Copy 7/5

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
TELEPHONE: (808) 768-3486 • FAX: (808) 768-3487 • WEBSITE: http://envhonolulu.org

KIRK CALDWELL
MAYOR

LORI M.K. KAHIKINA, P.E.
DIRECTOR

TIMOTHY A. HOUGHTON
DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO:
RD 18-062

June 25, 2018

Mr. Arnold Wong, Chair
Land Use Commission
Department of Business, Economic Development & Tourism
State of Hawaii
235 South Beretania Street, Room 406
Honolulu, Hawaii 96813

Ms. Ka'iulani Sodaro, Chair
Planning Commission
c/o Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. Wong and Ms. Sodaro:

SUBJECT: Docket No. SP09-403
New Special Use Permit
Waimanalo Gulch Sanitary Landfill

In accordance with the State Land Use Commission Order Adopting the City and County of Honolulu Planning Commission's Findings of Fact, Conclusions of Law, and Decision and Order with Modifications, the attached Eighth Annual Report is submitted for your information. This report covers the period from June 2017 through May 2018, unless otherwise stated in the report.

The report is being concurrently submitted to the Planning Commission and Land Use Commission.

Sincerely,

Lori M.K. Kahikina, P.E.
Director

Attachments

EIGHTH ANNUAL REPORT

STATUS OF ACTIONS TAKEN TO COMPLY WITH THE STATE LAND USE COMMISSION'S ORDER DATED OCTOBER 2, 2009
AND
STATUS OF OPERATIONS
WAIMANALO GULCH SANITARY LANDFILL

Prepared For:

Land Use Commission
State of Hawaii

Planning Commission
City and County of Honolulu

Prepared By:

Department of Environmental Services
City and County of Honolulu

June 12, 2018

TABLE OF CONTENTS

PREFACE 1

STATUS OF IDENTIFYING AND DEVELOPING NEW LANDFILL SITES ON OAHU 2

1. General 2
2. Current Status 2

STATUS OF LANDFILL OPERATIONS 3

1. Tonnage 3
2. Current Status of WGSL 3
3. Landfill Expansion Permits 3
   a. Solid Waste Permit 3
   b. Special Use Permit 3

COMPLIANCE WITH CONDITIONS OF ORDER 8

ALTERNATIVE TECHNOLOGIES 12

1. H-POWER 12
   a. Sludge 12
   b. Medical Waste 12
   c. Tires 12
   d. Process Residue 13
   e. Auto Shredder Residue (ASR) 13
   f. Other 13
2. Sludge Re-Use 13
3. Other Request for Proposals (RFPs) for Alternative Waste Disposal Technologies 14
4. Materials Recycling 14
   a. Curbside Recycling 19
   b. Multi-Material Recycling Centers 19
   c. Condominium Recycling 20
   d. Electronic Waste (e-waste) 20
   e. Business Recycling Programs 20

f. Plastic Bag Ban 20
g. Public Education 21

5. Interim Off-island Shipping of Waste 21

CONCLUSION 22

PREFACE

This report was prepared in accordance with the State of Hawaii Land Use Commission's ("LUC") Order Adopting the City and County of Honolulu Planning Commission's Findings of Fact, Conclusions of Law, and Decision and Order with Modifications, dated October 2, 2009 ("LUC Order"). Under Condition No. 6 of the LUC Order, the Applicant (Department of Environmental Services, City and County of Honolulu, hereinafter "ENV") is required to submit annual reports to the Planning Commission of the City and County of Honolulu ("Planning Commission") and the LUC regarding the following: (1) the status of identifying and developing new landfill sites on Oahu to supplement or replace the Waimanalo Gulch Sanitary Landfill ("WGSL"); (2) the WGSL operations; and (3) ENV's compliance with the conditions imposed by the LUC Order. This report shall also address ENV's efforts to use alternative technologies as appropriate, and to seek beneficial re-use of stabilized, dewatered sewage sludge.

This is the eighth report and covers the period from June 2017 through May 2018, or as otherwise stated.

STATUS OF IDENTIFYING AND DEVELOPING NEW LANDFILL SITES ON OAHU

1. General

Condition No. 4 of the LUC Order requires that, on or before November 1, 2010, ENV shall begin to identify and develop one or more new landfill sites that shall either replace or supplement the WGSL.

2. Current Status

The first meeting of the Landfill Advisory Committee (LAC) was held on January 20, 2011, and subsequent meetings were held on February 10, March 10, March 31, May 12, July 19, November 8, 2011 and February 1, March 16, and April 20, 2012. The LAC final report was completed on September 25, 2012. All committee meetings were open to the public and to public comment. Handouts provided to the LAC, the Group Memory of each meeting, and the final report are posted online at www.opala.org.

In the final report, 11 potential sites were identified and ranked based on community criteria. The City retained a consultant to further review and analyze the sites based on the following technical and engineering considerations: capacity, cost, feasibility, land ownership (including cost and ability to acquire, capacity and infrastructure requirements, logistics and transportation, development costs, and capacity projections for current landfills, WGSL and PVT), and a timetable for WGSL, new landfill development and construction. Based on the remaining capacities of the existing landfills and the projected fill rates, the City determined is was prudent to analyze whether any of the 11 identified sites could become more or less favorable based on this timetable.

The consultant's original contract called for an Environmental Impact Statement (EIS) to be undertaken as a part of their scope of work. Because the Landfill Advisory Committee identified 11 potential sites, it was not feasible to do an EIS at this stage. Therefore, the consultant's contract was amended to include the further analysis of the 11 sites as indicated above. The consultant evaluated the relevant criteria as described above. The report, "Assessment of Municipal Solid Waste Handling Requirements for the Island of Oahu", was completed in November 2017 and is available on-line at Opala.org.

STATUS OF LANDFILL OPERATIONS

1. Tonnage

Over the period beginning June 1, 2017, through May 31, 2018, the Waimanalo Gulch Landfill received the following amounts of material:

H-POWER Ash.....	134,430	tons
H-POWER Residue.....	21,559	tons
Municipal Solid Waste (MSW).....	115,702	tons

2. Current Status of WGSL

Activities conducted during the reporting period include MSW landfilling in Cells E-4, E-5, E-6 and E-7 and ash landfilling in Cell E-9.

3. Landfill Expansion Permits

a. Solid Waste Permit

The final solid waste permit for the proposed lateral expansion was approved by the State of Hawaii, Department of Health (DOH) on June 4, 2010. A permit renewal application was submitted on a timely basis to DOH in May 2014. In accordance with Hawaii Revised Statutes § 343H-4(e) and Hawaii Administrative Rules §11-58.1-04(3), the landfill is legally continuing operations under the conditions of the previous permit and the current operations plan submitted to DOH. The permit renewal is expected to be issued later in 2018. New cell construction and drainage improvements are complete.

b. Special Use Permit (SUP)

The current SUP provided that WGSL stop accepting MSW for disposal as of July 31, 2012. Condition No. 14 of the SUP stated, "Municipal solid waste shall be allowed at the Waimanalo Gulch Sanitary Landfill up to July 31, 2012, provided that only ash and residue from H-POWER shall be allowed at the WGSL after July 31, 2012." At the time Condition No. 14 was imposed, certain wastes such as sewage sludge, animal carcasses, and treated medical sharps could not be disposed of at H-POWER. Moreover, because H-POWER's operating permit requires a permitted landfill as a back-up disposal option, it was conceivable that H-POWER would have to shut down if WGSL was required to stop accepting MSW.

On June 28, 2011, ENV filed a SUP Amendment Application with the City Department of Planning and Permitting, to delete Condition No. 14 of the SUP.

This amendment will allow WGSL to continue accepting MSW until the landfill reaches its capacity as permitted by DOH.

The City and County of Honolulu Planning Commission (Planning Commission) convened a public hearing on October 5, 2011, to consider ENV's application to delete Condition No. 14 of the SUP. The Planning Commission heard public testimonies and granted petitions to intervene in the SUP proceeding to KOCA and Maile Shimabukuro (collectively referred to as "KOCA"), and Schnitzer Steel Hawaii Corp. With the granting of the petitions to intervene, the matter proceeded as a contested case. A pre-hearing conference to discuss procedural and others matters in the contested case was held on October 12, 2011. A contested case hearing began on December 7, 2011, with opening statements given by ENV and intervenors. The contested case hearing continued on January 11, 25, February 8, March 7, 14, April 4, 11, 23 and May 25, 2012. On May 25, 2012, the Planning Commission stayed the matter for six (6) months in light of the Hawaii Supreme Court's (Supreme Court's) decision to strike Condition No. 14 of the SUP described below.

The City filed an appeal to the Supreme Court on February 22, 2012 to delete Condition No. 14. On May 4, 2012, the Supreme Court ruled in favor of the City and struck down Condition No. 14. The Supreme Court further ordered that the matter be remanded to the Circuit Court and the LUC for action on the SUP consistent with the Supreme Court decision. The LUC convened on July 5, 2012, to discuss procedural options only, in light of the Supreme Court remand and stayed Planning Commission proceeding.

Upon request by ENV, the LUC directed the parties to file written briefs regarding the proper procedural steps. ENV argued that the case decided by the Supreme Court remain with the LUC for decision-making. The intervenors argued to remand the Supreme Court case back to the Planning Commission with a request to consolidate the amendment application and the Supreme Court cases. On September 14, 2012, the LUC remanded the Supreme Court case to the Planning Commission with a recommendation to consolidate the two cases.

On December 19, 2012, the Planning Commission continued its consideration of the LUC request to consolidate the two cases to allow the incoming City administration to weigh in on the matter and the possibility of a joint recommendation from the parties. On February 20, 2013, the Planning Commission again continued its consideration of the LUC request to consolidate based upon the parties' representation that they intended to file a joint recommendation to the Planning Commission regarding both the consolidation and the subject matter of the remand. On May 16, 2014, the LUC requested a status report on the remanded matter. The City represented that the parties are continuing to negotiate a joint recommendation. The LUC directed the City to provide an update to the LUC and the parties of these negotiations every two months, beginning in July 2014.

At a public hearing before the LUC on October 22, 2015, ENV reported on the status of the proceedings before the Planning Commission. ENV stated that it made progress in negotiating with KOCA and that the parties needed additional time to establish objectives for further landfill waste diversion. Accordingly, ENV and KOCA represented that they would file a stipulation with the Planning Commission to commit to an 18-month schedule to implement additional alternative uses or disposal methods to increase waste diversion. The LUC requested that the parties include Colleen Hanabusa, who was an intervenor in the matter remanded by the Hawaii Supreme Court, in the negotiations.

All parties except Colleen Hanabusa agreed to continue the proceedings before the Planning Commission to April 22, 2017. Because there was no agreement among all parties, ENV moved to stay the proceedings. The Planning Commission denied the stay, ordered the consolidation of the matter remanded by the Hawaii Supreme Court and the SUP amendment application, and continued the contested case hearing to March 1, 2017.

On March 1, 2017, the Planning Commission adopted the City's proposed findings of fact, except facts that pre-dated the 2011 permit modification application, and conclusions of law. The Planning Commission also adopted the LUC's order adopting the Planning Commission's Findings of Fact, Conclusions of Law, and Decision and Order with Modifications dated October 22, 2009, deleted Condition No. 14, and added three conditions.

In accordance with HRS Section 205-6(e), the application was transmitted to the LUC. KOCA moved to deny and remand ENV's applications and in the alternative, moved to deny ENV's applications unless additional conditions are imposed. The City did not object to remanding the applications but objected to KOCA's contentions regarding the Planning Commission chair and KOCA's alleged erroneous findings of fact. The City also objected to KOCA's alternative motion.

On May 24, 2017, the LUC considered KOCA's motions and the Planning Commission's findings of fact, conclusions of law, and decision and order relating to proceedings on remand relating to ENV's applications. The LUC granted in part and denied in part KOCA's motion to deny and remand. The record on the applications were remanded to the Planning Commission for further proceedings to (1) clarify whether the Planning Commission followed Section 2-75 of the Rules of the Planning Commission in issuing its Findings of Fact, Conclusions of Law, and Decision and Order; (2) clarify the basis of the Planning Commission's proposed additional Condition No. 3, which specifies a December 31, 2022, date within which the Applicant is to identify an alternative site that will be used upon the WGSL reaching its capacity and the implications it has on the closure date of the WGSL to use and subsequent commencement of operations at the alternative landfill site; (3) clarify whether the record needs to

include updated information on the operation of the WGSL, the landfill site selection process, and the waste diversion efforts of the City and County of Honolulu; (4) assuming the Planning Commission eventually recommends approval of the matter, clarify the effective date of the Planning Commission's Findings of Fact, Conclusions of Law, and Decision and Order; and (5) clarify whether the Planning Commission is ruling on both the 2008 Application and the 2011 Application in its Findings of Fact, Conclusions of Law, and Decision and Order.

On June 20, 2017, KOCA moved to recuse or disqualify Honolulu Planning Commission Chair Dean Hazama. Subsequently, Hanabusa filed a renewal of objections to Mr. Hazama's participation and votes in the instant case and joinder to KOCA's motion. ENV filed its response to KOCA's motion on June 26, 2017, and took no position on the relief requested by KOCA.

At a hearing on August 16, 2017, Mr. Hazama declined to recuse himself and no other member of the Planning Commission moved to have him recused. Further, the Planning Commission stated its intent to issue a proposed decision in compliance with Planning Commission Rule 2-75.

The Planning Commission was scheduled to adopt proposed findings of fact, conclusions of law, and decision and order on October 25, 2017. Two days before the meeting, the Planning Commission cancelled the agenda item because it lacked quorum.

On November 22, 2017, KOCA moved to reopen the contested case hearing for the purpose of admitting additional evidence. ENV opposed the motion because the evidentiary record is complete, the evidence KOCA sought to admit is not relevant to the contested case hearing, and the unwarranted reopening of the contested case hearing would unduly delay the proceedings, which is contrary to the LUC's direction and would prejudice Applicant.

On November 29, 2017, ENV received the agenda for the Planning Commission's December 6, 2017 meeting, which included the adoption of proposed findings of fact, conclusions of law, and decision and order. KOCA objected to the agenda. ENV responded by contending that the agenda provided sufficient notice that the Planning Commission will act to adopt proposed findings of fact, conclusions of law, and decision and order, and that the adoption of a proposed decision complies with the LUC's June 6, 2017 order.

At the December 6, 2017 hearing, the Planning Commission acknowledged receipt of KOCA's objections to the agenda and ENV's response, and stated that it follows the legal requirements for notification for a continued contested case hearing. The Planning Commission adopted its proposed findings of fact, conclusions of law, and decision and order, and set dates for the parties to file written exceptions and for oral argument. Then, the Planning

Commission received comments on KOCA's objections and adjourned the meeting.

The parties submitted written exceptions to the Proposed Decision on February 5, 2018. On March 7, 2018, the Planning Commission granted KOCA's Motion to Strike Schnitzer's February 2018 Proposed Findings and heard oral arguments on KOCA's motion to reopen the contested case hearing, which was filed on November 22, 2017, and on the parties' exceptions to the Proposed Decision.

The Planning Commission set a hearing for April 4, 2018, for decision making on KOCA's Motion to Reopen the Contested Case Hearing and on the adoption of its findings of fact, conclusions of law, and decision and order. Two days before the hearing, the Planning Commission cancelled the agenda item because it lacked quorum. The Planning Commission subsequently clarified that it lacked quorum due the recusal of a fifth member of its commission.

By letter dated April 26, 2018, ENV, through its counsel, requested that the Planning Commission take appropriate action to urge the mayor to make a temporary appointment to the Planning Commission, as authorized by Section 3-1.5 of the Revised Ordinance of Honolulu 1990, as amended. A temporary appointment will allow the Planning Commission to attain quorum so that it may address the five clarifications requested by the Land Use Commission in its June 6, 2017 order without added delay.

The landfill will continue operations under the current SUP while the applications are remanded for further proceedings.

COMPLIANCE WITH CONDITIONS OF ORDER

The LUC adopted the Planning Commission's Findings of Fact, Conclusions of Law, And Decision and Order dated August 4, 2009, as its own Findings of Fact, Conclusions of Law, And Decision and Order, subject to sixteen (16) conditions. The general description and status of each condition is as follows:

Condition No.	Description
1	**The Applicant shall obtain all necessary approvals from the State Department of Health, Department of Transportation, Commission on Water Resources Management, and Board of Water Supply for all onsite and offsite improvements involving access, storm drainage, leachate control, water, well construction, and wastewater disposal.** Status: All applicable permits/approvals have been obtained.
2	**In accordance with Chapter 11-60.1 "Air Pollution Control," Hawaii 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.** Status: Dust control measures and management plan have been provided for as part of the Solid Waste Management Permit issued by the DOH.
3	**The City and County of Honolulu shall indemnify and hold harmless the State of Hawaii 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.** Status: So noted.
4	**On or before November 1, 2010, the Applicant shall begin to identify and develop one or more new landfill sites that shall either replace or supplement the WGSL. The Applicant's effort to identify and develop such sites shall be performed with reasonable diligence, and the Honolulu City Council is encouraged to work cooperatively with the Applicant's efforts to select a new landfill site on Oahu. Upon the selection of a new landfill site or sites on Oahu, the Applicant shall provide written notice to the Planning Commission. After receipt of such written notice, the Planning Commission shall hold a public hearing to reevaluate 2008/SUP-2 (SP09-403) and shall determine whether modification or revocation of 2008/SUP-2 (SP09-403) is**

Condition No.	Description
	appropriate at that time. The Planning Commission shall make a recommendation to the Land Use Commission. Status: See section on Status of Identifying and Developing New Landfill Sites on Oahu in this report.
5	**The Applicant shall continue its efforts to use alternative technologies to provide a comprehensive waste stream management program that includes H-POWER, plasma arc, plasma gasification and recycling technologies, as appropriate. The Applicant shall also continue its efforts to seek beneficial reuse of stabilized, dewatered sewage sludge.** Status: See section on Alternative Technologies in this report.
6	**The Applicant shall provide, without any prior notice, annual reports to the Planning Commission and the Land Use Commission regarding the status of identifying and developing new landfill sites on Oahu, the WGSL's operations, and Applicant's compliance with the conditions imposed herein. The annual reports also shall address the Applicant's efforts to use alternative technologies, as appropriate, and to seek beneficial re-use of stabilized, dewatered sewage sludge. The annual reports shall be submitted to the Planning Commission and Land Use Commission on June 1 of each year subsequent to the date of this Decision and Order.** Status: Subsequent reports will be submitted in June of each year.
7	**Closure Sequence "A" for the existing landfill cells at WGSL as shown on Exhibit "A12" must be completed, and final cover applied, by December 31, 2012.** Status: Closure Sequence "A" was commenced in June 2012 and the final cover was applied and substantially completed in December 2012.
8	**WGSL shall be operational only between the hours of 7:00 a.m. and 4:30 p.m. daily, except that ash and residue may be accepted at the Property 24 hours a day.** Status: The Solid Waste Management Permit issued by DOH requires that landfill operations be confined to between the hours of 7:00 a.m. and 4:30 p.m. Permission to extend hours to accommodate refuse loads during H-POWER outages shall be obtained from DOH on an as-needed basis.

Condition No.	Description
9	**The Applicant shall coordinate construction of the landfill cells in the expansion area and operation of WGSL with Hawaiian Electric Company (HECO), with respect to required separation of landfill grade at all times and any accessory uses from overhead electrical power lines.** Status: Coordination with HECO will be done to ensure that landfill construction and operations are adequately separated from overhead electrical power lines.
10	**The operations of the WGSL under 2008/SUP-2 (SP09-403) shall be in compliance with the requirements of Section 21-5.680 of the Revised Ordinances of the City and County of Honolulu 1990, to the extent applicable, and any and all applicable rules and regulation of the State Department of Health.** Status: Revised Ordinances of Honolulu § 21-5.680 is inapplicable to the WGSL as that Property is a public use and said ordinance therefore does not impact operations at WGSL. The operations of the WGSL are in compliance with any and all applicable rules and regulations of the DOH.
11	**The Planning Commission may at any time impose additional conditions when it becomes apparent that a modification is necessary and appropriate.** Status: So noted.
12	**Enforcement of the conditions to the Planning Commission's approval of 2008/SUP-2 (SP09-403) shall be pursuant to the Rules of the Planning Commission, including the issuance of an order to show cause why 2008/SUP-2 (SP09-403) should not be revoked if the Planning Commission has reason to believe that there has been a failure to perform the conditions imposed herein by this Decision and Order.** Status: So noted.
13	**The Applicant shall notify the Planning Commission and Land Use Commission of termination of the use of the Property as a landfill for appropriate action or disposition of 2008/SUP-2 (SP09-403).** Status: Respective notifications will be made prior to termination of the use of the property as a landfill.

Condition No.	Description
14	**Municipal solid waste shall be allowed at the WGSL up to July 31, 2012, provided that only ash and residue from H-POWER shall be allowed at the WGSL after July 31, 2012.** Status: The landfill will continue operations under the current SUP while the deadline for receipt of MSW is resolved by the State Land Use Commission. See section on Status of Landfill Operations, 3. Landfill Expansion Permits, b. Special Use Permit.
15	**The Honolulu City Council through the City Administration shall report to the public every three months on the efforts of the City Council and the City Administration in regard to the continued use of the WGSL, including any funding arrangements that are being considered by the City Council and the City Administration.** Status: See Condition No. 16 Status.
16	**The City Council and the City Administration shall have a public hearing every three months to report on the status of their efforts to either reduce or continue the use of the WGSL.** Status: On August 3, 2010, the Circuit Court of the First Circuit issued its order modifying this condition by substituting ENV for the City Council and the City Administration. That portion of the order was not appealed. Public hearings are being conducted every 3 months to report on the efforts of ENV in regard to the continued use of the WGSL, including any funding arrangements being considered by the City Council and the City Administration. During the reporting period, 4 public hearings were held at Kapolei Hale on July 10, 2017, October 9, 2017, January 8, 2018, and April 9, 2018. For the 4 hearings held during this period, a grand total of 3 members of the public have attended (the same person on 3 occasions). No members of the public attended the April 9, 2018 hearing. ENV publishes public notice of the public hearings in the newspaper and posts notice on opala.org. ENV also requested that the Neighborhood Commission Office notify each Neighborhood Board of forthcoming meetings, which has been done. Reports of what occurred during the hearings are also posted online at opala.org.

ALTERNATIVE TECHNOLOGIES

1. H-POWER

The H-POWER waste-to-energy facility, operated by Covanta, continues to process over 750,000 tons of municipal solid waste each year. The facility has operated reliably for over twenty-seven years and has disposed of over 17,400,000 tons of municipal solid waste, generating in excess of $46,000,000 annual net revenues from the sale of electricity, recovered metals and tipping fees, and avoided the importation of 17,400,000 barrels of oil. The original refuse-derived fuel (RDF) facility was upgraded with state of the art air pollution control equipment (fabric filter bag houses) in 2009 and refurbishment of major equipment such as boiler water walls, shredders, and magnets has been ongoing since 2010.

The facility's capacity to process municipal solid waste was increased by 50% in 2012 with the addition of a third boiler, which utilizes mass-burn technology. The third boiler opened to commercial operations on April 2, 2013. It enables the facility to process and burn bulky waste that previously had to be disposed at the landfill. With the addition of the third boiler, and other efforts to divert waste from the landfill, H-POWER now plays an even larger role in reducing waste disposal at the landfill.

a. Sludge

The sludge receiving station at H-POWER commenced commercial operations in May 2015. The sludge processing system has the capacity to process 90 tons of sludge per day and is accepting dewatered sludge from Honouliuli, Waianae, and Kailua Wastewater Treatment Plants. The 20,000 tons per year of sludge currently produced by these plants is now being diverted from the landfill to H-POWER. In addition, a corresponding amount of bulky waste, which was required to bulk the sludge at the landfill, is now being disposed of at H-POWER.

b. Medical Waste

The disposal of treated medical waste at H-POWER commenced on December 30, 2015. Due to safety concerns, however, medical sharps is not accepted at H-POWER and will continue to be disposed of at the landfill.

c. Tires

H-POWER received a conditional variance from DOH to accept used auto tires collected by the City, including refuse collection, convenience centers, illegal dumping, and the City's automotive services, Department of Parks and Recreation, and Department of Facilities Maintenance. The variance allows H-POWER to process up to 400 tires per day or 65,000 tires per year. The variance is now part of H-POWER's current solid waste management permit and

is in effect until February 28, 2021, which coincides with the expiration/renewal of the facility's solid waste management permit.

d. Process Residue

The City has had discussions with Covanta on residue reduction/reprocessing options to reduce/eliminate residue disposal at the landfill. Reprocessing residue through the 3rd Boiler has been considered; however, residue content, including fine metal, glass and grit have been thought to be detrimental to boiler performance. Further evaluation and testing is required to ensure boiler safety.

In the meanwhile, emerging technologies are also being explored. An Ash Conversion Request for Proposals (RFP) was issued on February 8, 2018 to recover/recycle ash, residue and auto shredder residue (ASR). The successful contractor will construct a processing facility on a parcel neighboring H-POWER and commence operations by mid-2019 (tentative).

e. Auto Shredder Residue (ASR)

Approximately 23,000 tons per year of ASR is disposed at WGSL. Although ASR was envisioned to be diverted to H-POWER, evaluation of ASR test data has concluded that the high Fluorine and Chlorine content of the material is extremely harmful to the boiler. The matter is pending further evaluation and possible testing. Further, as indicated above, the City issued an RFP in February 2018 to recover/recycle ASR.

f. Other

As of March 1, 2017, after resolving challenges with material handling and fees at the alternate disposal sites, bulk loads of commercially-generated spoiled food have been diverted from WGSL.

2. Sludge Re-use

Laie WWTP: Converts green waste mixed with sewage sludge into compost by using the Windrow process.

Sand Island WWTP: Processes sewage sludge into fertilizer pellets using the Synagro process. Please see table below summarizing annually the percentages of sludge that was reused and landfilled, respectively. Note that there are times, especially during calendar year 2016, when the farms experienced heavy rains and were not accepting the pellets.

Year	Reused %	Landfill %
2014	93%	7%
2015	97%	3%
2016	89%	11%
2017	94%	6%

3. Other Request For Proposals (RFPs) for Alternative Waste Disposal Technologies

To further reduce the amount of waste disposed of at the landfill, the City issued a RFP for demonstrating waste-to-energy facilities in July 2009, and RFPs for recycling H-POWER residue, fly ash, and bottom ash in March 2010. Although the City did not receive any responses to these RFPs, ash recovery technologies have since emerged and another RFP was put out on February 8, 2018, which was successful in generating responses. The awarded contractor will construct, operate and maintain an ash recovery/recycling facility to process ash, residue and even ASR, with the goal to divert a significant amount of these materials from the landfill.

Another technology seriously being pursued by the City involves the processing and conversion of glass into a useful lightweight building material. This technology, which originated in Japan, promises to be an excellent glass recycling option and, if feasible, could eliminate the high cost of shipping glass to mainland recycling markets, while generating a marketable building material.

4. Materials Recycling

To present a complete waste flow picture for Oahu, the most current data available is for calendar year 2016. Although waste to the landfill and HPOWER is tracked every month by ENV, recycling data is provided by commercial recycling companies that are surveyed annually. Recycling data for 2016 was gathered and compiled during the first half of 2017; updated charts and analysis are posted below. Recycling data for 2017 is currently being compiled and will be posted on Opala.org by mid-year.

The island's waste data is presented in two charts:

1. TOTAL WASTE which includes Municipal Solid Waste (MSW) and Construction and Demolition (C&D) material, processed through recycling, waste-to-energy or landfilling; and
2. MSW only, processed through recycling, waste-to-energy or landfilling.

Both charts present data for the most recent five (5) calendar years (2012-2016). Moreover, this data shows how Oahu's waste has been diverted from the landfill through recycling and waste-to-energy.

TOTAL WASTE data is presented in the chart below. For 2016, rates for C&D material recycling and disposal rose significantly for a second straight year due to ongoing major construction projects on island, while recycling and waste-to--energy combined to divert nearly 77% of waste from the landfill.

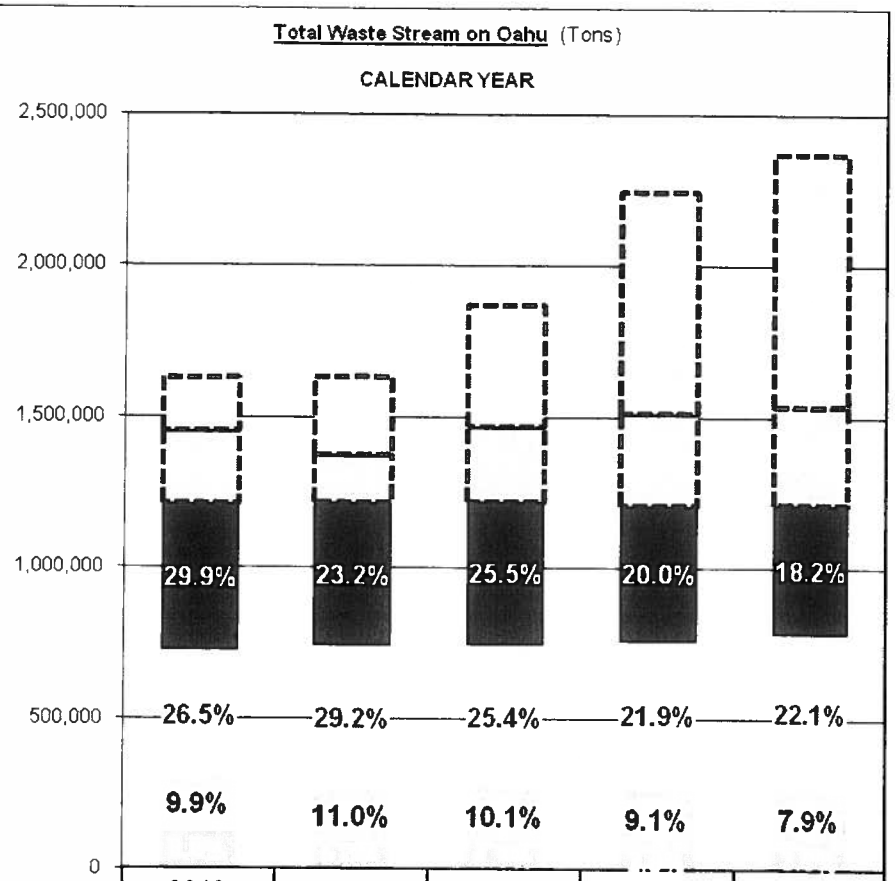
There are two landfills on Oahu: the City's Waimanalo Gulch Sanitary Landfill (WGSL), which is designated for MSW, and the privately-owned PVT Landfill, which is permitted for Construction and Demolition (C&D) waste only.

MSW ONLY data is presented in the chart below. Robust recycling and waste-to-energy rates continue to contribute to the steady decline of MSW tonnage going to the Waimanalo Gulch Sanitary Landfill. Considering MSW only and landfill diversion specific to the WGSL, the landfill diversion rate achieved through recycling and waste-to-energy is nearing 81%, and the general material recycling rate is almost 36%. Landfill diversion rates for the most recent five (5) years at WGSL are charted below, allowing for a better visual assessment of the data. Important to note that of the 21% of material landfilled at WGSL in 2016, less than 6% was MSW, with the rest consisting of ash and noncombustible residue from HPOWER.

C&D = Construction & Demolition

MSW = Municipal Solid Waste

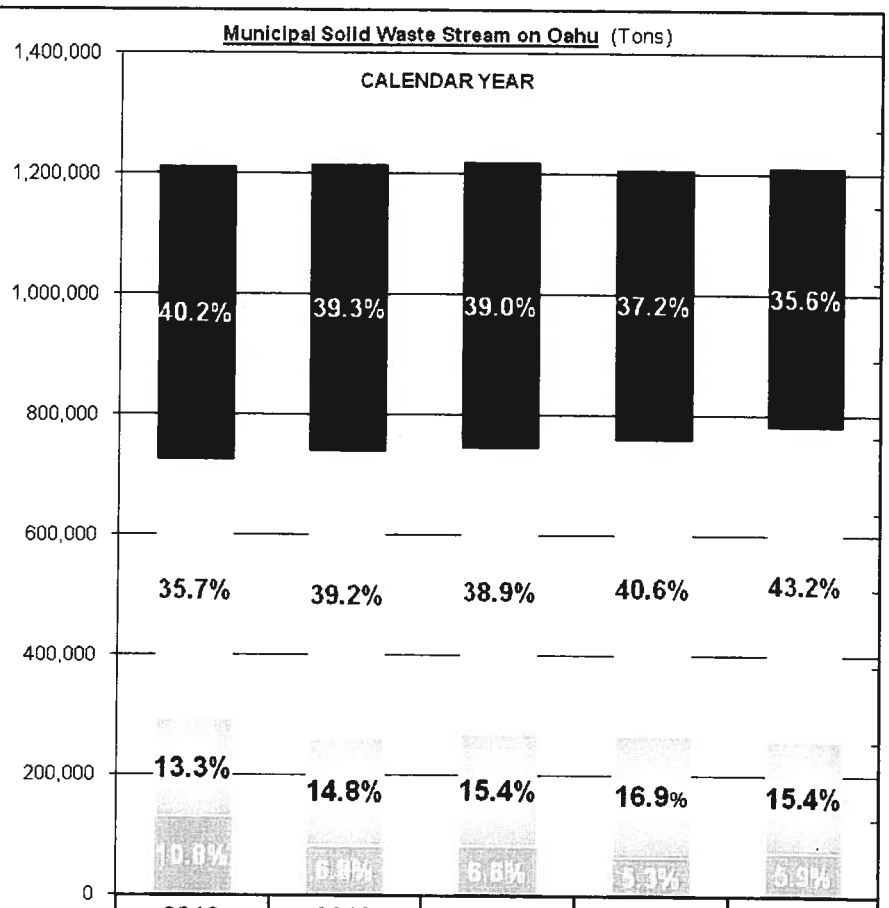
*HPOWER Ash/Residue tons are shown separately to avoid double counting in both HPOWER and landfill receivables.



	2012	2013	2014	2015	2016
C & D - Recycling	179,906	257,287	401,335	731,865	830,414
C & D Landfill	237,789	159,356	248,032	304,354	324,476
General Material Recycling (MSW)	487,157	477,011	475,953	449,152	430,831
HPOWER - Waste-To-Energy (MSW)	432,333	475,824	474,466	490,374	523,883
HPOWER (Ash & Residue - Landfill)*	161,665	180,369	188,399	203,698	186,000
MSW Landfill	130,940	81,989	81,023	64,103	71,162
Total Landfill Diversion % (MSW / C&D)	68.6%	75.5%	73.6%	75.6%	76.4%
TOTAL Tonnage	1,629,790	1,631,836	1,869,209	2,243,546	2,366,766

MSW = Municipal Solid Waste

*HPOWER Ash/Residue tons are shown separately to avoid double counting in both HPOWER and landfill receivables.



	2012	2013	2014	2015	2016
General Material Recycling (MSW)	487,157	477,011	475,953	449,152	430,831
HPOWER - Waste-To-Energy (MSW)	432,333	475,824	474,466	490,374	523,883
HPOWER (Ash & Residue - Landfill)*	161,665	180,369	188,399	203,698	186,000
MSW Landfill	130,940	81,989	81,023	64,103	71,162
Total Landfill Diversion % (MSW)	77.5%	80.2%	79.8%	79.8%	80.8%
TOTAL Tonnage (MSW)	1,212,095	1,215,193	1,219,842	1,207,327	1,211,876

Recycling data: The tables below provide detail of tons recycled by material type. The City has gathered annual recycling data since 1988 (except for 1989 and 1990). Note the upward trend of general material recycling from approximately 75,000 tons in 1988 to nearly 500,000 tons today. Recycling of construction and demolition (C&D) materials, such as concrete, rock and asphalt, contributed an additional 800,000+ tons to the recycling rates, for a total of almost 1.3M tons recycled for 2016. C&D recycling rates tend to fluctuate based on the volume and type of construction projects undertaken from year to year but have risen significantly over the past two years due to several ongoing major projects across the island.

Yearly Recycling Rates (tons)

Year	General Material Recycling	C&D Recycling	Total Recycled
2016	430,831	830,414	1,261,245
2015	449,153	731,865	1,181,018
2014	475,953	401,335	877,286
2013	477,011	257,287	734,298
2012	487,159	179,906	667,065
2011	490,061	181,087	671,148
2010	448,639	101,556	550,195
2009	426,947	116,670	543,617
2008	456,876	216,745	673,621
2007	453,282	148,952	602,234
2006	421,072	121,675	542,747
2005	417,669	193,829	611,498
2004	386,338	173,916	560,254
2003	366,639	106,773	473,412
2002	352,699	139,055	491,754
2001	367,300	114,070	481,370
2000	327,710	165,000	492,710
1999	314,075	225,200	539,275
1998	318,690	148,800	467,490
1997	313,394	204,400	517,794
1996	299,574	95,300	394,874
1995	294,340	44,400	338,740
1994	290,412	35,700	326,112
1993	241,600	30,000	271,600
1991	167,152	0	167,152
1988	73,992	0	73,992

Oahu Recycling 2016	
Material Type	**Amount in tons**
PAPER	
Corrugated Cardboard	41,053
Newspaper	10,551
Office Paper	24,980
Other Paper	1,320
METALS	
Ferrous (includes autos)	111,084
Non-Ferrous (includes aluminum)	16,293
GLASS	15,480
PLASTIC	5,251
TIRES	7,919
AUTO BATTERIES	6,337
ELECTRONIC SCRAP	2,468
GREEN WASTE (yard trimmings)	112,128
WOOD WASTE/PALLETS	12,381
CONSTRUCTION & DEMOLITION (rock, concrete, asphalt)	830,414
FOOD WASTE	42,109
OTHER REUSE (Goodwill, Salvation Army)	21,478
TOTAL	1,261,245

The City's efforts to increase residential recycling rates have continued with its ongoing efforts to educate residents about the value and benefits of its three cart curbside program, and the continued promotion of its condominium recycling assistance program. Additionally, the City requires commercial sector recycling through mandatory laws established by City ordinance, and provides assistance to businesses to setup and expand their recycling programs.

Curbside Recycling – Curbside recycling participation remains strong and material recovery rates are increasing every year. ENV completed the final phase expansion of the fully-automated 3-cart curbside recycling program in May 2010. There are currently 160,000 homes participating in the program, capturing material at a rate of 23,000 tons of mixed recyclables and 75,000 tons of green waste per year. Increased public experience with identifying and sorting recyclables is producing higher results for the City's curbside recycling program. The program continues to be evaluated to identify strategies for improving participation and efficiencies.

Multi-Material Recycling Centers – Recycling through HI-5 redemption and other recycling drop-off is available to those without curbside collection service. HI-5 redemption centers now accept a wide array of recyclable materials, providing the community with a one-stop recycling center for all their materials. Currently, there are about 30 locations around Oahu that offer "HI-5

plus" recycling, accepting paper, plastic and glass containers, and metals, along with providing HI-5 container redemption services. Among these sites are two City recycling drop-off locations in Haleiwa, one fronting its Waialua Base Yard (Emerson Rd) and the other at its Kawailoa Transfer Station. Both locations feature several 96-gallon blue carts, complete with instructional signage and stickers for the community to use. All blue cart recyclables are acceptable, including plastics (1 & 2), glass bottles and jars, metal cans, newspaper, paper bags, corrugated cardboard and white and colored office paper.

Condominium Recycling -- The City continues to promote condominium recycling through a program that reimburses condominium properties for costs associated with the start-up of a recycling program, and additionally provides technical assistance, educational materials, wheeled carts and guidance in establishing collection services.

Electronic Waste (e-waste) – A State law requiring manufacturers to provide take-back programs for electronic waste went into effect January 1, 2010, and is administered by DOH. In general, the covered electronics include computers and televisions. Collection and recycling of e-waste has increased, but the law is weak in its requirements for the manufacturers to achieve recovery goals or to provide consumer convenience in take back programs. DOH is looking for ways to strengthen the collection programs, and has proposed bills in the most recent four State legislative sessions (2012, 2013, 2014, and 2015). In 2015 the law was amended to require electronic device manufacturers to establish drop-off locations for e-waste and prohibited mail-back only recycling options for some devices. ENV will continue to work in collaboration with DOH and local e-waste recycling companies to support local programs and legislative proposals.

Business Recycling Programs -- The City continues to provide assistance to commercial sector recycling efforts and to ensure compliance with mandatory recycling policy established in the mid 1990's, which requires office buildings to recycle office paper, bars/restaurants to recycle glass and a variety of food operations to recycle food waste. Disposal site bans/restrictions divert materials from landfill and H-POWER, including green waste, cardboard, metals, tires, auto batteries, and e-waste. The City provides technical assistance to businesses for designing and implementing recycling programs through how-to guides, workshops and on-site support, and works collaboratively with the State's Green Business Program.

Plastic Bag Ban – As of July 1, 2015, businesses are prohibited from providing plastic checkout bags and non-recyclable paper bags to their customers at the point of sale. Per ORD 12-8, amended by ORD 14-29, ENV is responsible for implementing and enforcing the ban. Prior to the ban's effective date, ENV mailed compliance surveys and tip sheets to approximately 10,000 potentially-affected businesses and asked them to return the compliance forms

and indicate how they planned to comply with the ban. Public notices were placed in the Star Advertiser and MidWeek in May. All information pertaining to the ban is also posted online on Opala.org. On July 1, 2015, City staff began enforcing the ban. The City mailed out a Plastic Bag Ban Compliance Form dated March 7, 2016 with a return date of April 29, 2016. Retail industry feedback based on the returned forms indicates that about 35% of businesses will not provide bags. 28% of businesses indicated they were exempt from the ban. Of the remaining 37% offering bags, 13% are offering paper bags, 7% are offering reusable bags, 3% are offering compostable bags, and 15% are offering some combination of the three types of allowable bags. Businesses are required to submit annual compliance information to verify their compliance with the ban. The ban was amended by ORD 17-37, in 2017 to require businesses to charge 15 cents per bag for reusable, recyclable paper or compostable bags to customers at the point of sale, effective July 1, 2018. Beginning January 1, 2020, compostable bags will be banned and plastic film bags will no longer be considered to be reusable bags.

Public education – Public education regarding recycling is ongoing and includes the distribution of brochures and print materials, dissemination of information via the Opala.org website, WasteLine e-newsletter and annual events such as Tour de Trash.

Recycling education in the schools -- Recycling education shows presented by the Honolulu Theatre for Youth (HTY) combined with classroom activity books educate our youth to become expert recyclers and encourage them to support their family to properly sort their waste home. Every year, the program reaches approximately 20,000 students and teachers. The eighth 2017-18 season included a Tenney Theatre presentation of "Extraordinary Stories from an Ordinary Ohana" that took place in November and December 2017. "Sort It Out", a recycling performance workshop type show at local schools concluded in late February. "SHOCKA", a musical on how Hawaii will reach 100% renewable energy by 2045 using such methods as Waste-to-Energy, H-POWER concluded in May 2018.

5. Interim Off-island Shipping of Waste

No waste was ever shipped to the mainland due to various problems encountered by Hawaiian Waste Systems LLC ("HWS"), the bidder awarded the contract to ship waste to the mainland. These problems culminated in the U.S. District Court, Eastern District of Washington ruling on August 30, 2010 to enjoin the shipment of waste from Hawaii to Washington or Oregon ports on the Columbia River and/or to the Roosevelt Landfill in Washington. Consequently, the U.S. Department of Agriculture canceled the compliance agreement permits of all Hawaii shippers that might otherwise have enabled the shipment of waste to the mainland. At the point where shipping was

no longer possible, HWS had approximately 20,000 tons of baled waste stored at three locations. To dispose of this baled waste, HWS agreed to disassemble the bales, sort the waste and take the burnable waste to H-POWER and the non-burnable waste to the Waimanalo Gulch Landfill.

As of January 2011, approximately 11,000 tons had been taken to H-POWER and 140 tons had been taken to WGSL. On January 6, 2011, there was a fire at the HWS facility that damaged the building in which the waste bales were disassembled and processed. The City, however, continued to work with HWS and DOH to dispose of the remaining bales of waste.

On May 12, 2011, the last bale of waste at the HWS facility was removed and delivered to a City waste disposal facility. Of the original 20,000 tons in its possession, HWS delivered 14,779 tons to H-POWER (76%) and 4,565 (24%) tons to WGSL. HWS was able to extract and recycle 1,525 tons of metal.

CONCLUSION

The foregoing report is submitted in accordance with reporting requirements set forth in the LUC Order dated October 2, 2009. This report focuses on the status of ENV's efforts to identify and develop one or more landfill sites that shall either replace or supplement the WGSL and the 16 Conditions contained in the LUC Order. Also discussed are the further progress of WGSL operations and the City's active efforts to reduce waste volume that is directed to the landfill, such as the expansion of the H-POWER facility and recycling.

The City intends to continue its efforts to ensure proper solid waste management for the people of Oahu, in close coordination with applicable regulatory agencies and decision-makers.