiates the wrapped MSW to kill the insects and pests entrained in the bale. In a 10-month study, DEKRA Umwelt, an international service provider, determined that the filmed bale environment is made up of 1 percent oxygen and more than 50 percent methane; that within 24 hours, any insects captured during baling of the MSW died from lack of oxygen. The film contracts once it is wound around the MSW. This ensures that during transshipment and disposal no materials or insects are leaked.[12]

5.4.2.2 Disposal

Disposal of MSW must take place at an approved facility. The Roosevelt Landfill has a permit issued pursuant to the federal Subtitle D regulations and would be considered an approved facility.

5.5 Potential Issues

A shipping strike would create potential problems for Oahu should it occur during transshipment of MSW to the continental United States. The plastic film used to bale the MSW in preparation for transshipment is required by the USDA Compliance Order to be re-wrapped if the bale will not be in the landfill within 75 days.[13] The film has a life of at least 100 days when exposed to sunshine in tropical environments such as that found on Oahu.[12] Assuming a transit time of 14 to 21 days, even a short strike would threaten to cause the shipper to exceed the 75 day time limit from wrapping to disposal as required by the USDA. Oahu would not be able to transship its MSW during a shipping strike. This could potentially result in a health and safety catastrophe, leaving Oahu with no place to dispose of its waste.

According to the Chief Executive Officer of HWS,[17] the bales can be stacked two high. The space they have at the port facility will allow for storage of 30,000 tons of MSW. Assuming that the company handles 100,000 TPY, they can store about four months of shrink-wrapped MSW. In addition, the agreement for barge services allows management of the barge company to operate the equipment needed to transship the waste in a strike due to the health and safety aspects of transporting the waste.

Another issue with transshipment off-island is that green and agricultural wastes, as well as household hazardous wastes, are not permitted to be shipped commingled with the MSW. Incidental amounts, less than three percent of the total amount of MSW shipped, are permitted. Therefore, the source of waste that is transshipped must separate green and agricultural wastes from the MSW.

Assuming that a bale weighs 3.5 tons[17] the total weight in the bale is 7,000 pounds. The limitation of three percent or less of yard wastes[16] allows for 210 pounds of yard waste in the bale. While it is a small percentage of the bale, that amount of green waste should be observed in the inspection prior to baling.

Transshipping Honolulu's MSW makes the C&C dependent upon an outside source rather than maintaining self-sufficiency managing its own refuse. For a state that in recent months has continued to voice its desire for independence, transshipment could be a step backwards.

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

Transshipment would also result in the loss of high BTU value waste that would otherwise go to H–POWER. Transferring the disposal of a portion of the City's waste reduces the generating capacity at the H–POWER facility, which provides power to 45,000 homes.[18] It could also require the use of more oil and/or coal to generate power to compensate for the loss of H-POWER generation.

Relying on outside sources for the transshipment of MSW leaves Honolulu vulnerable to shipping strikes and with less negotiating power. The municipality would lose control of cost and possibly lose a source for disposal.

5.6 Impact on City Solid Waste Management System

From an environmental perspective, the impact of transshipment through the HWS system will be consistent with the impact of on-island disposal.

- The transfer, baling, shrink-wrap, and loading will be done at a permitted transfer station.
- The material will be contained within a system that has received approval from the federal government based on the system's ability to prevent the unexpected discharge of waste or plant pests.

From the perspective of how transshipment will impact the City's current system for financing the solid waste collection and disposal activities, the conclusion is not so clear. If transshipment removes 100,000 tons (the total could be more as there are at least three vendors seeking to transship up to 100,000 TPY each), the tip fee and energy revenues from energy production and disposal of that waste will be lost to the city. That revenue helps support the collection system, so the City will have to find other sources of funds to offset the lost revenue.

The transshipment of up to 100,000 TPY would also reduce the amount of energy produced from the H-POWER facility. Currently, H-POWER processes approximately 600,000 TPY of solid waste. With a loss of 100,000 TPY of MSW, the fuel to the H-POWER facility will be reduced, reducing the amount of homes powered by the facility if the C&C were unable to make up the tons shipped off-island. That loss would also increase the cost of power to the residents and businesses on the island because the utility would have to import more oil to generate the necessary power, assuming the utility has the excess generating capacity.

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18 H-POWER. http://www.honoluluhpower.com, March 11, 2008.

The CEO of HWS has provided a summary of their company's suggestions on how to integrate their transshipment program into the City's solid waste management system. The e-mail summarizing his suggestions is in Attachment B.

5.7 Consistency With City Requirements

The C&C guidelines regarding the transshipment of MSW off-island are listed in section 5.1, which were summarized from the Notice to Bidders released on January 22, 2008.

In addition, not all waste can be shipped off-island. Items such as flocked Christmas trees, sewage sludge, auto fluff, out of date medicines, and other hard-to-handle wastes cannot be shipped without special arrangements to dispose of these materials. The shipping alternative only accepts materials from a specific waste stream and does not eliminate the need for a landfill.

5.8 Additional Considerations

The C&C had issued an RFP seeking Alternative Technologies. On January 18, 2008 the Mayor announced that the City had decided to install the third boiler at H–POWER and not proceed with the other alternative technologies. The Mayor also stated that "... the city will invite companies to bid to ship 100,000 tons of Oahu's trash off island." [5]

5.9 Global Warming Considerations

In addition to these actions, the increasing concern about global warming and climate change caused an evaluation of the greenhouse gas emissions from transshipment. An analysis was conducted (See Attachment C for details) of the emissions of greenhouse gases (GHG) from transshipment compared to landfilling the same amount of waste in the Waimanalo Gulch Sanitary Landfill or burning it in H–POWER. The assumptions and general conditions in the analysis were:

- Commonly accepted emission factors used to calculate the emissions.

- Where actual data was unavailable to define the logistical details of transshipment process necessary to quantify emissions (e.g., physical considerations in port facilities, the time needed to move the wrapped waste onto and off the barge), a report prepared for the C&C to estimate the cost of transshipment was used as a resource.[19]

- Manufacturer's data was used to estimate electrical use by a baler and a shrink wrap machine as data was unavailable on the equipment that had been proposed for transshipment.

- Information on the fuel use on a tug and the time required for a load to be moved from Oahu to the mainland was obtained from shipping industry contacts.[20]

The results of the evaluation are summarized in *Table 4, Comparison of GHG Emissions from Transshipment to On-island Disposal* which shows the emissions in thousands of tons of CO_2 equivalent per year. The emissions at H–POWER are negative because the GHG emissions resulting from the power it generates are more than offset by the reduction in emissions from burning either coal or oil to produce that same amount of energy in other power plants on the island. The emissions from the Waimanalo Gulch Sanitary Landfill are negative because this landfill (as does Roosevelt) sequesters the carbon emissions due to the efficient landfill gas collection system. In addition, the emissions for Roosevelt also reflect the credit for offsetting the electrical generation from other sources in the Northwest. Roosevelt produces power with the gas collected and the Waimanalo Gulch Sanitary Landfill incinerates the gas using a flare.

Table 4, Comparison of GHG Emissions from Transshipment to On-island Disposal

Disposal Location	Emissions ($MTCO_2e$ per year)
H–POWER	(28,711)
Waimanalo Gulch	(3,686)
Roosevelt	3,978

19 RW Beck, Draft Integrated Solid Waste Management Plan Update, November 2007, Appendix C Trans-Shipment of Waste Analyses.

20 Personal communication with a representative of Young Brothers.

6 Alternative Technologies

This section of the Alternatives Analysis discusses the alternative technology approaches that may be able to reduce the demand for landfilling. Currently, there are no alternatives that have been proven to completely eliminate the need for a landfill. Alternative technologies reduce the demand for a landfill, but some residue will need to be disposed in a landfill.

Prior to the evaluation of alternative technologies, there are several factors that are important to the discussion.

The City encourages alternatives methods for waste disposal, such as the H–POWER facility. This facility converts about 40 percent of the MSW produced on Oahu into electricity. By-products are ash, residual, and unprocessible materials that require landfilling.

Prior to the H-POWER facility, the City operated the Waipahu, Kewalo (two plants), and Kapalama Incinerators at different times to reduce the volume of material needing disposal.

Currently, the City has contacted a private vendor to operate a sludge pelletizing facility at the Sand Island Waste Water Treatment Plant. The dryer converts sludge material previously disposed at the Waimanalo Gulch Sanitary Landfill into a fertilizer amendment product. At the current time, the fertilizer product is not being marketed.

These examples share several characteristics:

- All were operated for many years using waste material similar to that produced on Oahu and in amounts in excess of the capacity needed for Honolulu.
- The risk of operational problems was minimized because of the history of operations and the availability of firms to design, build, and operate the plants that had long term operating results.
- The environmental impacts of the technologies were well understood and all had long histories of operating in compliance with regulations.
- The total cost of the technology was well understood.
- H-POWER has resulted in a significant reduction in volume of material disposed in the landfill disposal, with the dried sludge being used as cover.
- The City has continued its search for additional alternatives. Other areas of the

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.

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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.

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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 faction 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 acetongenic 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]

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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.

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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]

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28 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.

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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:

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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 kKWh 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]

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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 sources[36], 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.

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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)
	MSW	SR,ASR	MSW	SR,ASR		Generation	Consumption	Sold	Line1+Line2
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).

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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.

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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.

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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.

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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.

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 City[60] and Los Angeles County[61]) 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.

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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.

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.

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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.

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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.

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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.

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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 results[48] 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 discuses 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.

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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 mange 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 Permit[49] 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.

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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
Maili	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.

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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						
Maili						
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.

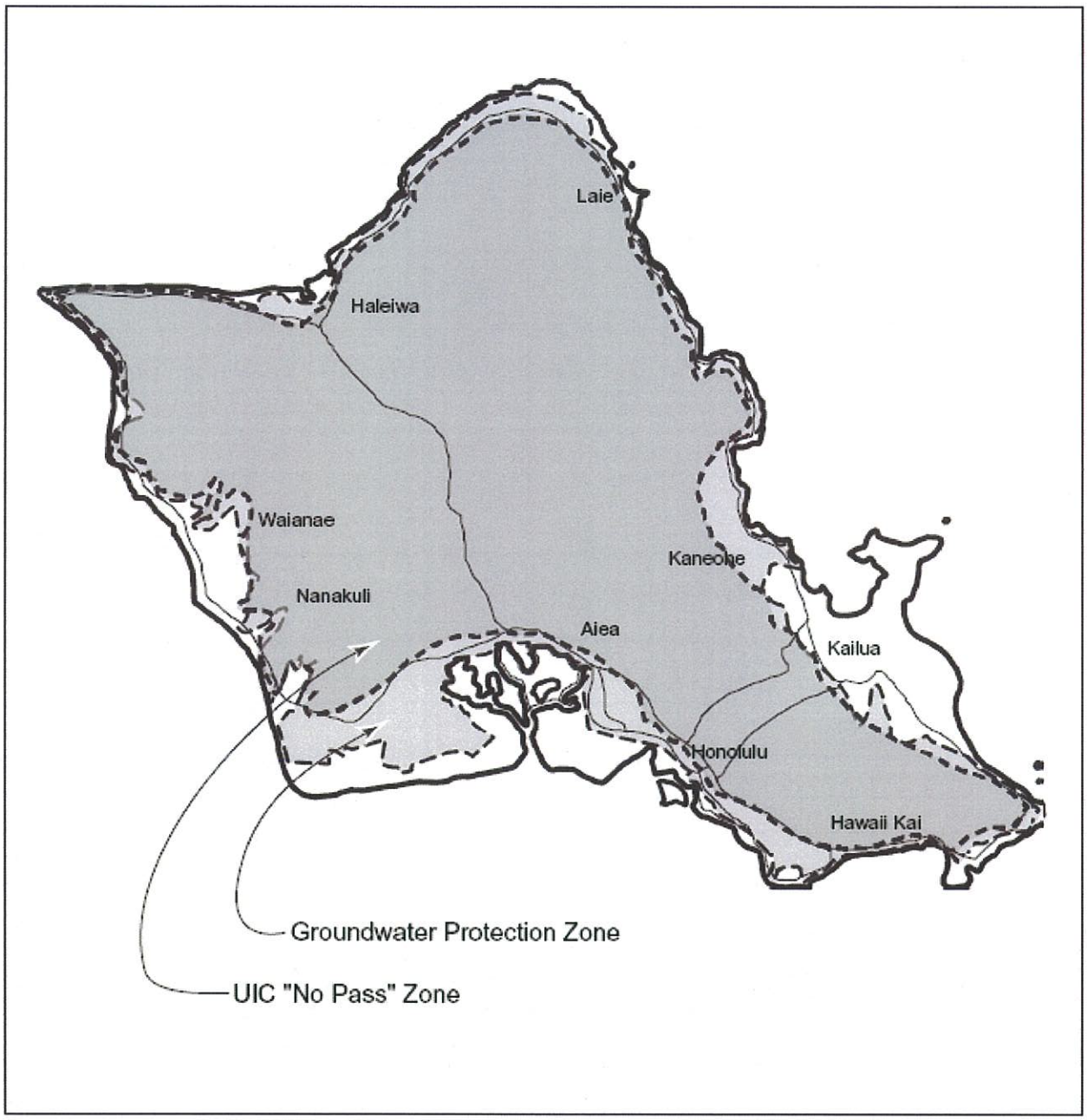
The City also reviewed potential sites that were expansions of closed landfills. Landfills on the original list that have been filled to capacity and closed were removed from further consideration.

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		
Waianae 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.

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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.	
Kaloi	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
Mililani	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/o 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 Factor*s 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 busines	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 LUC[54].

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.

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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	Maili	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
Maili	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.

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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.

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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 representative[54]
- 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

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57 Waste Management, Keeping Hawaii Clean, http://www.keepinghawaiiclean.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 are 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 that 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 CO_2 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.

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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.

8.4 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

49309

Rules and Regulations

Federal Register
Vol. 71, No. 163
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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;[1] 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 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

[1] The 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/epaoswer/osw/index.htm.*

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

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 proposal[3] 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 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/m^3, 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

[3] 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.

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.

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

[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 bale processing lines, the fraction of yard waste in baled Hawaiian MSW should be reduced to 3 percent or less.

[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 12988

This final rule has been reviewed under Executive Order 12988, Civil 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

[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.

[10] 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, 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.

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(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, 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 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)

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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)(ii)(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 CO_2 Emissions from Disposal of Waste at Waimanalo Gulch Sanitary Landfill, H–POWER, and Washington State

Pacific Waste
CONSULTING GROUP

April 2008

Evaluation of CO_2 Emissions from Disposal of Waste at Waimanalo Gulch Sanitary Landfill, H–POWER, and Washington State

April 2008

Prepared by:

Pacific Waste Consulting Group
8801 Folsom Blvd., Suite 105
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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 CO_2.

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 CO_2 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 electrticity 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 Gasosline)*
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 CO_2 was included. The emission factor used for Covanta was an average of all the plants they operate. It was not possible to disaggregate the CO_2 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 CO_2 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 emissions[2]. 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 percent[3] and the recovered gas being used to produce electricity.

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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 CO_2 was included. It was not possible to disaggregate the CO_2 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.

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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 hour[6].

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 representative[7]:

- 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 days[8].

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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 ($MTCO_2e$ 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 ($MTCO_2e$) per year. Approximately 41,631 $MTCO_2e$ 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 $MTCO_2e$ 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 CO_2 was included. Covanta reported its emissions of all six primary GHGs. We were unable to disaggregate the CO_2 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 ($MTCO_2e$ 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 $MTCO_2e$ 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 CO_2 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 ($MTCO_2e$ 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 $MTCO_2e$ 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 CO_2 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

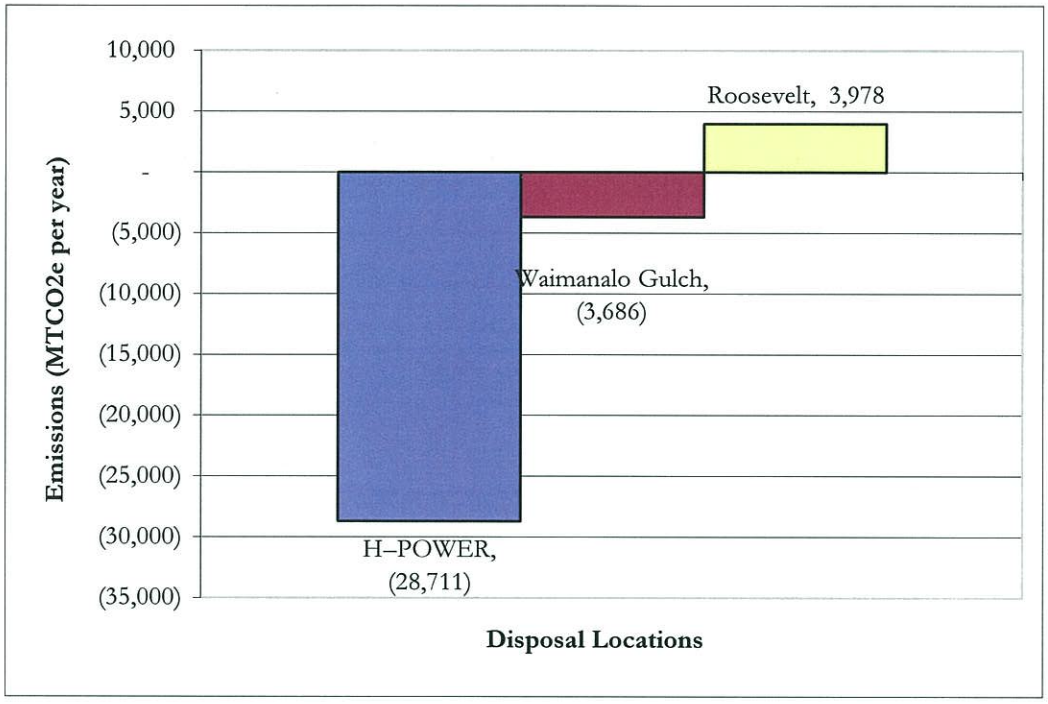
Activity	Quantity	Emission Factor	Emissions ($MTCO_2e$ per year)
Transport collected waste from base to HWS Transfer Station	7,857 gallons	10.15 kg CO_2/gallon	80
Baling waste	337,736 kWh	1,728.12 lbs/MWh	265
Plastic wrapping bales	666,279 kWh	1,728.12 lbs/MWh	522
Loading flatbed trailers	3,751 gallons	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 CO_2 emissions from transshipment to Roosevelt for disposal are significantly higher than either of the two on-island alternatives. The relative CO_2 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
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

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.

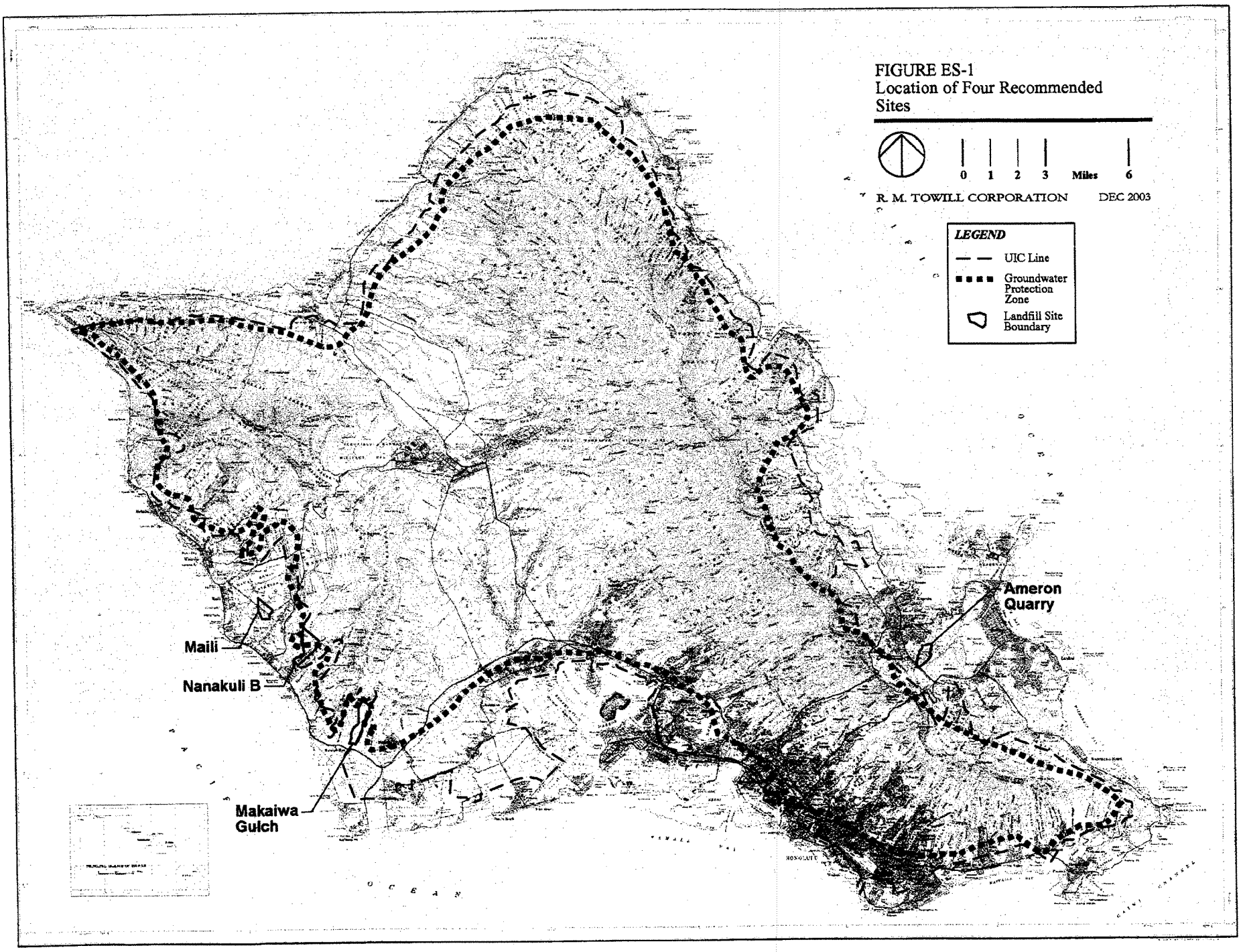
FIGURE ES-1
Location of Four Recommended Sites
0 1 2 3 Miles 6
R. M. TOWILL CORPORATION
DEC 2003
LEGEND
UIC Line
Groundwater Protection Zone
Landfill Site Boundary
Ameron Quarry
Maili
Nanakuli B
Makaiwa Gulch
O C E A N

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 Ohikilolo 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	Number of Sites 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:

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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
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	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

		Cri	n			A	on	ellows	Mai	Ma	va	anal	B	ikilc	Wa	inal Sulc	Wai	alo orth
		Co	unit															
Dis	emen	eside	s and	iness			3	1			3		3					3
Dis	e to r	st re	nce, s	ol or	ness		3	3			3		3					3
Wir	rectic	lative	opul	area			6	2			2		2					6
Pop	on d	y nea	e site				3	3			3		6					3
Pro	y to	s anc	eatic	facilit			2	1			1		2					1
	En	nme	and	d Us														
Zor							1	1			3		3					3
Cor	ibility	y/dist	to e	ng la	ses		2	1			1		1					1
Visi	fron	ener	e pul	oad			2	3			2		1					3
Visi	fron	idenc	nd/o	ools.			6	6			2		2					4
Gro	water						9	9			9		9					9
We	ls						3	6			6		6					9
Flo	d fau	abita					6	6			6		2					6
Site	thetic						2	2			1		2					2
Res	tial u	along	ess r				3	1			3		3					3
Sch	or h	als al	acces	ad			3	3			3		3					3
Fin	e of t	ite w	the la	l is c	l		1	1			1		1					1
Arc	ogica	/or h	ical s	icanc			6	3			3		6					3
		E	omic															
Cos	site a	sition					6	3			6		9					6
Cos	devel	ent					6	3			6		6					3
Cos	opera	s					3	3			9		3					6
Imp	of re	l of s	n ta	e			1	3			1		1					3
Hau	tance	n H–	ER				4	2			6		6					2
		T	ical															
Lan	capa	r site					6	6			9		6					6
Anr	precip	on					2	4			4		4					4
Ade	y of	age					1	1			2		2					1
Acc	o fire	tectic					1	1			2		3					1
Len	of ha						4	2			6		4					4
Gec							2	3			2		2					3
Clos	and	closu	st				3	2			2		1					3
		ner C	dera	s														
Emp	nent						1	2			2		3					2
Acc							6	2			4		4					2
Tot	e Sc						07	89	10		3		9	11		131		109

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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 then 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
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

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 HAWAI`I

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

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

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[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

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[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 HAWAI`I

In The Matter Of The Application Of The	)	DOCKET NO. SP87-362
	)	
DEPARTMENT OF ENVIRONMENTAL SERVICES, CITY AND COUNTY OF HONOLULU (FKA DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU	)	DECISION AND ORDER APPROVING AMENDMENT TO SPECIAL USE PERMIT
	)	
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)	)	

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 HAWAI'I

By _____
LAWRENCE N. C. ING
Chairperson and Commissioner

By _____
P. ROY CATALANI
Vice Chairperson and Commissioner

By _____
STANLEY ROEHRIG
Vice Chairperson and Commissioner

By _____
BRUCE A. COPPA
Commissioner

By _____
PRAVIN DESAI
Commissioner

By _____
ISAAC FIESTA, JR.
Commissioner

By _____
STEVEN MONTGOMERY
Commissioner

By _____
RANDALL SAKUMOTO
Commissioner

By OPPOSED
PETER YUKIMURA
Commissioner

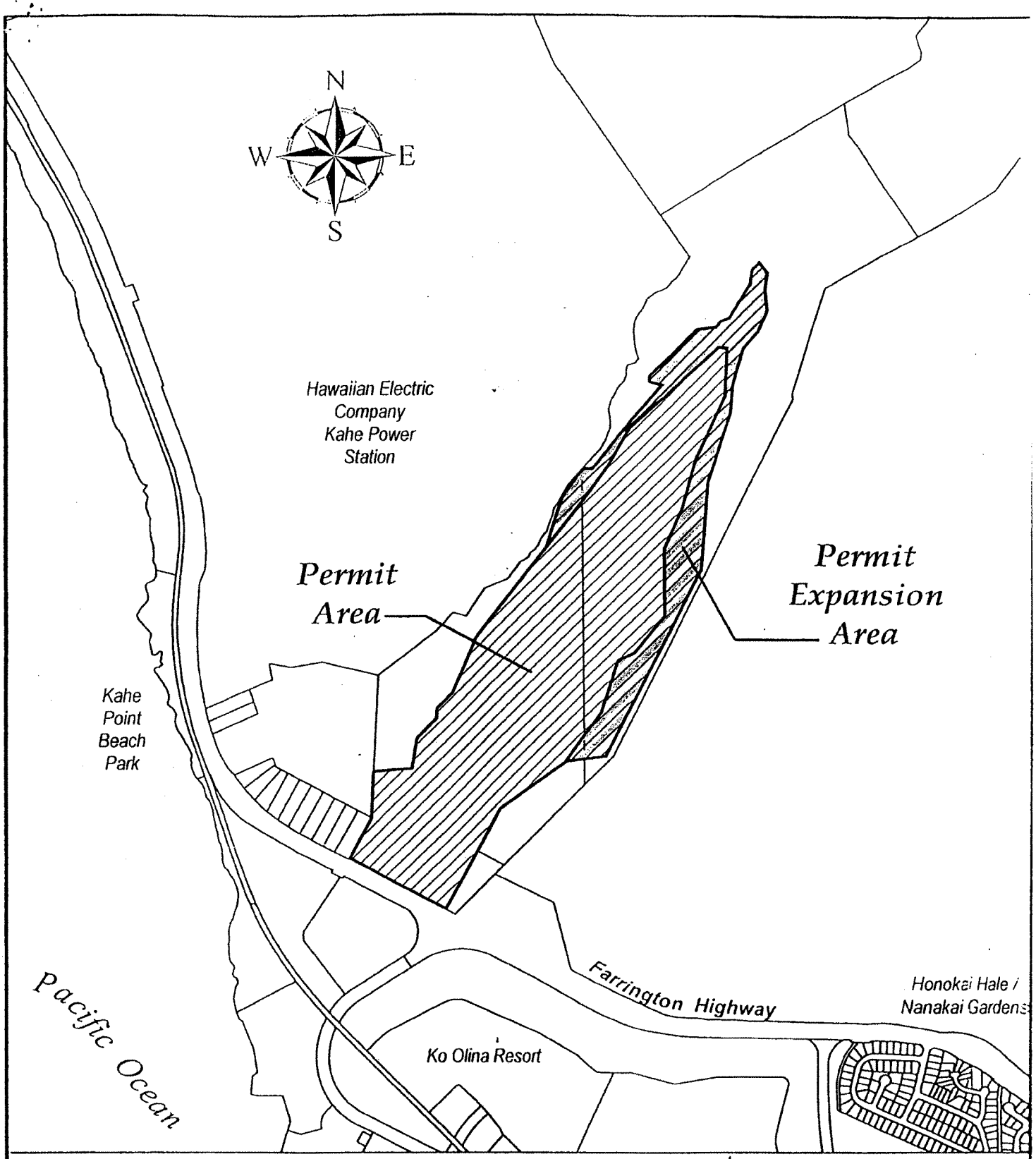
APPROVED AS TO FORM:

_____
Deputy Attorney General

Filed and effective on
June 9, 2003

Certified by:

_____
Executive Officer

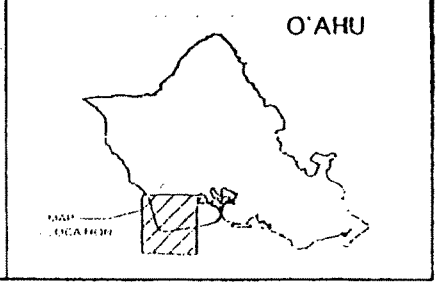


SP87-362 DEPARTMENT OF ENVIRONMENTAL SERVICES, CITY AND COUNTY OF HONOLULU
(fka Department of Public Works, City and County of Honolulu)

LOCATION MAP

TMK No.: 9-2-3: portion 72 and portion 73
Waimanalo Gulch, Honouliuli, 'Ewa, O'ahu, Hawai'i
Scale: 1: 1,000 ft.

EXHIBIT "A"



BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAI`I

In The Matter Of The Application Of The	)	DOCKET NO. SP87-362
	)	
DEPARTMENT OF ENVIRONMENTAL SERVICES, CITY AND COUNTY OF HONOLULU (FKA DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU	)	CERTIFICATE OF SERVICE
	)	
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)	)	

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

PLANNING COMMISSION OF THE CITY AND COUNTY OF HONOLULU

STATE OF HAWAII

IN THE MATTER OF THE APPLICATION OF DEPARTMENT OF ENVIRONMENTAL SERVICES FOR AN AMENDMENT TO A STATE SPECIAL USE PERMIT	)	2002/SUP-6

FINDINGS OF FACT, CONCLUSIONS, AND DECISION

I. PROPOSAL

The Planning Commission, at its public hearing held on March 5, 2003, pursuant to Section 205-6, Hawaii Revised Statutes and Subchapter 4, Rules of the Planning Commission, City and County of Honolulu, considered the application of Department of Environmental Services to amend Special Use Permit (SUP) File No. 86/SUP-5. The applicant proposes a 21-acre, 5-year capacity expansion to the existing 86.5-acre landfill to allow continued disposal of municipal solid waste (MSW). The proposed expansion includes 4 cells (E1 through E4) for disposing MSW, berms, detention and stilling basins, drainage channels, and access routes located within the State Land Use Agricultural District in Waimanalo Gulch, Honouliuli, Ewa, Oahu. The project area is identified by Tax Map Key 9-2-3: portion of 72 and portion of 73.

II. FINDINGS OF FACT

On the basis of the evidence presented, the Commission hereby finds that:

1. The subject expansion area is identified by Tax Map Key 9-2-3: portion of Parcel 72 and portion of Parcel 73 and is owned by the City & County of Honolulu.
2. The site is located in Waimanalo Gulch, Honouliuli, Ewa, Oahu.
3. The site is within the State Land Use Agricultural District, is partially within the Urban Growth Boundary of the Ewa Development Plan, and is zoned AG-2 General Agricultural District.
4. The landfill is not classified by the State Agricultural Lands of Importance to the State of Hawaii classification system. The University of Hawaii Land Study Bureau overall master productivity rating for the property is "E" which indicates very poor crop productivity potential.
5. The site is adjacent to Hawaiian Electric Company's Kahe Power Plant and Kahe Point Homes on its northwestern boundary; to the proposed Makaiwa Hills residential and commercial community on its southeastern boundary; and to Farrington Highway on its southwestern boundary. Across Farrington Highway from the site is the Ko Olina Resort, which contains resort and residential units, a golf course and marina. Honokai Hale and Nanakai Gardens residential subdivisions are located about 4,000 feet to the southeast of the site.
6. The Waianae Coast Neighborhood Board No. 24 recommended that Cell E1 be relocated to minimize litter, odor, and visual impacts; that the 5-year deadline to terminate landfill

operations be clarified, and that community members be on the landfill siting team. The Honokai Hale/Makakilo/Kapolei Neighborhood Board No. 34 opposed the placement of refuse towards the front of the landfill.

7. The Department of Planning and Permitting (DPP) accepted the Final Supplemental Environmental Impact Statement (FSEIS) on January 10, 2003. Notice of the DPP's acceptance of the FSEIS was published in the January 23, 2003 issue of the Environmental Notice, in accordance with the Environmental Impact Law, Chapter 343, Hawaii Revised Statutes.

8. The Planning Commission received a Report and Recommendation dated February 28, 2003 from the Director of Planning and Permitting providing an analysis of the Special Use Permit amendment request and its recommendation for approval with 2 additional conditions.

9. At the public hearing of March 5, 2003, 3 persons testified and one written testimony was received. Councilmember Mike Gabbard, representing Council District 1, supported the request with conditions relating to closure of the landfill and to inclusion of community members on a proposed alternative site selection committee. Councilmember Nestor Garcia, representing Council District 9, supported the expansion with conditions relating to closure, alternative site selection, inclusion of community members in the site selection committee, and encouragement of use of alternative technologies and waste recovery programs. State Senator Brian Kanno opposed the expansion request. A member of the Waianae community indicated that there are concerns on impacts to the neighborhood and the environment and opposed the expansion request.

10. The Planning Commission considered the public testimony and recommended that:

a. The applicant submit to the City Council, an alternative landfill site(s) by December 31, 2003, and

b. Community members be included on the alternate site selection committee.

Items 10a and 10b are recommendations to the applicant and are not included as conditions of approval of the SUP amendment.

III. CONCLUSIONS OF LAW

The Planning Commission hereby concludes that:

1. The proposed use would not be contrary to the objectives of the State Land Use Law. The landfill and proposed expansion are located on soils that have very poor potential for crop production.
2. The proposed expansion would not adversely affect surrounding property if operated in accordance with relevant governmental approvals and requirements, including conditions of the Special Use Permit. Concerns relating to impacts on the surrounding community and the environment have been adequately disclosed in the FSEIS. Mitigation measures should be implemented in accordance with the applicant's representations as documented in the FSEIS.
2. The proposal will not unreasonably burden public agencies to provide roads and streets, sewers, water, drainage, school improvements, and police and fire protection. Government agencies did not object to the proposed SUP amendment.
3. Unusual conditions, trends and needs have arisen since the Agricultural District boundaries and regulations were established. The landfill is quickly approaching its

maximum capacity, and there is no feasible alternative that can be implemented in time to dispose MSW after the approved landfill capacity is exhausted. At the time the original SUP was granted, the Planning Commission and the Land Use Commission found that the proposal met all 5 guidelines for issuing an SUP. Also at that time, plans for the development of Kapolei as the Second City and development of support housing, Ko Olina Resort, industrial, and support infrastructure in proximity to the landfill were being implemented.

4. The site's soil quality is not conducive crop production and the steep terrain does not lend itself to pasture use. Prior SUP approvals have allowed the removal of the property from agricultural use. Circumstances relating to use of the property for agriculture have not changed since the original SUP was granted. The State Department of Agriculture has not objections to the proposal.

IV. DECISION AND ORDER

Pursuant to the foregoing Findings of Fact, Conclusions and attachment, it was the decision of the Planning Commission, at its meeting of March 5, 2003, to approve Special Use Permit No. 2002/SUP-6, subject to the following additional conditions:

10. 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.

11. Prior to commencing land filling in the 21-acre expansion area, the applicant shall submit to the Director 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 Planning and Permitting, providing there is no net increase to the approved area of 107.5 acre.

Dated at Honolulu, Hawaii this 13th day of March, 2003.

PLANNING COMMISSION

CITY AND COUNTY OF HONOLULU

By Brian Yahata for
CHARLIE RODGERS, Chair

Doc 207619

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, HONOLULU, HAWAII 96813
Phone: (808) 523-4414 • Fax: (808) 527-6743
Web site: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

ERIC G. CRISPIN, AIA
DIRECTOR

BARBARA KIM STANTON
DEPUTY DIRECTOR

86/SUP-5(RY)

March 13, 2003

Mr. Lawrence N. C. Ing, Chairperson
State Land Use Commission
P. O. Box 2359
Honolulu, Hawaii 96804-2359

Dear Chairperson Ing:

Subject: Amendment of Special Use Permit File No. 86/SUP-5 for an Expansion to Waimanalo Gulch Sanitary Landfill
Department of Environmental Services
Tax Map Key 9-2-3: Portion 72 and Portion 73

On March 5, 2003, the City and County of Honolulu Planning Commission approved the application of the Department of Environmental Service, City and County of Honolulu, for an amendment to State Special Use Permit (SUP) File No. 86/SUP-5 to allow a 21-acre expansion to the existing 86.5-acre Waimanalo Gulch Sanitary Landfill for a total area of 107.5 acres. The approval was subject to 2 additional conditions to the existing 9 conditions, which relates to a 5-year deadline to close the landfill and the submittal of a metes and bounds survey showing the approved SUP area.

Because the expansion is in excess of 15 acres, the Planning Commission's Findings of Fact, Conclusions, and Decision and Order, and one original and 15 copies of the entire record of the proceedings, are attached for the State Land Use Commission's review and decision.

If you have any questions, please contact Raymond Young of the Department of Planning and Permitting at 527-5839.

Sincerely,

Brian Yahata for

CHARLIE RODGERS, Chair
Planning Commission

FORWARDED:

ERIC G. CRISPIN, AIA
Director of Planning and Permitting

CR:ry

Attachments

Doc 208182

Attachment B – Mayor's Letter to Committee Members; List of Committee Members and Meeting Schedule; Meeting Sign-in Sheets; Group Memory from the Meetings

DEPARTMENT OF ENVIRONMENTAL SERVICES

CITY AND COUNTY OF HONOLULU

REFUSE DIVISION
1000 ULUOHIA STREET, SUITE 212, KAPOLEI, HAWAII 96707
Phone: (808) 692-5358 Fax: (808) 692-5404

JEREMY HARRIS
MAYOR

FRANK J. DOYLE, P.E.
DIRECTOR

JOHN C.T. LEE, P.E.
ACTING CHIEF

IN REPLY REFER TO:
RE 03-092

July 3, 2003

«FirstName»
«Address1»
«Address2»

Dear «FirstName»:

Subject: Landfill Selection Committee

Thank you for agreeing to serve on the Mayor's Landfill Selection Committee. This advisory group will help the City establish site selection criteria and recommend one or more sites to the City Council for approval of the location of the next municipal solid waste landfill. Your training, experience, and leadership make you imminently qualified to deliberate the complex, interrelated issues that bear upon landfill siting, and we expect committee discussions to be well-considered and productive.

The next meeting will be on July 11, 2003, at 10:00 a.m. in the Mayor's conference room on the third floor of City Hall. Enclosed are the meeting agenda and a list of committee members.

There will be much information to assimilate, and committee members may wish to discuss issues with their constituencies to identify and add sites that meet minimum criteria to the list of potential landfill sites. For these reasons, the subsequent meeting is scheduled for August 8, same time and place.

Should there be any questions, please call Wilma Namumnart at 692-5378.

Sincerely,

John C.T. Lee

JOHN C.T. LEE, P.E.

Enclosures

cc: Brian Takeda, R.M. Towill
DeeDee Letts, Resolutions Hawaii

Mayor's Advisory Committee on Landfill Selection
Committee Members and Meeting Schedule

The following members served on the Mayor's Advisory Committee:

- Anderson, Bruce
- Apo, Peter
- Apo, Todd
- Bryant Hunter, Kathy
- Chun, Michael
- Guinther, Eric
- Holmes, Steve
- Jung, Ted
- Kane, Shad
- Paty, William
- Rezentes, Cynthia
- Slovin, Gary
- Thielen, Cynthia
- Tomita, Gary
- Tong, Robert
- Yamamoto, George

The Committee worked between June and November, 2003. Meetings held during this period were on the following dates:

- July 25, 2003
- August 8, 2003
- August 23, 2003
- August 29, 2003
- October 3, 2003
- October 10, 2003
- October 24, 2003
- November 7, 2003
- November 21, 2003

MAYOR'S ADVISORY COMMITTEE ON LANDFILL SITING 2003

Name	12/1	8/8	8/22	8/29	10/3 ~~9/26~~	10/10	10/24	11/7	11/21
Anderson, Bruce	RAA	RAA		RAA	RAA		RAA		RAA
Apo, Peter		PKA	RESIGNED						
Apo, Todd									
Bryant Hunter, Kathy	KB	KB	KB	KB	KB	KB	KB	KB	KB
Chun, Michael	MC	MC		MC					MC
Guinther, Eric	EBG	EBG	EBG	EBG	EBG	EBG	EBG	EBG	EBG
Holmes, Steve		SH	SH				SH	SH	SH
Jung, Ted									
Kane, Shad									
Paty, William									
Rezentes, Cynthia									
Slovin, Gary									
Thielen, Cynthia									
Tomita, Gary									
Tong, Robert									
Yamamoto, George									

LANDFILL SITING COMMITTEE

10:00 A.M., FRIDAY, JULY 11, 2003
MAYOR'S OFFICE CONFERENCE ROOM

NAME	MAILING ADDRESS	TELEPHONE FAX	E-MAIL
ROBERT L.P. TONG	92-616 MAKAKILO Dr Kapolei, HI 96707	672-3354	tongr002@hawaii.rr.com
Rep. Cynthia Thielen	State Capitol Rm 443 415 So. Beretania St.	586-6480 x 6481	repthielen@capitol.hawaii.gov
Steve Holmes	530 S. King St. #506 Honolulu, HI 96813	523-4714 550-6199	sholmes@co.honolulu.hi.us
TED JUNG	1825 LAUKAHI PL. HONO 96821	383-2461-C 521-3423	jungt002@hawaii.rr.com
Bruce S. Anderson	~~3452 Kalaoaniolo Dr. Honolulu HI 96817~~ JABSOM 1960 East-West Rd., Honolulu, HI 96817	956-5776	bsa@hawaii.edu
Gary Slovin	1099 Alakea St. #1800 96813	547-5746, 5880	gslovin@goodsill.com
Brian Takeda	RUTR	842-1133/842-1937	

LANDFILL SITING COMMITTEE

10:00 A.M., FRIDAY, JULY 11, 2003
MAYOR'S OFFICE CONFERENCE ROOM

NAME	MAILING ADDRESS	TELEPHONE FAX	E-MAIL
MARK WHITE	5714 FOLSOM BLVD #240 SACRAMENTO, CA 95819	916/387-9777 916/387-9802	MARK@PWCG.NET
Wilma Namumnart			
Eric Guinther	45-309 Akimala Pl. Kaneohe Hi 96744	808-247-4906	
GARY K. TOMITA	94-1117 HUAKAI ST. WAIPAHU, HI 96797-3726	808-677-4546(ofc) 808-677-4546*51	igtwink@aol.com
SHAD KANE	92-1309 UAHANAI ST. KAPOLEI, HI 96707	808-672-4765	KIKA@HAWAII.RR.COM
George Yamamoto	92-1539 Aliinui Dr. #H Kapolei, HI 96707	~~692~~ 6790414 692-4253	George.S.Yamamoto@alumni.usc.edu
~~Cynthia Thielen~~			

LANDFILL SITING COMMITTEE

5:30 P.M., FRIDAY, JUNE 13, 2003

MAYOR'S OFFICE CONFERENCE ROOM

NAME	MAILING ADDRESS	TELEPHONE FAX	E-MAIL
SHAD KANE	92-1309 Makanai St.	672-4765	Kila@Hawaii.rr.com
Cynthia K.L. Rezentes	87-149 Maipela St. Waianae 96792	696-0131	rezentesc@aol.com
GARY K. TOMITA	94-1117 Huakai St. Waipahu, HI 96797	677-4546 (work) 535-8538 (cell)	igtwink@aol.com
George Yamamoto	92-1539 Aliinui Dr. #H Kapolei, HI 96707	679 0414	GeorgeS.Yamamoto@alumni.usc.edu
TED JUNG	1825 LAUKAHI PL 96821	383-2461	~~theodore.g.jung~~ jungt002@hawaii.rr.com.
Eric Guinther	45-309 Akimala Pl Kaneohe 96744	247-3426 236-1782 (cell)	guinther@hawaii.rr.com
Steve Holmes	530 S. King St. #306 Honolulu, HI 96813	523-4714	sholmes@co.honolulu.hi.us

LANDFILL SITING COMMITTEE

5:30 P.M., FRIDAY, JUNE 13, 2003
MAYOR'S OFFICE CONFERENCE ROOM

NAME	MAILING ADDRESS	TELEPHONE FAX	E-MAIL
Barbara Marshall	530 S. King Honolulu 96813	547-7003	bmarshall@ co.honolulu.hi.us
Bruce Anderson	John A. Burns School of Medicine 1960 East-West Road Honolulu, HI 96822	956-5775	bsa@hawaii.edu
Karen Onishi	R.M. Towill Corp. 420 Waiakamilo Rd #411 Hon 96817	842-1133	
Kathy Bryant Hunter	248 Uilama St Kailua 96734	262 6012	kathybryant@ dpr4adr.com
Gary Slovin	1099 Alakea st. Suite 1800 Honolulu 96813	547-5746 547-5880	gslovin@godsill.com

Group memory
Mayor's Advisory Committee on Landfill Siting
Friday, July 11, 2003
10:00AM to 11:30AM
Mayor's Conference Room

Attendance

Present:

Bruce Anderson
Todd Apo
Ted Jung
Eric Guinther
Steve Holmes
Shad Kane
Cynthia Rezentes
Gary Slovin
Cynthia Thielen
Gary Tomita
Robert Tong
George Yamamoto

Wilma Namumnart (Refuse Division, Dept. of Environmental Services)
Brian Takeda (RM Towill)
Mark White (Pacific Waste Consulting Group)
Roy Tsutsui (RM Towill)

Puni Chee (Representative for Council member Nestor Garcia)
Nancy Crittenden (Representative for Council member Barbara Marshall)
Roc Riggs (Representative for Council member Michael Gabbard)
Dee Dee Letts (Facilitator)
Karen Takahashi (Recorder)

Absent: Michael Chun, Bill Paty, Kathy Bryant-Hunter

Introductions, Overview, Purpose and Guideline Adoption

Facilitator Dee Dee Letts welcomed and thanked members of the Mayor's Advisory Committee on Landfill Siting for attending and asked them to introduce themselves. Wilma Namumnart then asked members to fill out parking request form and send her an e-mail with missing information.

An overview of the meeting agenda was posted and reviewed by Dee Dee Letts. Agenda items for the meeting included the following:

- Introductions, Overview, Purpose, and Guideline Adoption
- Purpose
- Outcome
- Site Overview
- Criteria Overview
- Additional Criteria Discussion
- Additional Sites Identification Discussion
- Next Steps

The following meeting guidelines were explained by Dee Dee Letts:

- Be respectful of people's time. Meetings will start and end on time.
- Meetings are 90 minutes unless otherwise agreed to by the group.
- Each member is responsible for the success of the group.
- All meetings will have a clear objective and agenda.
- Members will be responsible for getting caught up on missed meetings.
- Issues not people are criticized. Courtesy shall prevail.
- It's okay to disagree.
- Members will do agreed upon homework in a timely manner.
- All members are equal and will participate in a manner that does not monopolize the process.

Group memories that include items as recorded on the newsprint will be provided to group members for each meeting. Committee members will be responsible for the accuracy of what is on the newsprint and were asked to offer corrections during the meeting to insure the accuracy of the group memory. Committee members agreed to the meeting guidelines.

Purpose

It was explained that the purpose of the Mayor's Advisory Committee on Landfill Siting is to provide feedback and recommendations to the administration, consultant and others involved in the process from a committee perspective about the various issues involved in siting a landfill and proposed sites.

Outcome

It was also explained that the desired outcome is to develop an optimum list of community issues and concerns regarding siting that need to be addressed and to recommend several sites to be examined in the EIS process.

Site Overview (Brian Takeda)

Consultant Brian Takeda provided an overview of the landfill siting process. He explained that the consultants are seeking guidance from the Committee in identifying 3-5 landfill sites by the December 2003 timeframe. He noted the following:

July 2003 -	Develop criteria and conduct site review LUC notification
August through October 2003 -	Research and Analysis
November 2003 -	Recommend sites
December 2003 -	Report to Land Use Commission
January 2004 -	Additional sub-consultant studies on sites (e.g., hydrology, flora/fauna, etc.) Analysis of sub-consultant studies

The following information was identified as useful in helping Committee members understand the process and will be provided to Committee members:

- Copy of the original LUC order (Wilma Namumnart)
- The internet site to obtain a copy of the EIS alternatives (Mark White)
- Copy of Oahu Landfill Selection Committee, Informational Materials (Brian Takeda)

Criteria Overview (Wilma Namumnart)

Wilma explained that in 1977, a report was issued relating to an investigative study conducted on alternative potential landfill sites for Oahu. Land to be considered was non-prime land that no one wanted (e.g., large, deep, able to be filled). In the informational materials provided to Committee members, reference was made to potential landfill sites in Section 5, Table of Landfill Sites and Projected Capacity. It was noted that numbers 16 (Kalaheo) and 19 (Kapaa No. 2 and 3) were closed while numbers 6 (Ewa No. 2), 9 (Heeia Kai), 31 (Olomana), and 34 (Sand Island) were lost to housing developments and a state park. It was also noted that there were development plans for number 4 (Diamond Head Crater) and that number 22 (Koko Crater) had endangered and endemic species which needed to be considered.

Other factors that should be considered include:

- City wants 15 year landfill life.
- It takes about 7 years to go through the permitting and construction process before the first load can be accepted at the landfill.

- Sites should have at least a 5 year capacity. A site with at least 10 years capacity is desirable and more realistic and as noted above the city would prefer a 15 year life.
- An estimated rate of 500 tons per day was used to develop the capacity for the original list.
- Landfill life may be decreased or increased. Through operations/other means, there may be an opportunity to expand the capacity of any particular site for landfill expansion.
- In order to determine the total capacity, further research needs to be done.

Questions raised included the following:

- Should sites with less than 5 years capacity be taken off the list? It was suggested that the Committee should determine whether to do this.
- What is the remaining capacity at the Waimanalo Gulch? Based on the area permitted, there is enough capacity for only 5 more years. However, the area available could allow a longer period of use. There is more potential to expand, but a better number of what it could be expanded to needs to be determined. The actual landfill footprint is 84 acres; better numbers are needed. **(Subsequent to the meeting the city provided the information that beyond the 5 year permitted area, the site could accept waste for another twenty (20) years to completely fill the valley)**
- Is there potential for other sites to be expanded? Yes, there is more potential. More research would need to be conducted.

Additional Criteria Discussion

Brian Takeda referenced the following criteria which is used to guide the landfill siting process:

- ***Code of Federal Regulations (CFR), Part 258***, governs the development, operation and closure of landfills. This Federal regulation is administered by the Environmental Protection Agency (EPA), and is delegated to the State of Hawaii, Department of Health (DOH). The State's implementation of 40 CFR 258 is through the DOH Solid Waste Permit Program.

  There are six location restrictions applicable to the siting of landfills (See Informational Materials, Section 6, Identification of New Landfill Sites Worksheet, Worksheet Instructions #1-6):

  - Airport restriction
  - Floodplains
  - Wetlands
  - Fault areas
  - Seismic impact zones

- Unstable areas

- ***Capacity Requirement*** - The City has identified a benchmark regarding capacity. The desired landfill capacity requirement is 10 years and is based on projected and current rates of waste generation. The total airspace requirement will be 8 million cubic yards.

- ***Technical and Resource Criteria*** - There are a total of seven criteria for the siting of a landfill which have been previously considered by the City. They include the following:

  - *Protection of Natural Resources*
    - City Council Resolution 03-09 establishes a policy that municipal solid waste landfills should not be located anywhere above the Department of Health's Underground Injection Control line, within the Board of Water Supply's groundwater protection zone, or over any of the City's drinking water sources.

  - *Compatibility with Area Land Use*
    - Discussion and dialogue with the affected area population to incorporate community concerns and address issues associated with landfill developments.

  - *Protection of Natural Habitat*
    - Landfills should not be sited in locations which serve as habitat for Federal or State listed threatened or endangered species.

  - *Protection of Cultural Resources*
    - Landfills should not be located in places with known significant archaeological or historic cultural sites (e.g., archaeological items, burial sites, sites used for cultural and religious practices, etc.).

  - *Technical viability*
    - Technical viability includes site evaluation of engineering feasibility, cover availability, site access, and availability of utilities.

  - *Economic Development Costs*
    - This refers to what it costs to develop the site, analysis of haul distances, and material import costs. It also includes costs associated with construction of administrative and operational facilities.
    - The Committee needs to determine if it will add ash to the proposed landfill site; if so, it should look at ash monofill at the

same time that it looks for a site for municipal solid waste.

- Land Acquisition Issues
  - Ownership issue: is it privately or publicly owned land? If land is privately owned, acquisition issues such as purchase cost, condemnation costs need to be considered.
  - Other factors: community issues, public use issues, location of the landfill in relation to existing or proposed future development.

The following questions were raised relating to this criteria:

- Are the criteria for an ash monofill significantly different than that for a municipal solid waste landfill?
- What is the proximity to H-POWER for hauling purposes? Wilma will provide this information to Committee members at the next meeting.
- What community issues need to arranged: characteristics of landfill operations, effects/impacts?

- Is the haul distance to H-power: significant economic and environmental criteria?
- How much material (ash and other materials) leaves H-Power to be landfilled?
- What are our assumptions regarding what is going into the landfills?
- Should C&D (construction debris) continue to be accepted at landfills? Wilma Namumart will provide list of banned materials to Committee members.

Wilma explained that the City is looking at alternatives to reduce the wastestream and also decrease its dependency on landfills (e.g., Plasma Request-for-Proposals, recycling, expansion of H-POWER, organics composting, etc.).

The following questions and comments were provided by Committee members:

- Is the Advisory Committee wasting its time if the City Council has already taken a position via Resolution 03-9? Due to this resolution, only 7 sites are available for the Committee to consider. Shouldn't the Committee start with the strictest criteria first and eliminate those sites which are behind the red/green lines?

- Does the Committee want to look at other sites?

- The Committee will still need to narrow down the choices to 2-3 sites.

- Rather than focus on all technical issues, should the effort start with sites that meet Resolution 03-9 criteria? The Committee needs to know if there is a hard restriction by the City Council, Department of Health, Board of Water Supply,

and community groups.

- Resolution reflects the Council's desire/intent. Believe that the sites should not be eliminated and that the review process should proceed.

- Another item for review by the Committee: Overview of landfill operations, economics of running a landfill, what it costs – should be provided to Committee members.

Additional criteria discussion:

Brian Takeda asked Committee members to review the informational materials provided along with the criteria listed and to identify any additional sites using the worksheets provided in the informational materials provided. He asked that Committee members return their worksheets by faxing them to Wilma no later than Friday, 7/25/03. Upon receipt, a compilation will be created and provided to Committee members at the next meeting.

Additional sites identification worksheets

Committee members were asked to identify additional sites that could be considered for landfill. It was noted that if a site were suggested for consideration and that based on federal criteria that it could not be permitted as a municipal landfill, that the site would have to be eliminated from further consideration. We expect this may be an exception to the rule since in most cases we would need to do the research first and then confirm whether or not the site should be further evaluated.

Next Steps

The following items will be provided to Committee members:

- Executive Summary for the Alternatives expansion report (website address; hard copy upon request)
- Where C&D wastes are going
- Overview of landfill operations – economics of running landfill, what it costs
- List of banned materials

Other issues to be discussed at the next meeting include:

- Expanding criteria
- Should C&D continue to be accepted at landfills? % to be provided by Wilma.
- Are criteria monitoring significantly different for ash as solid waste?

Next Meeting

The next meeting of the Mayor's Advisory Committee on Landfill Siting is scheduled for Friday, August 8, 2003 from 10:00 AM to 11:30 AM in the Mayor's Conference Room.

Mayor's Advisory Committee on Landfill Siting
Friday, August 8, 2003
10:00AM to 11:45AM
Mayor's Conference Room

Attendance

Present:

Bruce Anderson
Kathy Bryant-Hunter
Michael Chun
Eric Guinther
Steve Holmes
Shad Kane
Cynthia Rezentes
Gary Slovin
Cynthia Thielen
Gary Tomita
Robert Tong

Wilma Namumnart (Refuse Division, Dept. of Environmental Services)
Brian Takeda (RM Towill)
Roy Tsutsui (RM Towill)

Nancy Crittenden (Representative for Council member Barbara Marshall)
Roc Riggs (Representative for Council member Michael Gabbard)
Dee Dee Letts (Facilitator)
Karen Takahashi (Recorder)

Absent: Todd Apo, Ted Jung, Bill Paty, George Yamamoto

Agenda Overview

Facilitator Dee Dee Letts welcomed members of the Mayor's Advisory Committee on Landfill Siting and asked them to introduce themselves. Dee Dee then provided an overview of the meeting agenda which included the following items:

- Distribute Group Memory for 7/11/03 meeting
- Homework
- Description of Landfill Operations
- Economics of Operating Waimanalo Gulch
- Landfill Selection Criteria
- Next Steps

Committee members were provided with a meeting timetable which outlined the schedule of meetings, including optional meetings, if needed. Advisory Committee members were reminded that the focus of the schedule is to have a list of three sites by December 2003. The meeting timetable is as follows:

8/8/03	Discuss Draft Criteria
8/22/03	Discuss Final Criteria / Sites Discussion
8/29/03	(Optional) Discuss Final Criteria / Sites Discussion
9/26/03	Analysis of Viable Sites
10/10/03	Discuss Analysis of Viable Sites and Select Short Listed Sites
10/24/03	(Optional) Discuss Analysis of Viable Sites and Select Short Listed Sites
11/7/03	(Optional) Discuss Analysis of Viable Sites and Select Short Listed Sites

Distribute Group Memory

Copies of the group memory from the July 11, 2003 meeting were distributed and members were asked to note the discussion printed in bold on page 4 relating to capacity at the Waimanalo Gulch which reads as follows:

> **"(Subsequent to the meeting the city provided the information that beyond the 5 year permitted area, the site could accept waste for another twenty (20) years to completely fill the valley.)"**

Homework

The following responses were provided as follow-up to the last meeting:

- Copies of the Executive Summary for the Alternatives expansion report were provided to Task Force members.
- Where are C&D wastes going? C&D wastes are going to the Nanakuli landfill (PVT Land Company).
- A list of banned materials was provided to Advisory Committee members.
- Should C&D continue to be accepted at landfills? Per Wilma Namumnart, less than 5% is being accepted.
- Are criteria monitoring significantly different for ash as compared to solid waste? Per Wilma Namumnart, if ash is from municipal solid waste, the criteria for monitoring is the same.

- An overview of landfill operations was provided by Joe Hernandez.

Description of Landfill Operations

Joe Hernandez, Environmental Manager, Waste Management of Hawaii, provided a description of landfill operations to Advisory Committee members.

- At Waimanalo Gulch, the Environmental Manager monitors compliance with regulations.
- Operations directs trucks to City and County Scalemaster.
- Waste is screened to ensure banned waste not going into landfill.
- Waste goes to active phase (commercial and residential wastes) where it is backed-up into landfill. Equipment pushes/compacts waste.
- Landfill operators are trained to identify hazardous waste.
- Special waste program is a multi-tiered system. Program seeks to ensure that wastes are dumped properly, after being screened, and tested to determine if it is hazardous or non-hazardous waste.
- Process includes compaction.
- At end of the day, operator is required to cover with a minimum of 6 inches of soil.
- Samples of liners used for landfill were distributed to Task Force members to give them an idea of the type of material used.
- On average, 3-4 acres are lined with liner, covered with gravel, then a fabric material cover, and 18-24 inches of protective layer of soil.
- Question: Aside from cost, are there are state-of-the-art things that can be done? Cover the landfill, set up portable fencing to prevent litter from blowing. When the site is finished, landscape the most visible areas.
- Question: Is the landfill covered every day? Yes; landfill is covered with soil that has been screened. Some contaminated soil is used. Contaminated soil falls under a special waste criteria but a test is done to make sure that it is not classified as hazardous according to RCRA, Subtitle D.
- Question: Does monitoring require an assessment of impacts to the surrounding area and are monitoring reports required? Monitoring reports look at gas, leaking

of the liner, leaching, etc. and are provided semi-annually to the Department of Health. Waste Management samples the wells and submits result to an outside laboratory for testing.

- Question: Is the City aware of the Navy's efforts at Kalaeloa where they have moved lead and other heavy metals which breakdown and require redoing liners? Monitoring has determined that migration of heavy metals is not occurring at Waimanalo Gulch.

- Question: Have there been any impact studies regarding impact to the ocean? HECO does chemical analysis at Kahe Point in addition to long-term studies of outfall to the ocean.

- Question: How do other places handle their waste? In some places, big berms are put up to shield landfills visually. Berms in Hawaii are small and visible. Big berms could act as a visual shield, help contain or catch litter, and also control odor. Berms will also help to minimize the view of landfill operations. In some places, large berms are used as active parks by the public, traffic is not visible, and also do not back up on the roads. The aesthetics/visibility issues can also be addressed by changing the color of the liner (e.g., green). It was recommended that instead of little berms for each cell, that a large berm be constructed to shield the entire area.

- Need to know the state-of-the-art, what could be done to make it more aesthetically pleasing (e.g., hydromulching will lead to green areas.)

- Question: How do you deal with materials above/outside of the liner that goes downhill? Example given of ash-like waste found outside of the liner. Waste Management and the City were unaware of this situation. Ash is filled behind the berm and Waste Management is required to be sure that the ash does not runoff.

- Joe will look at the ash onsite from Waimanalo to the ocean to follow through on the above-mentioned situation.

- Joe will also check to see if the liner material is available in green.

Economics of Operating Waimanalo Gulch

A handout on the Economics of Operating Waimanalo Gulch were provided to Task Force members from Wilma Namumnart.

- Disposal fee per ton multiplied by the total MSW tons provides the potential revenue. For Fiscal Year 2003, this amount was $18,321,346.

- There are two types of tonnage: non-revenue tonnage and revenue tonnage.

- Actual revenue tonnage has two different rates: (1) other city agencies @$16.50 per ton; (2) Commercial entities @$72.25 per ton.

- Recyclers get an 80% discount and pay only 20% of the commercial rate.

- Transfer Stations collect from other city agencies @$50 per ton and commercial entities @$98.75 per ton.

- Fee paid to Waste Management for MSW operations (i.e., excavation, lining, tonnage) reduces that actual revenue for landfill and transfer stations.

- Total amount collected less than potential revenue.

Landfill Selection Criteria

Advisory Committee members were provided copies of letters from the United States Environmental Protection Agency Landfill Selection Criteria(US EPA) and Department of Health relating to landfills located above the Underground Injetion Control Line. Members were also provided with copies of a "Draft Technical Siting Criteria and Evaluation Approach for the City and County of Honolulu Blue Ribbon Landfill Siting Committee" prepared by Pacific Waste Consulting Group. The siting criteria provide a basis for judging one potential landfill site relative to all the others.

Consultant Brian Takeda explained that the six criteria that the US EPA identifies as landfill siting requirements are applied before the siting criteria. Of the six US EPA requirements (i.e., airports, floodplains, wetlands, fault areas, seismic impact zones, unstable areas), the last three do not always apply to Hawaii.

The siting criteria are organized into five categories and each category has criteria that are assigned a point value, ranging from zero to five. The five categories are as follows: (1) Community; (2) Environmental and Land Use; (3) Administrative; (4) Economic; and (5) Technical. On page 19 of the draft, an example of application of weighting criteria is provided. Advisory Committee members will advise what kind of weight is needed for the various criteria. Advisory Committee members were asked to look at the criteria closely, determine whether they like the criteria and the point values associated with the criteria, and advise of changes that will need to be made. Once the criteria is finalized, it can then be applied to the various landfill sites. The Consultant will collect the data, give its best judgment, and then bring it back to the Committee.

The following questions were asked regarding the criteria:

- Will the criteria require massive amounts of data for each site? The process is composed of two parts. The first phase will be to look at all possible sites and narrow it down to three to five sites over the next few months. Data will be

provided by the Consultant.

- Is it possible to look at past criteria that was used? (e.g., Waimanalo Gulch) Per Wilma Namumnart, the EIS report from the past study is available.

- Was this done with the siting of Waimanalo Gulch and its placement? Can it be made available for use as a guide in this process? Concern was raised that we should not go back since laws have changed and that this criteria should suffice.

- A suggestion was made that a criteria be added to minimize the proximity of landfills to nearshore waters. **(Subsequent to the meeting, the Consultant provided the information that Criteria No. 36 addresses distance from surface water bodies.)**

- What would be the increased economic costs of developing a landfill more than the 12 mile radius from H-POWER if ash had to be hauled there for disposal? The City was unable to answer the question because this would become part of the contract negotiations.

Concerns were raised about the need to go back to their respective constituency or community to review the draft siting criteria and to determine if it is the right criteria, with the right weighting for each of the criteria. There was also some discussion about possible moving of the August 29th meeting into September to allow for appropriate input. A suggestion was made that a community briefing could be held to provide information and solicit input. This issue will be revisited at the August 22nd meeting.

The Group Memory will be posted on the City and County of Honolulu Refuse Division's website located at www.opala.org.

Next Steps

For those who are interested, a landfill tour has been arranged for Thursday, August 14, 2003 from 8:30 a.m to 11:30 a.m. Those interested in attending were asked to meet Wilma Namumnart at Kapolei Hale. Transportation will be provided.

It was suggested that at the next meeting, the following items be discussed:

- Feedback from Joe regarding ash wastes near Waimanalo Gulch landfill and whether green liners are available.

- Regulator's perspective regarding landfills (i.e., DOH, US EPA) when permitting a landfill. To accommodate this discussion, Advisory Committee members agreed to a half-hour extension of the next meeting.

- Discuss and finalize siting criteria.

- Discuss and finalize criteria weighting system.

Next Meeting

The next meeting of the Mayor's Advisory Committee on Landfill Siting is scheduled for Friday, August 22, 2003 from 10:00 AM to 12:00 PM in the Mayor's Conference Room.

Mayor's Advisory Committee on Landfill Siting
Friday, August 21, 2003
10:00AM to 11:45AM
Mayor's Conference Room

Attendance

Present:

Todd Apo
Kathy Bryant-Hunter
Eric Guinther
Steve Holmes
Ted Jung
Shad Kane
Cynthia Rezentes
Cynthia Thielen
Gary Tomita
Robert Tong
George Yamamoto

Wilma Namumnart (Refuse Division, Dept. of Environmental Services)
Brian Takeda (RM Towill)
Roy Tsutsui (RM Towill)
Mark White (Pacific Waste Consulting Group)

Nancy Crittenden (Representative for Council member Barbara Marshall)
Dee Dee Letts (Facilitator)

Absent: Bruce Anderson, Peter Apo, Michael Chun, Bill Paty, Gary Solvin

Guests:

Gary Siu, State Department of Health, Office of Solid Waste
Lene Ichinotsubo, State Department of Health, Office of Solid Waste
Joe Hernandez, Waste Management of Hawaii
David Fuiawa, Waste Management of Hawaii

Agenda Overview

- Requested presentation by State Department of Health, Gary Siu
- Response to questions from previous meeting by Joe Hernandez, Waste Management of Hawaii

- Criteria Discussion
- Weighting of Criteria

State Department of Health

Gary Siu from DOH went over the key concerns about siting from a DOH perspective. He noted that the group had already gone over the federal criteria which DOH would also have to see satisfied. He noted that one of DOH's key concerns would be that the chosen site does not impact ground water resources. Other concerns or things they might look at:

- The shortness of the haul from HPOWER to minimize the accidental spilling of ash
- Buffers to shield the activity from other land uses

He also noted that permitting would take at least one year.

C: Should address the safety of ash transport now and require the safest transport method instead of worrying about distance.

Q: If you increase haul distance don't you increase deadhead time and wouldn't that create a higher economic cost?
A: Probably but we are looking at safety issues

Joe Hernandez

Per the questions the committee asked last time the liner does come in green but regulations require us to cover it with black felt material so nothing would be gained visually by buying green. Joe also shared pictures on how water flow is handled on site to minimize any mix between landfill byproducts and water flowing to the ocean.

Q: My concern is windblown ash getting into the ocean and control of this.
A: The ash is damp when delivered and solidifies like cement so that we have to use a dozer to move it around – it is not a substance subject to being blown by the wind.

Q: Did you ever test for ash in water?
A: Yes. The only elevated levels found in the water were iron and this is probably because of the red iron rich soil.

Landfill Selection Criteria

The committee asked if the score will be the highest or lowest to be the most suitable landfill site. The highest score will denote the more preferred landfill site. The consultant will review the criteria for consistency throughout as far as the ratings alternative. The group requested that where measurements were changes criteria with

similar measurement features also be changed so that measurements would be consistent. The consultant agreed to do this.

The group next went through the criteria and measurements one at a time the following comments were received. Criteria needing continued discussion at the next meeting are noted in **bold**.

Criteria 1: OK

Criteria 2: distance is measured from the property line to the property line. The group suggested that the measure be less the ¼ mile a ¼ to ½ mile and over ½ mile

Criteria 3: there was some discussion on including wind direction toward the ocean but the group decided to take this up later

Criteria 4: This will be revisited at the next meeting – need more discussion and definition how density will be determined and what boundaries will be used.

Criteria 5: Make measures consistent with 2

Criteria 6: Reflect that the zoning on the majority of the site should be consistent

Criteria 7: Make consistent

Criteria 8: Tinker with it to make it consistent and possible remove it and add to 6.

Criteria 9: Define high use road as a road with a state route number

Criteria 10: Change it to residences and schools and revisit the question of businesses.

Criteria 11: OK fist measurement replace or with and and clean up language in the rest of the measurements.

Criteria 12: add "or adjacent to" and define wetlands with the Fish and Wildlife definition

Criteria 13: add "or adjacent to"

Criteria 14: OK

Criteria 15: Needs discussion

Criteria 16: OK

Criteria 17: Add schools

Criteria 18: The group wants to see a list of optional uses for closed land fills

Criteria 19 & 20: Combine and add "or adjacent to" – use SHPO definition of significance

Criteria 21 & 22: Delete

Criteria 23 & 24: Combine and again check consistency – use annual amortized cost

Criteria 25 & 26 & 27: Check for consistency

Criteria 28: Change distance to less the 12 miles and 12.1 and above

Criteria 29: Look at standard versus substandard road conditions as defined by county standards and also look at the road ownership issue some are private.

Criteria 30: Check consistency

Criteria 31: OK

Criteria 32: Change to soil available or soil not available on site

Criteria 33: OK

Criteria 34: Look at using isohyets for measurements

Criteria 35: OK – need to look outside footprint

Criteria 36: Add Ocean to surface water

Criteria 37: Use response time not distance

Criteria 38: Look at turning needs for vehicle sizes and acceleration and deceleration needs

Criteria 39 – 42: These need tweaking and 42 needs quantification

The consultant agreed to get a new draft to the group prior to the next meeting.

The following criteria will be revisited during the August 29th meeting. 4, 10, 15, 28, 29. Additional criteria to be looked at will be sent to the consultant prior to the meeting. One developed for discussion at that meeting was wind direction toward the ocean. The group also needs to look at a definition of populated area.

Next Steps

- Discuss and finalize siting criteria.
- Discuss and finalize criteria weighting system.

Next Meeting – Note change in Place

The next meeting of the Mayor's Advisory Committee on Landfill Siting is scheduled for Friday, August 29, 2003 from 10:00 AM to 12:00 PM in the Second Floor Conference Room at the Honolulu Municipal Building.

Mayor's Advisory Committee on Landfill Siting
Friday August 29, 2003
10:00 AM to 12:30 PM
2nd Floor Municipal Building

Attendance

Present: Bruce Anderson
Todd Apo
Kathy Bryant-Hunter
Michael Chun
Eric Guinther
Ted Jung
Shad Kane
Cynthia Rezentes
Gary Slovin
Cynthia Thielan
Robert Tong

Wilma Namumnart (Refuse Division, Dept. of Environmental Services)
Brian Takeda (RM Towill)
Mark White (Pacific Waste Consulting Group)

J. Ikaika Anderson (Representative for Council member Barbara Marshall)
Dee Dee Letts (Facilitator)

Absent Peter Apo, Steve Holmes, Bill Paty, Gary Tomita, George Yamamoto

Agenda Overview

- Criteria Discussion
  - Last meeting
  - Requested language changes, measures and consistency issues
  - Definitions
  - Errors
- Prioritization

Discussion

All criteria numbers and adoptions are done from the August 28th draft passed out at the August 29th meeting.

Criteria 4 (population density) – was adopted with the deletion of the phrase "living within 0.5 miles of the [footprint] property" in all measures

Criteria 9 (visibility from residences, schools, and visitors) – this criterion was change to be a general visibility criterion to read "Visibility of Landfill for residents, visitors and school populations – the measure should be changed to reflect the angle of visibility to the ocean.

Criteria 11 (wetlands) – this criteria will use the Fish and Wildlife definition of wetlands and aquatic sites which includes oceans – the word adjacent will be added and the references to mitigation in the measures will be removed – these measures will reflect the change of this criteria from and economic to an impact criteria and the distances will be standardized the distances used in other criteria and approved by the group

Criteria 12 (flora and fauna) – adjacent will be added and the measures will be distance standardized and critical habitat will be added

Criteria 14 (oceans) is removed as it is now covered by criteria 11 (wetlands)

Criteria 18 (archeological and historical significance, now criterion 17) – adjacent will be added and it will be standardized for distance

Criteria 25 (haul distance from H-POWER) will stay however one member suggested that we look at different ash sites especially old holes at Kalaeloa that might be suitable for this use – he was asked to get together with the consultant so that this could be looked at

Criteria 26, 27 and 28 were combined into one set of access road considerations

Criteria 37 (traffic safety, now criterion 28) – needs to look at the impact on safety of potential haul distances – the measures will be reworked to assess haul distances for city vehicles and some estimates will be made from central areas of private pick ups

Errors

- Criteria 3 first measure needs to read 50 to 80% - change will be made
- Criteria 8 the measures should high visibility, moderate visibility and low visibility – the word public needs to be inserted before road in measure 3
- Criteria 17 the measure values need to be reversed
- Criteria 26 – in the first line "haul" needs to be replaced with "access" for consistency

All of the other criteria were Ok as presented in the draft.

The group discussed that there could be positive criteria such as employment opportunities that were not looked at. Employment, restoration of degraded sites and a decrease in the community of roadside dumping were mention as examples. The consultant stated that they could come up with measures for the first two but that quantifying roadside dumping impacts would be hard. The group asked the consultants to do the first two and then to run the sites twice once with just the approved criteria and

once adding the new positive criteria and bring the results back to the group at their September meeting.

The group moved forward to the prioritizing exercise and some combining of criteria was done in preparation for this exercise.

- Numbers 26, 27, and 28 were combined into access road considerations criteria.
- Numbers 21, 24, 29, 31 and 32 were combined into a cost of operations criteria
- Numbers 20, 23, and 29 were combined into a cost of development criteria

The group next asked the consultants and City staff to leave the room while they prioritized the criteria so the results of the prioritization would not influence the consultant's evaluation of the sites. The sites will be presented at the September meeting with no weighting by priority – the results of today's exercise will be shared at that meeting and applied to the site list.

The next meeting will be September 26th from 10 to 11:30 at the Mayor's Conference Room.

Meeting adjourned at 12:30

1Mayor's Advisory Committee on Landfill Siting
Friday, October 3, 2003
10:00AM to 11:45AM
Mayor's Conference Room

Attendance

Present:

Kathy Bryant-Hunter
Eric Guinther
Shad Kane
Cynthia Rezentes
Gary Slovin
Cynthia Thielen
Robert Tong

Wilma Namumnart (Refuse Division, Dept. of Environmental Services)
Brian Takeda (RM Towill)
Mark White (Pacific Waste Consulting Group)

Nancy Crittenden (Representative for Council member Barbara Marshall)
Roc Riggs (Representative for Council member Michael Gabbard)
Dee Dee Letts (Facilitator)
Karen Takahashi (Recorder)

Absent:

Bruce Anderson, Todd Apo, Michael Chun, Steve Holmes, Ted Jung, Bill Paty, Gary Tomita, George Yamamoto

Agenda Overview

Facilitator Dee Dee Letts welcomed members of the Mayor's Advisory Committee on Landfill Siting and provided an overview of the meeting agenda which included the following items:

- Discussion - Benefit Criteria
  - Employment Opportunity
  - Restoration of Degraded Sites
- Discussion - Possible Community Benefit Concept
  - Ko Olina Presentation with Questions and Answers
  - Mark White, Presentation on Host Community Benefit Concepts Research with Questions and Answers
  - Privatization
- Discussion - Landfill Capacity
- Adjournment

Discussion of Benefit Criteria

Dee Dee asked Mark White to address positive benefit criteria in the areas of (1) Employment / Jobs and (2) Restoration of Degraded Sites / Remediation. Mark White indicated that, irrespective of site, approximately 25 would be employed at the landfill. The Committee agreed to add a criteria on employment but to also factor in the % unemployment present in the proposed host community.

It was also suggested that the potential for employment should include employment numbers factoring in any resulting secondary employment. It was pointed out that this might be difficult to assess. To illustrate this suggestion, the University of Hawaii's location of its West Oahu campus was provided. Based on President Evan Dobelle's projections, 150 acres will be used for the university campus, 100 acres for future expansion, and 100 acres for commercial businesses. Similarly, if the landfill is sited somewhere, could it become a magnet for other potential businesses (e.g., composting businesses, etc.)? The Committee decided to revisit this matter when the discussion of specific sites occurs.

Mark explained that remediation/rehabilitation of degraded sites would only be applicable in quarry situations – so the only site would be Ameron. The beneficial use of the landfill when closed is covered under the criteria on landfill closure. The Committee agreed that remediation should be deleted as a criteria.

Dee Dee asked the Committee if they were okay with the consultants conducting a single run using all of the criteria since the Committee had the opportunity to discuss all the criteria. The Committee agreed that a single run was sufficient.

Regarding Host Community Benefits, it was noted that benefits occur primarily when there are private interests involved. A question was raised asking if there was a benefit to privatization the landfill operations (i.e., a community, municipal-owned operation versus a private entity)?

Committee members were provided a compilation of articles researched by Pacific Waste Consulting Group entitled *Host Community Benefit Concepts*. The handout included the full text of one report on Host Community Benefits (HCB), an article from a national publication, and two other articles that illustrate the actual benefit as applied by different communities. Mark noted that the Cornell summary was helpful because it explained the conditions necessary for host community benefits. Todd Apo had indicated that he was not able to make the meeting and that someone from KoOlina would be present to make the presentation. No one from KoOlina was present.

The Committee discussed the possibility of the community determining their own controls and oversight on mitigation for an operating site. It was noted that a survey may help to suggest ideas and identify opportunities for benefits. If constructed well, surveys may provide useful information and get more responses than a public hearing. When the

community identifies sites, it is possible to present recommendations that link host community benefits with site recommendations. It was noted that there could also be financial benefits for the community (i.e., make recommendations that a surcharge on dump fees could go to the community).

The Committee agreed that when the committee identifies potential site recommendations, these need to strongly include the recommendation that no proposed site shall be permitted until a community benefit package specific to the selected community is agreed to.

Some in the Committee believe that the landfill is a short-term solution and that other issues contribute to the problem (e.g., population increase). It was suggested that a short-term landfill site be selected and that alternative technology be explored.

The Committee discussed the issue of privatization briefly. Wilma Namumnart explained that the landfill property is owned by the City while the landfill operator is contracted by the City. The City currently manages the scale house and sets the tip fees. If it was a private landfill, tip fees would need to be set up. She also explained that research was conducted to determine if it is more economical to operate the landfill with city employees or to privatize the landfill. It was noted that host community benefit articles provided by the consultant illustrate private landfill operations.

One of the Committee members asked for information on the City's RFP on plasma technology.

Capacity

Dee Dee noted that after reviewing the group memories, there was ambiguity regarding the minimum number of years for sites to be considered. The number of years ranged from 10 years to 25 years. A question was raised as to what will be used as the basis -- today's estimated capacity or revised numbers based on successful alternatives as they are implemented. It was explained that any successful alternative would lengthen the site life by the same amount at any site and that the current capacity numbers would be used. Another question was raised as to when the Committee decides on a new landfill, whether there would be two sets of equipment. It was explained that the equipment at the current landfill that belongs to the city is minimal – weigh station etc. The new landfill would have to have its own infrastructure as most of what is at the old one will still be in use and is not moveable.

Fiscal Year 2002-2003 tonnage is used to determine capacity. Household and commercial wastes to H-POWER. It is assumed that 600,000 cubic yards per year, including cover, should be used to calculate the life of the landfill. This also includes MSW and ash. The current tonnage per year is 490,000 tons per year to 550,000 cubic yards. It was noted that the basis for calculation is very conservative and could be less depending on recycling efforts. This figure would be applied to all sites.

It was suggested that one approach would be favor a lower capacity landfill in order to apply pressure on the City to find alternative technologies. It was explained that the City's philosophy has always been to save landfill capacity (e.g., plasma technology RFP's recently put out to bid and are currently being evaluated, H-POWER).

Another question was raised regarding what makes up the 600,000 cubic yards? It was suggested that there needs to be an explanation from legitimate scientists regarding this issue. Consultant Mark White noted that the composition can be identified (e.g., metal, glass, asphalt, roofing materials, etc.) but indicated that it is a conservative estimate, and until the design is completed, precise capacity would be difficult to ascertain. He also explained that alternative technologies are often costly (e.g., plasma arch technology costs $4 per pound).

The Committee agreed that 10 years minimum size should be used to maximize the number of sites to be looked at.

It was also clarified that the costs to develop a land fill as far as equipment are generally minimal compared to the cost of land acquisition.

Next Steps

Wilma Namumnart explained the following:

(1) The consultant will be finishing the evaluation criteria and will bring the criteria to the next meeting.
(2) A draft generic press release will be e-mailed to Committee members for their review and discussion at the next meeting.
(3) The website will be made current with minutes and updated criteria

Next Meeting

The next October meetings of the Mayor's Advisory Committee on Landfill Siting are scheduled 10/10/03 and 10/24/03 from 10:00 am to 11:30 am in the Mayor's Conference Room.

1Mayor's Advisory Committee on Landfill Siting
Friday, October 3, 2003
10:00AM to 11:45AM
Mayor's Conference Room

Attendance

Present:

Bruce Anderson
Todd Apo
Kathy Bryant-Hunter
Michael Chun
Eric Guinther
Ted Jung
Shad Kane
Cynthia Rezentes
Gary Slovin
Cynthia Thielen
Robert Tong
George Yamamoto

Wilma Namumnart (Refuse Division, Dept. of Environmental Services)
Brian Takeda (RM Towill)
Mark White (Pacific Waste Consulting Group)

Nancy Azeri (Representative for Council member Barbara Marshall)
Roc Riggs (Representative for Council member Michael Gabbard)
Dee Dee Letts (Facilitator)
Karen Takahashi (Recorder)

Absent: Steve Holmes,_Bill Paty, Gary Tomita_

The consultant presented the scoring on the various sites on the agreed to criteria. The site locations and names were not noted at this time to maintain the anonymity during weighting and ranking. The previous weighting of criteria that the committee had done and not shared with the consultant was unveiled. One of the criteria that the committee had combined as they weighted the criteria did not get translated to the consultant and therefore no scoring was available on Access Road. The consultant will compute this and bring it to the next meeting. The access road criterion was to cover such issues as condition of the road and ownership.

The committee again confirmed that high numbers in the consultants scoring denoted the most favorable or preferred sites and low numbers indicated the least desirable sites. The weighting that the committee had done ranged from a score of 0 to 10, with 6 items receiving 0, 5 items 1, 5 items2, 1 item 3, 1 item 4, no items 5, 6 items 6, 2 items 7, 1

item 8, 1 item 9, and 2 items 10. The committee grouped them into high, medium and low with low being assigned 1 points, medium 2 points and high 3 point. Criteria receiving 0 to 3 votes were considered low, those receiving 4 to 6 votes were considered medium and those receiving 7 to 10 votes were considered high.

After reviewing the results there were several discussions which the results prompted. One was that costs were underweighted in the calculation and that the group needed to take another look at the cost issues and decide how and if to weight them differently than the original weighting. The point was made that the costs to the tax payers was a key issue and that the group would be remiss in not addressing this issue in the weighting scheme. As the weighting currently stood all cost criteria were ranked low in the weighting scheme.

The other discussion was a revisit of the discussion had at the last meeting regarding the minimum number of years for a site to be considered. Several members felt that the ten year minimum set by the group was too short and that 15 or 20 years should be the minimum. Some members of the group wanted to vote on changing the minimum. After allowing everyone a chance to express their opinions the group decided to wait until the next meeting and asked the consultant to be prepared to present one final product that included 10 and more year sites and a second one that included 15 and more year sites.

There was also discussion about the LUC special use permit which stated that the Blue Ribbon Committee should pick one site. Wilma explained that the City was in the process of requesting an amendment to the permit as the City has consistently asked this committee to recommend 3 – 5 sites for study in the EIS process which would determine the preferred site. There was disagreement around the table that the EIS would do this as the committee felt that most EIS documents they were familiar with included a preferred site at the beginning of the process. The committee will select 3 to 5 sites and if the amendment to the LUC is not successful then the committee will be reconvened to choose the preferred site.

It was agreed that the consultant will send out the methodology used in scoring the sites by October 15, 2003. The committee members would submit any questions they had by October 22, 2003 in order to give the consultant time to look at the concern prior to discussion at the next meeting. Committee members also would express via email their preference for a 10 or 15 year minimum for the site. Those speaking in favor of the larger site discussed length of time and difficultly in permitting and that no matter how well the City implemented alternatives a landfill site was still going to be needed. Those in favor of the 10 year minimum noted their desires to force the City to move more quickly to alternatives and also to allow for banking of future sites as the City has not done this in the past and therefore has lost several viable sites to development.

A draft press release was distributed for comment and input at the next meeting. It was noted that it would be up to the committee if a press release goes out and what it says. The concern noted was that if the committee does not do a press release then the work of the committee will be subject to interpretation by whoever wants to talk to the press.

The next meeting is October 24th 10AM to 12PM at the Mayor's Conference Room.

Mayor's Advisory Committee on Landfill Siting
Friday, October 24, 2003
10:00AM to 11:45AM
Mayor's Conference Room

Attendance

Present:

Bruce Anderson
Todd Apo
Kathy Bryant-Hunter
Eric Guinther
Steve Holmes
Shad Kane
Cynthia Rezentes
Gary Slovin
Gary Tomita
Cynthia Thielen
Robert Tong
George Yamamoto

Wilma Namumnart (Refuse Division, Dept. of Environmental Services)
Brian Takeda (RM Towill)
Mark White (Pacific Waste Consulting Group)

Ikaika Anderson (Representative for Council member Barbara Marshall)
Roc Riggs (Representative for Council member Michael Gabbard)
Dee Dee Letts (Facilitator)

Absent: Bill Paty, Ted Jung, Michael Chun

The meeting began at 10. Several members arrived between 10:15 and 10:30. The first item for discussion was the methodology document distributed via e-mail to the group. The consultant asked if there were any questions to the methodology as none had been received via e-mail. The group had no questions on the methodology.

A letter was shared from DLNR, the landowner of the Waimanalo North site, stating that they would not entertain its use as a landfill site. The group agreed that for the integrity of the work done the Waimanalo North site would stay on the list and the report that went forward would state that DLNR would not consider it for this use and that the letter would be attached to whatever was forwarded by the committee.

Next on the agenda was a revisiting of the minimum capacity questions for the landfill. Group members had been asked to register their preference via e-mail for a minimum of 10 or 15 years. Eleven members chose to register their preferences regarding this issue.

Two voted for 15 years or longer and nine expressed a preference for 10 years or stated that they did not think the smaller sites should be removed at this time. A total of eight sites remained after removing those that did not provide at least 10 years of life.

The consultant passed out the ranking of the various sites with the weighting and scoring filled in for discussion purposes. The consultant noted that they had summarized the site scores grouped by categories of criteria (community, environmental and land use, economic, technical and other considerations). No matter whether the criteria categories were considered individually or as a group, the order of the top sites did not change significantly – the top 4 to 5 remained the top 4 to 5. A table was passed out showing this. Some members of the group after receiving the information felt that there had been an agreement to talk about the cost-based criteria and discuss re-prioritizing the cost criteria prior to knowing the site names. The discussion on the cost criteria was held after the sites were identified. Dee Dee apologized for any confusion on this. The discussion on weighting and costs was extensive. Some felt that costs should be given a higher weighting value as they felt the committee would look less then credible if they did not rank costs as important. They noted that costs are a major concern of taxpayers in general and to not reflect that made them feel uncomfortable with the work of the group. Others felt that the committee composition had been set up to ascertain what the most important factors were to the communities that might host a landfill and therefore felt the weighting that was done was appropriate. After much discussion it was decided that the integrity of what the group felt was a good process would be jeopardized if the group chose to start tinkering with any of the criteria or weighting factors. Group members noted that this product was only one thing the committee would be looking at it in making its final recommendations and that the ranking of the sites through this process did not necessarily mean that this ranking would be the preferred order.

The group then proceeded to look at the various sites. The consultants noted that they had brought all the background information for the committee members to take with them and rather than try to absorb it today. They wanted to pass it out at the end of the meeting and have a discussion around it on November 7th after committee members had had a chance to look at it.

There were several general concerns noted by the group:

- No criteria addresses the impact on the construction industry on the removal of Ameron as a quarry site – it was noted that these costs could be significant.
- The archaeological criteria, No. 17, does not take into account undocumented burials that are completely missed by the current research effort. The consultant concurred this would be case until the 3-5 sites are decided upon by the committee at which time a detailed study would be done as part of the EIS effort.
- There was also a question as to why Ameron and Bellows received different scores as regards Haul distance from H-Power as they are both on the windward side. The consultant noted that Ameron was off a major highway and that the distance to Bellows was significantly farther as regards haul.
- There was a question about the assumption that Ohikilolo and Nanakuli B would have low purchase costs. There is a belief that Ohikilolo would result in a lawsuit

and past history indicates this is a possibility. The consultant noted that it is difficult to assign numbers or weights to things that might or might not happen.

- It was also noted that using the tax base as a way to set value is not valid or accurate as the tax base is always low. The consultant noted that the tax base would be equally low for each site so relatively speaking the spread would be the same.
- It was noted that the only site that would not require condemnation is Waimanalo Gulch as the City already owns it.
- It was also noted that as discussions continue criteria 18,19 and 20 need to be grouped and dealt with appropriately as the cost criteria (some of this went back to whether or not to re-weight these criteria or separate them out – which the group decided not to do)
- The committee noted a lack of clarity on the part of the City as to whether Waimanalo Gulch is on the table. Members noted the LUC hearing where the 5 year extension approval was predicated on the City closing the Gulch site. Even though the City has talked about filing a request to amend this decision those present at the hearing felt that based on the testimony this is not an option. They also site statements from both the Mayor and Frank Doyle to the effect that the Gulch would be closed. Others noted that it would be irresponsible to throw it out as there is significant capacity remaining, is owned by the City, and is already a landfill.
- There is still concern about recommending 3 to 5 sites as the LUC order asks the committee for one and it has not been amended.
- Members of the group pointed out that there are always going to be costs that can't be quantified at this point. An example was archeological sites: we can only compute costs for what we know now and when a survey is done we might find others that either raise costs or make the site not feasible.

The group discussed what its final report would look like. Some members wanted to just send the matrix of how all the sites scored. Others felt that this was not acceptable because as they had previously stated they felt the matrix was only one thing the committee would look at. Others felt that the group should just send their recommendations and no explanation of the process the committee went through to arrive at their recommendations. The group for the time being agreed to have the consultant prepare a report for their input that would have the following contents:

- Introduction
  - Background and purpose
  - Workplan (Approach rationale, criteria etc.)
- Results
  - Criteria evaluation, matrix etc.
- Discussions and issues raised
- Recommendations

Meeting adjourned at 12. The next meeting is November 7, 9:30 to 12 at the Mayor's Conference Room.

Mayor's Advisory Committee on Landfill Siting
Friday, November 7, 2003
9:30AM to 12:30PM
Mayor's Conference Room

Attendance

Present:

Todd Apo
Kathy Bryant-Hunter
Eric Guinther
Steve Holmes
Ted Jung
Shad Kane
Cynthia Rezentes
Gary Slovin
Gary Tomita
Cynthia Thielen
Robert Tong
George Yamamoto

Wilma Namumnart (Refuse Division, Dept. of Environmental Services)
Brian Takeda (RM Towill)
Mark White (Pacific Waste Consulting Group)

Roc Riggs (Representative for Council member Michael Gabbard)
Ikaika Anderson (Representative for Council member Barbara Marshall)
Dee Dee Letts (Facilitator)
Karen Takahashi (Recorder)

Absent: Bruce Anderson, Michael Chun, Bill Paty

Agenda Overview

Facilitator Dee Dee Letts explained that the purpose of the meeting is to surface the top sites. She explained that Advisory Committee members were emailed instructions to review the eight sites and identify pros/cons/questions for each site.

Pros/Cons/Questions – Eight Sites

Ameron

Pros:

- Pretty good access

- Has existing ground cover
- Proximity to former landfill
- Hole in ground; needs to be filled
- Potentially compatible

Cons:

- Site not viable given its importance as rock quarry, cost of acquisition, and relatively limited capacity (Bruce Anderson)
- Lost revenue to Ameron
- Increased operational costs
- 59 years lost lease revenue to landowner
- Cost of equipment
- Value of lost reserves
- Phase 1 – active for next 10-20 years
- Economic impact
- 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
- Impacts construction industry/other businesses/government projects including roads and government buildings
- Difficult to resite quarry
- 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

Questions:

- 15 years filling up phase 1
- Can a landfill and quarry coexist?
- Can you place safely in a rock cup with that much rainfall close to an environmental sensitive site (Kawainui Marsh)?
- Capacity seems low with potential site providers

Bellows

Pros:

- Federal land
- High unemployment area
- Two access routes to landfill
- Not super environmentally sensitive area – no wetlands

Cons:

- Federal land – cannot be condemned
- Bellows an environmentally protected area

- Relatively small capacity – 12 ½ years
- Two access routes poor – two lane road
- Coastal area; probably was wetland

Maili

Pros:
- Approximately 20 years
- Onsite fill
- Onsite brackish well for dust control
- Consistent zoning
- Utilities onsite
- Below UIC pass/no pass lines
- Viable site (Bruce Anderson)
- Dry area

Cons:
- Traffic
- Hazardous rockfalls
- 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 Maili Elementary School and major subdivision
- Schools and medical facilities along the route
- Only coral quarry on island
- Loss of taxes – income and excise

Questions:
- What is the status of the Department of Health's review of quarry operation for taking coal ash?
- 0-5 feet above water - would need fill prior to liner – added cost / diminished volume.
- How is capacity calculated?

Makaiwa Gulch

Pros:
- Next best site (#2) (Bruce Anderson)
- Access
- Large capacity – 25 years
- Zoning consistent
- Property currently not being used
- Below UIC line
- Shortest distance from H-POWER and center of population growth (short haul distance)

- Extensive archeological/flora/fauna surveys completed
- Dry area

Cons:

- Cost (i.e. Campbell Estate's objections)
- Upwind from heavily populated residential and resort area
- No onsite utilities and access road
- Close to transition between H-1 and Farrington Highway
- Planned for residential, upscale residential development
- View plains readily seen
- Major economic impact that would close down residential development at resort and resort development according to developers looking at the area
- Close to center of population growth
- Archeological information (i.e., Hawaiian cultural sites)

Nanakuli B

Pros:

- Already zoned
- Dry area
- Viable site (top 3 sites – Bruce Anderson)
- Proximity to existing landfill
- Utilities readily accessible
- Currently not being used
- Site acquisition costs relatively low
- Brackish wells for dust control
- Below UIC line
- 22.3 year life span

Cons:

- Very similar to Maili – Traffic
- Bad access
- Hazardous rockfalls (#11 of 117 potential rockfall sites studied)
- Planned highway projects i.e. construction
- Traffic accidents cause major delays – one road
- Pedestrian cross traffic
- Status of NAV-MAG road
- Upwind of residences behind Pacific Mall, Pacific Mall – potential odors would wipe out businesses
- Dust problems
- Passes schools, medical facilities to get there

Questions:

- Need to clarify the impact of the Waianae Coast Emergency route

Ohikilolo

Pros:

- Precipitation – dry area
- Far removed from most residences
- Large acreage – 660 acres
- Access road already onsite
- Utilities onsite
- AG-2 zoning appropriate
- Below UIC line
- Landfill traffic slow
- Acquisition cost low

Cons:

- Most remote
- Access will be bad; numerous churches, schools, medical facilities along the route
- Hazardous rockfalls
- Numerous known archeological sites
- Traffic/informal raceway (majority at night)
- Pedestrian cross traffic
- Construction and planned future highway improvements
- 13 year lifespan – smaller capacity site
- Operation cost high

Questions:

- Unreported cultural sites in central portion said to include heiau
- Question on water table/ fishponds
- If condemned, potential lawsuit relating to ownership; Hawaiian ancestry issues

Waimanalo Gulch

Pros:

- Should be on final list because least costly site to acquire and operate; with proper management, lifespan of 20+ years (Bruce Anderson)
- Proximity to existing landfill; H-POWER
- All factors of site known
- Road access reasonably good
- Close to population centers
- Precipitation – dry area

Cons:

- Land Use Commission, Planning Commission and current Administration are on record as not supporting continued use of the site
- Upwind and visible of major resort area
- Control of operations/management improved, but need further improvement (escaping waste)
- Based on past experience and slope, hard to hide
- Economic impact (see Makaiwa Gulch)
- Truck visibility – lineups onsite and along Farrington Highway
- Traffic
- Road access problem
- Projected increase in traffic

Questions:
- Is technology available to make it invisible?

Waimanalo North

Pros:
- Life capacity higher than other sites
- Moderate precipitation

Cons:
- State says No
- City cannot condemn State land
- Traffic problems
- Long haul distance

Final Recommendations:

The Committee eliminated by consensus the following three sites: Bellows, Ohikilolo, and Waimanalo North. The following five sites emerged because there was no consensus to take any other sites off of the list. The five sites include: Ameron, Maili, Makaiwa, Nanakuli B, and Waimanalo Gulch.

It was agreed that a document review subcommittee would be created to work with the consultants to develop the final report. The following Advisory Committee members volunteered to serve on the subcommittee: Todd Apo, Kathy Bryant-Hunter, Eric Guinther, Cynthia Rezentes. Subcommittee members will review the report outline and work with the consultants on the final report.

Advisory Committee members agreed that it would not issue a press release explaining their recommendations.

It was also recommended that the report include some discussion about community benefits, landbanking multiple sites, and the reason why Waimanalo Gulch was not eliminated as a potential landfill site. The question of requesting that the Board of Water

supply review the UIC/no pass line was raised. There was significant support for making this recommendation although consensus was not reached.

The consultants will be drafting the report and distribute copies to Advisory Committee members by November 18th. Advisory Committee members were asked to submit their comments to the consultants if they were unable to attend the final meeting scheduled to November 21st from 10:00 a.m. to 12:00 p.m. at the third floor conference room at Kapolei Hale.

November 7, 2003

Notes Submitted by
Cynthia Rezentes, Advisory Committee Member

MA`ILI

PROS

- Approximately 20 acre site ready for filling and another significant area already being quarried.
- Onsite cover material
- Onsite permitted brackish water well for dust control
- Within an area already zoned for landfill use (Agriculture-2)
- Utilities already onsite
- Below the artificial UIC and Pass-No Pass lines

CONS

- "Rockfall Protection Study At Various Locations on the Island of Oahu" (Final Report) dated November 2002 prepared by Earth Tech, Inc. for State of Hawai`i Department of Transportation refers to a traffic volume of 24786 AVT (Average Daily Traffic) at the entrance to Nanakuli (Black Rock)
- Traffic volume as reported for the Waimanalo Gulch Sanitary Landfill Expansion FSEIS dated December 2002 page 4.2 (prepared by R.M. Towill for the C&C of Honolulu Department of Environmental Services) reports per long-range projections from the Oahu Regional Transportation Plan done by OMPO in 1995, the "morning peak traffic along Farrington Highway at Kahe Point will increase from the current 2,000 vehicles per hour to 2,880, or from 36,000 to 70,000 vehicles per day (about 45%)."
- From the rockfall study, Black Rock is the number 11 priority out of 117 sites ranked or within the top 10% of sites ranked.
- Farrington Highway is currently scheduled for significant construction. Current plans call for construction to begin 1Q04 for safety upgrades including, converting sidewalks in Nanakuli to meet ADA standards, placing "zip-type" barriers along Ma`ili Point (temporary barrier with further permanent design/construction projected), drainage upgrades in Nanakuli at two separate locations.
- Any incident causes huge backups of traffic along Farrington Highway. Example 1: October 23, 2003-construction at Sack n Save driveway in Nanakuli into one lane of Farrington Highway was not managed well from a traffic perspective. The final result was a traffic backlog at 4:15-4:30 p.m. to the Campbell Industrial Park Interchange. Example 2: November 3, 2003-An accident at 5:30 a.m. involving an oil spill resulted in a traffic backlog at 8:00 a.m. to Kaukamana Road in Ma`ili, a distance of approximately five (5) miles. November 6, 2003-a traffic accident involving a fuel spill (Wai`anae bound direction) caused lookie-loos to cause a traffic backup to Hakimo Road, a distance of approximately two (2) miles. It is not unusual to have one fairly major traffic tie-up per month on Farrington Highway.
- There is significant pedestrian traffic along Farrington Highway laterally and cross-wise (access to bus stops and the beach).
- Pa`akea Road is a private road owned by Lone Star Hawaii. It is one road that the farmers depend upon for access from one area to another without having to license their farm vehicles. This status should not change but then who would be responsible to upgrade Pa`akea Road to handle the increased truck volume on a road currently not adequate for regular heavy vehicular traffic?
- Upwind of Ma`ili Elementary School which has fought for relief from farm odors, flies, etc. already. Even though the classrooms are air-conditioned what happens during recess, etc.?
- Upwind from numerous residences (old Lualualei Homesteads, "Manu" streets subdivision), Ho`okele subdivision)
- Upwind from Ma`ili Kai subdivision which already recognizes odors from nearby husbandry operations and have disclosures in sales documents per a Unilateral Agreement with the City. The area is currently undergoing a new area expansion with more, probably, planned in the future.
- Passes: 4 churches, 1 pre-school, 1 school and 2 medical facilities if Lualualei Naval Magazine Road is used. If Ma`ili`ili`i Road is used as access then the numbers become: 8 churches, 1 pre-school, 2 schools, and 3 medical facilities.

MISSING INFORMATION

- State DOH reviewing whether to require a formal permit to allow the continued placement of AES coal ash onsite. (AES coal ash has a high level of arsenic and may need to be placed in a lined area.)
- State DOH also believes that the depth which can be used any landfill is approximately 8-10 feet above the water table. This level could mean the landfill could only be approximately 30 feet below surrounding grade.

Cynthia K.L. Rezentes 11/07/03

NANAKULI B

PROS

- Within an area already zoned for landfill use (Agriculture-2)
- Utilities readily accessible
- Property currently not being used
- Near brackish water sources (wells drilled further inland reveal brackish water readily available within the area)
- Below the artificial UIC and Pass-No Pass lines

CONS

- "Rockfall Protection Study At Various Locations on the Island of Oahu" (Final Report) dated November 2002 prepared by Earth Tech, Inc. for State of Hawai`i Department of Transportation refers to a traffic volume of 24786 AVT (Average Daily Traffic) at the entrance to Nanakuli (Black Rock)
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- Any incident causes huge backups of traffic along Farrington Highway. Example 1: October 23, 2003-construction at Sack n Save driveway in Nanakuli into one lane of Farrington Highway was not managed well from a traffic perspective. The final result was a traffic backlog at 4:15-4:30 p.m. to the Campbell Industrial Park Interchange. Example 2: November 3, 2003-An accident at 5:30 a.m. involving an oil spill resulted in a traffic backlog at 8:00 a.m. to Kaukamana Road in Ma`ili, a distance of approximately five (5) miles. November 6, 2003-a traffic accident involving a fuel spill (Wai`anae bound direction) caused lookie-loos to cause a traffic backup to Hakimo Road, a distance of approximately two (2) miles. It is not unusual to have one fairly major traffic tie-up per month on Farrington Highway.
- There is significant pedestrian traffic along Farrington Highway laterally and cross-wise (access to bus stops and the beach) including children who walk to school.
- Upwind of nearby residences behind Pacific Mall (abutting the property being proposed). There is already a significant dust problem with houses downwind of the current PVT landfill (Wai`anae side of LLL NavMag Road).
- Upwind of Sack n Save, KFC, McDonald's, Chinese restaurant, Korean restaurant, Nanakuli Giant (grocery store), Nanaikeola Clinic (Kaiser), WCCHC Clinic, Tongan/Samoan foodstore, 2Go minimart, Baskins-Robbins.
- Passes: 4 churches, 1 pre-school, 1 school and 2 medical facilities.

MISSING INFORMATION

- Property makai of this parcel or on the makai portion of this parcel is being proposed for a part of the Wai`anae Coast Emergency Access Route project.

`OHIKILOLO

PROS

- Far removed from most residential areas of Wai`anae (only a few homes located nearby)
- Large acreage
- Access road already onsite
- Some utilities already onsite, electric, water, telephone
- Within an area already zoned for landfill use (Agriculture-2)
- Below the artificial UIC and Pass-No Pass lines

CONS

- Numerous churches, schools, pre-schools and medical facilities along the route.
- "Rockfall Protection Study At Various Locations on the Island of Oahu" (Final Report) dated November 2002 prepared by Earth Tech, Inc. for State of Hawai`i Department of Transportation refers to a traffic volume of 24786 AVT (Average Daily Traffic) at the entrance to Nanakuli (Black Rock)
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- Farrington Highway is currently scheduled for significant construction. Current plans call for construction to begin 1Q04 for safety upgrades including, converting sidewalks in Nanakuli to meet ADA standards, placing "zip-type" barriers along Ma`ili Point (temporary barrier with further permanent design/construction projected), drainage upgrades in Nanakuli at two separate locations.
- Any incident causes huge backups of traffic along Farrington Highway. Example 1: October 23, 2003-construction at Sack n Save driveway in Nanakuli into one lane of Farrington Highway was not managed well from a traffic perspective. The final result was a traffic backlog at 4:15-4:30 p.m. to the Campbell Industrial Park Interchange. Example 2: November 3, 2003-An accident at 5:30 a.m. involving an oil spill resulted in a traffic backlog at 8:00 a.m. to Kaukamana Road in Ma`ili, a distance of approximately five (5) miles. November 6, 2003-a traffic accident involving a fuel spill (Wai`anae bound direction) caused lookie-loos to cause a traffic backup to Hakimo Road, a distance of approximately two (2) miles. It is not unusual to have one fairly major traffic tie-up per month on Farrington Highway.
- There is significant pedestrian traffic along Farrington Highway laterally and cross-wise (access to bus stops and the beach) including children who walk to school.
- This portion of Farrington Highway has been the scene of numerous fatal traffic accidents. Accidents were typically the result of speeding, drinking under the influence, "dangerous" highway conditions, etc.

MISSING INFORMATION

- Unrecorded cultural sites are said to be located in the lower central portion of the valley including a suspected heiau not listed.
- There is a suspicion that a portion of the valley was used as fishponds (prior to Farrington Highway and the railroad being located in its present location). If this is true, then there needs to be a determination as to the water table and the potential porosity of the soils.
- Verification needs to be made regarding all owners of the parcel in question. Alika Silva claims to have been the one to have claimed 2 acres were given to him by his grandmother in a centralized portion of the property and his holding out on selling to Alpha Kai is what doomed the proposed golf course at the initial sale. If Alika still believes he owns 2 acres, there will be a contentious lawsuit.

Cynthia K.L. Rezentes 11/07/03

MAKAIWA

PROS

- Below the artificial UIC and Pass-No Pass lines
- Within an area already zoned for landfill use (Agriculture-2 and Preservation-2)
- Property currently not being used

CONS

- Upwind from heavily populated area (specifically, Honokai Hale and Nanakai Gardens)
- No onsite utilities or access road
- Close to transition of H1 freeway and Farrington Highway (previous vehicular and pedestrian accidents in the vicinity)
- Future plans for the area per the 'Ewa Sustainable Communities Plan (Development Plan) include upper-scale housing as part of total Makakilo-Kapolei development
- View planes to the site would be like Waimanalo Gulch, readily seen from a highly traveled road and residences and part of KoOlina Resort

MISSING INFORMATION

- Unknown

Cynthia K.L. Rezentes 11/07/03

WAIMANALO GULCH

PROS

- Already being used for a landfill
- "All" factors known regarding the site
- Capacity available greater than that permitted

CONS

- Upwind of a major resort area (KoOlina)
- Better control but still not 100% control on operations, visual and odor
- Economic impacts to a major resort (KoOlina)
- Not be a site to be considered per statements made by Mayor Harris, Frank Doyle, Order 12 by the Land Use Commission and Decision and Order 10 from the Planning Commission

MISSING INFORMATION

- Verification that this is no longer a site to be considered based on statements made during the request for permit modification for expansion to May 2008

November 7, 2003

Notes Submitted by
Linda Goldstein, Ameron

AMERON QUARRY SITE

Kapaa Quarry is slated to be a quarry through 2052. Phase I (the current active pit) is an essential part of that operation, and will be for at least the next 10 to 20 years. Beyond this major, important, and existing use, the following is provided:

1. Economic Impact
   - Cost to acquire: City & County appraised property value of $768,200, **plus** some or all of the equipment appraised at $2,416,000, **plus** value of lost rock reserves and related items such as lost lease revenue to landowner, Castle Trust
   - Loss of taxes paid to State and County: Portion of $785,000 annual General Excise and Use Tax (based upon 2003 projections), **plus** portion of income taxes paid to State and Federal governments
   - Financial impact to Ameron Hawaii: Lost revenue on 5 million tons of rock reserves in Phase I, increased operations costs and reduced production for Phase II, increased cost to dispose of water and Phase II dirt (700,000 cubic yards annually)

2. Environmental Consequences
   - Reduction of Ameron Hawaii's positive stewardship of Kawainui Marsh: A zero-discharge NPDES permit results in Ameron Hawaii containing all stormwater that falls on the quarry and the need to contain 6.3 million cubic yards (1.3 billion gallons) of water in the Phase I pit
   - Ameron Hawaii's active and financial participation in environmental and educational projects in Hawaii would be severely reduced: Resources would need to be redirected to bolster impacted operations because continued use of the Phase I pit beyond extraction of the rock reserves is essential for effective operations in Phase II

3. Effect on Construction Industry
   - Ameron Hawaii is one of two major suppliers of ready-mix concrete and one of two Grade A rock quarries on Oahu: Without Phase I as part of the viable operation of Kapaa Quarry, scheduled projects, such as massive military housing (7700 units) and municipal and State road construction projects, will take significantly longer to complete and cost much more than originally planned
   - Loss of production from Grace Pacific's asphalt plant at Phase I will result in a reduction of asphalt production for Oahu, and similarly result in more expensive and delayed projects
   - Three small trucking companies are also now located at Phase I and could need new locations, difficult to find on the Windward side of Oahu
   - With a decrease in rock products available on Oahu, and the resulting negative impacts on project timing and costs, other members of the construction industry will be forced to adjust accordingly

Group Memory
Mayor's Advisory Committee on Landfill
Friday November 21, 2003
Kapolei Conference Room

Attendance

Present: Bruce Anderson
Todd Apo
Kathy Bryant-Hunter
Eric Guinther
Steve Holmes
Shad Kane
Cynthia Rezentes
Gary Slovin
Cynthia Thielen
Gary Tomita
George Yamamoto

Wilma Namumnart (Refuse Division, Dept. of Environmental Services)
Brian Takeda (RM Towill)
Mark White (Pacific Waste Consulting Group)
Dee Dee Letts (Facilitator)

Absent: Michael Chun, Bill Paty, Ted Jung, Robert Tong

The Committee began by going over the proposed final report of the Committee. The sections regarding recommendations were put on hold pending discussion about another meeting to further try to reduce the five recommended sites. Several edits and changes to the report were made that the consultant will incorporate. The report without the recommendation sections was approved as long as the edits are made.

The Committee next took up the issues of whether to add to the agenda a discussion on reducing the number of proposed sites from 5 to 1. It was noted that under Sunshine such a move would take a vote by 2/3 of the members that the Committee was entitled to. Since the Committee has 15 members that met 10 votes were needed. The motion to place the issue on the agenda failed.

The Committee next discussed whether or not to schedule another meeting and if such a meeting were scheduled what the agenda for the meeting would be. An informal poll of the entire Committee had been taken via email as a member of the report drafting subcommittee stated their intent to push for a vote for one site in the last five minutes of the final drafting meeting. A deadline of close of business November 20 was set for registering your view. At the deadline there were 6 in favor of a meeting, one abstention and 7 opposed. On the morning of this meeting Wilma received an email from one

member to change his vote from opposed to favor. There was much discussion around this issue. The key points are bulleted below:

- A question was asked of those proposing to reduce the sites what process they intended for the Committee to use to do this, as consensus had not worked to reduce the list of 5. Those in favor of reducing the sites stated that the only way they could see to do it was to vote.
- Some members felt that voting at this stage would only polarize the membership and that after working for five months by consensus this was unnecessary as what was currently on the table for a recommendation met the charge given to the Committee by the City.
- Several members felt that voting would be inappropriate due to the unfair makeup of the Committee for voting i.e. more leeward than windward residents, and special interests advocating against some sites with other special interests not being at the table.
- Two members claimed that the LUC at its Maui meeting today had reconfirmed its prior order. The Committee and City will wait to be notified in writing and wait for the City to clarify whether the order changes the mandate to the Committee. Members pointed out that this was a City Committee and that the LUC had no jurisdiction over what the Committee does.
- Some Committee members felt that efforts by a Committee member to move things in a particular way outside the Committee deliberations were disrespectful to the Committee and the process. This included the circulation of petitions to some not all Committee members with no discussion at the table. One petition requested the removal of Waimanalo Gulch from consideration and the other chose the site of Nanakuli B. Several members of the Committee felt that this was unfair and that decisions of the Committee had to be made at the table through discussion and not behind the backs of Committee members. They also felt that this action violated Sunshine.
- Some Committee members felt that with the lack of information available about the various sites to push forward to vote one site would discredit all the work the Committee had done thus far.
- There was a question of whether the member pushing to pick one site really wanted to pick one site or just get Waimanalo Gulch off the list. The member maintained that he felt the Committee needed to come up with one site despite the City's charge to the contrary.

The Committee voted 6 to 5 to hold another meeting to discuss further reductions of the five sites. The meeting will be December 1 from 9 to 10:30 at the Kapolei Third Floor Conference Room. The agenda will be to finalize the site recommendations and the recommendations section of the report should changes to the final recommendations be needed based on the first item on the agenda.

A motion was made that should this meeting not take place or that no agreement be reached, then the current draft report would go forward with no recommendations. The report would have a statement of where the Committee ended up and that it could go no

further. The motion carried 6 to 5. (One vote was gotten via email as one member had had to leave as the meeting was running over time.)

The meeting adjourned at 12:15.

Group Memory
Mayor's Advisory Committee on Landfill
Monday December 1, 2003
9AM to 10:30 AM
Kapolei Conference Room

Attendance

Present: Bruce Anderson
Todd Apo
Kathy Bryant-Hunter
Michael Chun (arrived 10:10)
Eric Guinther
Ted Jung
Shad Kane
Cynthia Rezentes
Gary Slovin
Cynthia Thielen
Gary Tomita
Robert Tong
George Yamamoto

Wilma Namumnart (Refuse Division, Dept. of Environmental Services)
Brian Takeda (RM Towill)
Mark White (Pacific Waste Consulting Group) via phone
Dee Dee Letts (Facilitator)

Absent: Steve Holmes, Bill Paty

This meeting was an extra meeting scheduled by the Committee to 1) see if there was any correspondence from the LUC that the committee could not recommend multiple sites and that Waimanalo Gulch could not be considered, 2) to see if the list of 5 sites arrived at by consensus could be further narrowed and 3) to make changes to the recommendations section of the plan should the sites be narrowed.

Wilma reported that no correspondence had been received by the City from the LUC and that she had verbally contacted Tony Ching who had reiterated his earlier statements that the LUC had no jurisdiction over the Committee and therefore it can consider any sites it feels are appropriate and, that the Committee will have met its charge if it recommends several sites. If Waimanalo Gulch was recommended and selected, the State Land Use Commission's Decision and Order must be amended before May 1, 2008. The Committee also received several pieces of correspondence one from Jeff Stone at Ko Olina and the other from Frank Doyle Director of Environmental Services for the County stating that the City Administration would not consider Waimanalo Gulch and that the Committee was free to recommend whatever it decided as the City Council would select the site.

Cynthia Thielen handed out a letter she had sent to the Honorable Mark Bennet (AG), Leslie Kondo (Director OIP) and Peter Carlisle (Prosecuting Attorney) regarding what she viewed as illegal activities under Sunshine taken by Todd Apo. She stated that she feels that the petitions that were circulated to selected Committee members for signature in support of removal of Waimanalo Gulch from the list of recommended sites and the choosing of Nanakuli B as the final site violated the open decision making intent of the Sunshine Law.

Discussion was then open regarding further reductions to the list of five proposed sites. Bruce Anderson made the following points in a written statement:

- 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. Indeed, they deserve this information.

- 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

- That although the City Administration had made a commitment to the Community this does not bind the City Council and that the LUC has a process for revisiting its decision should Waimanalo Gulch become the preferred site.

Other Committee members expressed that the Administration had made a commitment to the Leeward Community to close Waimanalo Gulch and they should honor this commitment. The LUC order says that Waimanalo Gulch will be closed in 2008 and the City agreed. These members felt that this was not a decision that was made lightly but that the City had the benefit of two years of study and was aware of the severe impact expansion of the site would

have on Ko Olina.

A Committee member asked Wilma if the Committee would fulfill its obligation if it forwarded multiple sites. Wilma stated that she had checked with Corporation Counsel and that they had said multiple sites would fulfill the mandate.

A Committee member voiced that we should proceed by consensus as the Committee has operated this way for five months and that we have done our best to reduce the number of sites to a reasonable list. They noted that the Committee has several opinions that forwarding multiple sites fulfills their mandate and that there is nothing to the contrary from the LUC. Nor is there anything from the LUC prohibiting Waimanalo Gulch from being on the list.

It was noted by some members that they felt that the letter received from Ko Olina, Jeff Stone was written in a way to threaten legal action against them individually and therefore further fair and open deliberations were not possible, and that the continuing Committee process under these circumstances could not be perceived as fair.

A motion was put on the floor by Todd Apo to change the Committee process from consensus to voting – it was seconded by Shad Kane – For: Gary S., Gary T., George Y., Mike C., Cynthia R., Todd A., Robert T., Ted J., Shad K., – opposed Kathy, Bruce, Eric G., and Cynthia T.

During the discussion on the motion several members stated that they felt strongly about forwarding a consensus report and that if the process were changed to voting due to the unbalanced nature of the Committee as previously noted they would not put their names on the final recommendations. Some also felt that due to threatening nature of Jeff Stone's letter they could not participate in a process that included voting. Mike Chun arrived during this discussion.

When the motion passed Bruce Anderson, Cathy Bryant-Hunter, Eric Guinther and Representative Cynthia Thielen resigned from the Committee and left the meeting. They noted that they did not want their names associated with any section of the final report that changed due to a vote by the remaining Committee members.

Todd Apo moved and Shad Kane seconded to remove Waimanalo Gulch from the recommended sites. For: Todd, Mike, George, Gary S., Gary T., Robert, Shad, Cynthia R., and Ted. All other Committee members had resigned so there were no opposing votes.

The recommendations section of the report will be amended to reflect sending 4 sites forward and the resignations of the Committee members concerning this action will be included.

Meeting adjourned at 10:40.

December 1, 2003

Notes Submitted by
Dr. Bruce Anderson, Advisory Committee Member

Comments by Bruce Anderson Concerning the Site Selection Process
Read to the Committee on December 1, 2003

Our Committee has come very close to succeeding–beyond my expectations--in making a sound, objective recommendation to the City on where the next municipal landfill should be on the Island of Oahu. I was pleased that Frank Doyle was not closed-minded and said at our first meeting that the City would accept whatever the recommendation the committee developed. It was on this basis that I agreed to continue as a committee member and, until recently, I was very proud top be part of the effort.

I remember looking around the room at our first meeting and wondering how such a group could possibly come up with a recommendation that would consider all the interests of the residents on the island of Oahu. As everyone introduced themselves, it was obvious the committee was appointed with political expediency in mind to include a disproportionate number of representatives of communities most likely be impacted by the decision, those from Leeward and Windward Oahu. A handful of others were appointed because of their experience, expertise or because of a history of dealing with difficult issues. After working for over 20 years at the State Health Department on environmental health issues and problems, including solid waste management, I hoped I could be helpful.

After the first few meetings, I was pleasantly surprised with the process that our Committee agreed to follow. Despite not having a Chair, Dee Dee has done an outstanding job in facilitating a process that has served us well. After coming up with a list of over 40 potential sites, our Committee developed comprehensive criteria to rank sites. Although we did not have anyone with landfill management experience on the committee, we did come up with valid criteria based on input from those the concerned about potential impacts on their communities and comments from others who were generally aware of problems and issues associated with landfills.

Both environmental and social criteria were considered and incorporated into a method of objectively ranking potential landfill sites. Environmental criteria included such factors as the presence or absence of potable groundwater and capacity and social criteria considered factors such as the proximity of nearby residents and schools. We even included some rough estimates of costs as criteria for ranking the sites. It was only then that I become cautiously optimistic that our Committee's recommendations would be objective and based on the best information available. On reflection, there seemed to be some wisdom in selecting members of the Committee from communities who have hosted landfills in the past who know what the impacts may be based on their experience. Based on criteria developed by the committee, the list was rapidly narrowed to eight sites for detailed evaluation by the City's consultant.

The consultant did a fine job in gathering information that was available on the eight sites and applying this to the siting criteria without the committee knowing before hand how the criteria would be applied. Weighting factors were subsequently developed by the Committee and applied to the sites. This assured that biases were not introduced in the process by the consultants or by the Committee to skew the final rankings.

I must admit that I was skeptical that we could weigh the criteria–giving emphasis to factors that were most important--in a manner that was objective given the make-up of the committee. It seemed to me that people were emphasizing criteria that would make the landfill least likely to be in their community. However, I was pleasantly surprised at that even when weighting factors, such as the cost of acquisition, development and operations, were varied, the relative ranking of sites did not change. This gave me confidence that the criteria were not only appropriate, they were robust enough to endure changes and not significantly affect the ranking of sites.

When the ranking of actual sites were first revealed by the consultant, we all had the opportunity to scrutinize how the criteria were applied to each site. Again, the presence of representatives from potentially affected areas helped to assure that the consultants were fair and impartial in making their assessments and applying the criteria appropriately to the individual sites. In fact, there was little argument from the community representatives as it relates to the application of criteria to specific sites. The consultants have done a good job, too.

Finally, based on federal land-ownership and other factors that are beyond the control of the City or the State, we narrowed the number to sites from eight to five. Although there still may be some argument that the criteria has not been fairly applied to the sites that remain, there is no apparent disagreement that these are the five best sites based on the criteria developed. We now have five sites for the City to further evaluate. Our committee is poised to make a recommendation–a sound recommendation--based on criteria we developed, not political promises or any other factors that should be excluded from the process

Last week, the process turned ugly. One member of the committee proposed throwing out all of what had been accomplish over the last few months and selecting a single site by vote from committee members–at least those that remain active–ignoring the fact that the committee was never intended to represent the interests of the people who live on Oahu. This would eliminate the two sites that ranked highest on the list, Waimanalo Gulch and Makaiwa Gulch, based on environmental and social criteria developed by the committee. In fact, the site he recommended, Nanakuli B, ranked number 4 on the list.

This negates all that we have gone through for the past five months. Farrington Highway is already extremely congested, many residents already live immediately adjacent to this site in Nanakuli and it is the logical extension of the existing PVT construction and demolition debris landfill next door. I can only presume that this site was felt to be most politically viable because nearby residents would complain the least. It certainly is not the best site based on the criteria our committee has developed that has been uniformly applied to each site.

To my surprise, other members of this committee seem to support this recommendation, throwing out everything we have discussed, previously agreed to, and worked so hard to accomplish. I will have no part of it. The residents of our island deserve better.

I urge that we stick to the process we all agreed to at the outset and the criteria we have developed over the past few months to rank sites with the best information that is available. Let the City take our recommendation–a recommendation of the five most viable landfill sites on Oahu–and continue with the process of further evaluating these sites. Much more information is needed on all five sites before a good decision can be made. If any or all of the sites is found to be untenable for political or other reasons, so be it. Ultimately, the City Council, the duly elected body legislative body representing all the residents of this island, should make a final decision based on the best information they have at the time.

Thank you for listening.

Attachment C – Application of Preliminary Siting Criteria

ATTACHMENT C
APPLICATION OF PRELIMINARY SITING CRITERIA

1. INTRODUCTION

This attachment describes the process used by ENV and the consultant to analyze the 45 preliminary landfill sites against the following siting criteria:

1. Environmental Protection Agency (USEPA), Resource Conservation Recovery Act Subtitle D (RCRAD) Regulations;
2. Restrictions on developed areas where a landfill cannot be sited;
3. Board of Water Supply groundwater restrictions; and,
4. A minimum capacity requirement of more than 10 years for a new landfill site.

2. ORIGINAL SITES LIST

Table A, Original Site List and **Figure A, Alternative Landfill Sites,** identifies the original 45 sites which were obtained from previous literature and work completed by ENV for the siting of landfills. The list represents sites which were previously considered or used over an approximately 30 year period.

Table A, Original Site List

Site Name	TMK	Total Acreage	Million Cubic Yds Capacity*	Years Lifespan*
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

Table A, Original Site List, Continued

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
Maili	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 New 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

*Capacity is based on analysis of site characteristics, slope, and area available for development by ENV.

**Lifespan is based on capacity divided by disposal rate of 600,000 cubic yards MSW per year.

See Table E in this Attachment.

Note: Based on Final EIS for Waimanalo Gulch Expansion, December 2002.

3. ANALYSIS OF PRELIMINARY SITING CRITERIA

A. Resource Conservation and Recovery Act (RCRAD) Criteria

Volume 40 of the Code of Federal Regulations (CFR), Part 258, governs the development, operation and closure of landfills. This Federal regulation is administered by the EPA, and delegated to the State of Hawaii, Department of Health (DOH). The State DOH, Solid Waste Permit Program, which incorporates the Federal Municipal Solid Waste Landfill (MSWLF) Criteria, identifies six criteria related to the location of existing and new municipal solid waste landfills. The criteria and a brief summary are provided below:

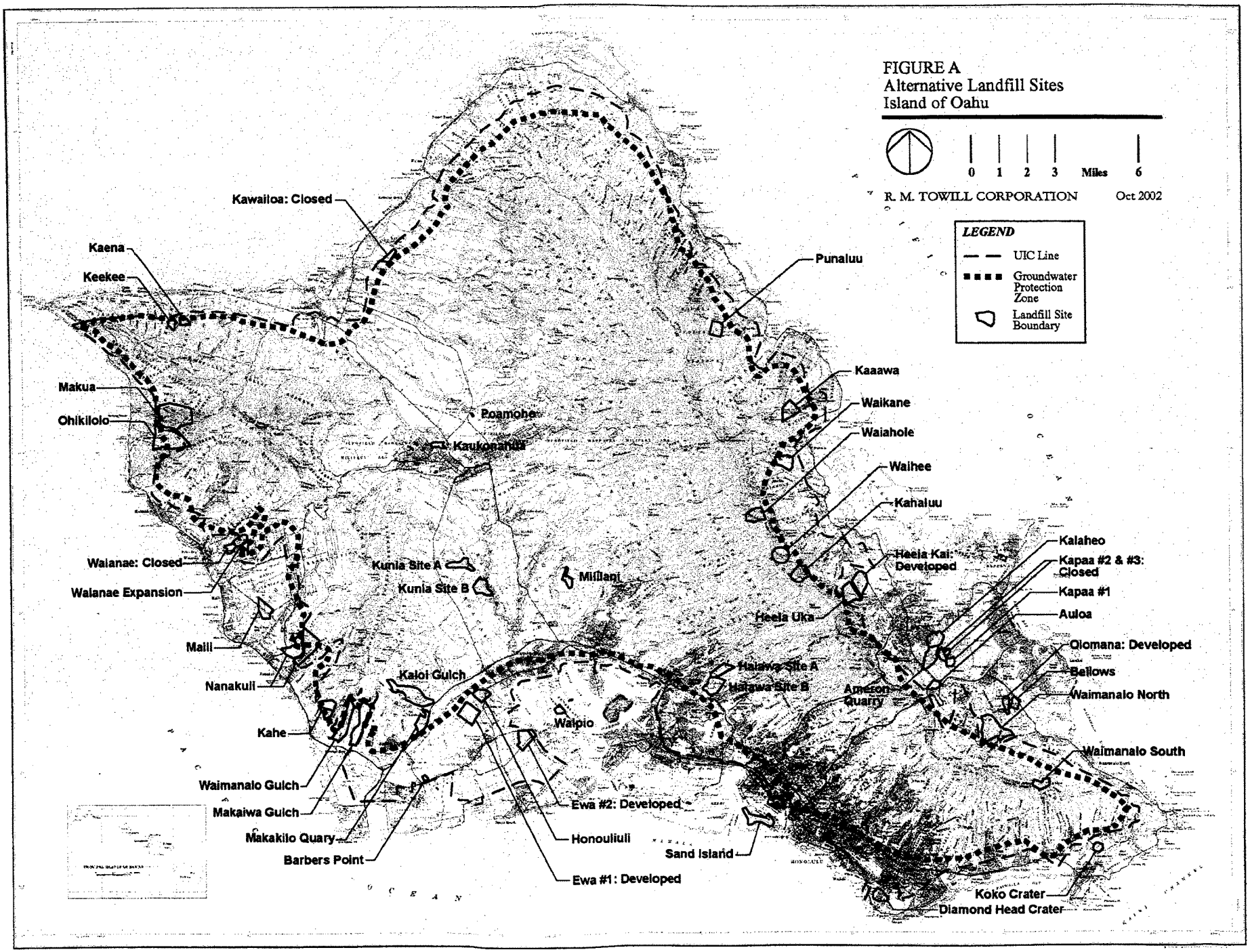
FIGURE A
Alternative Landfill Sites
Island of Oahu
0 1 2 3 Miles 6
R. M. TOWILL CORPORATION
Oct 2002
LEGEND
UIC Line
Groundwater Protection Zone
Landfill Site Boundary
Kawailoa: Closed
Kaena
Keekee
Punaluu
Kaaawa
Waikane
Waiahole
Waihee
Kahaluu
Makua
Ohikilolo
Poamoho
Kaukonahua
Waianae: Closed
Waianae Expansion
Kunia Site A
Kunia Site B
Mililani
Heeia Kai: Developed
Kalaheo
Kapaa #2 & #3: Closed
Kapaa #1
Auloa
Heeia Uka
Maili
Nanakuli
Kaloi Gulch
Halawa Site A
Halawa Site B
Amazon Quarry
Olomana: Developed
Bellows
Waimanalo North
Kahe
Waipio
Waimanalo South
Waimanalo Gulch
Makaiwa Gulch
Makakilo Quary
Barbers Point
Ewa #2: Developed
Honouliuli
Ewa #1: Developed
Sand Island
Koko Crater
Diamond Head Crater
O C E A N

Overview - Operators and owners must comply with each of the six criteria and maintain records in the facility operating record demonstrating that each of the criteria has been met. These criteria include the following:

Restriction No. 1: Airport Restriction - Owners/operators must demonstrate that the landfill 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 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 5 miles of any airport, the airport and the Federal Aviation Administration (FAA) must be notified.

Restriction No.2: Floodplains - Landfills located within a 100 year floodplain cannot restrict stormflows within the floodplain, reduce the temporary water storage capacity of the floodplain, or allow the washout of solid waste.

Restriction No. 3: Wetlands - Owners/operators of a new or existing landfill may not build or expand into wetlands. An exception to this rule may be permitted by 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;

Restriction No. 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. However, the director of an authorized EPA permitting program may permit an alternative setback distance of less than 200 feet if the owner or operator can demonstrate that the landfill will maintain structural integrity in the event of a fault displacement.

Restriction No. 5: 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, et. al., has been designed to resist the effects of ground motion due to earthquakes.

Restriction No. 6: 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 which are initiated by explosives or sonic booms; and,
- The sudden liquefaction of soil after prolonged periods of repeated wetting and drying.

The results of comparing the sites to the USEPA criteria are shown in **Table B, Application of USEPA Criteria**.

Table B, Application of USEPA Criteria

Site Name	Sites Failing EPA Criteria					
	1. Airport Restriction	2. Flood Plain	3. Wetlands	4. Fault Areas	5. Seismic Impact Zone	6. 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						
Maili						
Makaiwa						
Makakilo Quarry						
Makua						
Mililani						
Nanakuli A						

Table B, Application of USEPA Criteria, Continued

Nanakuli B						
Ohikilolo						
Olomana						
Poamoho						
Punaluu						
Sand Island	X	X				
Waiahole						
Waianae Expansion						
Waihee						
Waikane						
Waimanalo Gulch New Exp.						
Waimanalo North						
Waimanalo South						
Waipio						

Application of the USEPA criteria resulted in the removal of five sites from the original list of 45 sites. 40 sites remained for further evaluation.

B. Developed Areas

This criteria includes the evaluation of developed areas where a landfill cannot be sited. Included in this criteria are closed landfills with no further capacity available.

Table C, Application of Developed Area Criteria, shows the 40 sites left after the USEPA criteria and the application of the Developed Areas Criteria.

Table C, Application of 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		

Table C, Application of Developed Area Criteria, Continued

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		
Waianae Expansion		
Waihee		
Waikane		
Waimanalo Gulch New Exp.		
Waimanalo North		
Waimanalo South		
Waipio		

Application of the Developed Areas criteria resulted in the removal of six sites from the list of 40 sites. 34 sites remained for further evaluation.

C. Board of Water Supply Groundwater Restrictions

There were 34 sites remaining after application of the developed area and closed landfill criteria. The remaining sites were reviewed with BWS staff to identify areas believed to be useful for water supply or which should be protected based on groundwater concerns. **Table D, Results of Review by BWS Staff,** lists the sites, comments, and indicates sites that were eliminated.

Table D, Results of Review by BWS Staff

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 potable water 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 potable water 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 resource zone, but within an area considered subject to groundwater impact.	X
Kaaawa	Very little to no groundwater resources. BWS does not consider feasible for potable water 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 potable water use.	
Kaloi	Groundwater resources present or nearby.	X
Kapaa No. 1	Very little to no groundwater resources. BWS does not consider feasible for potable water use.	
Kaukonahua	Site within BWS groundwater resource.	X
Koko Crater	Very little to no groundwater resources. BWS does not consider feasible for potable water use.	
Kunia A	Groundwater resources present or nearby.	X
Kunia B	Groundwater resources present or nearby.	X
Maili	Brackish groundwater present but BWS does not consider feasible for potable water use.	
Makaiwa	No potable resources. BWS does not consider feasible for potable water use.	
Makakilo Quarry	Groundwater resources present or nearby.	X
Makua	Groundwater resources present or nearby.	X
Mililani	Site within BWS groundwater resource.	X
Nanakuli A	Very little to no groundwater resources. BWS does not consider feasible for potable water use.	
Nanakuli B	Very little to no groundwater resources. BWS does not consider feasible for potable water use.	
Ohikilolo	Only half of site available for development where there are very little to no groundwater resources in the lower half of property. BWS does not consider feasible for potable water 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 New Expansion	Very little to no groundwater resources. BWS does not consider feasible for potable water use.	

Table D, Results of Review by BWS Staff, Continued

Waimanalo North	Very little to no groundwater resources. BWS does not consider feasible for potable water use.	
Waimanalo South	Groundwater resources present or nearby.	X
Waipio	Very little to no groundwater resources. BWS does not consider feasible for potable water use.	

Application of the BWS Groundwater Restriction criteria resulted in the removal of 18 sites from the list of 34 sites. 16 sites remained for further evaluation.

Table E
Disposal Capacity Needed
Based on Waimanalo Gulch Sanitary Landfill

Material or Item	Amount		Notes
H-POWER Ash	101,665	Tons	1
H-POWER Residue	94,549	Tons	2
Rubbish that is weighed	225,370	Tons	
Rubbish that is not weighed	22	Tons	3
Total rubbish to be compacted	225,392	Tons	
Compaction ratio	1,600	Pounds/Cubic Yard	
Compacted rubbish volume	180,314	Cubic Yards	
Volume of rubbish and residue to be covered	274,863	Cubic Yards	
Percent of rubbish and residue that is cover	20%		4
Volume of cover	54,973	Cubic Yards	
Volume of rubbish, residue, and cover	329,836	Cubic Yards	
Volume of rubbish, residue, cover, and ash	431,500	Cubic Yards	
Volume of rubbish, residue, cover, and ash	0.43	Million Cubic Yards	
Allowance for growth in the amount of material disposed over the life of the landfill.	20%		
Annual volume demand used to estimate life of the landfill (includes cover)	0.6	Million Cubic Yards	

1. This material is not required to be covered.
2. This material is covered, but does not compact.
3. Rubbish is not weighed when the scale is down. Assumed density of 1,000 pounds/cubic yard.
4. Includes volume of cover only; volume of liners would reduce site capacity.

Attachment D – Individual Site Evaluations

See Attached Under Separate Cover

Attachment E – Correspondence

DEPARTMENT OF ENVIRONMENTAL SERVICES

CITY AND COUNTY OF HONOLULU

1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
Phone: (808) 692-5159 Fax: (808) 692-5113

JEREMY HARRIS
MAYOR

FRANK J. DOYLE, P.E.
DIRECTOR

TIMOTHY A. HOUGHTON
DEPUTY DIRECTOR

IN REPLY REFER TO:
RE 03-125

September 12, 2003

Commanding General
Attention: Assistant Chief of Staff G4
Building 216
Box 63002
Marine Corps Base Hawaii
Kaneohe, Hawaii 96863-3002

Dear Commanding General:

Subject: Request for Use of Land for a Municipal Solid Waste Landfill at Bellows Air Force Station, Waimanalo, Hawaii

The City and County of Honolulu is examining the potential for use of land at various locations on Oahu for landfill purposes due to the scheduled closure of Waimanalo Gulch Sanitary Landfill in five years, or 2008. Bellows Air Force Station has been identified as one of several locations with potential space for a new municipal landfill. We have attached a description of the site location and request your consideration and reply concerning the feasibility for use of this site.

Thank you in advance for your consideration of this important matter. If further information is required, please call Wilma Namumnart at 692-5378.

Sincerely,

For FRANK J. DOYLE, P.E.
Director

Attach.

cc: Mayor's Advisory Committee on Landfill Siting
Brian Takeda, R.M. Towill Corporation

10. BELLOWS FIELD LANDFILL SITE

The Bellows Field Landfill Site is situated at the north end of Waimanalo Community and Bellows Air Force Base. See Plate II-A-1. Keolu Hills Subdivision is adjacent but over a hill north of the site. Site is not over ground water source. The total area is approximately 173 acres, with usable area of 133± acres.

The site is approximately 2,500 ft. wide and 3,500 ft. long, capacity is 7,510,000± cubic yards and life is 15.4± years. Cover material is available on the site.

Temporary destruction of vegetation will be necessary. The site will be returned to a green area. A buffer strip with heavy landscaping will be required to screen the landfill activity from Bellows Field Air Base and the Olomana Golf Course.

Prevailing trade wind direction is away from the residential area and is favorable.

A drainage system must be constructed on and off site to control runoff and infiltration, soil erosion and flooding of lower areas.

Approximately 2,000 ft. of access road and utilities from Kalanianaole Highway to the site must be constructed.

Site preparation and improvement costs will be moderate and will include a new access road; drainage system; water, electric power and telephone connection; a sanitary waste disposal system; permanent operation and maintenance facilities.

With proper screening and buffer areas, this site can be a desirable site. However, according to the military, the site is needed to maintain military preparedness and is not available for sanitary landfill purposes.

UNITED STATES MARINE CORPS
FACILITIES DEPARTMENT
MARINE CORPS BASE HAWAII
BOX 63082
KANEOHE BAY, HAWAII 96863-3082

RECEIVED

'03 NOV -4 P2:01

IN REPLY REFER TO:
11000
Ser G-4/
29 October 2003

Mr. Frank J. Doyle, PE
Director, Department of Environmental Services
City and County of Honolulu
1000 Uluohia Street, Suite 308
Kapolei, HI 96707

Dear Mr. Doyle,

In response to your letter of 17 September 2003 requesting consideration by Marine Corps Base Hawaii to allow the City use of approximately 173 acres of Marine Corps Training Area Bellows (MCTAB) for siting of a Municipal Solid Waste Landfill. We commend your proactive search for a viable location to replace the Waimanalo Gulch Sanitary Landfill. We regret that Marine Corps Base Hawaii will not be able to accommodate your request for siting of a new landfill at MCTAB.

Through recent events, both on a local and international level, it is clear that the Hawaiian Islands are becoming of greater strategic military significance and will remain, a focal point for training and operations throughout the Pacific. MCTAB is a critical element to the training and readiness of Marine and Naval forces assigned throughout the Pacific Rim. Marines and Sailors stationed in Hawaii, and those going to or from hot spots throughout the world regularly train at MCTAB. MCTAB affords military forces a realistic amphibious and littoral training environment that cannot be matched anywhere on US soil in the Pacific. MCBH hosted sixty separate units, consisting of over 13,000 Marines, sailors, soldiers, airmen and civilians throughout the course of FY 2003 at MCTAB, during which all areas of MCTAB were fully utilized. Hawaii Army National Guard units also routinely use MCTAB for their training on weekends. Your request for utilization of approximately 16% of the MCBH owned land at MCTAB would impede regularly conducted training today, and negatively impact on our plans for development of MCTAB into a world class training area. These plans include a $21 million Military Operations on Urban Terrain (MOUT) Training Facility on 38 acres of land in the close proximity to the parcel you are requesting.

My point of contact is Commander Ian Lange, Public Works Officer, at 257-2171 extension 223. Again, we commend and applaud your proactive efforts to replace Waimanalo Gulch.

Sincerely,

KENT MURATA
Director, Installations and Logistics
Marine Corps Base Hawaii

DEPARTMENT OF ENVIRONMENTAL SERVICES

CITY AND COUNTY OF HONOLULU

1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
Phone: (808) 692-5159 Fax: (808) 692-5113

JEREMY HARRIS
MAYOR

FRANK J. DOYLE, P.E.
DIRECTOR

TIMOTHY A. HOUGHTON
DEPUTY DIRECTOR

IN REPLY REFER TO:
RE 03-124

September 16, 2003

Mr. Anthony J.H. Ching, Executive Officer
State Land Use Commission
P.O. Box 2359
Honolulu, Hawaii 96804-2359

Dear Mr. Ching:

Subject: Notification Concerning Docket No. SP87-362, Decision and Order Approving Amendment to State Special Use Permit

We are providing the following update and notice concerning Condition No. 1 of the Decision and Order, which states,

> "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."

We are moving expeditiously to identify the recommended landfill site(s), but believe that it is necessary to comply with Chapter 343, Hawaii Revised Statutes (HRS), which requires the completion of full and complete environmental review and disclosure prior to selection of a preferred site. We therefore propose the following schedule to meet the spirit of Condition No. 1:

1. Phase 1: June - August 2003. The Mayor's Advisory Committee on Landfill Siting (Blue Ribbon Site Selection Committee) has completed a series of meetings starting on June 27, 2003, with subsequent meetings held on July 11th, and August 8th, 22nd, and 29th. Site selection criteria have been established, and the next phase will be to review alternative sites in the light of the selection criteria.

2. Phase 2: September 2003 - October - 2003. This phase will involve the review of alternative sites with regard to EPA and Site Selection Committee criteria. As required, preliminary research will be undertaken to facilitate the work of the committee. The conclusion of this effort will be the recommendation of not less than three landfill sites subject to environmental review.

3. Phase 3: November 2003 - December 1, 2003. The third phase will involve preparing a summary Report and Recommendation of the Mayor's Advisory Committee on Landfill Siting. The report and recommendation identifying the sites will be forwarded to the State Land Use Commission and Honolulu City Council by December 1, 2003.

4. Phase 4: December 2003 - February 2004. This phase will involve preparation and publication of the EIS Preparation Notice (EISPN). The EISPN will document the work of the Mayor's Advisory Committee on Landfill Siting, and the proposed analysis of alternative landfill sites.

5. Phase 5: March 2004 - September 2004. A Draft EIS (DEIS) will be prepared to address requirements of Chapter 343, HRS, and the Office of Environmental Quality Control (OEQC). The DEIS will identify the preferred landfill sites and document the basis for selection of one or more landfill sites. Information used for preparation of the DEIS shall be forwarded to the Honolulu City Council for their appropriate action in accordance with Condition No. 1.

6. Phase 6: October 2004 - January 2005. The Final EIS (FEIS) will be prepared to address public comments in the DEIS and serve to complete the Chapter 343, HRS, process.

We understand that the proposed schedule is a modification of our current approved permit. However, we hope that you and the Commission will agree that it is correct and appropriate to meet the spirit of Condition No. 1, involving identification of a selected site(s) through use of the Chapter 343, HRS, process.

Thank you in advance for your consideration of this important matter. Should you or your staff have any questions, please contact Ms. Wilma Namumnart at 692-5378.

Sincerely,

For FRANK J. DOYLE, P.E.
Director

cc: Mayor's Advisory Committee on Landfill Siting
Brian Takeda, R.M. Towill Corporation

Statement of Anthony Ching, Executive Officer of the State Land Use Commission

November 17, 2003

Disclaimer – The executive officer of the Land Use Commission is a non-voting member of the commission. Nothing in this statement should be construed to be anything other than the non-binding opinion of the executive officer. Among other duties, the executive officer certifies orders as to their accuracy, assists the chair in establishing the Commission's calendar, supervises staff of the agency and serves at the pleasure of the Commission.

1. With respect to the recommendation and submission by the Blue Ribbon Site Selection of **multiple sites for a new landfill** to the City Council for their consideration.

   The operative part of Condition #1 of the Commission's Decision and Order Approving Amendment to Special Use Permit says that the Blue Ribbon Site Selection Committee shall make **its recommendation** to the City Council by December 1, 2003.

   I believe that the order is silent with respect to the scope or nature of any recommendation by the Site Selection Committee. The committee's recommendation is their own choosing and device and is not specifically governed by the Commission's order. It is my personal opinion and hope that if multiple sites are provided to the City Council by the site selection committee, that they be at a minimum, ranked in priority order.

   I believe instead that the critical deadline specified in the Commission's order is that the City Council shall select a new site no later than June 1, 2004 or suffer immediate expiration of the LUC special permit.

2. With respect to the inclusion of Waimanalo Gulch as one of the recommended sites for the new landfill.

   Condition #12 of the Commission's Decision and Order clearing specifies that no later than May 1, 2008, that the Waimanalo Gulch Landfill will be restricted from accepting any additional waste material and will be closed in accordance with an approved closure plan. Should the City Council choose to expand rather than close the Waimanalo Gulch Landfill, they would have to petition the Land Use

Commission for relief prior to May 1, 2008. The Commission may approve, or not, any such petition for relief on the merits of the presentations made to it.

DEPARTMENT OF ENVIRONMENTAL SERVICES

CITY AND COUNTY OF HONOLULU

1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
Phone: (808) 692-5159 Fax: (808) 692-5113

JEREMY HARRIS
MAYOR

FRANK J. DOYLE, P.E.
DIRECTOR

TIMOTHY A. HOUGHTON
DEPUTY DIRECTOR

IN REPLY REFER TO:
RE 03-132

September 23, 2003

Mr. Peter T. Young, Chairperson
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

Dear Chairperson Young:

Subject: Inquiry Concerning Potential for Use of Land for Municipal Landfill at TMK: 4-1-8: Parcel 13, Waimanalo North, Waimanalo, Oahu, Hawaii

The City and County of Honolulu is examining the potential for use of land at various locations on Oahu for landfill purposes. As you may be aware, the pending closure of the Waimanalo Gulch Sanitary Landfill in approximately five years, or 2008, requires that we consider all options with the potential to benefit the broader Oahu island community.

One of the potential landfill sites that the Mayor's Oahu Landfill Site Selection Committee has included for evaluation is the Waimanalo North site. That location has been identified as one of only a few locations with the capacity and location characteristics that could support a landfill. The City has set an aggressive schedule for review and evaluation of potential sites. In that effort, we are asking if your office has any reasons that the Waimanalo North site should not be considered a potential site for the our siting analysis. Given the short time we have for analysis, we would appreciate your response by October 10, 2003.

Thank you for your attention to this important matter. We look forward to your response.

Sincerely,

Frank J. Doyle

FRANK J. DOYLE, P.E.
Director

cc: Oahu Landfill Site Selection Committee
Brian Takeda, R.M. Towill Corporation

WAIMANALO NORTH LANDFILL SITE

A. BASIC DATA OF SITE

1. Location: South of Kailua urban areas, west of Olomana Golf Course and Bellows Air Force Station, northwest of Waimanalo urban areas, north of Waimanalo farm lands and approximately one mile southeast of Olomana Peak.

2. Tax Map Key: 4-1-08:13

3. Total Area: 171±acres

4, Owner: State of Hawaii

5. Present Use of Land: Open

6. City Zone District: Agriculture

7. City General Plan Land Use: Agriculture

8. State Land Use District: Agricultural

9. Adjacent Land Uses, Zones, etc.: Agriculture and Residential

10. Restrictions and Setbacks: Special permit required from State for construction in Agricultural District

11. Historical and Archeological Significance: No sites known to exist

12. Proximity to Population and Refuse Centers: Between Waimanalo and Kailua urban areas (about 500 ft. from the closest residents of north Waimanalo community)

B. DESCRIPTION OF SITE

1. Accessibility: Access from Kalanianaole Highway

2. Topography: The site consists of two defined gullies. Approximately a third of the lower area rises at 5 to 15% slope, half of the area lies between 15 to 30±% slope and the balance of the area greater than 30+% slope. The width at its widest point is 3000± ft. and is 2500±ft. from the lower limit to the ridge line.

3. Soil Classification: Site consists of the following soils taken from the SCS Soil Survey:

   0 to 6% slopes, Hanalei silty clay
   15 to 35% slopes, Alaeloa silty clay

Refuse # 37969
via DIT/Dep

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 8, 2003

RECEIVED
'03 OCT 15 P2:25

Mr. Frank Doyle, P.E., Director
Department of Environmental Services
City & County of Honolulu
1000 Uluohia Street, Suite 308
Kapolei, Hawaii 96707

Dear Mr. Doyle:

Subject: Inquiry Concerning Potential for Use of Land for Municipal Landfill at TMK 4-1-8: Parcel 13, Waimanalo North, Waimanalo, Oahu

Thank you for your letter dated September 23, 2003 regarding the proposed use of the subject State land for use as a municipal landfill. We offer the following comments.

On June 26, 1992, the Board of Land and Natural Resources approved the set aside of the subject parcel to the Division of Forestry and Wildlife (DOFAW) as an addition to the Waimanalo Forest Reserve. As a forest reserve, the area will benefit from management activities that include protection and enhancement in watershed, fire protection, erosion control, forest management, unique native plant and animal habitat, and public recreation through the Na Ala Hele trail and access program. DOFAW is working on scheduling a public hearing for the proposed addition. As such, the parcel has already been committed for forest reserve program.

Also, we note that the majority of the subject parcel is in the Conservation District.

Please feel free to contact my staff Barry Cheung at 587-0430 if you have any questions. Thank you.

Sincerely,

Peter T. Young
Chairperson

cc Land Board Member
DOFAW (Attn.: Mr. Earl Pawn)
District File (PSF 97OD-308)

THE ESTATE OF JAMES CAMPBELL

November 6, 2003

Mr. Frank J. Doyle, P.E.
Director
Department of Environmental Services
City & County of Honolulu
1000 Uluohia Street, Suite 212
Kapolei, Hawaii 96707

Mr. Brian Takeda
R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817

Dear Messrs. Doyle and Takeda:

Makaiwa Gulch

It has come to our attention that Makaiwa Gulch is under active consideration as a Municipal Refuse Facility. In that regard, we believe it is necessary to clarify certain misrepresentations and acquaint you with several points for your consideration.

The subject property is owned by the Estate of James Campbell. Contrary to the "Alternatives Analysis for Disposal of Municipal Refuse" by R. M. Towill Corporation dated March 2001, the property is in the State Urban District, not the State Agricultural District. Furthermore, it is an integral part of the overall Makaiwa Hills Residential Project which is designated on the City and County Ewa Development Plan as residential and is actively being planned for near term development.

If a condemnation action is initiated on this property for a Municipal Refuse Disposal facility, it would be vigorously opposed by the Estate. The Estate would seek, in addition to the value of the land condemned, direct and indirect economic damages caused by the adverse impact that such a facility would have on the value and marketability of its surrounding lands that have already been entitled for residential and commercial development.

We understand that the Mayor's Advisory Committee on Landfill Siting committee is to meet Friday. We feel it is important for the committee members to have this information and I have forwarded a copy of this letter to each of them.

Sincerely,

Stephen H. MacMillan
Chief Executive Officer

mga:01001900\K12074

1001 Kamokila Boulevard, Kapolei, Hawaii 96707 Phone (808) 674-6674 Facsimile (808) 674-3111 Website: www.kapolei.com

Ko Olina
RESORT & MARINA
HONOLULU

November 20, 2003

Mr. Frank Doyle
Director
Department of Environmental Services
City & County of Honolulu
1000 Uluohia Street, Suite 212
Kapolei, Hawaii 96707

Ms. Wilma Namumnart
Department of Environmental Services
City & County of Honolulu
1000 Uluohia Street, Suite 212
Kapolei, Hawaii 96707

Deedee Letts
c/o Wilma Namumnart
Department of Environmental Services
City & County of Honolulu
1000 Uluohia Street, Suite 212
Kapolei, Hawaii 96707

Mr. Brian Takeda
R.M. Towill Corporation
420 Waikamilo Road, Suite 411
Honolulu, Hawaii 96817

Re: Waimanalo Gulch Landfill Replacement Site

Ladies and Gentlemen:

We are writing in regards to the status of the Blue Ribbon Panel currently working on selecting a new landfill to replace the Waimanalo Gulch Landfill. We are appalled that the Panel is even considering having Waimanalo Gulch on any list for consideration. It has been made clear by the City, through statements by the Mayor, Ben Lee and Mr. Doyle, that Waimanalo Gulch Landfill will close no later than May 1, 2008, and that no further expansion would occur.

We assume that we need not remind you of the sworn statements of Mr. Doyle at the State Land Use Commission hearings on March 27, 2003, where he repeatedly confirmed the City's commitment and promise to be out of the Waimanalo Gulch Landfill within five years.

55 MERCHANT STREET, SUITE 1500 • HONOLULU, HAWAII 96813 • TEL: 808 531-9761 • FAX: 808 531-1144

We further point out that when Land Use Commission Chair Ing asked Mr. Doyle, "This proposed Blue Ribbon committee, could they come out with a recommendation that this Waimanalo Gulch landfill be expanded?" the response was a simple and pointed "No." (page 177 of hearing transcript, lines 21-25)

These facts and promise by the City are confirmed in both the City's Planning Commission Order and the State Land Use Commission Order concerning the recent permit for the 5 year expansion of Waimanalo Gulch Landfill. Both the Planning Commission and Land Use Commission orders specifically state that Waimanalo Gulch Landfill will close by May 1, 2008. Based on these statements, the City must instruct the Panel that it cannot select Waimanalo Gulch as a potential new landfill site.

As you are aware from our previous discussions with you, Mr. Doyle, the numerous existing, new and potential owners at the Ko Olina Resort have relied heavily on these statements and promises by the City concerning the closure of the Waimanalo Gulch Landfill. These owners, from large corporations owning and developing hotel, timeshare and commercial projects and operations to individual home owners have placed significant and justified reliance on the City's promises. And this is not the first time.

As was discussed in various community meetings in 2001 and 2002, the City had previously promised the leeward region that the Waimanalo Gulch Landfill would not be expanded and that it would be closed upon reaching its then current capacity, which was expected to between 2000-2002. As we argued during the initial attempts to expand the landfill for 15 years, our initial purchase of the bankrupt Ko Olina Resort in 1999 was done in reliance on City promises that the landfill would be closing in a few years, and those expectations fueled our opposition to any expansion of the Waimanalo Gulch Landfill. Similarly, Fortune 500 companies like Mass Mutual and Marriott International invested in the Resort based on their reliance that the landfill would soon close. We have documented well the impact that the landfill has on the Resort.

Our efforts to be the economic engine for the revitalization of the leeward coast is also well known. Two different state legislatures passed bills recognizing that:

> The legislature finds that further development planned by the State and the city and county of Honolulu to enhance the west side of Oahu and develop the second city of Kapolei and Ko Olina Resort and Marina would bring extensive economic benefits and result in the creation of thousands of construction and permanent jobs. The legislature believes that Ko Olina can play a pivotal role in regenerating Oahu's tourism economy.

As you know, the most recent version (SB377 – Act 100) was recently signed by Governor Lingle.

The attempt to even begin to consider the expansion of Waimanalo Gulch Landfill (or to consider the neighboring Makaiwa Gulch), is a direct insult to the joint efforts we have made with the State to resurrect the leeward coast and to help boost Hawaii's visitor industry.

The mere naming of the Waimanalo Gulch Landfill site as a possible "next" landfill will have a significant and real economic impact on the Ko Olina Resort and the entire region. Ko Olina Resort's role as an economic engine, providing jobs and infusing new money into our local economy, would be severely damaged. As was presented to the Panel, it is clear that even the *possible* expansion of the Waimanalo Gulch Landfill would impact future development at the Resort. The lands where these projects are to occur are already zoned and entitled for planned construction. Damages caused by such a turn of events would run in the billions of dollars. Deals completed and being finalized, planned construction and existing operations all have been embarked upon in reliance upon the City's promise that Waimanalo Gulch Landfill would close no later than May 2008. A change in this promise would be the direct cause of these economic damages.

We understand that some members of the Panel have rationalized that they could leave Waimanalo Gulch on the list of potential sites because the City Administration has not instructed them otherwise. We demand that you correct this situation immediately and instruct the Panel that it cannot name the Waimanalo Gulch as a potential site. We trust that you will forward this letter to each of the Panel members and convey to them the potential liabilities that exist by continuing to consider Waimanalo Gulch as a potential new landfill site. You must instruct the Panel to comply with the Land Use Commission Order and Planning Commission Order, and to act in accordance with the promises made by the City. Failure to do so, we believe, would be immediately actionable, and would risk the loss of the City's permit to operate the landfill. If the Waimanalo Gulch site is named, this would cause most, if not all, Resort landowners to seek immediate protection through the enforcement of the Land Use and Planning Commission Orders and to seek appropriate damages.

We have worked in good faith, and have attempted to help the City find solutions to the island's landfill needs. Even today, we are attempting to put together a solution for the Panel to select a new landfill site that will comply with the Land Use and Planning Commission Orders. We justifiably relied on the City's promises and we fully expect to City to live up to those promises. Mr. Doyle, you were fully aware of our position from the Resort and knew the development plans we had that were dependent on the landfill closing. With this information, you continued to make statements regarding the City's promise to close the Waimanalo Gulch Landfill. All we ask is that those promises be kept.

Ko Olina
RESORT & MARINA
HONOLULU

Finally, we share Campbell Estate's concerns regarding the potential use of Makaiwa Gulch as a landfill site and assure you that its use would have the same economic impact on the Resort and region as expanding Waimanalo Gulch. The Resort's role in the region is too important to lose, when other viable landfill sites are available.

We look forward to your immediate action and resolution of this matter.

Sincerely,

Jeffrey R. Stone

KAMEHAMEHA SCHOOLS
KAPĀLAMA CAMPUS
OFFICE OF THE PRESIDENT AND HEADMASTER

November 21, 2003

Wilma Namumnart
ENV/Refuse Division
City and County of Honolulu
Honolulu, Hawaii

Dear Wilma:

First of all, my commendations to you and your staff for your professionalism and patience in overseeing these very difficult landfill discussions. The task presented to the Blue Ribbon Committee has been daunting. Yet, with so many divergent views, you brought calm and thoughtfulness to the process. After so many years, it was good working with you once again. Thank you.

I am also impressed with the focused effort that members of the Committee directed to this important task. For my part, I apologize for not participating fully during these latest critical meetings. Despite my inability to attend all of these meetings, the electronic communications among members have helped to keep me abreast of the work that has taken place. So, while I apologize for not being present at the recent meetings, I do feel comfortable in providing my input.

After our recent conversation, I felt it important to share my thoughts with others on the Committee. As you recall, I do not want to meet again to select a single site. I believe it is in the City's best interest to have several legitimate sites to consider. Final determination rests with engineering and environmental impact studies, which together will help identify the most desirable among those we believe are suitable at this time.

Secondly, I do not believe Waimanalo Gulch should be offered at this time. Admittedly, my conclusion ignores any engineering or environmental

2010 Princess Drive, Honolulu, Hawai'i 96817-1598 Telephone (808) 842-8231 Fax (808) 842-8411

considerations. However, I cannot ignore the agreements and stipulations reached with the Land Use Commission that precludes this site in the long term.

Finally, I have serious concerns about offering the Ameron site. This site has serious economic implications, not only in terms of landfill operational costs but in terms of impacts on an on-going economically viable quarrying operation as well.

Given these comments, I recommend that the Committee seriously consider offering the three remaining sites for further planning and implementation by the City.

I hope my last minute comments do not muddy the waters. Please contact me with your questions, telephone, 842-8231.

Me ke aloha pumehana,

Michael J. Chun, Ph.D.
President and Headmaster
Kamehameha Schools

HOUSE OF REPRESENTATIVES

STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

November 25, 2003

BY FAX AND POST

The Honorable Mark Bennett
Attorney General
Department of the Attorney General
Hale Auhau
425 Queen Street
Honolulu, HI 96813

Leslie Kondo
Director
Office of Information Practices
No. 1 Capitol District Building
250 South Hotel Street, Room 107
Honolulu, HI 96813

Peter Carlisle
Prosecuting Attorney
Department of the Prosecuting Attorney
1060 Richards Street
Honolulu, HI 96813

Dear Attorney General Bennett, Director Kondo, and Prosecuting Attorney Carlisle:

I am writing this letter to inform each of you of a possible violation of Hawaii Revised Statutes chapter 92, otherwise referred to as the "Sunshine Law". I am also writing to request a formal investigation into this matter by the Office of Information Practices to determine whether a violation of the "Sunshine Law" has occurred, and to forward such case to the proper authorities should the Office of Information Practices determine that a violation of the "Sunshine Law" has occurred.

As background information, at the request of the City and County of Honolulu, I agreed to serve on the Mayor's Landfill Selection Committee in my capacity as a state representative. Please see the attached appointment letter dated July 3rd, 2003. According to the Department of Environmental Services letter that informed me of my appointment to this Committee, this Committee was described as an "advisory group [that] will help the City establish site selection criteria and recommend one or more sites to the City Council for approval of the location of the next municipal solid waste landfill." The Committee has met over the past five months in an effort to accomplish this goal. The Committee has operated its meetings pursuant to chapter 92 of the Hawaii Revised Statutes, publishing timely notice of

415 SOUTH BERETANIA STREET, ROOM 443 • HONOLULU, HI • 96813
PHONE: 586-6480 • FAX: 586-6481

open meetings and affording the opportunity for community input and discussion.

We have yet to reach consensus on our report to the City. The current draft report includes a list of five potential landfill sites that have been reported in both daily newspapers. At the November meeting of the Committee, no consensus could be reached as to reducing the number of sites below five to be forwarded to the City Council.

At some time when the Committee was not in open meeting, Committee member Todd Apo solicited signatures from other Committee members on two documents related to the decision making function of the Committee. Specifically, the first document called for the undersigned members of the Committee to make a statement clarifying their understanding of the undertaking they were assigned to perform, and that they "require[d] that Waimanalo Gulch be removed from any further consideration by the Committee as a potential landfill site, in accordance with the Land Use Commission Order." Adoption of such a document would result in altering the product of work done in open meetings, preparing a draft report that reduces the number of potential sites to five with Waimanalo Gulch included. The Committee members that signed on to the document were: Todd Apo, Shad Kane, Cynthia Rezentes, Gary Tomita, William Paty, and 4 others.

The second document calls for the recommendation of the site referred to as Nanakuli B as the decision of the Committee. This would clearly alter the work of the committee accomplished in open hearing as referred to above. The signatories to this document are: Todd Apo, Shad Kane, Gary Tomita, William Paty, and 3 others.

In light of the aforementioned actions, as part of the requested formal investigation, I also would like clarification as to whether a Committee member who solicits a vote or solicits promises to vote a certain way from Committee members outside of an open meeting situation violates the "Sunshine Law". Additionally, if such action represents a violation of the "Sunshine Law", I would like clarification as to whether a willful violation of the "Sunshine Law" is a misdemeanor, a criminal act.

Your prompt investigation of this matter would be greatly appreciated. Our next properly noticed meeting is December 1st, 2003.

Sincerely,

Cynthia Thielen

Representative Cynthia Thielen
Assistant Minority Floor leader
50th District, Kailua – Kaneohe Bay

Encls.

DEPARTMENT OF ENVIRONMENTAL SERVICES

CITY AND COUNTY OF HONOLULU

REFUSE DIVISION
1000 ULUOHIA STREET, SUITE 212, KAPOLEI, HAWAII 96707
Phone: (808) 692-5358 Fax: (808) 692-5404

JEREMY HARRIS
MAYOR

FRANK J. DOYLE, P.E.
DIRECTOR

JOHN C.T. LEE, P.E.
ACTING CHIEF

IN REPLY REFER TO
RE 03-092

July 3, 2003

The Honorable Cynthia Thielen
State Representative
State of Hawaii
State Capitol, Room 443
Honolulu, Hawaii 96813

Dear Representative Thielen:

Subject: Landfill Selection Committee

Thank you for agreeing to serve on the Mayor's Landfill Selection Committee. This advisory group will help the City establish site selection criteria and recommend one or more sites to the City Council for approval of the location of the next municipal solid waste landfill. Your training, experience, and leadership make you imminently qualified to deliberate the complex, interrelated issues that bear upon landfill siting, and we expect committee discussions to be well-considered and productive.

The next meeting will be on July 11, 2003, at 10:00 a.m. in the Mayor's conference room on the third floor of City Hall. Enclosed are the meeting agenda and a list of committee members.

There will be much information to assimilate, and committee members may wish to discuss issues with their constituencies to identify and add sites that meet minimum criteria to the list of potential landfill sites. For these reasons, the subsequent meeting is scheduled for August 8, same time and place.

Should there be any questions, please call Wilma Namumnart at 692-5378.

Sincerely,

John C.T. Lee

JOHN C.T. LEE, P.E.

Enclosures

cc: Brian Takeda, R.M. Towill
DeeDee Letts, Resolutions Hawaii

To the Blue Ribbon Site Selection Committee:

The persons signing below are members of the Blue Ribbon Site Selection Committee which was convened to make a recommendation for a new landfill site to the Honolulu City Council by December 1, 2003. We make this statement to clarify our understanding of the undertaking we were assigned to perform. We understood the Committee was charged with making a recommendation for a new landfill by December 1, 2003, and that this recommendation could not be the Waimanalo Gulch landfill site No decision, either by consensus or vote, has been made to recommend five landfill sites or to include the Waimanalo Gulch as a recommended site. We require that Waimanalo Gulch be removed from any further consideration by the Committee as a potential landfill site, in accordance with the Land Use Commission Order.

Cynthia K.L. Rezentes

To the Blue Ribbon Site Selection Committee

The persons signing below are members of the Blue Ribbon Site Selection Committee which was convened to make a recommendation for a new landfill site to the Honolulu City Council by December 1, 2003. We understand the Committee was charged with making a recommendation for a single landfill by December 1, 2003, and that this single recommendation could not be the Waimanalo Gulch landfill site. Consistent with this understanding, we recommend Nanakuli B as the new landfill site.

DEPARTMENT OF ENVIRONMENTAL SERVICES

CITY AND COUNTY OF HONOLULU

1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
Phone: (808) 692-5159 Fax: (808) 692-5113

JEREMY HARRIS
MAYOR

FRANK J. DOYLE, P.E.
DIRECTOR

DEPUTY DIRECTOR

IN REPLY REFER TO:

November 26, 2003

VIA FACSIMILE AND MAIL

Jeffrey R. Stone
Ko Olina Resort & Marina
55 Merchant Street, Suite 1500
Honolulu, Hawaii 96813

Re: Waimanalo Gulch Landfill Replacement Site

Dear Mr. Stone:

This letter is in response to your letter dated November 20, 2003. When the Mayor's Blue Ribbon Site Selection Committee ("Committee") met for the first time, the City made clear to the Committee that it intends to comply with the State Land Use Commission Decision and Order dated June 9, 2003 ("Order"), including condition #12, which requires the City to close Waimanalo Gulch Sanitary Landfill no later than May 1, 2008. We reiterate that commitment in this letter.

As you know, the Committee was formed for the purpose of discussing and analyzing potential sites in order to make its recommendations for one or more locations for a new landfill site to the City Council by December 1, 2003. Neither the City Administration nor the Land Use Commission can dictate what the City Council may or may not consider as a potential site. Therefore, the City Administration has not interfered with or tried to dictate what the Committee may or may not recommend. The City hired a consultant who provided the Committee with technical support. We understand the Committee's role is to provide an independent appraisal of potential landfill sites. Therefore, the City has not interfered with the Committee's process or decision in arriving at its recommendations. However, as stated above, the Committee is fully aware that the City will comply with the Order and close the Waimanalo Gulch Site Landfill no later than May 1, 2008.

The City administration anticipates receiving the Committee's recommendations on December 1, 2003, which we will transmit said recommendation to the City Council so it may select a new site by June 1, 2004 pursuant to the State Land Use Commission's Decision and Order.

Thank you for your concerns. Please call me at 692-5159 if you have any further questions or concerns.

Very truly yours,

FRANK J. DOYLE, P.E.
Director

FJD:MRC:mw

cc: Mayor's Blue Ribbon Site Selection Committee
Wilma Namumnart, P.E.
Brian Takeda
Dee Dee Letts

ENV-WAIMANALO GULCH.MRC

COMMITTEE E-MAIL LOGS

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Monday, December 01, 2003 12:00 PM
To: Brian Takeda (E-mail)
Subject: FW: Landfill Siting Committee - More Thoughts on Criterion

-----Original Message-----
From: Rezentesc@aol.com [mailto:Rezentesc@aol.com]
Sent: Friday, August 22, 2003 3:36 PM
To: Namumnart, Wilma
Subject: Landfill Siting Committee - More Thoughts on Criterion

Aloha Wilma,

I thought the meeting went well today and it was very lively indicating continuing interest in attempting to put a decision making process together that makes sense and covers most if not all of our individual concerns.

In addition to what was covered today other thoughts I had are:

Question 15: In addition to the change from populated areas to ocean, it may also be a good idea to consider adding whether or not the downstream wind pattern could be directly over conservation/preservation lands thereby potentially causing at least the need to address operationally the collection of windblown trash in more difficult areas to retrieve the materials.

Another approach to the question regarding wind direction towards the ocean might be to consider a distance measurement scheme. E.g. 0 points is >10 miles, 5 points if <1 mile (numbers are for illustration only). Something on this order should take into consideration any potential for windblown trash making it so far or not.

Additional thought should also be given to traffic considerations. I understand the difficulty in structuring a criteria or measurement but somehow we should consider the amount of traffic the refuse/ash trucks will be traveling in. How much traffic are they running with on H-1 or less adequate routes. Also, how can we take into consideration the condition of the roadways and current safety concerns. I mention this because access to some of the proposed sites would mean trucks would be traversing known high safety hazard roads.

Other than these additional thoughts (for now on a quicktime basis) I believe I got more than my two cents worth in regarding the measurements covered today (until I can digest more of the discussions we already had).

Again, thanks for hosting and having DeeDee facilitate and I believe that in the end we will at least have something we can all defend even though it may not be popular to some.

Mahalo and have a great weekend.

Cynthia

Brian Takeda

From: Mark White [MarkWhite01@comcast.net]
Sent: Tuesday, December 02, 2003 7:09 AM
To: 'Takeda Brian'
Subject: FW: Criteria

Mark White
Pacific Waste Consulting Group
916/387-9777 (Voice)
916/387-9802 (Fax)
916/996-9777 (Cell)
mark@pwcg.net (reply email address)

-----Original Message-----
From: Namumnart, Wilma [mailto:WNamumnart@co.honolulu.hi.us]
Sent: Monday, August 25, 2003 12:27 AM
To: Mark White
Subject: FW: Criteria

i think we add this as suggestions from the committee members for consideration.
-----Original Message-----
From: Todd K. Apo [mailto:tka@hawaii.rr.com]
Sent: Saturday, August 23, 2003 11:13 AM
To: Namumnart, Wilma
Subject: Criteria

Please have them add a section(s) regarding economic impact of the new landfill site. As you know, that analysis is required by the EIS process, and should be a factor in determining the next site.

I don't have my list in front of me, but I would also suggest a section on compatibility with adjacent properties (if it doesn't already exist).

Thanks.

Aloha -
Todd K. Apo

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Monday, December 01, 2003 12:01 PM
To: Brian Takeda (E-mail)
Subject: FW: Landfill COmmittee Criteria suggestions

-----Original Message-----
From: Kathy Bryant [mailto:kathybryant@dpr4adr.com]
Sent: Monday, August 25, 2003 11:55 AM
To: Namumnart, Wilma
Cc: mark@pwcg.net
Subject: Landfill COmmittee Criteria suggestions

Wilma:

Thank you for the opportunity to provide input on the criteria we reviewed on Friday. I apologize for having to leave early. I have the following suggestions:

1. I thought the DOH presentation was very helpful and provided some excellent criteria for our consideration. I would recommend that all the criteria presented in his handout be included particularly the section on siting and other considerations (pages 3-4 of handout). Some of the considerations are already included and I would recommend we add the others, particularly if DOH will be looking closely at those same considerations.

2. I would recommend that we add another criteria in the Economic Section(or expand an existing one) to include "Business elimination or permanent disruption". Will the siting of the landfill cause the elimination of or permanent disruption to existing businesses?

3. Criteria #29, could we add to access road considerations: "road improvements to meet state and county codes and standards". Some of the sites may be accessed by roads that may not be to county road standards and road improvements may be required which would be a cost to operations. (May also fit with Criteria #38 Traffic Safety for safety reasons.)

4. In the PWCG background material I reviewed, a number of the reports discussed "community benefits" in conjuntion with siting a landfill. Communities that were selected received additional funds for community projects such as parks, community centers, road improvements, etc. AS part of our discussion of siting a landfill we should discuss what the city and county can do for the impacted community to offset the obvious impacts of a landfill. Perhaps the Consultant can provide some background on how that has been most effective in other communities.

Thanks again,

Kathy Bryant
262-6012
kathybryant@dpr4adr.com

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Monday, December 01, 2003 12:02 PM
To: Brian Takeda (E-mail)
Subject: FW: additional technical siting criteria

-----Original Message-----
From: Rep. Cynthia Thielen [mailto:repthielen@Capitol.hawaii.gov]
Sent: Monday, August 25, 2003 4:06 PM
To: Namumnart, Wilma
Subject: additional technical siting criteria

Wilma,
Please add the following (ok to reword):
1. Impact on environment and on public health of long hauls from HPower to landfill. 2. Impact on nearby property values, which would lower City's tax base.

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Monday, December 01, 2003 12:02 PM
To: Brian Takeda (E-mail)
Subject: FW: next meeting 9/26

-----Original Message-----
From: Peter Apo [mailto:papo@hawaii.rr.com]
Sent: Monday, September 22, 2003 8:58 AM
To: Namumnart, Wilma
Subject: Re: next meeting 9/26

Aloha Wilma:

I regret that I have to decline continuing serving on the committee. Some family considerations have curtailed my availability to serve our community. Please convey my regrets to the Mayor.

Peter Apo

> From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
> Date: Wed, 17 Sep 2003 17:12:36 -1000
> To: "Brian Takeda (E-mail)" <briant@rmtowill.com>, "Bruce Anderson
> (E-mail)" <bsa@hawaii.edu>, "Cynthia Rezentes (E-mail)"
> <rezentesc@aol.com>, "Cynthia Thielen (E-mail)"
> <repthielen@capitol.hawaii.gov>, "DeeDee Letts (E-mail)"
> <ddletts@lava.net>, "Eric Guinther (E-mail)" <guinther@hawaii.rr.com>,
> "Gary Slovin (E-mail)" <gslovin@goodsill.com>, "Gary Tomita (E-mail)"
> <igtwink@aol.com>, "George Yamamoto (E-mail)"
> <georges.yamamoto@alumni.usc.edu>, "Kathy Bryant Hunter (E-mail)"
> <kathybryant@dpr4adr.com>, "Mark/Carol White (E-mail)"
> <mark@pwcg.net>, "Michael Chun (E-mail)" <michun@ksbe.edu>, "Peter Apo
> (E-mail)" <papo@hawaii.rr.com>, "Robert Tong (E-mail)"
> <tongr002@hawaii.rr.com>, "Shad Kane (E-mail)" <kiha@hawaii.rr.com>,
> "Steve Holmes (E-mail)" <SHolmes@co.honolulu.hi.us>, "Ted Jung
> (E-mail)" <jungt002@hawaii.rr.com>, "Todd Apo (E-mail)"
> <todd@koolina.com>, "William Paty (E-mail)" <bill@martroffice.com>
> Cc: "Brian Takeda (E-mail)" <briant@rmtowill.com>, "DeeDee Letts (E-mail)"
> <ddletts@lava.net>, "Mark/Carol White (E-mail)" <mark@pwcg.net>
> Subject: next meeting 9/26
>
> please note the next meeting will be in the corporation counsel's
> conference room on the first floor of city hall. please go to the ewa
> side of city hall in the corridor behind the open function room and
> stairway to the second and third floors. if you need further
> directions, please call me. i will be waiting at the doorway to let
> you into the room. see you all at 10 a.m. on friday, september 26th.
>
> Wilma Namumnart
> ENV/Refuse Division
> Phone 692-5378
> FAX 692-5402
>

Brian Takeda

From: Mark White [mark@pwcg.net]
Sent: Tuesday, December 02, 2003 7:09 AM
To: briant@rmtowill.com
Subject: FW: meeting postponed

Mark White
Pacific Waste Consulting Group
916/387-9777 (Voice)
916/387-9802 (Fax)
916/996-9777 (Cell)
mark@pwcg.net (reply email address)

-----Original Message-----
From: Namumnart, Wilma [mailto:WNamumnart@co.honolulu.hi.us]
Sent: Thursday, September 25, 2003 4:52 PM
To: Todd K. Apo; Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Gary Slovin (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark White; Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Holmes, Steve; Ted Jung (E-mail); William Paty (E-mail)
Subject: RE: meeting postponed

i am sorry you will not be here to attend the meeting on 10/3. do you have anything written that can be given to the committee members? would you like to send a representative to give a presentation? we will be talking about host community benefits at the 10/3 meeting.

Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

-----Original Message-----
From: Todd K. Apo [mailto:todd@koolina.com]
Sent: Thursday, September 25, 2003 9:16 AM
To: Namumnart, Wilma; Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Gary Slovin (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Holmes, Steve; Ted Jung (E-mail); William Paty (E-mail)
Subject: Re: meeting postponed

Unfortunately, I will be out of town next week Friday. Based on last meeting, I had planned to present the proposal regarding "regionalizing" the MSW and looking at ways to compensate communities impacted by accepting landfills. Also, we are obviously at an important point in the process. Therefore, while I know it is a big thing to ask, I need to ask that we try to identify a time where everyone will be available. As we discussed from the beginning of this process, commitment to the panel is important, which was at least part of the reason the meeting schedule was set out in advance, so that we could all secure those dates and times for meetings. While we all know that last minute changes are unavoidable at times, I hope we can find a way to reschedule the meeting to meet everyone's calendars.

Thanks for considering this request.

Aloha,
Todd Apo

----- Original Message -----
From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
To: "Brian Takeda (E-mail)" <briant@rmtowill.com>; "Bruce Anderson (E-mail)" <bsa@hawaii.edu>; "Cynthia Rezentes (E-mail)" <rezentesc@aol.com>; "Cynthia Thielen (E-mail)" <repthielen@capitol.hawaii.gov>; "DeeDee Letts (E-mail)" <ddletts@lava.net>; "Eric Guinther (E-mail)" <guinther@hawaii.rr.com>; "Gary Slovin (E-mail)" <gslovin@goodsill.com>; "Gary Tomita (E-mail)" <igtwink@aol.com>; "George Yamamoto (E-mail)" <georges.yamamoto@alumni.usc.edu>; "Kathy Bryant Hunter (E-mail)" <kathybryant@dpr4adr.com>; "Mark/Carol White (E-mail)" <mark@pwcg.net>; "Michael Chun (E-mail)" <michun@ksbe.edu>; "Robert Tong (E-mail)" <tongr002@hawaii.rr.com>; "Shad Kane (E-mail)" <kiha@hawaii.rr.com>; "Steve Holmes (E-mail)" <SHolmes@co.honolulu.hi.us>; "Ted Jung (E-mail)" <jungt002@hawaii.rr.com>; "Todd Apo (E-mail)" <todd@koolina.com>; "William Paty (E-mail)" <bill@martroffice.com>
Sent: Wednesday, September 24, 2003 10:55 AM
Subject: meeting postponed

our friday,september 26th meeting is postponed until friday, october 3rd. the meeting will be in the mayor's conference room on the third floor of city hall from 10:00 a.m. - 11:30 a.m.

Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

Brian Takeda

From: Mark White [mark@pwcg.net]
Sent: Tuesday, December 02, 2003 7:11 AM
To: briant@rmtowill.com
Subject: FW: draft press release, project update, benefits criteria

Mark White
Pacific Waste Consulting Group
916/387-9777 (Voice)
916/387-9802 (Fax)
916/996-9777 (Cell)
mark@pwcg.net (reply email address)

-----Original Message-----
From: Namumnart, Wilma [mailto:WNamumnart@co.honolulu.hi.us]
Sent: Tuesday, October 07, 2003 7:39 PM
To: Slovin, Gary M.
Cc: DeeDee Letts (E-mail); Mark White; briant@rmtowill.com
Subject: RE: draft press release, project update, benefits criteria

it was prepared by carol costa, mark white, brian takeda, dee dee letts, suzanne jones, and me. we can discuss release or non-release at the meeting and make any revisions.

i am very concerned that once the sites are known, someone either on the committee or off will leak to the press. we may be able to get the committee members to agree to a gag order, but what about people off the committee? we can discuss this.

-----Original Message-----
From: Slovin, Gary M. [mailto:gslovin@goodsill.com]
Sent: Tuesday, October 07, 2003 4:29 PM
To: Namumnart, Wilma; Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Holmes, Steve; Ted Jung (E-mail); Todd Apo (E-mail); William Paty (E-mail)
Subject: RE: draft press release, project update, benefits criteria

Wilma: My thoughts are that the press release is important enough to discuss at the next meeting before it is released. (Until a couple of days ago I didn't know there was going to be a press release and I'm not convinced this is a good time to be releasing one.) Email comments don't work very well for important documents because you don't get the discussion and give and take of a live meeting. In its present form, I am not comfortable with it.

Can you let us know who prepared it?

-----Original Message-----
From: Namumnart, Wilma [mailto:WNamumnart@co.honolulu.hi.us]
Sent: Tuesday, October 07, 2003 4:13 PM
To: Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Slovin, Gary M.; Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Steve Holmes (E-mail); Ted Jung (E-mail); Todd Apo (E-mail); William Paty
(E-mail)
Subject: draft press release, project update, benefits criteria

<<draftpress.doc>> <<projectupdate.doc>> <<Employment Criterion and capacity table1.doc>> since the draft press release is late, please submit any comments by email to me before close of business, Thursday, 10/9. Also please note that the criteria for the employment benefit will be revised to reflect actual conditions of unemployment in the census tracts affected. the 2% and 3% are just place holders until research is completed.

Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

Brian Takeda

From: Mark White [mark@pwcg.net]
Sent: Tuesday, December 02, 2003 7:13 AM
To: briant@rmtowill.com
Subject: FW: draft press release, project update, benefits criteria

BRIAN,
THIS IS THE ONE WITH THE COMPLETE THREAD. IT WOULD BE THE BEST TO US.

Mark White
Pacific Waste Consulting Group
916/387-9777 (Voice)
916/387-9802 (Fax)
916/996-9777 (Cell)
mark@pwcg.net (reply email address)

-----Original Message-----
From: Namumnart, Wilma [mailto:WNamumnart@co.honolulu.hi.us]
Sent: Wednesday, October 08, 2003 12:57 PM
To: Slovin, Gary M.
Cc: Brian Takeda (E-mail); DeeDee Letts (E-mail); Mark White
Subject: RE: draft press release, project update, benefits criteria

mark white is with pacific waste consulting group, who are subbed to rm towill, our consultant.

the press release can come from the committee alone. we added the mayor's name as a courtesy, but he is being asked if he even wants to be part of the press release. he may ask that his name be deleted.

you are correct. no vote or extensive discussion was held on the press release. it is on the agenda for 10/10. we didn't want to start with a blank sheet of paper and 10+ ideas, so we did a draft that can be marked up. you can initiate another draft, if you want to.

isn't life fun!!

-----Original Message-----
From: Slovin, Gary M. [mailto:gslovin@goodsill.com]
Sent: Wednesday, October 08, 2003 9:50 AM
To: Namumnart, Wilma
Subject: RE: draft press release, project update, benefits criteria

Because your message asked for comments by 10/9, I was concerned. Thanks for the clarification. Who is Mark White with? I'm not sure it is a good idea to have so much involvement in the press release by the administration. I am also not sure it is a good idea to have it issued by the Mayor and the Committee--I think it should come from the committee alone, if we do it at all. As a committee member, I doubt I will feel comfortable with a number of the statements since I don't feel I have to reach these conclusions yet. I'm not concerned about leaks--that is preferable to a premature press release, which I think this is. There is a pressure here, as I noted at the last meeting, to move us along to conclusions we have not reached yet.

I don't recall that the committee took a vote to do a press release; nor did we have input as to who would draft it. Perhaps that all came up at the meeting I missed but I don't recall that.

I understand the concern about doing this on time but it seems to me this is the committee's responsibility. I also feel 'that things are progressing very well and that we will finish on time. Your support and that of the consultants has been terrific and a great help and, despite my efforts to hold back Dee Dee from time to time, she has also done a great job as well.

-----Original Message-----
From: Namumnart, Wilma [mailto:WNamumnart@co.honolulu.hi.us]
Sent: Tuesday, October 07, 2003 4:39 PM
To: Slovin, Gary M.
Cc: DeeDee Letts (E-mail); Mark/Carol White (E-mail); briant@rmtowill.com
Subject: RE: draft press release, project update, benefits criteria

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-----Original Message-----
From: Slovin, Gary M. [mailto:gslovin@goodsill.com]
Sent: Tuesday, October 07, 2003 4:29 PM
To: Namumnart, Wilma; Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Holmes, Steve; Ted Jung (E-mail); Todd Apo (E-mail); William Paty (E-mail)
Subject: RE: draft press release, project update, benefits criteria

Wilma: My thoughts are that the press release is important enough to discuss at the next meeting before it is released. (Until a couple of days ago I didn't know there was going to be a press release and I'm not convinced this is a good time to be releasing one.) Email comments don't work very well for important documents because you don't get the discussion and give and take of a live meeting. In its present form, I am not comfortable with it.

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From: Namumnart, Wilma [mailto:WNamumnart@co.honolulu.hi.us]
Sent: Tuesday, October 07, 2003 4:13 PM
To: Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Slovin, Gary M.; Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Steve Holmes (E-mail); Ted Jung (E-mail); Todd Apo (E-mail); William Paty
(E-mail)
Subject: draft press release, project update, benefits criteria

<<draftpress.doc>> <<projectupdate.doc>> <<Employment Criterion and capacity table1.doc>> since the draft press release is late, please submit any comments by email to me before close of business, Thursday, 10/9. Also please note that the criteria for the employment benefit will be revised to reflect actual conditions of unemployment in the census tracts affected. the 2% and 3% are just place holders until research is completed.

Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

Brian Takeda

From: Mark White [mark@pwcg.net]
Sent: Tuesday, December 02, 2003 7:14 AM
To: briant@rmtowill.com
Subject: FW: Press Release

Mark White
Pacific Waste Consulting Group
916/387-9777 (Voice)
916/387-9802 (Fax)
916/996-9777 (Cell)
mark@pwcg.net (reply email address)

-----Original Message-----
From: Namumnart, Wilma [mailto:WNamumnart@co.honolulu.hi.us]
Sent: Thursday, October 09, 2003 12:18 PM
To: Slovin, Gary M.; Todd K. Apo; Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark White; Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Holmes, Steve; Ted Jung (E-mail); William Paty (E-mail)
Subject: RE: Press Release

i don't want to belabor the point, but i remember distinctly that you asked the we have professional help on the press release. i did not interpret that to mean an outside the City professional. if you had asked for that specifically, i would have responded that we have no one outside the city on contract, so i would not be able to provide that kind of professional help. we can talk more about this on friday.

-----Original Message-----
From: Slovin, Gary M. [mailto:gslovin@goodsill.com]
Sent: Wednesday, October 08, 2003 3:37 PM
To: Todd K. Apo; Namumnart, Wilma; Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Holmes, Steve; Ted Jung (E-mail); William Paty (E-mail)
Subject: RE: Press Release

Since Todd has responded to my comment regarding the authorship of the press release, I thought I should explain my concern which I raised at the last meeting.

My impression was that we would have professional help on the press release and I assumed when the consultant said at the last meeting that there was funding for that function that it meant an outside-of-the-City professional. Carol is certainly a professional public relations person but she is obviously part of the City. The other folks are not public relations people. While the committee is certainly independent, the appearance of independence is just as important as the reality. The circumstances of the press release may not support the appearance of independence. Therefore, in addition to the text of the press release we might want to discuss this aspect as well.

-----Original Message-----
From: Todd K. Apo [mailto:todd@koolina.com]
Sent: Tuesday, October 07, 2003 5:21 PM
To: Namumnart, Wilma; Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Slovin, Gary M.; Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Steve Holmes (E-mail); Ted Jung (E-mail); William Paty

(E-mail)
Subject: Press Release

To the Committee, I am sorry that I was unable to attend the rescheduled meeting last week. As I previously emailed, I would have liked to have tried to find a way to be more accommodating for the last minute date change. Nonetheless, without knowing the details of what was discussed last week, I concur with Gary and Cynthia regarding the need to discuss the press release at Friday's meeting. It is an important message that we all want to make sure is correct both in content and in timing.

I also echo Gary's questions regarding the author of the draft release.

Todd Apo
Ko Olina Resort & Marina

----- Original Message -----
From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
To: "Brian Takeda (E-mail)" <briant@rmtowill.com>; "Bruce Anderson (E-mail)" <bsa@hawaii.edu>; "Cynthia Rezentes (E-mail)" <rezentesc@aol.com>; "Cynthia Thielen (E-mail)" <repthielen@capitol.hawaii.gov>; "DeeDee Letts (E-mail)" <ddletts@lava.net>; "Eric Guinther (E-mail)" <guinther@hawaii.rr.com>; "Gary Slovin (E-mail)" <gslovin@goodsill.com>; "Gary Tomita (E-mail)" <igtwink@aol.com>; "George Yamamoto (E-mail)" <georges.yamamoto@alumni.usc.edu>; "Kathy Bryant Hunter (E-mail)" <kathybryant@dpr4adr.com>; "Mark/Carol White (E-mail)" <mark@pwcg.net>; "Michael Chun (E-mail)" <michun@ksbe.edu>; "Robert Tong (E-mail)" <tongr002@hawaii.rr.com>; "Shad Kane (E-mail)" <kiha@hawaii.rr.com>; "Steve Holmes (E-mail)" <SHolmes@co.honolulu.hi.us>; "Ted Jung (E-mail)" <jungt002@hawaii.rr.com>; "Todd Apo (E-mail)" <todd@koolina.com>; "William Paty (E-mail)" <bill@martroffice.com>
Sent: Tuesday, October 07, 2003 4:15 PM
Subject: agenda for 10/10 meeting

<<Agenda10-10-03.doc>> please note we have two more meetings in october on the 10th and 24th. we have an optional meeting scheduled for 11/7. we are grateful for your continued participation. see you on october 10th. mayor's conference room, third floor, city hall.

Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Monday, December 01, 2003 12:07 PM
To: Brian Takeda (E-mail)
Subject: FW: Landfill Life Expectancy

-----Original Message-----
From: Bruce Anderson [mailto:bsa@hawaii.edu]
Sent: Tuesday, October 14, 2003 12:35 PM
To: Namumnart, Wilma
Subject: Landfill Life Expectancy

Wilma,

It is noted in your group memory of our last meeting that we should "express via email (our) preference for a 10 or 15 year minimum for the site" but you did not say to whom we should express our preference. As I mentioned at the meeting, I think it would be a irresponsible from a land-use and cost standpoint to pick a site that has an expected life of less than 20 years. However, I would strongly recommend that any site with a expected lifetime of less than 15 years be excluded from future consideration. The Committee has few if any people who are focused on the cost side of the equation and it seems that nobody is thinking about the difficulty of finding a contractor who would be willing to bid on operating a site with a short life-expectancy. Despite more aggressive recycling and waste diversion practices, we'll be lucky if the net volume of solid waste does not increase over the next 10 years as our population and the total amount of wastes they generate increase. I hope this is not the case, but it is prudent to assume that it will be so. Any other position is wishful thinking. If we choose a site that has only a10 year life expectancy, you will need to reconvene another site selection committee immediately after we conclude our deliberations to start the process for selecting yet another site. I estimate that it will take about 10 years to go through the process again of selecting a site, getting the necessary county and state land use approvals, design, construction, bidding for operational contract, and permitting--if you're lucky. Anyway, I would vote for a minimum of 15 years--20 years would be more appropriate. Please pass this on to whomever is tallying the votes. Thanks.

Bruce

----- Original Message -----
From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
To: "Brian Takeda (E-mail)" <briant@rmtowill.com>; "Bruce Anderson (E-mail)" <bsa@hawaii.edu>; "Cynthia Rezentes (E-mail)" <rezentesc@aol.com>; "Cynthia Thielen (E-mail)" <repthielen@capitol.hawaii.gov>; "DeeDee Letts (E-mail)" <ddletts@lava.net>; "Eric Guinther (E-mail)" <guinther@hawaii.rr.com>; "Gary Slovin (E-mail)" <gslovin@goodsill.com>; "Gary Tomita (E-mail)" <igtwink@aol.com>; "George Yamamoto (E-mail)" <georges.yamamoto@alumni.usc.edu>; "Kathy Bryant Hunter (E-mail)" <kathybryant@dpr4adr.com>; "Mark/Carol White (E-mail)" <mark@pwcg.net>; "Michael Chun (E-mail)" <michun@ksbe.edu>; "Robert Tong (E-mail)" <tongr002@hawaii.rr.com>; "Shad Kane (E-mail)" <kiha@hawaii.rr.com>; "Steve Holmes (E-mail)" <SHolmes@co.honolulu.hi.us>; "Ted Jung (E-mail)" <jungt002@hawaii.rr.com>; "Todd Apo (E-mail)" <todd@koolina.com>; "William Paty (E-mail)" <bill@martroffice.com>
Cc: "Win, Zarli" <zwin@co.honolulu.hi.us>
Sent: Tuesday, October 14, 2003 10:36 AM
Subject: group memory for 10/10/03 meeting

<<gm10-10-03.doc>>
Wilma Namumnart
ENV/Refuse Division
Phone 692-5378

FAX 692-5402

Brian Takeda

From: Mark White [mark@pwcg.net]
Sent: Tuesday, December 02, 2003 7:15 AM
To: briant@rmtowill.com
Subject: FW: Landfill Life Expectancy

Mark White
Pacific Waste Consulting Group
916/387-9777 (Voice)
916/387-9802 (Fax)
916/996-9777 (Cell)
mark@pwcg.net (reply email address)

-----Original Message-----
From: Namumnart, Wilma [mailto:WNamumnart@co.honolulu.hi.us]
Sent: Wednesday, October 15, 2003 7:17 PM
To: Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Gary Slovin (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark White; Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Steve Holmes (E-mail); Ted Jung (E-mail); Todd Apo (E-mail); William Paty (E-mail)
Subject: FW: Landfill Life Expectancy

forwarded to you per dr anderson's request.

-----Original Message-----
From: Bruce Anderson [mailto:bsa@hawaii.edu]
Sent: Wednesday, October 15, 2003 4:15 PM
To: Namumnart, Wilma
Subject: Re: Landfill Life Expectancy

Wilma,

I thought about sending my comments to all the other committee members, but I didn't have all their email addresses. Obviously, I feel quite strongly that we should take a conservative approach toward estimating the wastes generated and that costs should be a very important criteria. Can you forward my comments (below) for me?

Bruce

----- Original Message -----
From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
To: "Bruce Anderson" <bsa@hawaii.edu>
Sent: Wednesday, October 15, 2003 1:26 PM
Subject: RE: Landfill Life Expectancy

i concur. you make some good points. would you be willing to share your comments with the whole committee?

-----Original Message-----
From: Bruce Anderson [mailto:bsa@hawaii.edu]
Sent: Tuesday, October 14, 2003 12:35 PM
To: Namumnart, Wilma
Subject: Landfill Life Expectancy

Wilma,

It is noted in your group memory of our last meeting that we should "express via email (our) preference for a 10 or 15 year minimum for the site" but you did not say to whom we should express our preference. As I mentioned at the meeting, I think it would be a irresponsible from a land-use and cost standpoint to pick a site that has an expected life of less than 20 years. However, I would strongly recommend that any site with a expected lifetime of less than 15 years be excluded from future consideration. The Committee has few if any people who are focused on the cost side of the equation and it seems that nobody is thinking about the difficulty of finding a contractor who would be willing to bid on operating a site with a short life-expectancy. Despite more aggressive recycling and waste diversion practices, we'll be lucky if the net volume of solid waste does not increase over the next 10 years as our population and the total amount of wastes they generate increase. I hope this is not the case, but it is prudent to assume that it will be so. Any other position is wishful thinking. If we choose a site that has only a10 year life expectancy, you will need to reconvene another site selection committee immediately after we conclude our deliberations to start the process for selecting yet another site. I estimate that it will take about 10 years to go through the process again of selecting a site, getting the necessary county and state land use approvals, design, construction, bidding for operational contract, and permitting--if you're lucky. Anyway, I would vote for a minimum of 15 years--20 years would be more appropriate. Please pass this on to whomever is tallying the votes. Thanks.

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Sent: Tuesday, October 14, 2003 10:36 AM
Subject: group memory for 10/10/03 meeting

<<gm10-10-03.doc>>
Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Monday, December 01, 2003 12:09 PM
To: Brian Takeda (E-mail)
Subject: FW: meeting agenda for 11/7

-----Original Message-----
From: Bruce Anderson [mailto:bsa@hawaii.edu]
Sent: Tuesday, November 04, 2003 4:21 PM
To: Namumnart, Wilma
Cc: Dee Dee Letts
Subject: Re: meeting agenda for 11/7

Wilma,

I will not be able to attend on Friday as I will be in San Diego.

The issue that I'm afraid will surface again is whether Waimanalo Gulch should remain on the list of options. I feel very strongly that it should be on our final list of recommended sites. Frankly, I can't think of any good reasons (other than those that are political in nature) why it shouldn't. It ranked highest based on the criteria developed by the Committee and it would be the least costly site to acquire and operate. Perhaps most important, it is irresponsible from a land use standpoint to walk away from this site (or any other existing landfill) on an island with such limited options and take up the valuable land at another site before fully utilizing the existing site. With proper management, Waimanalo Gulch can serve Oahu's municipal landfill needs for at least 20 more years.

I would strongly support that Makaiwa Gulch be on the final list of three, too. It was second in ranking and I think would be the next best site for a new landfill after Waimanalo Gulch has been fully utilized. I don't have any strong preference strong feeling about Maili or Nanakuli site. They were both tied in the latest rankings. Either would be viable. In my opinion, the Ameron Quarry site is not viable given it's continued importance as a rock quarry, the cost of acquisition, and it's relatively limited capacity. Other sites ranked lower. So, my top three choices would be Waimanalo Gulch, Makaiwa Gulch, and either Nanakuli or Maili (in that order). If you think it is appropriate, please don't hesitate to share this position with others.

If you have a draft report and/or draft press release ready for review before the meeting, I would like to have a copy and I will try to provide my comments before the meeting. Thanks.

Bruce

----- Original Message -----
From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
To: "Brian Takeda (E-mail)" <briant@rmtowill.com>; "Bruce Anderson (E-mail)" <bsa@hawaii.edu>; "Cynthia Rezentes (E-mail)" <rezentesc@aol.com>; "Cynthia Thielen (E-mail)" <repthielen@capitol.hawaii.gov>; "DeeDee Letts (E-mail)" <ddletts@lava.net>; "Eric Guinther (E-mail)" <guinther@hawaii.rr.com>; "Gary Slovin (E-mail)" <gslovin@goodsill.com>; "Gary Tomita (E-mail)" <igtwink@aol.com>; "George Yamamoto (E-mail)" <georges.yamamoto@alumni.usc.edu>; "Kathy Bryant Hunter (E-mail)" <kathybryant@dpr4adr.com>; "Mark/Carol White (E-mail)" <mark@pwcg.net>; "Michael Chun (E-mail)" <michun@ksbe.edu>; "Robert Tong (E-mail)" <tongr002@hawaii.rr.com>; "Shad Kane (E-mail)" <kiha@hawaii.rr.com>; "Steve Holmes (E-mail)" <SHolmes@co.honolulu.hi.us>; "Ted Jung (E-mail)" <jungt002@hawaii.rr.com>; "Todd Apo (E-mail)" <todd@koolina.com>; "William Paty (E-mail)" <bill@martroffice.com>
Sent: Tuesday, November 04, 2003 10:57 AM
Subject: meeting agenda for 11/7

just a reminder that the meeting will start at 9:30 a.m. <<Agenda 11 7.doc>>

Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

Brian Takeda

From: Dee Dee [ddletts@lava.net]
Sent: Tuesday, December 02, 2003 9:13 AM
To: Brian Takeda
Subject: FW: Press Inquiries

Dee Dee

-----Original Message-----
From: Rep. Cynthia Thielen [mailto:repthielen@Capitol.hawaii.gov]
Sent: Monday, November 17, 2003 2:08 PM
To: 'Slovin, Gary M.'; kathybryant@dpr4adr.com; Dee Dee; Namumnart, Wilma; Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Rep. Cynthia Thielen; Eric Guinther (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Steve Holmes (E-mail); Ted Jung (E-mail); Todd Apo (E-mail); William Paty (E-mail)
Subject: RE: Press Inquiries

I was contacted too and refused to give the names of the five sites. But someone evidently released the names. Who?? We reached a final decision on Nov. 7, and selected those five sites to go forward to Mayor Harris. I am not happy that Ameron is among the names, and I still believe we should not jeopardize our major quarry, but we made that group decision. It was hard, but we came to that FINAL decision, and five sites were selected. We all knew that that the final decision had been made on November 7, and we adjourned and left the room. The only purpose for our November 21 meeting is to give final approval to the cover document, transmitting the names of the five sites.
I now understand that some people are trying to reopen the decision. I am unalterably opposed to doing that and believe it is unacceptable dirty politics. If those members succeed in reopening what was a final decision, so they can push their special interest to remove Waimanalo Gulch, then I officially quit this highjacked Advisory Committee on Landfill Siting.
Rep. Cynthia Thielen

> -----Original Message-----
> From: Slovin, Gary M. [SMTP:gslovin@goodsill.com]
> Sent: Monday, November 10, 2003 4:26 PM
> To: kathybryant@dpr4adr.com; Dee Dee; Namumnart, Wilma; Brian Takeda
> (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia
> Thielen (E-mail); Eric Guinther (E-mail); Gary Tomita (E-mail); George
> Yamamoto (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail);
> Robert Tong (E-mail); Shad Kane (E-mail); Steve Holmes (E-mail); Ted
Jung
> (E-mail); Todd Apo (E-mail); William Paty (E-mail)
> Subject: RE: Press Inquiries
>
> I guess I should feel hurt that I was not contacted. Terrific
response.
> I'll just read the email if I get a call.
>
> -----Original Message-----
> From: Kathy Bryant [mailto:kathybryant@dpr4adr.com]
> Sent: Monday, November 10, 2003 3:49 PM
> To: Dee Dee; 'Namumnart, Wilma'; 'Brian Takeda (E-mail)'; 'Bruce
> Anderson (E-mail)'; 'Cynthia Rezentes (E-mail)'; 'Cynthia Thielen

> (E-mail)'; 'Eric Guinther (E-mail)'; Slovin, Gary M.; 'Gary Tomita
> (E-mail)'; 'George Yamamoto (E-mail)'; 'Mark/Carol White (E-mail)';
> 'Michael Chun (E-mail)'; 'Robert Tong (E-mail)'; 'Shad Kane (E-mail)';
> 'Steve Holmes (E-mail)'; 'Ted Jung (E-mail)'; 'Todd Apo (E-mail)';
> 'William Paty (E-mail)'
> Subject: RE: Press Inquiries
>
>
> I too was contacted and provided the same information as Cynthia.
>
> Kathy
>
> -----Original Message-----
> From: Dee Dee [mailto:ddletts@lava.net]
> Sent: Monday, November 10, 2003 3:21 PM
> To: 'Namumnart, Wilma'; 'Brian Takeda (E-mail)'; 'Bruce Anderson
> (E-mail)'; 'Cynthia Rezentes (E-mail)'; 'Cynthia Thielen (E-mail)';
> 'Eric Guinther (E-mail)'; 'Gary Slovin (E-mail)'; 'Gary Tomita
> (E-mail)'; 'George Yamamoto (E-mail)'; 'Kathy Bryant Hunter (E-mail)';
> 'Mark/Carol White (E-mail)'; 'Michael Chun (E-mail)'; 'Robert Tong
> (E-mail)'; 'Shad Kane (E-mail)'; 'Steve Holmes (E-mail)'; 'Ted Jung
> (E-mail)'; 'Todd Apo (E-mail)'; 'William Paty (E-mail)'
> Subject: RE: Press Inquiries
>
>
> Aloha,
>
> Cynthia Rezentes just called me to say that she has been contacted by
> the Advertiser about Friday's meeting. She is unable to send this
email
> now and has asked me to send it for her. Her response to the reporter
> is that the committee is finalizing their report and when it is
> forwarded to the Mayor in the next two weeks it will be public and
> available to the press until then she has no further comment on the
work
> of the committee. She hopes that anyone else who gets contacted will
> respond in similar fashion.
>
>
> Dee Dee
>
>
>
>
>

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Wednesday, December 03, 2003 1:28 PM
To: Brian Takeda (E-mail)
Subject: FW: various developments

-----Original Message-----
From: Todd Apo [mailto:todd@koolina.com]
Sent: Tuesday, November 18, 2003 5:17 PM
To: Namumnart, Wilma; 'Brian Takeda (E-mail)'; 'Bruce Anderson (E-mail)'; 'Cynthia Rezentes (E-mail)'; 'Cynthia Thielen (E-mail)'; 'DeeDee Letts (E-mail)'; 'Eric Guinther (E-mail)'; 'Gary Slovin (E-mail)'; 'Gary Tomita (E-mail)'; 'George Yamamoto (E-mail)'; 'Kathy Bryant Hunter (E-mail)'; 'Mark/Carol White (E-mail)'; 'Michael Chun (E-mail)'; 'Robert Tong (E-mail)'; 'Shad Kane (E-mail)'; Holmes, Steve; 'Ted Jung (E-mail)'; 'William Paty (E-mail)'
Cc: lkakazu@goodsill.com; olchun@ksbe.edu
Subject: RE: various developments

While I obviously have more expansive comments to this email (which I will address later - as I believe there are some mis-statements in Wilma's email), the key point I want to address first is that I disagree that "the Committee had agreed to recommend the five sites." The Committee has not made any final decision. I raised this issue numerous times at the last meeting, including when I asked that we take a vote on selecting sites. The Committee never made a decision to recommend five sites. All that was done was that we eliminated three sites by consensus. I continue my objection to submitting 5 sites.

Deciding to recommend 5 sites is very different from not being able to eliminate any more sites. Until we either have complete agreement to recommend 5 sites (by consensus) or we take a vote to recommend any specific sites (whether it be 1, 2 or 5), we, as the Committee, have not made any decision or recommendation.

As many of you know, I have been seeking a way for us, the Committee, to reach an actual decision. Given the differing views, the reality is that it is unlikely that such a decision will be by consensus. Therefore, I have been searching for a resolution that more than just a mere majority can agree upon. The bottom line is that we must make an actual recommendation decision.

On an additional technical note, in looking at the sunshine law requirements, no decision making was ever noticed in the agenda for the previous (Nov 7) meeting - all that was on the agenda was "discussion of sites." Therefore, even if we attempted to make decisions at that meeting, it would have been invalid. Additionally for this Friday, while we may review, comment and attempt to finalize the report on Friday, the Committee's final report must be actually accepted by the Committee. This act of accepting the report was not noticed in the Agenda for Friday.

Therefore, it is imperative that we schedule a meeting for next week, with proper notification that the Committee will be conducting decision making on recommending sites, and that we will be acting to accept the final report.

While I understand that some members believe that we made a final decision at the last meeting, that is not the case. We clearly didn't do so by consensus, and we clearly did not take a vote on anything. All we did was eliminate 3 out of 8 sites. I made this point at the last meeting as well as at the sub-committee meeting yesterday.

Therefore, I ask that the City properly notice a decision making meeting for next week. Given the timing that exists relative to the Thanksgiving holiday and the Dec 1 deadline, I ask that the meeting be scheduled and noticed as soon as possible (I believe that if it is noticed tomorrow, it can be scheduled for Tuesday), and that we not wait until Thursday to schedule it. If it is determined that the meeting is not necessary, we can cancel the meeting. However, I don't want us to lose the opportunity to get this done correctly.

Todd Apo

-----Original Message-----
From: Namumnart, Wilma [mailto:WNamumnart@co.honolulu.hi.us]
Sent: Tuesday, November 18, 2003 1:19 PM
To: Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Gary Slovin (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Steve Holmes (E-mail); Ted Jung (E-mail); Todd Apo (E-mail); William Paty (E-mail)
Cc: lkakazu@goodsill.com; olchun@ksbe.edu
Subject: various developments

This email addresses a recent development within the Committee's Sub-committee on drafting the final report and asks you to vote your preference by email before close of business on Wednesday, November 19, 2003.

The Sub-committee has been working diligently on the Committee's behalf to craft a report the Committee can be proud of. The Sub-committee met twice, the second meeting occurring this past Monday (11/17) for three hours. As the Sub-committee was ending this meeting a member of the sub-committee announced an intent to re-open the process on Friday (11/21) to remove Waimanalo Gulch from the list of recommended sites. It was pointed out that the Committee made its final recommendation at the last meeting on 11/7, and the only item on the 11/21 agenda is finalizing the report with the recommendation of five sites. This member continued to maintain that a vote should be taken even, when reminded that the Committee had agreed to recommend the five sites, as consensus could not be reached on removing any of them.
Other members of the Committee were unhappy with other sites staying on the list and put their differences aside in favor of not polarizing the Committee. This individual stated that they had talked with Anthony Ching, Executive Officer of the LUC, and that Anthony had said the Committee needed to come up with one site and that it could not be Waimanalo Gulch. The City, when informed of this comment, requested clarification from Anthony Ching. I sent his clarification by email to the Committee. In case anyone has not received a copy of his response, it is duplicated below. Basically Anthony states that the recommendation of the Committee can include multiple sites and that if the City decides to go back to Waimanalo Gulch, the City would have to file for and receive relief from the prior LUC ruling by May 1, 2008.

Statement of Anthony Ching, Executive Officer of the State Land Use Commission

Disclaimer - The executive officer of the Land Use Commission is a non-voting member of the commission. Nothing in this statement should be construed to be anything other than the non-binding opinion of the executive officer. Among other duties, the executive officer certifies orders as to their accuracy, assists the chair in establishing the Commission's calendar, supervises staff of the agency and serves at the pleasure of the Commission.

1. With respect to the recommendation and submission by the Blue Ribbon Site Selection of multiple sites for a new landfill to the City Council for their consideration.

The operative part of Condition #1 of the Commission's Decision and Order Approving Amendment to Special Use Permit says that the Blue Ribbon Site Selection Committee shall make its recommendation to the City Council by December 1, 2003.

I believe that the order is silent with respect to the scope or nature of any recommendation by the Site Selection Committee. The committee's recommendation is their own choosing and device and is not specifically governed by the Commission's order. It is my personal opinion and hope that if multiple sites are provided to the City Council by the site selection committee, that they be at a minimum, ranked in priority order.

I believe instead that the critical deadline specified in the Commission's order is that the City Council shall select a new site no later than June 1, 2004 or suffer immediate expiration of the LUC special permit.

2. With respect to the inclusion of Waimanalo Gulch as one of the recommended sites for the new landfill.

Condition #12 of the Commission's Decision and Order clearing specifies that no later than May 1, 2008, that the Waimanalo Gulch Landfill will be restricted from accepting any additional waste material and will be closed in accordance with an approved closure plan. Should the City Council choose to expand rather than close the Waimanalo Gulch Landfill, they would have to petition the Land Use Commission for relief prior to May 1, 2008. The Commission may approve, or not, any such petition for relief on the merits of the presentations made to it.

End of statement.

The City from the beginning of this committee process has requested multiple sites from the Committee to go forward to an EIS process. A multiple-site recommendation addresses the allegation that a site has been predetermined prior to completion of an EIS. Multiple sites offer the opportunity for detailed studies during the EIS process that could assist in identifying the optimum site for a landfill.

Subsequent to Anthony's letter, a member of the Sub-committee has asked me to schedule another meeting for next week to select a single site. The meeting agenda must be posted six calendar days before the meeting to comply with the Sunshine Law requirement. The meeting would be to reconsider the Committee's intent to recommend five sites. For all the reasons stated above, as well as the views of at least one of the Committee members who has shared these views with everyone on the Committee, the City does not believe that this is the proper way to proceed. However, this is the Committee's process so I am requesting that you all respond to this email by letting me know if you wish to schedule another meeting to discuss further reduction to the list of 5 recommended sites. Please let me know either by phone or by email before close of business tomorrow (11/19). The deadline to forward a final report by December 1, 2003, is still firm.

Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Wednesday, December 03, 2003 1:28 PM
To: Brian Takeda (E-mail)
Subject: FW: various developments

-----Original Message-----
From: Ted Jung [mailto:jung002@hawaii.rr.com]
Sent: Tuesday, November 18, 2003 7:07 PM
To: Namumnart, Wilma
Subject: Re: various developments

i think we cud be a serious conflict if we were to "re-vote " on something that was duly voted on. can we go back on other items that we previous voted on?it's not our pick anyway, the mayor will forword on to the council who will make the final decision. i think we will come under intense critisism if we were to revote, keep the five in place.
----- Original Message -----
From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
To: "Brian Takeda (E-mail)" <briant@rmtowill.com>; "Bruce Anderson (E-mail)" <bsa@hawaii.edu>; "Cynthia Rezentes (E-mail)" <rezentesc@aol.com>; "Cynthia Thielen (E-mail)" <repthielen@capitol.hawaii.gov>; "DeeDee Letts (E-mail)" <ddletts@lava.net>; "Eric Guinther (E-mail)" <guinther@HAWAII.RR.COM>; "Gary Slovin (E-mail)" <gslovin@goodsill.com>; "Gary Tomita (E-mail)" <igtwink@aol.com>; "George Yamamoto (E-mail)" <georges.yamamoto@alumni.usc.edu>; "Kathy Bryant Hunter (E-mail)" <kathybryant@dpr4adr.com>; "Mark/Carol White (E-mail)" <mark@pwcg.net>; "Michael Chun (E-mail)" <michun@ksbe.edu>; "Robert Tong (E-mail)" <tongr002@HAWAII.RR.COM>; "Shad Kane (E-mail)" <kiha@HAWAII.RR.COM>; "Steve Holmes (E-mail)" <SHolmes@co.honolulu.hi.us>; "Ted Jung (E-mail)" <jungt002@HAWAII.RR.COM>; "Todd Apo (E-mail)" <todd@koolina.com>; "William Paty (E-mail)" <bill@martroffice.com>
Cc: <lkakazu@goodsill.com>; <olchun@ksbe.edu>
Sent: Tuesday, November 18, 2003 1:18 PM
Subject: various developments

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I believe instead that the critical deadline specified in the Commission's order is that the City Council shall select a new site no later than June 1, 2004 or suffer immediate expiration of the LUC special permit.

2. With respect to the inclusion of Waimanalo Gulch as one of the recommended sites for the new landfill.

Condition #12 of the Commission's Decision and Order clearing specifies that no later than May 1, 2008, that the Waimanalo Gulch Landfill will be restricted from accepting any additional waste material and will be closed in accordance with an approved closure plan. Should the City Council choose to expand rather than close the Waimanalo Gulch Landfill, they would have to petition the Land Use Commission for relief prior to May 1, 2008. The Commission may approve, or not, any such petition for relief on the merits of the presentations made to it.

End of statement.

The City from the beginning of this committee process has requested multiple sites from the Committee to go forward to an EIS process. A multiple-site recommendation addresses the allegation that a site has been predetermined prior to completion of an EIS. Multiple sites offer the opportunity for detailed studies during the EIS process that could assist in identifying the optimum site for a landfill.

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Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Wednesday, December 03, 2003 1:26 PM
To: Brian Takeda (E-mail)
Subject: FW: various developments

-----Original Message-----
From: Bruce Anderson [mailto:bsa@hawaii.edu]
Sent: Tuesday, November 18, 2003 3:09 PM
To: Namumnart, Wilma; Brian Takeda (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Gary Slovin (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Holmes, Steve; Ted Jung (E-mail); Todd Apo (E-mail); William Paty (E-mail)
Cc: lkakazu@goodsill.com; olchun@ksbe.edu
Subject: Re: various developments

Wilma,

As discussed, I am opposed to meeting again to reconsider dropping Waimanalo or any other site from the list.

I was not able to attend the last meeting because I was giving a presentation on the mainland. However, I understand the Committee as a whole agreed to recommend five sites to the City for further evaluation. Although I would have preferred that the list be narrowed down to three sites, I defer to the judgment of the Committee at large and support this recommendation. I realize that it would be difficult at best to narrow the options. Further, it would be inappropriate given the limited amount of information that is available on each site. I think the City has a recommendation that will allow them to proceed through the next steps to more thoroughly evaluate the sites. Should the City ultimately choose to expand rather than close the Waimanalo Gulch Landfill, they would need to request approval of the Land Use Commission (LUC) just as they would for any other site that would require LUC approval. The deadline for asking for relief from the LUC (May 1, 2008) allows the City over four years to carefully evaluate the options and to go through the EIS process. This is all very reasonable and it does not preclude any of the five sites from further consideration.

Our commission was charged with a very difficult and thankless task. Given the potentially volatile and controversial nature of the issue, I am comfortable that we have done our job--and done it well. We have a recommendation we all agreed to and we should stick with it.

Respectfully submitted,

Bruce

----- Original Message -----
From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
To: "Brian Takeda (E-mail)" <briant@rmtowill.com>; "Bruce Anderson (E-mail)" <bsa@hawaii.edu>; "Cynthia Rezentes (E-mail)" <rezentesc@aol.com>; "Cynthia Thielen (E-mail)" <repthielen@capitol.hawaii.gov>; "DeeDee Letts (E-mail)" <ddletts@lava.net>; "Eric Guinther (E-mail)" <guinther@hawaii.rr.com>; "Gary Slovin (E-mail)" <gslovin@goodsill.com>; "Gary Tomita (E-mail)" <igtwink@aol.com>; "George Yamamoto (E-mail)" <georges.yamamoto@alumni.usc.edu>; "Kathy Bryant Hunter (E-mail)" <kathybryant@dpr4adr.com>; "Mark/Carol White (E-mail)" <mark@pwcg.net>; "Michael Chun (E-mail)" <michun@ksbe.edu>; "Robert Tong (E-mail)" <tongr002@hawaii.rr.com>; "Shad Kane (E-mail)" <kiha@hawaii.rr.com>; "Steve Holmes (E-mail)" <SHolmes@co.honolulu.hi.us>; "Ted Jung (E-mail)" <jungt002@hawaii.rr.com>; "Todd Apo (E-mail)" <todd@koolina.com>; "William Paty (E-mail)" <bill@martroffice.com>

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Brian Takeda

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Sent: Wednesday, December 03, 2003 1:26 PM
To: Brian Takeda (E-mail)
Subject: FW: various developments

-----Original Message-----
From: Rep. Cynthia Thielen [mailto:repthielen@Capitol.hawaii.gov]
Sent: Tuesday, November 18, 2003 1:43 PM
To: Namumnart, Wilma; Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Rep. Cynthia Thielen; DeeDee Letts (E-mail); Eric Guinther (E-mail); Gary Slovin (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Holmes, Steve; Ted Jung (E-mail); Todd Apo (E-mail); William Paty (E-mail)
Cc: lkakazu@goodsill.com; olchun@ksbe.edu
Subject: RE: various developments

My objection to reopening the FINAL decision still stands. No, no, no to a meeting to reduce the 5 sites. I still am appalled that some people who are unhappy with Waimanalo Gulch being on the list now want to hammer away until it is taken off. I do understand that some of this pressure comes from political person(s) not on the committee. That makes it even more unacceptable political manipulation. As I said before, I will not demean myself and participate in that political game. Rep. Cynthia Thielen

> -----Original Message-----
> From: Namumnart, Wilma [SMTP:WNamumnart@co.honolulu.hi.us]
> Sent: Tuesday, November 18, 2003 1:19 PM
> To: Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes
> (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric
> Guinther (E-mail); Gary Slovin (E-mail); Gary Tomita (E-mail); George
> Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White
> (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane
> (E-mail); Steve Holmes (E-mail); Ted Jung (E-mail); Todd Apo (E-mail); William Paty (E-mail)
> Cc: lkakazu@goodsill.com; olchun@ksbe.edu
> Subject: various developments
>
> This email addresses a recent development within the Committee's
> Sub-committee on drafting the final report and asks you to vote your
> preference by email before close of business on Wednesday, November
> 19, 2003.
>
> The Sub-committee has been working diligently on the Committee's
> behalf to craft a report the Committee can be proud of. The
> Sub-committee met twice, the second meeting occurring this past Monday
> (11/17) for three hours. As the Sub-committee was ending this meeting
> a member of the sub-committee announced an intent to re-open the
> process on Friday (11/21) to remove Waimanalo Gulch from the list of
> recommended sites. It was pointed out that the Committee made its
> final recommendation at the last meeting on 11/7, and the only item on
> the 11/21 agenda is finalizing the report with the recommendation of
> five sites. This member continued to maintain that a vote should be
> taken even, when reminded that the Committee had agreed to recommend
> the five sites, as consensus could not be reached on removing any of them.
> Other members of the Committee were unhappy with other sites staying on
> the list and put their differences aside in favor of not polarizing the
> Committee. This individual stated that they had talked with Anthony
> Ching, Executive Officer of the LUC, and that Anthony had said the
> Committee needed to come up with one site and that it could not be
> Waimanalo Gulch. The City, when informed of this comment, requested

> clarification from Anthony Ching. I sent his clarification by email to
> the Committee. In case anyone has not received a copy of his response, it
> is duplicated below. Basically Anthony states that the recommendation of
> the Committee can include multiple sites and that if the City decides to
> go back to Waimanalo Gulch, the City would have to file for and receive
> relief from the prior LUC ruling by May 1, 2008.
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> Statement of Anthony Ching, Executive Officer of the State Land Use
> Commission
>
> Disclaimer - The executive officer of the Land Use Commission is a
> non-voting member of the commission. Nothing in this statement should
> be construed to be anything other than the non-binding opinion of the
> executive officer. Among other duties, the executive officer
> certifies orders as to their accuracy, assists the chair in
> establishing the Commission's calendar, supervises staff of the agency
> and serves at the pleasure of the Commission.
>
> 1. With respect to the recommendation and submission by the
> Blue Ribbon Site Selection of multiple sites for a new landfill to the
> City Council for their consideration.
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> The operative part of Condition #1 of the Commission's Decision and
> Order Approving Amendment to Special Use Permit says that the Blue
> Ribbon Site Selection Committee shall make its recommendation to the
> City Council by December 1, 2003.
>
> I believe that the order is silent with respect to the scope or
> nature of any recommendation by the Site Selection Committee. The
> committee's recommendation is their own choosing and device and is not
> specifically governed by the Commission's order. It is my personal
> opinion and hope that if multiple sites are provided to the City
> Council by the site selection committee, that they be at a minimum,
> ranked in priority order.
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> I believe instead that the critical deadline specified in the
> Commission's order is that the City Council shall select a new site no
> later than June 1, 2004 or suffer immediate expiration of the LUC
> special permit.
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> 2. With respect to the inclusion of Waimanalo Gulch as one of
> the recommended sites for the new landfill.
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> Condition #12 of the Commission's Decision and Order clearing
> specifies that no later than May 1, 2008, that the Waimanalo Gulch
> Landfill will be restricted from accepting any additional waste
> material and will be closed in accordance with an approved closure
> plan. Should the City Council choose to expand rather than close the
> Waimanalo Gulch Landfill, they would have to petition the Land Use
> Commission for relief prior to May 1, 2008. The Commission may
> approve, or not, any such petition for relief on the merits of the
> presentations made to it.
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> End of statement.
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> multiple sites from the Committee to go forward to an EIS process. A
> multiple-site recommendation addresses the allegation that a site has
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> Subsequent to Anthony's letter, a member of the Sub-committee has
> asked me to schedule another meeting for next week to select a single
> site. The meeting agenda must be posted six calendar days before the
> meeting to comply with the Sunshine Law requirement. The meeting
> would be to reconsider the Committee's intent to recommend five sites.

> For all the reasons stated above, as well as the views of at least one
> of the Committee members who has shared these views with everyone on
> the Committee, the City does not believe that this is the proper way
> to proceed. However, this is the Committee's process so I am
> requesting that you all respond to this email by letting me know if
> you wish to schedule another meeting to discuss further reduction to
> the list of 5 recommended sites. Please let me know either by phone
> or by email before close of business tomorrow (11/19). The deadline
> to forward a final report by December 1, 2003, is still firm.
>
>
> Wilma Namumnart
> ENV/Refuse Division
> Phone 692-5378
> FAX 692-5402

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Wednesday, December 03, 2003 1:27 PM
To: Brian Takeda (E-mail)
Subject: FW: various developments-2

-----Original Message-----
From: Robert Tong [mailto:tongr002@hawaii.rr.com]
Sent: Tuesday, November 18, 2003 4:27 PM
To: Namumnart, Wilma
Subject: Re: various developments-2

Wilma,
I vote to leave the 5 sites with all comments and criteria as discussed on 11/7 on the report to be sent to the City Council. Bob Tong
----- Original Message -----
From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
To: "Brian Takeda (E-mail)" <briant@rmtowill.com>; "Bruce Anderson (E-mail)" <bsa@hawaii.edu>; "Cynthia Rezentes (E-mail)" <rezentesc@aol.com>; "Cynthia Thielen (E-mail)" <repthielen@capitol.hawaii.gov>; "DeeDee Letts (E-mail)" <ddletts@lava.net>; "Eric Guinther (E-mail)" <guinther@hawaii.rr.com>; "Gary Slovin (E-mail)" <gslovin@goodsill.com>; "Gary Tomita (E-mail)" <igtwink@aol.com>; "George Yamamoto (E-mail)" <georges.yamamoto@alumni.usc.edu>; "Kathy Bryant Hunter (E-mail)" <kathybryant@dpr4adr.com>; "Mark/Carol White (E-mail)" <mark@pwcg.net>; "Michael Chun (E-mail)" <michun@ksbe.edu>; "Robert Tong (E-mail)" <tongr002@hawaii.rr.com>; "Shad Kane (E-mail)" <kiha@hawaii.rr.com>; "Steve Holmes (E-mail)" <SHolmes@co.honolulu.hi.us>; "Ted Jung (E-mail)" <jungt002@hawaii.rr.com>; "Todd Apo (E-mail)" <todd@koolina.com>; "William Paty (E-mail)" <bill@martroffice.com>
Cc: <olchun@ksbe.edu>; <lkakazu@goodsill.com>
Sent: Tuesday, November 18, 2003 3:32 PM
Subject: FW: various developments-2

to clarify the email below, the question you are being asked to email or phone me about is "do you wish to schedule another meeting for next week to select a single site or do you wish to have the five recommended sites go forward?" for those of you who have already emailed me, please disregard this email unless you did not understand the question and wish to change your vote.

> -----Original Message-----
> From: Namumnart, Wilma
> Sent: Tuesday, November 18, 2003 1:19 PM
> To: Brian Takeda (E-mail); Bruce Anderson (E-mail); Cynthia Rezentes (E-mail); Cynthia Thielen (E-mail); DeeDee Letts (E-mail); Eric Guinther (E-mail); Gary Slovin (E-mail); Gary Tomita (E-mail); George Yamamoto (E-mail); Kathy Bryant Hunter (E-mail); Mark/Carol White (E-mail); Michael Chun (E-mail); Robert Tong (E-mail); Shad Kane (E-mail); Steve Holmes (E-mail); Ted Jung (E-mail); Todd Apo (E-mail); William Paty (E-mail)
> Cc: 'lkakazu@goodsill.com'; 'olchun@ksbe.edu'
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It was pointed out that the Committee made its final recommendation at the last meeting on 11/7, and the only item on the 11/21 agenda is finalizing the report with the recommendation of five sites. This member continued to maintain that a vote should be taken even, when reminded that the Committee had agreed to recommend the five sites, as consensus could not be reached on removing any of them.
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the list and put their differences aside in favor of not polarizing the Committee. This individual stated that they had talked with Anthony Ching, Executive Officer of the LUC, and that Anthony had said the Committee needed to come up with one site and that it could not be Waimanalo Gulch. The City, when informed of this comment, requested clarification from Anthony Ching. I sent his clarification by email to the Committee. In case anyone has not received a copy of his response, it is duplicated below. Basically Anthony states that the recommendation of the Committee can include multiple sites and that if the City decides to go back to Waimanalo Gulch, the City would have to file for and receive relief from the prior LUC ruling by May 1, 2008.
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Commission
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> End of statement.
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> The City from the beginning of this committee process has requested
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>
>
> Wilma Namumnart
> ENV/Refuse Division
> Phone 692-5378
> FAX 692-5402
>

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Wednesday, December 03, 2003 1:29 PM
To: Brian Takeda (E-mail)
Subject: FW: various developments

-----Original Message-----
From: Shad Kane [mailto:kiha@hawaii.rr.com]
Sent: Tuesday, November 18, 2003 9:35 PM
To: Namumnart, Wilma
Cc: Michael Chun (E-mail); Eric Guinther (E-mail); Bryant, Kathy; Yamamoto, George; Mark/Carol White (E-mail); Tong, Robert; Cynthia Thielen (E-mail); Brian Takeda (E-mail); Cynthia Rezentes (E-mail); Gary Slovin (E-mail); William Paty (E-mail); DeeDee Letts (E-mail); Ted Jung (E-mail); Holmes, Steve; Todd Apo (E-mail); Bruce Anderson (E-mail); Gary Tomita (E-mail)
Subject: Re: various developments

I think that I need to restate something that I have said a number of times. It amazes me how something so elementary is so difficult to understand by people with colorful resumes. The whole reason this process was put in place is simply because a substantial number of people said NO to Waimanalo Gulch. The Director of the Department of Environmental Services said that Waimanalo Gulch is not an option. He subsequently backed down under the abrasive behavior of several well placed, politically motivated members. This abrasive attitude is supported by some of these individuals identifying themselves by their political office held. Is it even okay to have
politicians serve on this committee??? It is suprising that we have
politicians (who hold paid positions) accusing volunteer community representatives (who are unpaid) of being political!

I constantly read in all these email communications that the "Committee of the Whole" in consensus agreed to moving 5 sites forward. Let me repea twhat I have said before that seems difficult for some of our members to understand. There was no consensus. The decision is divided. If the decision goes forward recommending 5 sites it needs to go forward with a statement that a substantial number of members disagree with the inclusion of Waimanalo Gulch.

I am in support of another meeting to resolve this issue and bring it in compliance with the reason for the establishment of the Blue Ribbon Landfill Committee.

Shad Kane
Volunteer Community Representative

----- Original Message -----
From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
To: "Brian Takeda (E-mail)" <briant@rmtowill.com>; "Bruce Anderson (E-mail)" <bsa@hawaii.edu>; "Cynthia Rezentes (E-mail)" <rezentesc@aol.com>; "Cynthia Thielen (E-mail)" <repthielen@capitol.hawaii.gov>; "DeeDee Letts (E-mail)" <ddletts@lava.net>; "Eric Guinther (E-mail)" <guinther@HAWAII.RR.COM>; "Gary Slovin (E-mail)" <gslovin@goodsill.com>; "Gary Tomita (E-mail)" <igtwink@aol.com>; "George Yamamoto (E-mail)" <georges.yamamoto@alumni.usc.edu>; "Kathy Bryant Hunter (E-mail)" <kathybryant@dpr4adr.com>; "Mark/Carol White (E-mail)" <mark@pwcg.net>; "Michael Chun (E-mail)" <michun@ksbe.edu>; "Robert Tong (E-mail)" <tongr002@HAWAII.RR.COM>; "Shad Kane (E-mail)" <kiha@HAWAII.RR.COM>; "Steve Holmes (E-mail)" <SHolmes@co.honolulu.hi.us>; "Ted Jung (E-mail)" <jungt002@HAWAII.RR.COM>; "Todd Apo (E-mail)" <todd@koolina.com>; "William Paty (E-mail)" <bill@martroffice.com>
Cc: <lkakazu@goodsill.com>; <olchun@ksbe.edu>
Sent: Tuesday, November 18, 2003 1:18 PM
Subject: various developments

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Statement of Anthony Ching, Executive Officer of the State Land Use Commission

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1. With respect to the recommendation and submission by the Blue Ribbon Site Selection of multiple sites for a new landfill to the City Council for their consideration.

The operative part of Condition #1 of the Commission's Decision and Order Approving Amendment to Special Use Permit says that the Blue Ribbon Site Selection Committee shall make its recommendation to the City Council by December 1, 2003.

I believe that the order is silent with respect to the scope or nature of any recommendation by the Site Selection Committee. The committee's recommendation is their own choosing and device and is not specifically governed by the Commission's order. It is my personal opinion and hope that if multiple sites are provided to the City Council by the site selection committee, that they be at a minimum, ranked in priority order.

I believe instead that the critical deadline specified in the Commission's order is that the City Council shall select a new site no later than June 1, 2004 or suffer immediate expiration of the LUC special permit.

2. With respect to the inclusion of Waimanalo Gulch as one of the recommended sites for the new landfill.

Condition #12 of the Commission's Decision and Order clearing specifies that no later than May 1, 2008, that the Waimanalo Gulch Landfill will be restricted from accepting any additional waste material and will be closed in accordance with an approved closure plan. Should the City Council choose to expand rather than close the Waimanalo Gulch Landfill, they would have to petition the Land Use Commission for relief prior to May 1, 2008. The Commission may approve, or not, any such petition for relief on the merits of the presentations made to it.

End of statement.

The City from the beginning of this committee process has requested multiple sites from the Committee to go forward to an EIS process. A multiple-site recommendation addresses the allegation that a site has been predetermined prior to completion of an EIS. Multiple

sites offer the opportunity for detailed studies during the EIS process that could assist in identifying the optimum site for a landfill.

Subsequent to Anthony's letter, a member of the Sub-committee has asked me to schedule another meeting for next week to select a single site. The meeting agenda must be posted six calendar days before the meeting to comply with the Sunshine Law requirement. The meeting would be to reconsider the Committee's intent to recommend five sites. For all the reasons stated above, as well as the views of at least one of the Committee members who has shared these views with everyone on the Committee, the City does not believe that this is the proper way to proceed. However, this is the Committee's process so I am requesting that you all respond to this email by letting me know if you wish to schedule another meeting to discuss further reduction to the list of 5 recommended sites. Please let me know either by phone or by email before close of business tomorrow (11/19). The deadline to forward a final report by December 1, 2003, is still firm.

Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

Brian Takeda

From: Dee Dee [ddletts@lava.net]
Sent: Tuesday, December 02, 2003 9:10 AM
To: Brian Takeda
Subject: FW: various developments

Dee Dee

-----Original Message-----
From: Rezentesc@aol.com [mailto:Rezentesc@aol.com]
Sent: Wednesday, November 19, 2003 8:43 AM
To: WNamumnart@co.honolulu.hi.us; briant@rmtowill.com; bsa@hawaii.edu; repthielen@capitol.hawaii.gov; ddletts@lava.net; guinther@hawaii.rr.com; gslovin@goodsill.com; IGTWINK@aol.com; georges.yamamoto@alumni.usc.edu; kathybryant@dpr4adr.com; mark@pwcg.net; michun@ksbe.edu; tongr002@hawaii.rr.com; kiha@hawaii.rr.com; SHolmes@co.honolulu.hi.us; jungt002@hawaii.rr.com; todd@koolina.com; bill@martroffice.com
Cc: lkakazu@goodsill.com; olchun@ksbe.edu
Subject: Re: various developments

I have no objections to holding another meeting to settle the concerns expressed regarding clarifying whether we clearly are forwarding the five sites by consensus and would encourage it to get a full committee position.

Also, although I am no attorney and I understand that opinions, commitments and positions sometimes change on the winds and with whomever is in charge, I believe the City and County has made a verbal contract with the West Coast community, KoOlina, the PC and LUC by stating, not once but many times, they will not operate Waimanalo Gulch Sanitary Landfill beyond May 1, 2008. (My definition of a contract, verbal or written, remembered from my 500 level Business Law Class, is that both sides get something for something. In this case the City got their permit extension for another five years to operate Waimanalo Gulch Sanitary Landfill and the community and KoOlina got the commitment for closure after those five years were up.)

Cynthia Rezentes

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Wednesday, December 03, 2003 1:30 PM
To: Brian Takeda (E-mail)
Subject: FW: various developments

-----Original Message-----
From: Shad Kane [mailto:kiha@hawaii.rr.com]
Sent: Wednesday, November 19, 2003 10:40 AM
To: Namumnart, Wilma
Subject: Re: various developments

Aloha Wilma,
I am in support of another meeting next week after this Fridays meeting. The purpose of this meeting to reduce the 5 sites to 1 site. Mahalo, Shad

----- Original Message -----
From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
To: "Brian Takeda (E-mail)" <briant@rmtowill.com>; "Bruce Anderson (E-mail)" <bsa@hawaii.edu>; "Cynthia Rezentes (E-mail)" <rezentesc@aol.com>; "Cynthia Thielen (E-mail)" <repthielen@capitol.hawaii.gov>; "DeeDee Letts (E-mail)" <ddletts@lava.net>; "Eric Guinther (E-mail)" <guinther@HAWAII.RR.COM>; "Gary Slovin (E-mail)" <gslovin@goodsill.com>; "Gary Tomita (E-mail)" <igtwink@aol.com>; "George Yamamoto (E-mail)" <georges.yamamoto@alumni.usc.edu>; "Kathy Bryant Hunter (E-mail)" <kathybryant@dpr4adr.com>; "Mark/Carol White (E-mail)" <mark@pwcg.net>; "Michael Chun (E-mail)" <michun@ksbe.edu>; "Robert Tong (E-mail)" <tongr002@HAWAII.RR.COM>; "Shad Kane (E-mail)" <kiha@HAWAII.RR.COM>; "Steve Holmes (E-mail)" <SHolmes@co.honolulu.hi.us>; "Ted Jung (E-mail)" <jungt002@HAWAII.RR.COM>; "Todd Apo (E-mail)" <todd@koolina.com>; "William Paty (E-mail)" <bill@martroffice.com>
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I believe instead that the critical deadline specified in the Commission's order is that the City Council shall select a new site no later than June 1, 2004 or suffer immediate expiration of the LUC special permit.

2. With respect to the inclusion of Waimanalo Gulch as one of the recommended sites for the new landfill.

Condition #12 of the Commission's Decision and Order clearing specifies that no later than May 1, 2008, that the Waimanalo Gulch Landfill will be restricted from accepting any additional waste material and will be closed in accordance with an approved closure plan. Should the City Council choose to expand rather than close the Waimanalo Gulch Landfill, they would have to petition the Land Use Commission for relief prior to May 1, 2008. The Commission may approve, or not, any such petition for relief on the merits of the presentations made to it.

End of statement.

The City from the beginning of this committee process has requested multiple sites from the Committee to go forward to an EIS process. A multiple-site recommendation addresses the allegation that a site has been predetermined prior to completion of an EIS. Multiple sites offer the opportunity for detailed studies during the EIS process that could assist in identifying the optimum site for a landfill.

Subsequent to Anthony's letter, a member of the Sub-committee has asked me to schedule another meeting for next week to select a single site. The meeting agenda must be posted six calendar days before the meeting to comply with the Sunshine Law requirement. The meeting would be to reconsider the Committee's intent to recommend five sites. For all the reasons stated above, as well as the views of at least one of the Committee members who has shared these views with everyone on the Committee, the City does not believe that this is the proper way to proceed. However, this is the Committee's process so I am requesting that you all respond to this email by letting me know if you wish to schedule another meeting to discuss further reduction to the list of 5 recommended sites. Please let me know either by phone or by email before close of business tomorrow (11/19). The deadline to forward a final report by December 1, 2003, is still firm.

Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Wednesday, December 03, 2003 1:31 PM
To: Brian Takeda (E-mail)
Subject: FW: Various developments

-----Original Message-----
From: Robert Tong [mailto:tongr002@hawaii.rr.com]
Sent: Wednesday, November 19, 2003 2:08 PM
To: Namumnart, Wilma
Subject: Various developments

Wilma,
I would like to change my vote to send the five sites to the city council. If the majority wishes to meet next week I am available on Monday, 11/24, Tuesday, 11/25, or Wednesday, 11/26, to meet.

Bob Tong

Brian Takeda

From: Dee Dee [ddletts@lava.net]
Sent: Tuesday, December 02, 2003 9:08 AM
To: Brian Takeda
Subject: FW: Landfill Panel

Dee Dee

-----Original Message-----
From: Todd Apo [mailto:todd@koolina.com]
Sent: Monday, November 24, 2003 4:36 PM
To: 'DeeDee Letts (E-mail)'; Wilma Namumnart
Subject: Landfill Panel

Wilma and DeeDee,

I want to confirm that part of the agenda for Monday's meeting is to confirm the vote taken at last Friday's meeting that Waimanalo Gulch will be taken off from any further consideration and from any report of the Committee. This will confirm that after we took the vote on "what to do if we do not reach a decision on Monday, Dec 1," we then voted to remove Waimanalo Gulch from any further consideration. The vote was 7-3 (Apo, Gunthier, Kane, Rezentes, Slovin, Tomita, and Yamamoto in favor; Holmes, Hunter, and Thielen opposed) in favor of taking Waimanalo Gulch off. Additionally, I passed out copies with 9 signatures to take Waimanalo Gulch off – this included the signature of Bob Tong, Ted Jung and William Paty. I also understand that Mike Chun sent in a letter confirming his agreement that Waimanalo Gulch should be removed from further consideration. Therefore, there are 11 (of 15) committee members on record as opposing Waimanalo Gulch from any further consideration.

While this will be a part of finalizing site selection, we would like, to avoid any confusion or procedural problems, to have the agenda specifically reflect that this will be officially decided upon at Monday's meeting – either as a sub-matter under finalizing site selection or as a separate agenda item.

I would appreciate hearing back from you on this.

Aloha,
Todd

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Wednesday, December 03, 2003 1:11 PM
To: Brian Takeda (E-mail)
Subject: FW: meeting, 12/1

-----Original Message-----
From: Bruce Anderson [mailto:bsa@hawaii.edu]
Sent: Monday, November 24, 2003 8:59 AM
To: Namumnart, Wilma
Cc: Dee Dee Letts
Subject: Re: meeting, 12/1

Wilma,

I think we all need some further clarification on the purpose(s) of another meeting.

As you know, I think the Committee has gone as far as it can given its constituency in recommending five sites for the City to consider. Others on the Committee share this opinion. We simply don't have enough information to narrow the list further at this point and would be inappropriate to do so by vote. If the purposes of the meeting is to vote on a preferred site or to vote on eliminating Waimanalo Gulch (the top choice based on criteria agreed to by the Committee) or any other site, I will be no part of this meeting.

Did you find out if the Land Use Commission provide further direction at their last meeting as represented by Todd Apo? If so, I would check to see if there was a public notice that this topic would be on the agenda. If the Commission did not provide adequate notice, this topic should not been discussed. I certainly would have commented at their meeting had I known this would be a topic of discussion--as would others. I would check on that and press the issue (through the AG), if necessary. That's what the public notice issue is all about. In any event, our Committee is an "advisory committee" to the City and is not beholden to the Commission or anyone else.

It would be helpful to everyone to have some further guidance before the meeting on exactly what would be discussed. Please check with Dee Dee.

Thanks.

Bruce

----- Original Message -----
From: "Namumnart, Wilma" <WNamumnart@co.honolulu.hi.us>
To: "Brian Takeda (E-mail)" <briant@rmtowill.com>; "Bruce Anderson (E-mail)" <bsa@hawaii.edu>; "Cynthia Rezentes (E-mail)" <rezentesc@aol.com>; "Cynthia Thielen (E-mail)" <repthielen@capitol.hawaii.gov>; "DeeDee Letts (E-mail)" <ddletts@lava.net>; "Eric Guinther (E-mail)" <guinther@hawaii.rr.com>; "Gary Slovin (E-mail)" <gslovin@goodsill.com>; "Gary Tomita (E-mail)" <igtwink@aol.com>; "George Yamamoto (E-mail)" <georges.yamamoto@alumni.usc.edu>; "Kathy Bryant Hunter (E-mail)" <kathybryant@dpr4adr.com>; "Mark/Carol White (E-mail)" <mark@pwcg.net>; "Michael Chun (E-mail)" <michun@ksbe.edu>; "Robert Tong (E-mail)" <tongr002@hawaii.rr.com>; "Shad Kane (E-mail)" <kiha@hawaii.rr.com>; "Steve Holmes (E-mail)" <SHolmes@co.honolulu.hi.us>; "Ted Jung (E-mail)" <jungt002@hawaii.rr.com>; "Todd Apo (E-mail)" <todd@koolina.com>; "William Paty (E-mail)" <bill@martroffice.com>
Sent: Saturday, November 22, 2003 9:03 AM
Subject: meeting, 12/1

our meeting will be at kapolei hale in the third floor conference room from 9 - 10:30 a.m. attached is the agenda. <<Agenda 12 1.doc>>

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Friday, November 28, 2003 8:38 AM
To: Brian Takeda (E-mail); DeeDee Letts (E-mail); Mark/Carol White (E-mail)
Subject: FW: Landfill Committee on behalf of Bill Paty

-----Original Message-----
From: Susan Gall [mailto:susan@martroffice.com]
Sent: Wednesday, November 26, 2003 11:44 AM
To: Namumnart, Wilma
Cc: Wm W. Paty
Subject: Landfill Committee on behalf of Bill Paty

Wilma,

I regret that due to continuing family illness I have been unable to attend committee meetings. I have been following the minutes; I support the removal of Waimanalo gulch from further consideration.

Bill Paty

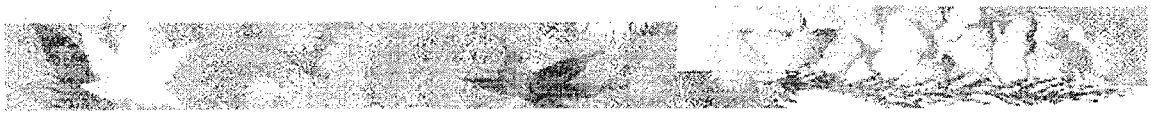
(the preceding msg is being sent on behalf of Bill Paty. His direct email is bill@martroffice.com)

Brian Takeda

From: Dee Dee [ddletts@lava.net]
Sent: Tuesday, December 02, 2003 9:15 AM
To: Brian Takeda
Subject: FW: Response to Todd Apo's email

Dee Dee

-----Original Message-----
From: Dee Dee [mailto:ddletts@lava.net]
Sent: Friday, November 28, 2003 4:04 PM
To: 'bsa@hawaii.edu'; 'Rep. Cynthia Thielen'; 'Eric Guinther (E-mail)'; 'Gary Slovin (E-mail)'; 'Gary Tomita (E-mail)'; 'George Yamamoto (E-mail)'; 'Kathy Bryant Hunter (E-mail)'; 'Michael Chun (E-mail)'; 'Robert Tong (E-mail)'; 'Shad Kane (E-mail)'; 'Steve Holmes (E-mail)'; 'Ted Jung (E-mail)'; 'Todd Apo (E-mail)'; 'William Paty (E-mail)'
Cc: Wima Namumnart (wnamumnart@co.honolulu.hi.us); Brian Takeda (BrianT@rmtowill.com); 'Mark White'
Subject: Response to Todd Apo's email



TO: Members of the Mayor's Blue Ribbon Committee on Landfill

FR: Dee Dee

RE: Email received from Todd Apo

I have duplicated below Todd's email sent to Wilma and myself and am via this email sending it to the entire Committee as I feel it concerns the entire Committee. I would request that any email sent to myself be sent to the entire Committee as I am responsible to the Committee as whole not individual members.

My responsibility is the process by which the Committee moves forward not the substance that the Committee considers or recommends. All substantive questions belong to the Committee as a whole not me. As far as process goes one member or one group of members can not change the agenda or group memories of the group. Agenda items are generally agreed to at the end of one meeting for the next and once posted require a 2/3 vote of all Committee members to change. In this case the agenda items for the December 1 meeting are a discussion about further narrowing the recommendations. Under this item a discussion of removal of Waimanalo Gulch can take place. The second item allows the group to change the

recommendations section in the final report, if the first item results in changes.

This Committee has operated under the Sunshine Law, thus decisions must be made in the open at Committee meetings. There are no provisions for accepting petitions or email votes on substantive items. Votes for process items such as whether to have another meeting are OK but substantive decisions are not.

In regards to the meeting on November 24 there were three votes taken at that meeting. The first to put the discussion of site reduction on the agenda which required 2/3 of the entire Committee to amend the agenda under Sunshine and failed to get the 10 votes required. The second to hold the December 1 first meeting which passed, and the third which was to forward the report with no recommendations and just a list of the sites currently in the report if the December 1 meeting did not happen or resolution on the issue of reducing the number of sites could not be achieved which passed.

I hope this clears up any confusion around process. I look forward to seeing you all on December 1. Should the group decide to vote at that time it will be a change from the process the Committee has employed for five months and even if the Committee decides to do this, process questions will continue to be handled by consensus.

Mahalo for all your hard work and efforts toward forwarding a thoughtful set of recommendations to this point.

_Todd's email follows below

Wilma and DeeDee,

I want to confirm that part of the agenda for Monday's meeting is to confirm the vote taken at last Friday's meeting that Waimanalo Gulch will be taken off from any further consideration and from any report of the Committee. This will confirm that after we took the vote on "what to do if we do not reach a decision on Monday, Dec 1," we then voted to remove Waimanalo Gulch from any further consideration. The vote was 7-3 (Apo, Gunthier, Kane, Rezentes, Slovin, Tomita, and Yamamoto in favor; Holmes, Hunter, and Thielen opposed) in favor of taking Waimanalo Gulch off. Additionally, I passed out copies with 9 signatures to take Waimanalo Gulch off – this included the signature of Bob Tong, Ted Jung and William Paty. I also understand that Mike Chun sent in a letter confirming his agreement that Waimanalo Gulch should be removed from further consideration. Therefore, there are 11 (of 15) committee members on record as opposing Waimanalo Gulch from any further consideration.

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I would appreciate hearing back from you on this.

Aloha,
Todd

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Wednesday, December 03, 2003 1:34 PM
To: Brian Takeda (E-mail)
Subject: FW: Response to Todd Apo's email

-----Original Message-----
From: Todd Apo [mailto:todd@koolina.com]
Sent: Saturday, November 29, 2003 12:04 AM
To: 'Dee Dee'; bsa@hawaii.edu; 'Rep. Cynthia Thielen'; 'Eric Guinther (E-mail)'; 'Gary Slovin (E-mail)'; 'Gary Tomita (E-mail)'; 'George Yamamoto (E-mail)'; 'Kathy Bryant Hunter (E-mail)'; 'Michael Chun (E-mail)'; 'Robert Tong (E-mail)'; 'Shad Kane (E-mail)'; Holmes, Steve; 'Ted Jung (E-mail)'; 'William Paty (E-mail)'
Cc: Namumnart, Wilma; 'Brian Takeda'; 'Mark White'
Subject: RE: Response to Todd Apo's email

Dee Dee,

Thank you for the response email, and the confirmation that we will address the Waimanalo Gulch issue under the current agenda. As my email started off, I was trying to confirm my understanding of "the process" for Monday's meeting, which is why I emailed you and Wilma initially, and not the whole committee. From your email, I understand that we will be making all substantive decisions at the meeting with those present, and not via email or petition.

From your email, I have two remaining questions:
1) Please confirm your understanding of the 7-3 vote that I referenced in my previous email below.
2) How do we make changes to the group memories?

Thank you again Dee Dee for your work on effort in keeping our group moving through this difficult task.

Aloha,
Todd

From: Dee Dee [mailto:ddletts@lava.net]
Sent: Friday, November 28, 2003 4:04 PM
To: bsa@hawaii.edu; 'Rep. Cynthia Thielen'; 'Eric Guinther (E-mail)'; 'Gary Slovin (E-mail)'; 'Gary Tomita (E-mail)'; 'George Yamamoto (E-mail)'; 'Kathy Bryant Hunter (E-mail)'; 'Michael Chun (E-mail)'; 'Robert Tong (E-mail)'; 'Shad Kane (E-mail)'; 'Steve Holmes (E-mail)'; 'Ted Jung (E-mail)'; 'Todd Apo (E-mail)'; 'William Paty (E-mail)'
Cc: Wima Namumnart; Brian Takeda; 'Mark White'
Subject: Response to Todd Apo's email

TO: Members of the Mayor's Blue Ribbon Committee on Landfill

FR: Dee Dee

RE: Email received from Todd Apo

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at Monday's meeting – either as a sub-matter under finalizing site selection or as a separate agenda item.

I would appreciate hearing back from you on this.

Aloha,
Todd

Brian Takeda

From: Namumnart, Wilma [WNamumnart@co.honolulu.hi.us]
Sent: Monday, December 01, 2003 11:29 AM
To: Brian Takeda (E-mail)
Subject: FW: addition to section 7.1 landfill costs

-----Original Message-----
From: Mark White [mailto:mark@pwcg.net]
Sent: Monday, December 01, 2003 11:18 AM
To: Namumnart, Wilma
Subject: RE: addition to section 7.1 landfill costs

Thank you.

Mark White
Pacific Waste Consulting Group
916/387-9777 (Voice)
916/387-9802 (Fax)
916/996-9777 (Cell)
mark@pwcg.net (reply email address)

-----Original Message-----
From: Namumnart, Wilma [mailto:WNamumnart@co.honolulu.hi.us]
Sent: Monday, December 01, 2003 12:58 PM
To: Mark White
Subject: addition to section 7.1 landfill costs

from kathy bryant

After reviewing the matrix, 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 weights, the Committee agreed that costs are a very significant factor and have a larger impact on the taxpayer. The Committee considered the issues in the brainstorming deliberations on the strengths and weaknesses of each site.

Wilma Namumnart
ENV/Refuse Division
Phone 692-5378
FAX 692-5402

Attachment F – Host Community Benefit Summary

Host Community Benefit Concepts

September 2003

Prepared by
Pacific Waste Consulting Group

Pacific Waste
CONSULTING GROUP

Host Community Benefit Concepts

Host Community Benefits (HCB) can help address local opposition to the siting of landfills to needed to meet the City and County's future solid waste management needs. Some key advantages of using HCBs are

- 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 have been established over a range of costs, with the most prevalent being $1.00 per ton of material handled at the landfill site. Communities have customized the fee schedule to match their needs.
- HCB can be split between local jurisdictions.
- HCB has helped ease the resistance to being the host to a new or expanded landfill.
- HCB are very common. States that have them include New Jersey, Pennsylvania, Illinois, Iowa, Georgia, Michigan, West Virginia, Tennessee, California, and North Carolina.

This document provides the full text of one report on HCBs, an article from national publication, and two other documents on the topic. The fee schedule is provided to illustrate one level of fee compared to the tip fees that are charged at that site. The information provides a general discussion of the use of the benefit and how it has instrumental in improving key aspects of the local environment.

It is important to recognize that the material provided here represents a broad range of HCBs. These arrangements were crafted to address the local situation and each is adopted based on local conditions. The information provided here is only for example.

Table of Contents

General Information

1. **Cornell Waste Management Institute**

   Winning When You Have Lost:

   Cutting Your Losses With Host Community Benefits

   http://www.cfe.cornell.edu/wmi/WastRed/HCB5.pdf

   Comprehensive report with case studies from two communities.

   Clearly defines and outlines benefit and mitigation plans.

2. **WasteAge.com**

   Toronto's Trash To Call Michigan Home

   http://www.wasteage.com/ar/waste_torontos_trash_call/

   Community would like to increase use of landfill to increase revenue for other municipal projects.

   The last two paragraphs of the article, which are in italics, discuss HCB.

Examples of Fees

3. **Lycoming County Resource Management Services**

   Landfill Disposal Facility Fee Schedule

   http://www.lcrms.com/RMSWebPa.nsf/0/bd02c4061ebdfe9485256d3b0046c4a0/$FILE/2003%20Fee%20Schedule%20Landfill%20as%20of%20Jul%201.pdf

   This fee schedule is a detailed set of tables that show community benefit fees for various material types.

4. **DailyAdvance.com**

   Roundtree: Landfill To Aid Schools

   http://www.dailyadvance.com/news/newsfd/auto/feed/news/2002/11/25/1038243575.03162.1237.3787.html

   County Commissioners look to host community benefits to fund new school.

   The information about HCB is in the middle of the article and is in italics.

CORNELL WASTE MANAGEMENT INSTITUTE

Center for the Environment | Rice Hall | Ithaca, NY 14853-3501 | (607) 255-1187

WINNING WHEN YOU HAVE LOST:
Cutting Your Losses With Host Community Benefits

Lyle S. Raymond, Jr., Kenneth H. Cobb and Clifford W. Scherer
Cornell University

Since few communities volunteer to host a new landfill, usually a government or private entity outside the impacted neighborhood decides where the new site will be and imposes its decision on an unwilling community. Perceived fears provide the basis for opposition: decline of property values and community image; groundwater contamination; loss of development potential; uncertainty about future environmental problems; distrust of technology; increased truck traffic and consequent road deterioration and littering, to name a few. Compounding the problem are a lack of trust in promises of safety, lack of faith in governmental regulations and oversight, and fear that officials are neither sensitive to nor understand neighborhood concerns.

The arguments for and against a site polarize communities. One wins if the landfill is located in another neighborhood; one loses if it is forced to accept the site. Rarely are issues of fairness and equity discussed, such as how all those who use the new landfill benefit from it and therefore should share its potential detriments. And conversely, how those who shoulder the burden to a greater extent are entitled to fair and equitable treatment and some consideration for potential impacts.

This Fact Sheet examines a method investigated or adopted by many communities in New York and elsewhere to address this controversy and provide some way for affected residents to face the reality of compromise in resolving a common problem.

Are you in the midst of siting a waste disposal facility? Is the facility being sited in your back yard? Or are you breathing a sigh of relief because the facility is going elsewhere? If you answered yes to any of these questions, you need to know more about **Host Community Benefits**.

How your community disposes of your garbage can be one of the most controversial issues debated today. Nobody wants garbage dumped in their back yard. The situation can become even more contentious when waste from other communities is also involved. These controversies have become more strident as regulations have become stricter, thus forcing many facilities to close. Public awareness and concern has heightened over perceived environmental, economic and social problems. Siting new waste disposal facilities has become costly as irate citizens block all attempts by others to discuss, inform or convince them that the facility not only will be safe, but is the best solution to an ever-growing waste problem.

Unfortunately, siting conflicts do not have a "win-win" solution for any involved parties—the local community, county or local government, or private industry. Host Community Benefits is an emerging concept to reduce the losses to all parties in the resolution of the siting controversy.

FACT SHEET/ VIEWPOINT 5 1993

Host Community Benefits

The cornerstones of Host Community Benefits (HCB's) are **compensation** and **mitigation**. The moral and logical goals of the concept are **equity** and **fairness**. The attempt is to balance the need for safe disposal of solid waste with the sacrifices borne by a solid waste disposal facility's host community. Additionally, such programs give citizens a participatory role in the process.

To understand how HCB programs work, one must determine their personal stake. Here's how:

For those in the impacted neighborhood who feel powerless and threatened, the stake is the perceived risk of siting a facility in the vicinity. "Winning" means only one thing—to stop the siting of the facility. If they cannot stop it, they have "lost." Or have they? Initiation of an HCB package after a site has been chosen is the only method of cutting losses. It ensures that you, your neighbors and your community will receive at least some compensation for the losses you feel are important.

For the county or private corporation, the primary stake is to succeed in siting the facility. If they alienate the public while accomplishing this goal, they will have "won the battle but lost the war" for the trust they need for future decision making, expansion or image building. Entering good-faith negotiations with affected citizens in the development of an HCB package can help restore some of the trust. Even if a site is "lost," perceived sensitivity and openness in working with community representatives by responding to their fears will help maintain credibility for siting decisions and relations in the future and elsewhere.

For the citizens of the rest of the community or county who escaped the site, an HCB plan is the mechanism for reimbursing—through taxes or user fees—the host neighborhood for the sacrifices it will bear.

Therefore, no matter what the situation, everyone is involved in one way or another; everybody both wins and loses. An equitable balance is sought.

Benefit programs are unrelated to specific site selection. Rather they focus on helping the community at large fairly and equitably manage its solid waste without penalizing a host community.

This discussion focuses on landfills, but the concepts can be applied to all waste management facilities.

A Balancing Act

Simply stated, the concept of Host Community Benefits aims to balance the *sacrifices* a local neighborhood and its individual citizens must bear in hosting the site of a waste management facility against the *"reverse" benefits* received by users of the facility who escape having it in their neighborhood. Various benefits can counterbalance perceived and real threats to public health; the social, economic and physical environment and individual rights.

In return for hosting a new landfill and accepting negative impacts,

Preferred Benefits

This table lists the benefits preferred and those rejected by citizens responding to public opinion surveys undertaken in Tompkins and Onondaga Counties, New York.

Tompkins County Landfill (Dryden)

Top 10 Choices

Benefit	Percent Favoring
Free Water Tests	95%
Guarantee to Replace Water	92
Enforce Speed Limits	92
Hire Own Property Appraiser	92
Monitoring Well Reports	90
Property Value Protection	89
Landscaping	88
Restricted Operating Hours	87
Local Inspector	83
Special Contingency Fund	82

Bottom 10 Choices

Community Festival	26
Neighborhood Pool	27
College Scholarships	29
Park/Playground	30
Support Community Center	41
Public Sewer Lines	45
Payments to Town	47
Landfill Job Priority	50
Public Water (by opening date)	50
No Private Construction Disposal	53

Onondaga County Landfill (Van Buren)

Top 10 Choices

Benefit	Percent Favoring
Guarantee to Replace Water	88%
Extend Public Water Lines	88
Hire Own Property Appraiser	87
Control Litter	87
Free Water Tests	83
Landscaping	82
Monitoring Well Reports	80
Restricted Operating Hours	77
Local Inspector	75
Enforce Speed Limits	75

Bottom 10 Choices

College Scholarships	19
Free Water	21
Wildlife Ponds	26
Housing Loans	31
Reduce County Taxes	34
More Landfill Entrances	38
Support Ambulance	41
Free Town Garbage	41
Payments to Town	44
Support Fire Service	48

the host community is entitled to certain benefits. Hence, the concept of benefit sharing applies to the whole community: the neighborhood near the landfill is given benefits to ameliorate the impact of the nearby landfill, while the rest of the community receives the benefits of a new landfill without having it close by.

Mitigation

Mitigation refers to reducing problems and impacts that the host community believe may be caused by the landfill. Acting as a preventative maintenance incentive, it is also a way of encouraging compliance by the operators of the landfill with agreed-upon protective measures and operating procedures. Mitigative measures involve guarantees of costly remedial actions that do not kick in unless contamination occurs due to sloppy management. To avoid this possibility, landfill operators are stimulated to manage it so as to avoid these costs kicking in.

Mitigation addresses the dangers and fears of drinking water contamination, deterioration of highways, littering, odors, noise, visual eyesores, vermin, and reduced property values. By providing free water testing and guaranteed replacement if contamination is found is one example of how drinking water contamination can be mitigated.

Compensation

Compensation means providing some kind of direct payment (usually money or services) to offset the intangible effects of the landfill, such as a blemished community image and lower quality of life.

Compensation benefits can be in the form of cash payments to the host community's government, tax breaks, extra support for fire and ambulance services, free garbage pickup, new parks, and offering landfill jobs to local residents. Often, however, such benefits are perceived as bribes to buy off the community.

Flexibility

The process of determining an HCB plan is inherently flexible. It is as individual as each host community. Since each community has its own unique demographics, geography, and economic climate, the benefits to be gained are negotiated depending on the needs and character of that community. No two HCB packages are alike. Examples of preferred benefits are shown in the table to the left.

It is crucial to remember that negotiating HCB's will not remove opposition to landfill siting. It is better if HCB's are negotiated separately from the siting controversy itself. Otherwise HCB's may become entangled in the siting process, and used as weapons during an antagonistic process, making negotiation futile. Opponents may view HCB's as unacceptable bribes, undermining their opposition to a landfill site. Still, pursuing an HCB program is useful since opponents can use HCB's as a contingency plan should their efforts to prevent siting fail.

Citizens Advisory Committee

Citizens Advisory Committees (CAC) are a *critical part* of Host Community Benefits. Through them, citizens feel recognized and respected; they understand that they are part of the process and thus are empowered to participate. Two types of CAC's are important: **generic and site-specific**. This two-track system is attuned to the needs of both the larger community and the affected neighborhood, as well as to the different stages of the siting process.

A generic CAC is useful in the early stages of siting, before a specific site is chosen. It should have broad membership providing general citizen input to all aspects of the siting process, including the site search.

The CAC develops a generic HCB plan as a starting point for negotiating a more specific HCB program with the impacted community after a site is chosen. The generic CAC becomes the vehicle for providing public information on benefits to be considered and how they might be applied. Public opinion surveys may be conducted to obtain or verify public attitudes on solid waste issues, including HCB's.

After a site has been selected, the formation of a site-specific CAC can refine the generic HCB program to reflect the concerns of the affected neighborhood, who too often feel shut out, ignored or devalued. Frustration over feelings of impotence in the decision-making process is an important component of public reaction in the impacted community. To maintain credibility, the affected neighborhood should have dominant representation on this CAC.

Both types of CAC's must be officially recognized and have membership from, or at least access to, governmental planning, public works and health department staff to benefit from their expertise. If this is not possible or desired—the CAC may feel these experts' interests conflict with those of the committee—funds can be provided to the CAC, or directly to the affected community, to hire their own technical experts and conduct their own studies of the proposed site.

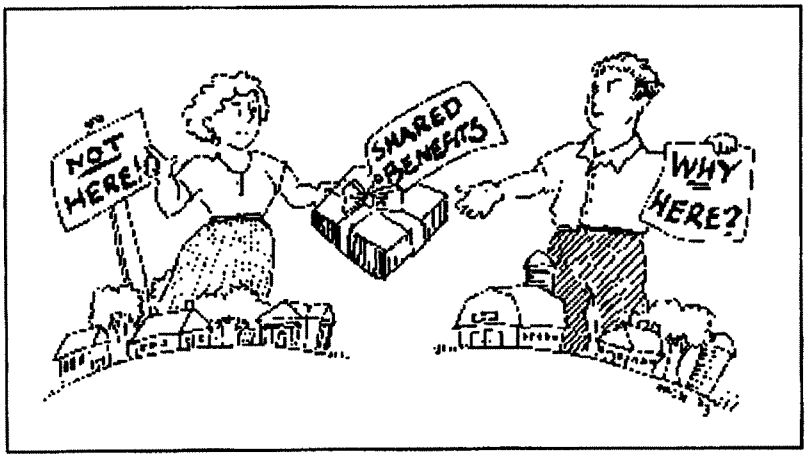
Public Opinion Surveys

Surveying residents and property owners in the vicinity of the proposed landfill provides data useful in assessing community feelings and perceptions and determining preferred benefits. Usually commissioned by the sponsoring entity

or a CAC and conducted by a neutral third party, the survey asks residents and property owners what they think of proposed benefits, what course of action they recommend, and their opinion of solid waste issues. The data generated should be freely shared to build trust and encourage open communications.

Such surveys demonstrate that the facility sponsor or local government will seriously consider local concerns. They are also an effective public education tool to inform people about HCB's since these are usually poorly understood; people are often suspicious of their purposes.

Public opinion surveys also provide another mechanism for citizen input. Public meetings are often the only source of direct public input. However, public meetings require that those who participate actively by speaking have confidence in their speaking ability and the courage to stand up in public. Also, due to time constraints, only a limited number of people can speak at any one meeting, thus limiting the public's input into decision-making. A well-designed survey gives everyone equal opportunity to provide input unhampered by the pressures of public speaking.



Judging by surveys taken in various communities around New York State, the public's views are remarkably similar. For example, surveys undertaken in Chenango, Onondaga and Tompkins counties—which have markedly different characteristics—indicated that people shared the same attitudes about host community benefits.

The conclusions of the public opinion survey concerning the proposed Van Buren Landfill in Onondaga County are indicative of statewide public opinion. "An examination of the responses to the questions leads to one conclusion," states the survey's Final Report. "Respondents to this study present an overall picture of rational concern: They are interested in preserving their environment as it now is—both natural and economic. They (like all of us) desire some control over the events which are impacting on their lives. Their belief in technology (technical safeguards to prevent water contamination, for example) is limited. But their approach to solving the problem is, for the most part, a rational one." (Some results of the survey are shown in the table on page 2.)

Negotiation

To avoid suspicion of impropriety, negotiation of HCB's should be informal and open. Again, it is crucial that negotiations represent the community's feelings.

Sensitivity to local perceptions and fears is vital to the success of negotiations. Specific benefits can be targeted in response to specific fears.

Equally important in the negotiating process is determining who will be eligible to receive benefits. The impact area can be rigidly defined by drawing lines on a map or more loosely defined depending on meeting certain criteria in order to receive benefits, regardless of location. In the latter case, different criteria can be applied to different benefits. For example, threats of water pollution are more critical downhill from the site as opposed to uphill, while loss of property values may depend on access roads or wind patterns.

Administration

After negotiations have produced an HCB agreement some entity must be designated to administer it. This could be the sponsoring entity, the local community, a separate body specifically formed for the purpose, or some combination of these. Whatever the composition of the administering body, to be successful, it must have **credibility** within the affected community. Following a protracted or contentious dispute or litigation, the impartiality and credibility of the administering agency becomes all the more important.

Benefits of HCB Programs

A Host Community Benefits program can accomplish several goals

Case History

The experience of **Tompkins County**, NY illustrates the HCB concept. This Central New York county (located midway between Syracuse and Binghamton) began consideration of a new county-operated landfill in 1985. A site was selected by the county in 1987 and implementation of benefits in the affected community began in 1989.

Initially the HCB concept was introduced to county officials, who were receptive to the concept and supported further discussion. HCB's were introduced to the public at several meetings on solid waste disposal issues.

Following a year and a half of quiet discussion and networking about the concept, one town supervisor (whose town included potential sites preliminarily identified by the county) proposed a detailed HCB program to the county solid waste committee. Subsequently, other towns proposed HCB plans.

The county Board of Representatives passed a resolution committing the county to negotiate a benefits program with the selected community. The resolution contained provisions for off-site well monitoring, creation of a citizens advisory committee, guaranteed potable water, property-owner compensation against adverse impacts, property value protection, financial compensation for the host town, and recycling and waste reduction programs. This resolution was passed six months before a site was selected.

Once a site was selected a Citizens Advisory Committee was created by the county from a list of people identified by community residents, citizen leaders and local officials. The committee was composed of 11 voting members: 2 selected by the affected town, 1 selected by a neighboring village, 5 selected by the county to represent landfill neighbors, 1 representative of the county board, and 2 selected by the county as at-large members. In addition, the county appointed the planning commissioner, public works commissioner, solid waste manager, assessment director, and environmental health director as nonvoting members.

A compensation task group was created to draft a more detailed HCB program. One of their first recommendations was to undertake an opinion survey of the affected neighborhood. The survey, paid for by the county and conducted by Cornell University, polled all property owners on the assessment rolls and all renters who could be identified within two miles of the proposed site—67% of property owners and 23% of rental households responded. In addition to gathering data on the affected community, the survey informed residents about the benefits program and guided the county in developing an acceptable plan.

The benefits preferred by respondents to the Tompkins County survey are listed in the table on page two.

Cornell Cooperative Extension of Tompkins County developed a countywide educational program on solid waste issues, including HCB's. County residents gave the presentations, not county officials (though a county official was on hand to answer questions), to several towns at well-attended public meetings.

A Neighborhood Protection Committee was created to implement the HCB program. The committee reviewed all requests for benefits and recommended appropriate action. The landfill was delayed due to wetland issues and continued reevaluation of priorities, and has now been abandoned on the basis of cost changes. Property value protection had been only benefit in effect.

Other New York counties have taken action on HCB programs, including Broome, Chenango, Dutchess, Monroe and Onondaga. Interest in the concept is being expressed by officials in a growing number of other New York counties. The New York State Department of Environmental Conservation, in a technical assistance guidance document for siting waste facilities, emphasizes that an HCB program should be strongly considered.

but does have *limitations*. It provides a more equitable and fair response to affected residents. It opens communication channels between residents and decision makers and involves those who are impacted in the process.

Limitations of an HCB program must be kept in mind. It will not stop opposition to a particular site nor will it stop lawsuits, although this may become part of the negotiations. Since it is best considered as a separate issue, it has little effect on the selection of a specific site.

Perhaps the greatest benefits of HCB programs are that they promote sensitive consideration of residents' fears and foster better, more equal relationships between residents and decision makers. In his book *The Community Development Process*, William Biddle found that

shared decisions are usually more actively supported by the community at large as well as being less prone to criticism or counter action by opposing groups.

The cost of HCB programs are low relative to the total cost of developing a landfill, particularly where mitigation (triggered by specific negative events) is favored over compensation (where funds are spent regardless of specific events).

A Host Community Benefits program directly addresses the fairness of competing interests between those who benefit from the new landfill and those who must live as its neighbors.

Lyle S. Raymond, Jr. is Extension Associate and Water Resources Specialist with the Local Government Program and the New York State Water Resources Institute in the Center for the Environment at Cornell University; Kenneth H. Cobb is Senior Extension Associate with the Waste Management Institute in the Center for the Environment at Cornell University; and Clifford W. Scherer is an Associate Professor in the Department of Communication at Cornell University.

This Fact Sheet was produced by Kenneth T. Marash and Susan A. Marash with Ghostwriters, inc. of Ithaca, NY.

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The Cornell Waste Management Institute
Cornell University
Rice Hall
Ithaca, NY 14853-5601

WasteAge.com

Toronto's Trash to Call Michigan Home

Brook Raflo

Waste Age, Dec 1, 2000

With the closure of its Keele Valley landfill looming on the horizon, the city of Toronto has spent more than a decade searching for a home for the 1.5 million annual tonnes of garbage it produces. Finally, the search is over. In the wake of a failed deal with Rail Cycle North, the city awarded municipal and private sector disposal contracts on October 30 to Republic Services, Ft. Lauderdale, Fla.

Until October 13, Rail Cycle North, a North Bay, Ontario-based consortium of waste management and transport companies, was set to dispose of Toronto's municipal waste after Keele Valley closes. But when Rail Cycle introduced a clause passing unforeseeable costs to the city, "our council found that would be too much liability for the city to take on," says Lawson Oates, manager of strategic planning for Toronto's solid waste management services.

Like New York City, Toronto has looked outside its borders for disposal capacity, and Oates says he and his team have watched New York's predicament closely. To avoid a similar predicament, Toronto has devised a three-part plan, which includes signing new disposal contracts, extending an existing disposal contract and implementing an ambitious diversion program, Oates says.

During each of the first two years of Republic's five-year contract with the city, Toronto-based Wilson Logistics will transport at least 300,000 tonnes of Toronto's garbage from city-owned transfer stations to Republic's Carleton Farms landfill in Wayne County, Mich. This will allow Toronto's Keele Valley landfill, which currently takes in nearly 1.35 million annual tonnes of the city's waste, to remain open until the end of 2002.

"By initiating the Republic contract in 2001, we will get continued waste settlement and decomposition of organics [at Keele Valley], which will allow us to create some additional capacity ... saving the city money," Oates says. Tipping fees at city-owned Keele Valley, he explains, are significantly lower than those at Carleton Farms.

Toronto also will seek to extend its five-year contract with Miami-based Onyx North America, the company that currently disposes of 450,000 tonnes of Toronto's waste per year at its Arbor Hills landfill in Northville, Mich. Because of a cap on Arbor Hills'

foreign waste intake, however, the landfill cannot accept more than 500,000 tonnes of Toronto's waste annually, Oates says.

Perhaps the most surprising aspect of Toronto's solid waste plan is its goal to divert 80 percent of the city's refuse from the waste stream by 2006.

The city's ambitious diversion plan includes an expanded curbside recycling program, construction of an anaerobic digestion facility designed to generate heat for the city's downtown core, a composting facility to provide landfill cover and soil remediation products, community outreach, funding for the research and implementation of emerging technologies, and new laws requiring apartment complexes to recycle. "There's a potential for 100 percent diversion by 2010," Oates says.

By 2003, Toronto's waste program will look very different than it does today, Oates continues. The city will divert an additional 5 percent of its refuse from the waste stream by the end of that year, bringing the total diversion rate to 30 percent or more, he says. Additionally, Keele Valley will be closed, and at least 100,000 tonnes per year of the city's waste will go to Carleton Farms landfill.

Republic's Area President Matt Neely says he expects Carleton Farms to receive much more than 100,000 tonnes.

"The projections Toronto has given us are about 500,000 tonnes of waste per year [after 2003]," Neely says.

Carleton Farms is a seven-year-old, 60-million-cubic-yard landfill, with 60 years of life remaining, Neely says. And, the landfill's host Wayne County is considering Republic's proposal to add an additional 40 million cubic yards to Carleton Farms' capacity, he notes.

Unlike Onyx's Arbor Hills landfill, Carleton Farms is not subject to a cap on foreign waste. In fact, Wayne county residents support the plan to import large quantities of Toronto's waste, according to Neely.

This is because when Republic acquired Carleton Farms from Houston-based Waste Management Inc. in February 1999, as part of a required divestiture, Waste Management diverted most of Carleton Farms' trash to a nearby Waste Management-owned landfill, Neely says. Consequently, Wayne county's Sumpter township, which had been receiving a host benefit for trash entering Carleton Farms, lost a significant amount of revenue, he explains.

"They had to lay off policemen and stop providing municipal services," he says. "So the township has been very supportive [of the Toronto deal]."

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LYCOMING COUNTY RESOURCE MANAGEMENT SERVICES

LANDFILL DISPOSAL FACILITY FEE SCHEDULE

2003 FEES Effective July 1, 2003
Hours: Monday - Friday 7:00 am - 4:30 pm; Saturday 7:30 am - 12:00 noon
Location: 447 Alexander Drive, Montgomery, PA 17752
Mailing Address: P.O. Box 187, Montgomery, PA 17752-0187
PHONE: (800) 326-9571 or (570) 547-1870 **FAX:** (570) 547-6534

A MINIMUM fee of $15.00 is charged on EACH transaction*
(* Certified Waste Haulers are exempt from the minimum fee)
EACH LOAD MUST BE TARPED
NO PERSONAL CHECKS ACCEPTED

1. Municipal Solid Waste

CUSTOMER TYPE	DISPOSAL FEE	PA STATE RECYCLING FEE	HOST MUNICIPAL BENEFIT FEE	ENVIRON. STWD FUND	COUNTY ADMIN. FEE
Individual Residents[1]	$48.60/Ton	$2/Ton	$1/Ton	$4.25/Ton	See Listing Below[2]
Commercial Business Accts[1]	$36.15/Ton	$2/Ton	$1/Ton	$4.25/Ton	See Listing Below[2]
Industrial Generator Accts[1]	$36.15/Ton	$2/Ton	$1/Ton	$4.25/Ton	See Listing Below[2]
Certified Waste Haulers[1]	$33.00/Ton	$2/Ton	$1/Ton	$4.25/Ton	See Listing Below[2]

[1]Rates listed are for MSW generated in the Counties naming Lycoming County Landfill in their solid waste plans including: Columbia, Lycoming, Montour, Northumberland, Snyder and Union Counties.

[2]County Administrative Fee: Add the following fee according to the county of origin as listed below:

Columbia County	$3/Ton
Montour County	$3/Ton
Northumberland County	$3/Ton
Snyder County	$2/Ton
Union County	$2/Ton

2. MSW Miscellaneous Fees, Individual Residents:

Automobiles:	$15.00	(cars, station wagons) If Gross wt. is >4200 lbs, reweigh required.
Pickup Trucks:	$15.00	(1/2 Ton Pickups, Vans) If Gross wt. is >5500 lbs, reweigh required.
Full-Sized Pickups:	$15.00	(3/4 Ton Pickups and greater) If Gross wt. is >6600 lbs, reweigh required.
Trailer attached to any of the above:	$15.00	Price according to weight w/$15 min., each load reweighed.

3. **Miscellaneous Service Fees:** (See Definitions)

White Goods without Refrigerant:	No Charge with certification of evacuation by authorized vendor
White Goods containing Refrigerant:	$15.00 per appliance
Digout Fee:	$15.00 per vehicle
Cleanup Costs:	Equipment rental cost and operator time plus any additional fees associated with cleanup.

4. **Industrial Residuals:** (See Definitions)

Rates will be established on an individual basis. A letter of notification will be sent to individual customers.

5. **Asbestos:** (See Definitions)

	Disposal Fee	State Recycling Fee	Host Benefit Fee	Environ. Stwd Fund
Friable and Non-Friable Asbestos	$46.55/Ton	$2/Ton	$1/Ton	$4.25/Ton

6. **Tires:****

	Disposal Fee	State Recycling Fee	Host Benefit Fee	Environ. Stwd Fund
Tires (Whole Loads)	$93.75/Ton	N/A	$1/Ton	$.25/Ton
Car/Sm Truck Tires (P & LT Series)	$3.00 each	N/A	N/A	N/A
Over-the-Road Truck Tires (R Series: 17" – 22")	$5.00 each	N/A	N/A	N/A
Tractor & Heavy Equipment Tires (over 22")	$148.75/Ton	N/A	$1/Ton	$.25/Ton

**Tires must be brought to the Landfill separately from other wastes. However, if tires are found mixed in other wastes at the time of disposal, an additional fee in addition to the original charge without reduction in weight for tires, will be added according to the tire size and number of tires found. The Standard Fee listed above is for whole, pneumatic, round, clean, and dry tires, which have the integrity to roll. This includes car, truck, ATV, golf cart, racing slicks, wheelbarrow, motorcycle, bicycle and mini bike tires. Tractor and Heavy Equipment tires include tires from farming equipment, heavy equipment such as graders, backhoes, etc., and airplane tires. Tire pieces, scrap sidewalls, tubes and wheels are to be landfilled at MSW posted rates, and will not be accepted for recycling purposes.

7. **Clean Wood Wastes:** (See Definition)

	Disposal Fee	State Recycling Fee	Host Benefit Fee	Environ. Stwd Fund
Participating Counties Rate	$19.30/Ton	N/A	$1/Ton	$.25/Ton

Sorting Costs: If unacceptable wood or other waste products are found in loads received at the clean wood site, a $10/hour sorting cost will be charged for the sorting of those items that are not acceptable. The unacceptable items will be weighed and charged at appropriate rates to the customer.

8. **Construction/Demolition Wastes:** (See Definition)

CUSTOMER TYPE	DISPOSAL FEE	PA STATE RECYCLING FEE	HOST MUNICIPAL BENEFIT FEE	ENVIRON. STWD FUND	COUNTY ADMIN. FEE
Individual Residents[1]	$25.00/Ton[2]	$2/Ton	$1/Ton	$4.25/Ton	See Listing Below[3]
Commercial Business Accts[1]	$25.00/Ton[2]	$2/Ton	$1/Ton	$4.25/Ton	See Listing Below[3]
Industrial Generator Accts[1]	$25.00/Ton[2]	$2/Ton	$1/Ton	$4.25/Ton	See Listing Below[3]
Certified Waste Haulers[1]	$25.00/Ton[2]	$2/Ton	$1/Ton	$4.25/Ton	See Listing Below[3]

[1]Rates listed are for MSW generated in the Counties naming Lycoming County Landfill in their solid waste plans including: Columbia, Lycoming, Montour, Northumberland, Snyder and Union Counties.

[2]When C/D loads contain waste other than C/D, causing RMS to transfer the load from the C/D site to the MSW site, clean-up costs will be added to the transaction cost. The ticket will be corrected to reflect MSW waste at MSW posted rates, and a clean-up fee of $32/Ton will also be charged. (The total cost for such transactions is $71.95/ton for Certified Waste Hauler accounts based on current MSW posted rates, or $75.05/ton for Commercial Business Accounts based on current MSW posted rates, and $87.40/ton for Individual Accounts based on current MSW posted rates.)

[3]County Administrative Fee: Add the following fee according to the county of origin as listed below:

Columbia County	$3/Ton
Montour County	$3/Ton
Northumberland County	$3/Ton
Snyder County	$2/Ton
Union County	$2/Ton

DEFINITIONS:

Certified Waste Hauler - A business enterprise trading in the solid waste industry, utilizing commercial grade solid waste industry equipment in the performance of their service, are subject to the PaDEP's rules and regulations, and conform to PA Code, Title 25, Chapter 285 – Storage, Collection, and Transportation Regulations, for collection and transportation of solid waste. Certified Waste Haulers are also required to carry automobile liability insurance with a combined single limit of $1,000,000.

Commercial Business Accounts - Commercial enterprises, or non-profit enterprises including municipalities, schools, hospitals, and government agencies, that do not trade for profit in the solid waste industry, do not generate or dispose of industrial residual wastes, and are not subject to the rules and regulations of the PaDEP for collecting and transporting solid waste. Commercial Business Accounts are required to carry automobile liability insurance with a combined single limit of $1,000,000.

Industrial Generator Accounts – A person generating and disposing approved waste through LCRMS's Form R, Waste Acceptance Plan. Industrial Generator Accounts delivering approved waste in their own vehicles are required to carry automobile liability insurance with a combined single limit of $1,000,000.

Individual Residents - Private individuals utilizing LCRMS facilities on an occasional basis.

White Goods – Appliances and other salvageable materials including, washing machines, dryers, refrigerators, freezers, air conditioners, dehumidifiers, dishwashers, hot water heaters, stoves, sheet iron, tin, and steel auto parts.

Digout – Frozen loads in containers that are removed with LCRMS equipment and operators.

Cleanup Costs – Fees charged to customers for removal of waste dumped in improper disposal area, and for reloading and/or cleanup of wastes rejected for disposal. Fees may include personnel costs, testing fees, and any special handling fees associated with the load in question.

Asbestos – Wastes contaminated with, or containing asbestos, as defined by PaDEP.

Industrial Residual Waste – Those wastes meeting the permit conditions as approved in LCRMS's Form R application, and have been pre-approved for disposal at LCRMS. Wastes are subject to PA DEP regulations.

Clean Wood Waste – Acceptable clean wood includes, unpainted wood, (stained wood and wood with glue is acceptable), brush, limbs not exceeding 10" in diameter, pallets, skids, compressed wood fiber pallets, utility spools with hardware removed, plywood and waferboard. Clean wood may not contain non-wood items, any treated wood, plasterboard, creosote products, demolition waste, masonite, or painted wood.

Construction Demolition Waste - Solid waste resulting from the construction or demolition of buildings and other structures including, wood, plaster, roofing shingles, metals, asphalt substances, bricks, blocks, concrete, cardboard, styrofoam, insulation, plastic, empty buckets: (tar, paint, plaster), fire debris from structures only (excluding contents).

Holidays: The Lycoming County Resource Management Services facilities will be closed on the following listed Holidays:

New Year's Day, Wednesday, (January 1, 2003)
Memorial Day, Monday, (May 26, 2003)
Independence Day, Friday, (July 4, 2003)
Labor Day, Monday, (September 1, 2003)
Thanksgiving Day, Thursday, (November 27, 2003)

Christmas Day, Thursday, (December 25, 2003)

Operating Hours: Operating hours at the Landfill are: 7:00 am - 4:30 pm Monday through Friday, and 7:30 am - 12:00 noon on Saturday. Any waste delivered outside regular posted hours will be charged an additional $1/Ton for approved, pre-arranged dumping Monday through Saturday, and $2/Ton for approved, pre-arranged dumping on Sunday and listed Holidays. All out-of-hour, Sunday and Holiday deliveries must be pre-approved by Lycoming County Resource Management Services.

ALL RATES ARE SUBJECT TO CHANGE WITH 30 DAYS POSTED NOTICE OR AS REQUIRED BY LAW.

DailyAdvance.com

Rountree: Landfill to aid schools

By JULIAN EURE

Camden commissioners are pursuing a $60 million deal with Waste Industries to bring a landfill to Camden because it's the only way to avoid a massive property tax hike needed to pay for new schools, the commission's chairman said Friday.

"With all these houses coming in (to Camden), we've got to have some money to build schools with," Commissioner J.C. Rountree said. Without a landfill or some other revenue source, "we're looking to have to raise taxes by 30 cents on the hundred."

Rountree, who represents South Mills Township, says officials have tried to slow down growth by implementing zoning and other measures. The trouble is, many of the areas being considered for development were already platted for residential use when the zoning rules were written. Consequently, landowners have use rights that can't be superseded by county ordinances.

The result has been a growing conversion of farmland into residential subdivisions. Rountree, a farmer, says he's lost three farms himself over the past three years because landowners couldn't pass up the price developers were offering for their land.

While the residential boom has helped the county's tax base, it's also increased pressure on the county's three-school school district, as many of the new Camden residents are bringing with them school-age children.

"Schools are what cost us the most money," Rountree said. "We're going to have to build another school in the next three years ... to take some pressure off Grandy" Primary School. Most likely the school will be for kindergartners and first- and second-graders, Rountree said.

The Board of Commissioners raised the property tax rate several years ago by 10 cents — to 75 cents per $100 of valuation — specifically to pay for improvements at the county's three schools. To build a new school in three years, however, would force commissioners to raise the tax rate another 30 cents, Rountree says.

Knowing "the landowners couldn't stand that much of a tax increase," commissioners have been casting about for other potential revenue sources. The one they finally came up with was playing host to a privately owned landfill, Rountree said.

"That's why we're interested in this (landfill project)," he said. "It's a way to solve" our revenue problems.

Hosting a landfill would be lucrative for Camden, says Ven Poole, vice president of corporate development for Waste Industries, the Raleigh-based company that's proposing to build the 600-acre landfill in the northern part of the county.

Not only would the county be able to dump its residential and commercial garbage in the landfill for free — saving the county about a quarter of a million dollars annually — it also would be able to tax the equipment used at the landfill, bringing the county another quarter of million dollars of income a year.

The real prize, however, would be the host fees the county would receive once the daily volume of trash received at the landfill reached certain levels.

According to the franchise agreement Camden commissioners have signed with Waste Industries to build and operate the landfill, the county would earn 5 percent of each dollar Waste Industries charges once daily tonnage exceeded 500, and 7 percent of each dollar once daily tonnage exceeded 1,500.

Although it would take a new landfill some time to build up garbage volume to those levels, the deal has the potential to earn Camden between $2 million and $3 million annually, officials say. That could make the deal, which is for 30 years, worth anywhere from $60 million to $90 million.

The deal is contingent on the state of North Carolina approving the landfill. Waste Industries is just beginning the initial steps to obtain the many permits it will need before it can build and operate the landfill. If the state OKs Waste Industries' plans, a landfill in Camden is still two to three years away.

Forrest Pugh, a commissioner who represents Shiloh precinct, agrees with Rountree that the landfill would be a less painful way to raise revenue. He disagrees with Rountree, however, that a massive tax increase was imminent for school construction.

While a 30-cent tax increase "is something we talked about, it's not an absolute must," Pugh said.

Pugh, who didn't seek re-election and will be leaving the Board of Commissioners in December, believes the school district should benefit from any revenues the county receives for hosting a landfill. He also says addressing the school growth issue is "definitely a big reason" why commissioners are pursuing a landfill and the host fees it would bring.

At the same time, however, he says commissioners don't want to commit to expensive projects that will require them to spend the principal it receives in host fees. Any money spent, he said, would likely be from the interest that accrues from investment of the principal.

Besides the schools, Pugh would like to see some of the landfill money go toward improving infrastructure — roads, sewer service, utilities — in the county, particularly in northern Camden.

When the state of Virginia eventually widens U.S. Highway 17 to four lanes, officials are expecting commerce and business development in Hampton Roads to gravitate southward a lot more quickly. When it comes, Camden wants to compete for the jobs the companies will bring. But to do it, the county will first have to have the infrastructure business depends on.

The landfill money will help Camden get ready, Pugh says.

"Hopefully we'll be able to have the infrastructure in place" to meet their needs, he said.

Regardless of how the landfill money is used, commissioners pursued the landfill because they wanted to improve the lives of Camden residents, Pugh says.

"We don't have an Albemarle Hospital like Pasquotank County does," he said. "We did this because we saw it as an opportunity to help the county."

http://www.dailyadvance.com/news/newsfd/auto/feed/news/2002/11/25/1038243575.03162.1237.3787.html