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RICK BLANGIARDI
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DIRECTOR

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DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO:
RH 22-018

December 14, 2021

RETURN RECEIPT REQUESTED
7018 0680 0001 2352 1572

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

RETURN RECEIPT REQUESTED
7018 0680 0001 2352 1589

Mr. Brian Lee, 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 Messrs. Scheuer and Lee:

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

In accordance with the November 1, 2019, State Land Use Commission Order Approving with Modifications the City and County of Honolulu Planning Commission's Recommendation to Approve Special Use Permit, the attached Fourth Semi-Annual Report is submitted for your information. This report covers the period from May 1, 2021 through October 31, 2021, unless otherwise stated in the report.

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

Sincerely,

Wesley T. Yokoyama, P.E.
Director

Attachment

cc: Kamilla Chan - COR

FOURTH SEMI-ANNUAL REPORT

STATUS OF ACTIONS TAKEN TO COMPLY WITH THE STATE LAND USE COMMISSION'S ORDER DATED NOVEMBER 1, 2019
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

December 2021

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PREFACE

This report was prepared in accordance with the State of Hawaii Land Use Commission's ("LUC") Order Approving With Modifications the City and County of Honolulu Planning Commission's Recommendations to Approve a Special Use Permit, dated November 1, 2019 ("LUC Order"). A copy of the LUC Order is available on the LUC's website at https://luc.hawaii.gov/wp-content/uploads/2019/11/SP09-403-final-FOFCOLDO-2019.pdf.

Under Condition No. 7 of the LUC Order, the Applicant (Department of Environmental Services, City and County of Honolulu, hereinafter "ENV") shall provide semi-annual reports to the Planning Commission of the City and County of Honolulu ("Planning Commission") and the LUC regarding the following:

a) The status of the efforts to identify and develop a new landfill site on Oahu,

b) The Waimanalo Gulch Sanitary Landfill's ("WGSL") operations, including gas monitoring,

c) ENV's compliance with the conditions imposed herein,

d) The WGSL's compliance with its Solid Waste Management Permit issued by the Department of Health and all applicable federal and state statutes, rules and regulations, including any notice of violation and enforcement actions regarding the WGSL,

e) The City's efforts to use alternative technologies,

f) The extent to which waste is being diverted from the WGSL and

g) Any funding arrangements that are being considered by the Honolulu City Council or the City Administration for activities that would further divert waste from the WGSL.

This is the third semi-annual report submitted in accordance with Condition No. 7 and covers the period from May 1, 2021 through October 31, 2021, or as otherwise stated.

STATUS OF IDENTIFYING AND DEVELOPING NEW LANDFILL SITES ON OAHU

1. General

Condition No. 5 of the LUC Order requires that, by no later than December 31, 2022, ENV shall identify an alternative landfill site that may be used upon closure of WGSL. Upon identification of the alternative landfill site, ENV shall provide written notice to the Planning Commission and the LUC.

2. Current Status

The City has been engaged in an ongoing effort to identify a landfill site. Condition 4 of the prior LUC Order in Docket No. SP09-403, which was certified on October 22, 2009 ("2009 LUC Order"), stated:

"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."

In accordance with Condition 4 of the 2009 LUC Order, Mayor's Advisory Committee on Landfill Site Selection ("MACLSS") met in 2011 and 2012, and completed its final report on September 25, 2012. All committee meetings were open to the public and to public comment. In the final report, 11 potential sites were identified and ranked based on community criteria. Handouts provided to the MACLSS, the Group Memory of each meeting, and the final report are posted online at www.honolulu.gov/opala.

The City retained a consultant to further review and analyze the sites based on technical and engineering considerations. The report, "Assessment of Municipal Solid Waste Handling Requirements for the Island of Oahu", was completed in November 2017 and is available online at www.honolulu.gov/opala.

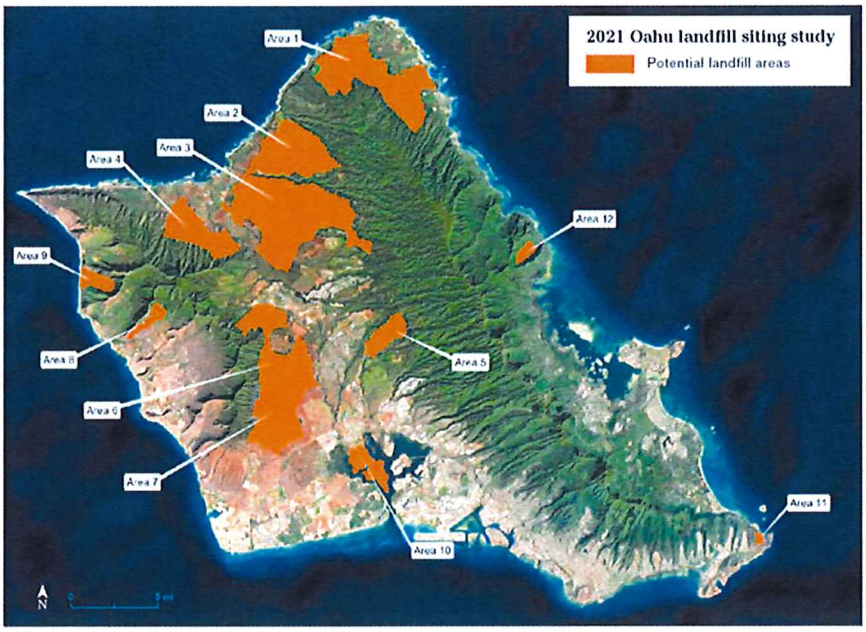
The passage of Act 73 (2020) prohibits the construction, modification, or expansion of waste disposal facilities without first establishing a buffer zone of no less than one-half mile around the waste or disposal facility. Although not required, the active area of WGSL is in compliance with this requirement.

An initial review of the available sites in Fall 2020 reduced the number of potential future landfill sites to four (Keaau, Upland Kahuku 1 and Upland Pupukea 1 and 2) based on sites short-listed in the 2017 landfill siting report. However, additional review in January 2021 determined that a more thorough review and evaluation of new locations island-wide with respect to Act 73 is warranted.

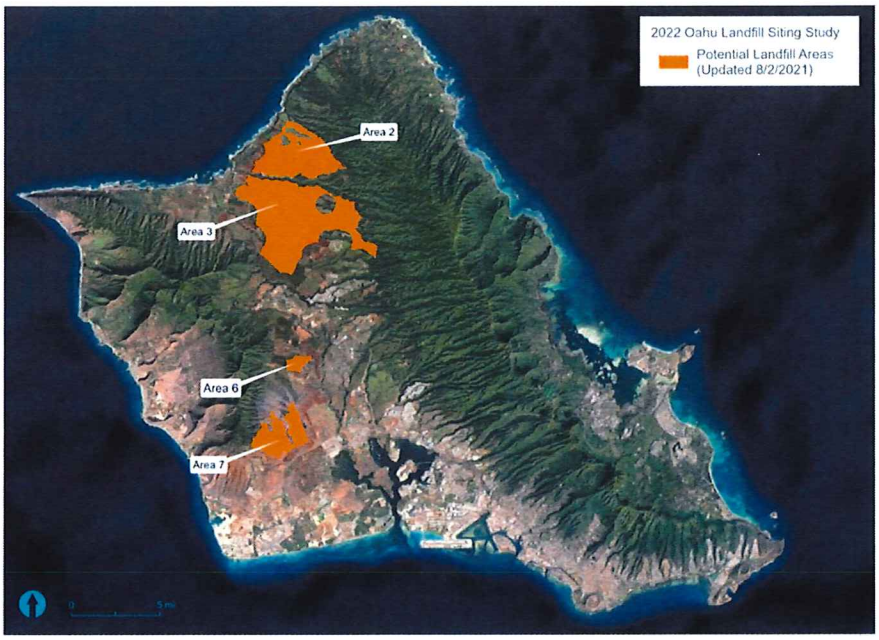
On April 27, 2021, ENV presented an update on integrated solid waste management and progress towards a future landfill site at a joint City Council committee

meeting. ENV shared a preliminary map showing areas compliant with Act 73 where a landfill could potentially be located. The consultant further refined the areas with respect to Act 73 and other constraints.

PROGRESS TOWARD FUTURE LANDFILL SITE



On August 26, 2021, ENV presented a landfill siting update to a joint City Council committee. ENV shared a further refined map of areas where a landfill could potentially be located.



On August 27, 2021, ENV launched a new landfill siting website containing an interactive map tool, resident survey and questions and answers.

On September 24, 2021, Mayor Rick Blangiardi appointed nine members to the Landfill Advisory Committee ("LAC"), which was established in accordance with Section 4-103 of the Revised Charter of the City and County of Honolulu 1973 (2017 edition), as revised. The LAC will evaluate and score potential landfill sites and the final selection of the new landfill site will be made by the City. The LAC's inaugural meeting was held on October 4, 2021, and it is anticipated that it will meet approximately once per month through June 2022. To learn more about the LAC and how to participate in the upcoming public meetings, the public should visit www.honolulu.gov/opala/newlandfill. ENV is continuing to periodically update the City Council and Neighborhood Boards.

3. District Boundary Amendment

In 2020, ENV began preparing an application for a District Boundary Amendment (DBA) to change the zoning of the WGSL site from Agricultural to Urban. ENV also began the environmental review process for the DBA. The EIS and DBA application are not being pursued at this time pending further development of landfill siting activities.

4. Integrated Solid Waste Management Plan

Hawaii Revised Statutes ("HRS") Section 342G-24 requires each county to submit revised integrated solid waste management plans every 10 years with an interim status report submitted five years after every submission of a revised plan. The City has completed the most recent Integrated Solid Waste Management Plan, dated November 2019. The plan was completed after Solid Waste Advisory Committee meetings, State of Hawaii, Department of Health (DOH) review, and a public comment

period. Comments from each step were incorporated. The Plan has been posted online at www.honolulu.gov/opala.

STATUS OF LANDFILL OPERATIONS

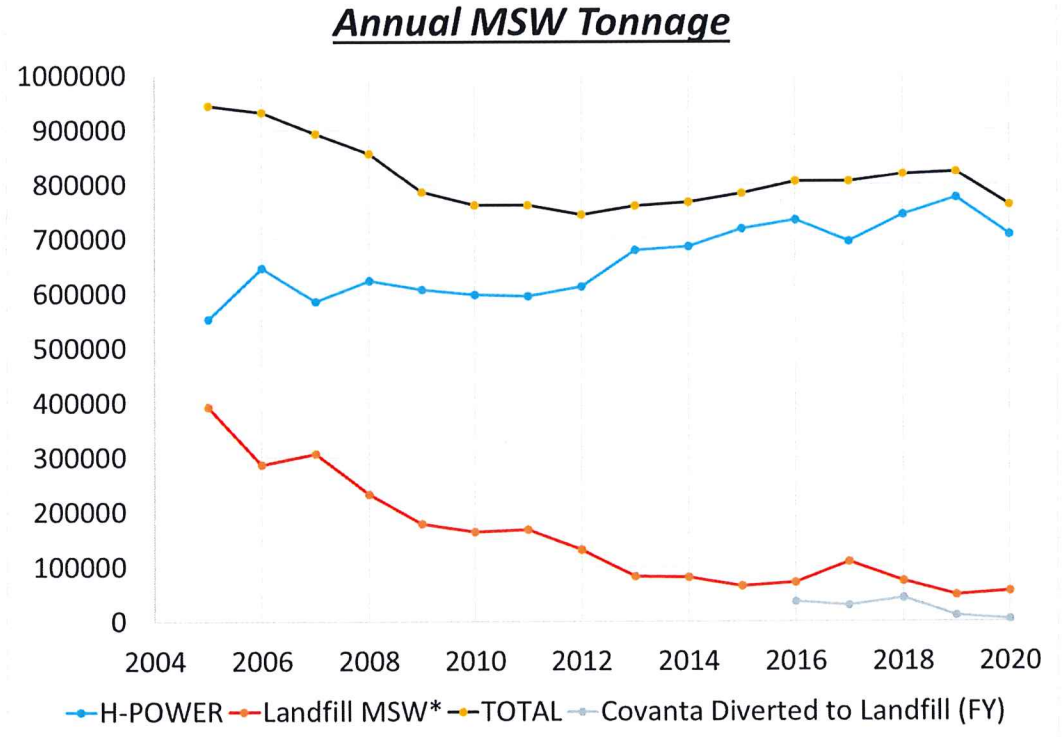
1. Tonnage

Over the period beginning May 1, 2021 through October 31, 2021, the WGSL received the following amounts of material:

H-POWER Ash.....	54,947 tons
H-POWER Residue.....	2,911 tons
Municipal Solid Waste (MSW).....	71,846 tons

The following graph illustrates the reduction of MSW delivered to WGSL (red line) generally as a result of diverting more waste to H-POWER (blue line). Note that the increase in MSW landfilled in 2017 was due to major refurbishment of the processing lines at H-POWER, a once in 30-year project. We are anticipating about 100,000 tons MSW landfilled in 2021, which is about 50,000 tons higher than 2020, due to a once in 6-year major overhaul of H-POWER's turbine-generator set #1 that was completed in May and June 2021.

Future planned projects including a common steam header and second dump condenser are intended to further reduce the amount of MSW diverted to WGSL during H-POWER maintenance outages.



2. Remaining Capacity

As of March 27, 2021 (the date of the last aerial survey), WGSL has 4,656,545 cubic yards of airspace remaining. Using the average fill rates and airspace utilization between March 5, 2020 and March 27, 2021 (time between surveys), WGSL has approximately 17 years of combined MSW and ash life remaining or could reach capacity in the year 2038. This estimate does not consider the impact from PVT Landfill's potential closure within the next 5 to 9 years. In addition, this estimate does not consider advances in technology and additional landfill diversion, discussed further in this report, which could reduce the City's use of WGSL, thereby slowing the rate of landfilling and delaying the date upon which it will reach capacity. The March 2021 survey data was reported to DOH in the annual operating report dated July 29, 2021. The next aerial survey will be conducted in spring 2022.

3. Current Status of WGSL

Activities conducted during the reporting period include MSW landfilling in Cells E-5, E-6, E-7 and E-8 and ash landfilling in Cells E-8 and E-9.

4. Impact of Potential PVT Landfill Closure

PVT Landfill informed haulers that due to the passage of Act 73, PVT would no longer be an option for disposal of asbestos containing material ("ACM") after January 1, 2021. To provide an on-island option for ACM, WGSL began accepting ACM as of January 6, 2021.

With PVT unable to proceed with their planned expansion, they are expecting to close within the next 5 to 9 years. The City is drafting C&D waste recycling legislation and permit modifications for H-POWER to be able to accept the wood or combustible fraction. In addition, Chapter 9 of the Revised Ordinances of Honolulu should be amended to include fees that reflect the actual cost of disposal and special handling required for asbestos and other special wastes.

5. Gas Monitoring

The gas collection and recovery system at WGSL continues to expand to accommodate landfilling operations while maintaining compliance. New air compliance regulations went into effect September 2021, which require additional monitoring around gas wells and surface emissions monitoring. The landfill is maintaining compliance with the new regulations.

COMPLIANCE WITH CONDITIONS OF ORDER

The LUC approved with modifications the Planning Commission's recommendations to approve a special use permit for WGSL and approved with modifications ENV's applications, subject to 17 conditions. The general description and status of each condition is as follows:

Condition No.	Description
1	**The WGSL shall close by no later than March 2, 2028. The WGSL shall not accept any form of waste after March 2, 2028.** Status: So noted
2	**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.
3	**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.
4	**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.
5	**By no later than December 31, 2022, the Applicant shall identify an alternative landfill site that may be used upon closure of WGSL. Upon identification of the alternative landfill site, the Applicant shall provide written notice to the Planning Commission and the LUC.** Status: See section on Status of Identifying and Developing New Landfill Sites on Oahu in this report.

Condition No.	Description
6	**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.
7	**The Applicant shall provide semi-annual reports to the Planning Commission and the LUC regarding the following: a) The status of the efforts to identify and develop a new landfill site on Oahu, b) The WGSL's operations, including gas monitoring, c) The Applicant's compliance with the conditions imposed herein, d) The Landfill's compliance with its Solid Waste Management Permit issued by the Department of Health and all applicable federal and state statutes, rules and regulations, including any notice of violation and enforcement actions regarding the landfill, e) The City's efforts to use alternative technologies, f) The extent to which waste is being diverted from the landfill and g) Any funding arrangements that are being considered by the Honolulu City Council or the City Administration for activities that would further divert waste from the landfill.** Status: Each year reports will be submitted to cover the six-month periods of November through April, and May through October.
8	**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.
9	**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. with the exception of H-POWER ash, which can be received 24 hours a day. 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
10	**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.
11	**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.
12	**The Planning Commission may at any time impose additional conditions when it becomes apparent that a modification is necessary and appropriate.** Status: So noted.
13	**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.
14	**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
15	**The Applicant 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 being considered by the City Council and the City Administration.** Status: See Condition No. 16 Status.
16	**The Applicant shall have a public hearing every three months in either Waianae, Maili, or Nanakuli to report on the status of their efforts to either reduce or continue the use of the WGSL.** Status: After November 1, 2019 (the date of the LUC Order), public hearings are being conducted in Nanakuli every 3 months to report on the status of efforts to either reduce or continue the use of the WGSL and the efforts of the City Council and City Administration in regard to the continued use of the WGSL, including any funding arrangements being considered by the City Council and the City Administration. ENV publishes public notice of the public hearings in the newspaper and posts notice on www.honolulu.gov/opala. Summaries of the hearings are posted online at www.honolulu.gov/opala. During the reporting period, two public hearings were held on July 20, 2021 and October 19, 2021. Due to the COVID-19 Emergency Declarations, the designated meeting site, the Kalanianaole Beach Park in Nanakuli, was closed to the public and the public hearings were held remotely via WebEx. A total of 11 members of the public attended the hearings.
17	**If the landfill releases waste or leachate, the Applicant must immediately a) notify the surrounding community, including the Makakilo/Kapolei/Honokai Hale, Waianae Coast and Nanakuli-Maili Neighborhood Boards, Intervenors Schnitzer Steel Hawaii Corp., Ko Olina Community Association, Maile Shimabukuro and Colleen Hanabusa and b) take remedial actions to clean up the waste and to keep the waste from spreading. Such remedial actions shall include, but shall not be limited to, placing debris barriers and booms at the landfill's shoreline outfall to prevent waste from spreading into the ocean.** Status: So noted.

REGULATORY COMPLIANCE

1. Solid Waste Permit

The final solid waste permit for the proposed lateral expansion was approved by the 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), WGSL 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 by DOH later in 2021. New cell construction and drainage improvements are complete.

2. Consent Decree

The City and Waste Management of Hawaii ("WMH"), the WGSL operator, reached a settlement with the U.S. Environmental Protection Agency ("EPA") and DOH over alleged violations of the Clean Water Act and State law. The alleged violations arose primarily from storm events that occurred in the winter of 2010-2011, during construction of the WGSL's western diversion drainage system. The EPA and DOH alleged that following the large rain storms the City and WMH violated the Clean Water Act by discharging pollutants without National Pollutant Discharge Elimination System Permit authorization and by discharging pollutants in storm water in violation of the terms of the Notice of General Permit Coverage for Industrial Stormwater issued to the City.

On July 3, 2019, the U.S. District Court for the District of Hawaii entered the consent decree in United States of America and State of Hawaii Department of Health v. Waste Management of Hawaii, Inc. and City and County of Honolulu, Case No. 1:19-cv-00224.

In accordance with the consent decree, the City paid a civil penalty of $62,500 to the United States and $62,500 in lieu of a civil penalty to the state Department of Land and Natural Resources Division of Aquatic Resources. Similarly, WMH paid $150,000 to each entity.

Also in accordance with the consent decree, the City and WMH implemented enhancements to WGSL's western diversion drainage system, revised the facility's stormwater pollution control plan, and applied for an individual stormwater permit for WGSL. DOH Clean Water Branch is reviewing the permit application. The City and WMH continue to comply with the detention basin operating and monitoring parameters set forth in the consent decree.

ALTERNATIVE TECHNOLOGIES AND LANDFILL DIVERSION

1. H-POWER

The H-POWER waste-to-energy facility, operated by Covanta, continues to process over 725,000 tons of municipal solid waste each year. The facility has operated reliably for over 30 years and has disposed of about 20,000,000 tons of municipal solid waste, generating in excess of $55,000,000 annual net revenues from the sale of electricity, recovered metals and tipping fees, and avoided the importation of about 20,000,000 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 WGSL. With the addition of the third boiler, and other efforts to divert waste from WGSL, H-POWER now plays an even larger role in reducing waste disposal at WGSL.

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 the wastewater treatment plants. The 20,000 tons per year of sludge currently produced by these plants is now being diverted from WGSL to H-POWER. In addition, a corresponding amount of bulky waste, which was required to bulk the sludge at WGSL, 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 WGSL.

c. Tires

H-POWER's solid waste management permit issued by DOH allows acceptance of used auto tires collected by the City, including refuse collection, convenience centers and illegal dumping up to 400 tires per day or 65,000 tires per year.

d. In-Feed Waste Processing Improvements and Baling

ENV and Covanta are planning in-feed waste processing improvements to the RDF Waste Processing Facility that will include a mobile baling system. The project will allow processing of bulky waste into RDF. The mobile baler will provide flexibility to store waste during extended maintenance outages. The baled waste would be stored and processed later, further reducing diversion of waste to WGSL. The equipment was tested in March 2021 and DOH approval is pending for operation and storing of bales.

e. Bulk Loads of Food Waste

Since March 1, 2017, bulk loads of commercially-generated spoiled food have been diverted from WGSL. ENV is evaluating technologies for the digestion of food waste.

2. Ash, Process Residue and Auto Shredder Residue

In July 2021, H-POWER began combusting its process residue on a trial basis. Operating data is being collected to determine whether to make the change permanent. This change has reduced the amount of process residue being disposed at the landfill from about 4000 tons per month to zero.

A project for the processing and beneficial reuse of ash was awarded to Covanta Projects LLC. The project is pending approval by EQT, the new owner of Covanta, anticipated by the end of 2021. This project, when permitted and built, has the potential to divert at least 60% of the H-POWER ash that is currently disposed at WGSL.

Approximately 30,000 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 can be extremely harmful to the boiler. The matter is pending further evaluation and possible testing. The ash project may consider ASR processing as a potential future option.

3. Plasma Arc Gasification

Plasma Arc Gasification is mostly used overseas (i.e. Japan) for hazardous waste (very high tip fee), auto shredder fluff, ash, or other homogenous wastes. It has not worked well on mixed waste (trash) and has only been applied as research, demo, military or ship-bound or pilot scale projects in the last 15-20 years.

There are currently no operating commercial-scale plasma arc gasification facilities in North America. Any such facilities in North America that were operating in the past are no longer operating. The Ottawa, Canada and St. Lucie County, Florida projects both failed to proceed past the planning, financing and permitting stage and are not active.

Plasma arc technology continues to face major obstacles including:

- inability to scale up to commercial-scale
- excessively high cost
- excessively high amount of power purchased and imported from the utility to power the plasma torches
- high maintenance demands and limited life
- lot of downtime
- inability to obtain financing and regulatory permits

Until these challenges are resolved, plasma arc technology should not be considered for Honolulu.

4. Sludge Re-use

Further processing and reuse of sludge avoids the need to landfill this waste stream. Laie Wastewater Treatment Plant ("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. Since 2014, the average Synagro pellet reuse has been 93% (7% landfilled). Note that there are times, especially during 2016, when the farms experience heavy rains and are not able to accept the pellets.

4. Materials Recycling

To present a complete waste flow picture for Oahu, the most current data available is for calendar year 2020. Although waste to WGSL and H-POWER is tracked monthly by ENV, recycling data is provided by commercial recycling companies that are surveyed annually. Recycling data for 2020 was gathered and compiled during the first half of 2021; updated charts and analysis are posted below. Recycling data for 2020 is posted on www.honolulu.gov/opala.

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

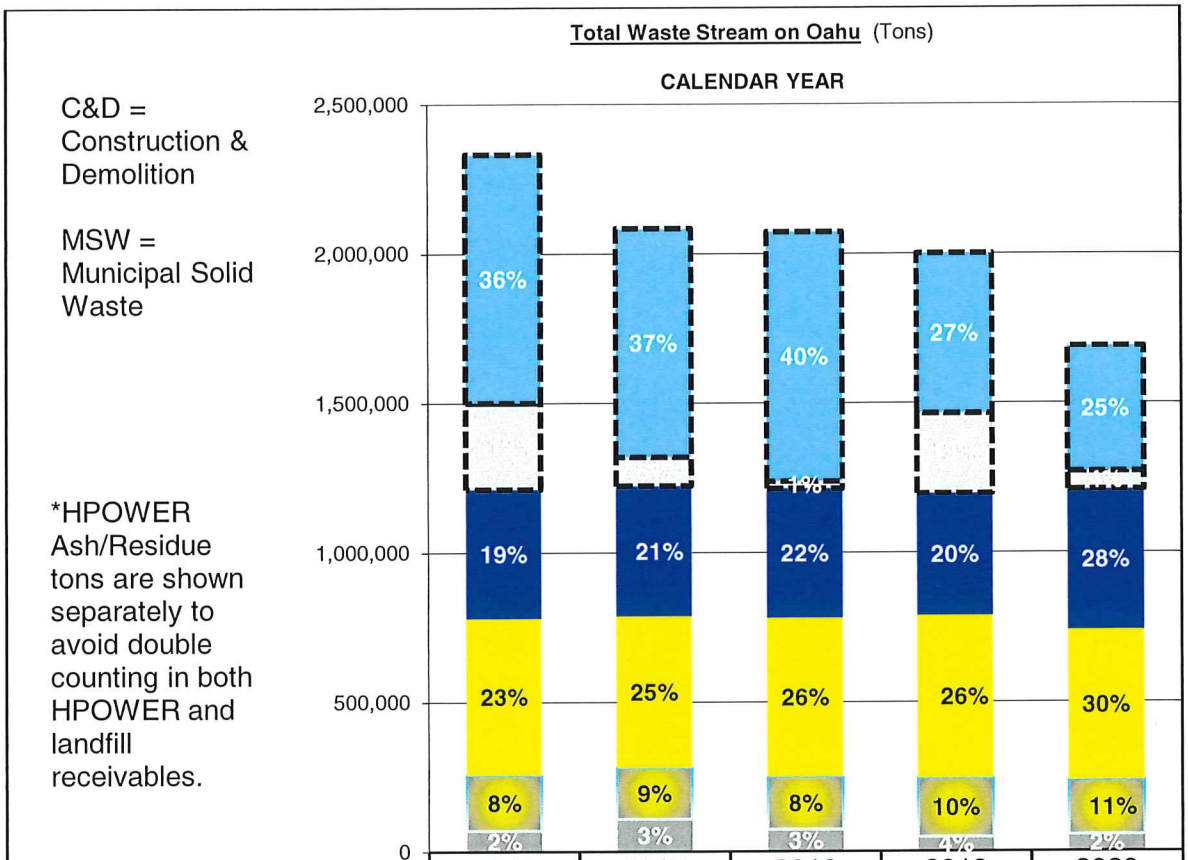
1. TOTAL WASTE which includes Municipal Solid Waste ("MSW") and Construction and Demolition ("C&D") material, processed through recycling, waste-to-energy or landfilling; and

2. MSW only, processed through recycling, waste-to-energy or landfilling.

Both charts present data for the most recent five (5) calendar years (2016-2020). Moreover, this data shows how Oahu's waste was diverted from WGSL through recycling and waste-to-energy.

TOTAL WASTE data is presented in the chart below. For 2020, rates for C&D material recycling and disposal decreased overall from the 2019, while recycling and waste-to--energy combined to divert nearly 76% of waste from landfills.

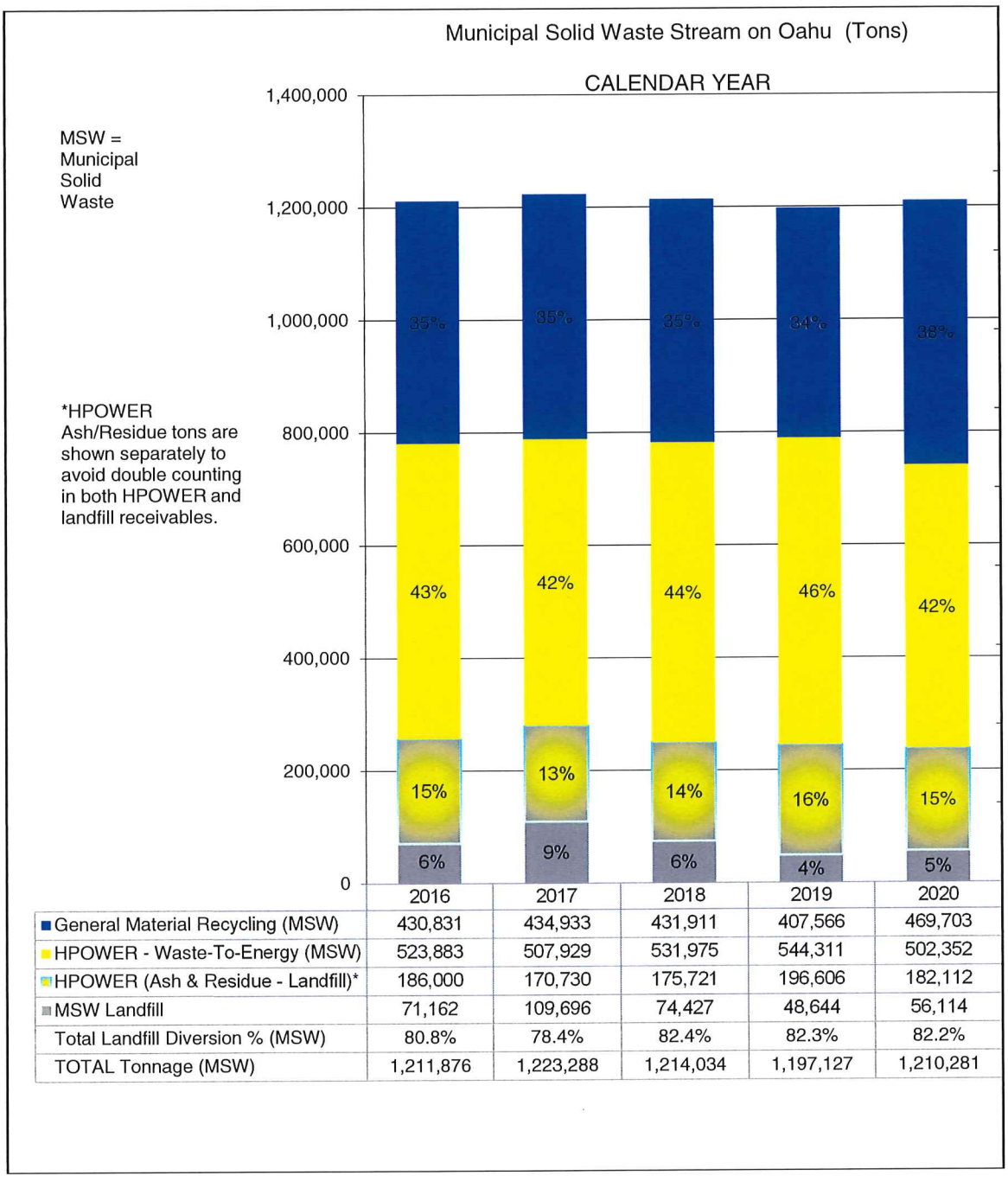
There are two landfills on Oahu: the City's WGSL, which is designated for MSW, and the privately-owned PVT Landfill, which is permitted for C&D waste only.



	2016	2017	2018	2019	2020
C & D - Recycling	830,414	763,279	833,566	534,722	417,854
C & D Landfill	289,924	97,426	24,939	268,796	61,694
General Material Recycling (MSW)	430,831	434,933	431,911	407,566	469,703
HPOWER - Waste-To-Energy (MSW)	523,883	507,929	531,975	544,311	502,352
HPOWER (Ash & Residue - Landfill)*	186,000	170,730	175,721	196,606	182,112
MSW Landfill	71,162	109,696	74,427	48,644	56,114
Total Landfill Diversion % (MSW / C&D)	77.6%	82.7%	88.5%	76.0%	83.6%
TOTAL Tonnage	2,332,214	2,083,993	2,072,539	2,000,645	1,689,829

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 WGSL. Considering MSW only and landfill diversion specific to the WGSL, the landfill diversion rate achieved through recycling and waste-to-energy is at 82.2%, and the general material recycling rate increased to 38%, an increase of 4% from 2019. 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 5% of the approximate 20% of material landfilled at WGSL

in 2020, was MSW, with the rest consisting of ash and noncombustible residue from H-POWER.



	2016	2017	2018	2019	2020
General Material Recycling (MSW)	430,831	434,933	431,911	407,566	469,703
HPOWER - Waste-To-Energy (MSW)	523,883	507,929	531,975	544,311	502,352
HPOWER (Ash & Residue - Landfill)*	186,000	170,730	175,721	196,606	182,112
MSW Landfill	71,162	109,696	74,427	48,644	56,114
Total Landfill Diversion % (MSW)	80.8%	78.4%	82.4%	82.3%	82.2%
TOTAL Tonnage (MSW)	1,211,876	1,223,288	1,214,034	1,197,127	1,210,281

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 470,000 tons in 2020. Recycling of C&D materials, such as concrete, rock and asphalt, contributed an additional 417,854 tons to the recycling rates, for a total of

almost 900,000 tons recycled for 2020. 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 since 2015 due to ongoing major projects. In 2020, there was a significant drop in C&D Recycling due to a decrease in construction and the stored recyclable material at the private C&D landfill.

Yearly Recycling Rates (tons)

Year	General Material Recycling	C&D Recycling	Total Recycled
2020	469,703	417,854	887,557
2019	407,566	534,722	942,288
2018	431,911	868,617	1,300,528
2017	434,933	763,279	1,198,212
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 2020	
Material Type	**Amount in tons**
PAPER	
Corrugated Cardboard	41,812
Newspaper	8,574
Office Paper	5,213
Other Paper	1,060
METALS	
Ferrous (includes autos)	139,366
Non-Ferrous (includes aluminum)	10,855
GLASS	10,947
PLASTIC	4,799
TIRES	7,783
AUTO BATTERIES	9,193
ELECTRONIC SCRAP	1,000
GREEN WASTE (yard trimmings)	169,933
WOOD WASTE/PALLETS	8,715
CONSTRUCTION & DEMOLITION (rock, concrete, asphalt)	417,854
FOOD WASTE	38,361
OTHER REUSE (Goodwill, Salvation Army)	11,821
TOTAL	887,557

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 and rejuvenation 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.

a. 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 May 2010. There are currently 170,000 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, efficiencies and to decrease contamination.

b. Multi-Material Recycling Centers – Recycling is available to those without curbside collection service. There 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.

c. Condominium Recycling – The City continues to promote condominium recycling through a program reimbursing 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.

d. 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. 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 continues to work in collaboration with DOH and local e-waste recycling companies to support local programs and legislative proposals.

e. 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. It is no longer mandatory for Advance Disposal Fee ("ADF") glass to be sorted by the liquor establishments but the recyclers still receive ADF glass through their commercial accounts. The City suspended the ADF portion of the glass relating to the glass ordinance but the City still receives the State Subsidy for ADF glass the recyclers are collecting. State legislation is needed to increase the fee to lift the suspension on the ADF glass. Disposal site bans/restrictions divert materials from WGSL and H-POWER, including green waste, cardboard, metals, tires, auto batteries, and e-waste. The City is encouraging businesses to generate less food waste and to support food security programs. 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.

f. Plastic Bag Ordinances – 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 Ordinance 12-8, amended by Ordinance 14-29, ENV is responsible for implementing and enforcing the ban. All information pertaining to the ban is also posted online on www.honolulu.gov/opala. Businesses are required to submit annual compliance information to verify their compliance with the ban. The ban was amended by Ordinance 17-37, in 2017 to require businesses to charge a minimum of 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 were banned and plastic film bags were no longer considered to be reusable bags. The ban was amended by Ordinance 19-30 changing the definition of "plastic" and amending the definitions for "plastic checkout bag" and "plastic film bag" as well as revising the exemptions list.

g. Disposable Food Ware Ordinance – Parts of Ordinance 19-30 took effect on January 1, 2021 and has been termed the Disposable Food Ware Ordinance or DFWO. To continue with the City's efforts to educate the public and business effected by Ordinance 19-30, the City provided an additional 90-day "Education Period" from January 1 to March 31, 2021. The intent of the DFWO is to protect human safety and welfare and to improve environmental quality on the island, in the neighboring marine environment and globally. The DFWO affects all food vendors and businesses operating within the City. The DFWO amends the Oahu Plastic Bag Ban and restricts the use and sale of polystyrene foam food ware, disposable plastic food ware and disposable plastic service ware. It also dictates when disposable service ware may be provided. Inspections for compliance with Ordinance 19-30 began in June 2021, but the City is aware that many food vendors are experiencing economic hardship due to the measures taken to address the COVID-19 public health emergency. In order to promote and protect the public health, safety, and welfare of the residents of the City, and to provide relief from the economic impact directly and indirectly caused by COVID-19, the City recently suspended the restrictions on disposable plastic service ware and polystyrene foam food ware. The suspension of Section 41-27.2(b) and (d), Revised Ordinances of Honolulu, took effect on June 25, 2021, and will continue through September 5, 2021, pursuant to the Mayor's Fourteenth Proclamation of Emergency or Disaster (COVID-19 [Novel Coronavirus]). The Mayor's Fifteenth proclamation extended the suspension through October 22, 2021.

h. Public education – Public education regarding recycling is ongoing and includes the distribution of brochures and print materials, dissemination of information via City's new refuse website, www.honolulu.gov/opala, WasteLine e-newsletter and virtual presentations. There has been an increase in social media participation to assist with the public education program. Source reduction will be another component to add to our public education program. Opala.org will have a redirect to the new website. The transition period to phase out the old website will be approximately 2 years.

Composting workshops – Composting workshops presented by City staff were reinstated as part of the City's public education program. The workshop teaches residents to manage green waste at home by utilizing the green cart for large items such as branches and to aerobically compost the grass trimmings, leaves and small diameter branches. The City is also gathering information to provide food waste composting through the use of worms

called vermiculture and beneficial microbes with the Bokashi method. Due to the pandemic, composting workshops are through a virtual format.

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 at home. Every year, the program reaches approximately 20,000 students and teachers. The 12th season will include a feature on HTY's HI-Way program aired through the television media with a focus on food waste reduction and the introduction of Fats, Oil and Grease. This program features environmental issues including solid waste management and concludes in late February.

FUNDING ARRANGEMENTS

Funding arrangements for the landfill and alternate technologies have been requested and approved for the Fiscal Year 2021 (Ordinance 20-23) and 2022 (Ordinance 21-21) Capital Improvements (CIP) Budgets. Copies of the CIP budget ordinances are available on the Honolulu City Council website www.honolulu.gov/council, follow the link to Council Bills, Resolutions, and Communications.

CONCLUSION

The foregoing report is submitted in accordance with reporting requirements set forth in the LUC Order dated November 1, 2019. 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 17 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 WGSL.

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.