Status Report on Reducing and/or Continuing the Use of
Waimanalo Gulch Sanitary Landfill
July 20, 2021
10:00 a.m.
WebEx Meeting

Status Report

1. Introduction and Background

Notice of this public hearing was published in the Honolulu Star Advertiser on July 9, 2021 and posted on the City's Refuse Division website, www.Opala.org.

The City and County of Honolulu, Department of Environmental Services ("ENV"), holds a public hearing once every three months in accordance with the terms of the FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION AND ORDER APPROVING WITH MODIFICATIONS THE CITY AND COUNTY OF HONOLULU PLANNING COMMISSION'S RECOMMENDATION TO APPROVE SPECIAL USE PERMIT certified on November 1, 2019, by the State of Hawaii Land Use Commission (LUC) in Docket No. SP09-403 (the LUC Order). This public hearing is held to comply with Conditions 15 and 16 of the LUC Order, which states:

"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 that are being considered by the City Council and the City Administration."

"16. The Applicant shall have a public hearing every three months in either Wai`anae, Mā`ili, or Nānākuli to report on their efforts to either reduce or continue the use of the WGSL."

The complete LUC Order is available at the State LUC website:
https://luc.hawaii.gov/

In a letter dated July 12, 2021, the City notified the LUC and Honolulu Planning Commission of the need to hold this meeting remotely via the WebEx platform. The meeting room at Kalanianaole Beach Park in Nanakuli that the City used for its January 21, 2020 public meeting is still closed to the public. Instead of postponing or canceling the public hearing, the City will hold this meeting remotely via the WebEx platform, where the public may still participate. The City plans to resume its public hearings at Kalanianaole Beach Park when the meeting rooms reopen to the public.

In accordance with the foregoing, the following report covers developments during the last calendar quarter regarding the matters set forth in Conditions 15 and 16 of the LUC Order.

2. Progress Toward Another Landfill Site

A. Condition 5 of the LUC Order states in relevant part:

"By no later than December 31, 2022, the Applicant shall identify an alternative landfill site that may be used upon closure of WGSL."

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, the Landfill Advisory Committee ("LAC") 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 LAC, the Group Memory of each meeting, and the final report are posted online at www.opala.org.

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.opala.org.

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.

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 on one day a week (Wednesdays) as of January 6, 2021.

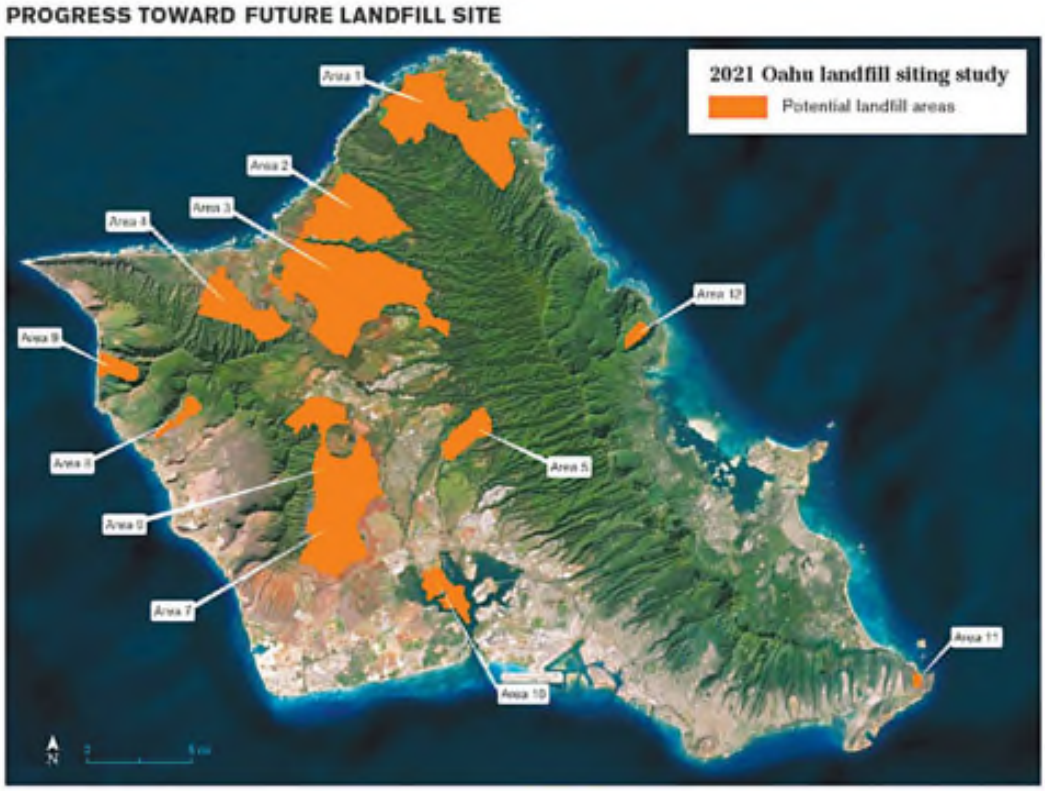
With PVT unable to proceed with their planned expansion, they are expecting to close within the next 5 to 9 years. The City is drafting C&D waste recycling legislation and permit modifications for H-POWER to be able to accept the wood or combustible fraction. In addition, Chapter 9 of the Revised Ordinances 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.

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.

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. The City is currently engaged in completing a review of available locations and is developing a new Mayor's Advisory Committee on Landfill Site Selection.

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



B. The following table summarizes the amount of Municipal Solid Waste (MSW), and H-POWER ash and residue delivered to WGSL during the last three months:

MONTH	MSW*	ASH	RESIDUE
April 2021	3,895.81	11,052.65	4,510.44
May 2021	36,563.00	6,806.47	522.06
June 2021	19,202.30	8,768.10	1,451.15

*Note: MSW includes the following waste streams: MSW, auto shredder waste, special waste, sludge and does not include homeowner loads.

During the reporting period, there was one odor complaint received from Ko Olina on April 21, 2021. An odorous load arrived at the gate before the facility opened at 7:00 am. Site staff contacted Honolulu Disposal Service (transporter) and Pacific Biodiesel (generator) and explained the conditions of the permit and the requirement for transporter to arrive at WGSL during the acceptance hours for odorous loads (between 8:30 am and 2:30 pm). Additionally, site management suggested to the transporter and generator to apply an odor suppressant to their material prior to arrival to assist the onsite odor management system and minimize odors. It is imperative for the customer to adhere to the rules of the designated hours of acceptance in order for the facility to manage the odorous loads as intended with the systems in place.

3. Progress Report on Landfill Diversion, Recycling and Planning

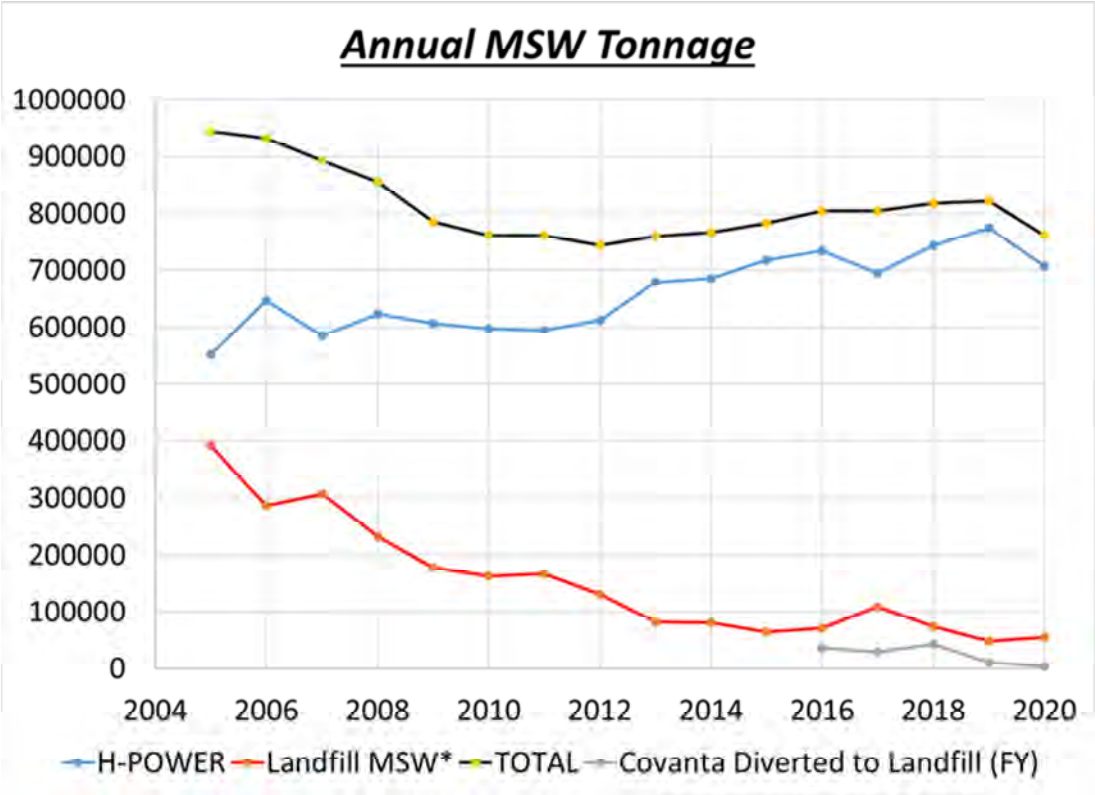
A. H-POWER

The H-POWER Waste-to-Energy facility is operating at full capacity, including processing of treated dewatered wastewater sludge, bulky waste, ENV-Refuse collected used auto tires and treated non-sharps medical waste. A project for the processing and beneficial reuse of ash was awarded to Covanta Projects LLC.

ENV and Covanta are planning in-feed waste processing improvements to the Refuse Derived Fuel (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 the landfill. The equipment was tested in March 2021 and DOH approval is pending for operation and storing of bales.

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.



B. Materials Recycling

To present a complete waste flow picture for Oahu, the most current data available is for calendar year 2019. 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 2019 was gathered and compiled during the first half of 2020; updated charts and analysis are posted below. Recycling data for 2019 is posted on www.Opala.org. The City initiated the requests for recycling data for 2020 in the spring of 2021. 2020 data is likely to be posted in August.

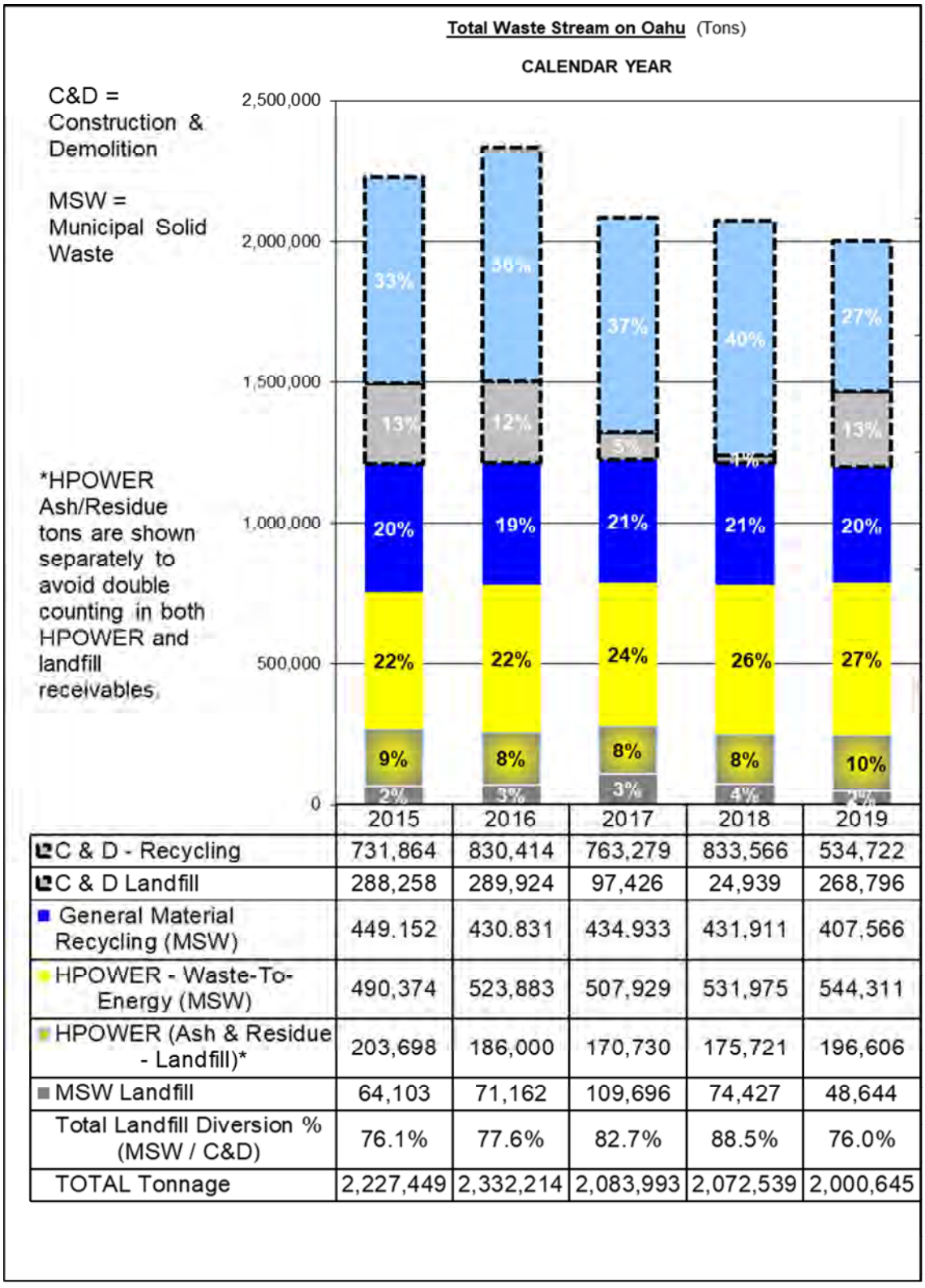
The island's waste data is presented in two charts:

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 (2015-2019). Moreover, this data shows how Oahu's waste was diverted from WGSL through recycling and waste-to-energy.

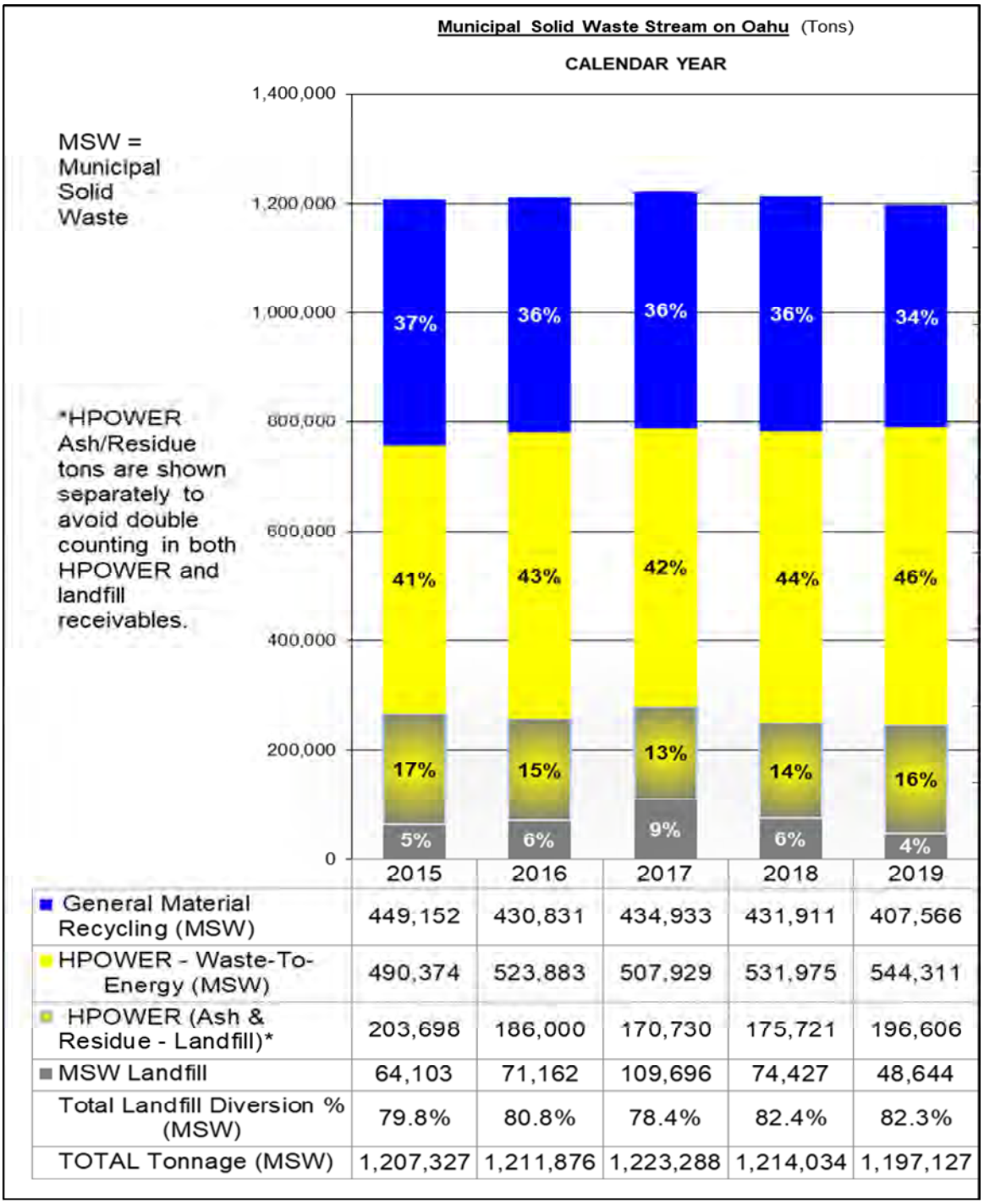
TOTAL WASTE data is presented in the chart below. For 2019, rates for C&D material recycling and disposal decreased overall from the 2018, while recycling and waste-to-energy combined to divert nearly 76% of waste from landfills.

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.



	2015	2016	2017	2018	2019
C & D - Recycling	731,864	830,414	763,279	833,566	534,722
C & D Landfill	288,258	289,924	97,426	24,939	268,796
General Material Recycling (MSW)	449.152	430.831	434.933	431,911	407.566
HPOWER - Waste-To-Energy (MSW)	490,374	523,883	507,929	531,975	544,311
HPOWER (Ash & Residue - Landfill)*	203,698	186,000	170,730	175,721	196,606
MSW Landfill	64,103	71,162	109,696	74,427	48,644
Total Landfill Diversion % (MSW / C&D)	76.1%	77.6%	82.7%	88.5%	76.0%
TOTAL Tonnage	2,227,449	2,332,214	2,083,993	2,072,539	2,000,645

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 nearing 76%, and the general material recycling rate is dropped to 34% mostly due to the drop in general recycling tonnage. 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 20% of material landfilled at WGSL in 2019, only 4% was MSW, with the rest consisting of ash and non-combustible residue from H-POWER.



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MSW Landfill	64,103	71,162	109,696	74,427	48,644
Total Landfill Diversion % (MSW)	79.8%	80.8%	78.4%	82.4%	82.3%
TOTAL Tonnage (MSW)	1,207,327	1,211,876	1,223,288	1,214,034	1,197,127

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 407,000 tons in 2019. Recycling of C&D materials, such as concrete, rock and asphalt, contributed an additional 534,722 tons to the recycling rates, for a total of almost 1.0M tons recycled for 2019. 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 2019, there was a significant drop in C&D Recycling due to a decrease in construction and the stored recyclable material stored on site.

Yearly Recycling Rates (tons)

Year	General Material Recycling	C&D Recycling	Total Recycled
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 2019	
Material Type	**Amount in tons**
PAPER	
	138,675
	12,440
	13,647
PLASTIC	4,996
TIRES	7,784
AUTO BATTERIES	7,652
ELECTRONIC SCRAP	1,210
GREEN WASTE (yard trimmings)	103,429
WOOD WASTE/PALLETS	6,6067
CONSTRUCTION & DEMOLITION (rock, concrete, asphalt)	537,772

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.

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.Opala.org.

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".

7. 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]).

8. Public education – Public education regarding recycling is ongoing and includes the distribution of brochures and print materials, dissemination of information via the www.Opala.org website, 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. The City is in the process of revising ENV website to include a new website to replace www.Opala.org. The new website is to launch in July 2021. The current website will still be active while the new website is on-line. There will be a transition period to phase out www.Opala.org.

   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 11th 2020-21 season included a feature on HTY's HI-Way program aired through the television media. This program features environmental issues including solid waste management and concludes in late February. The program switch was due to the pandemic.

C. 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, DOH review, and a public comment period. Comments from each step were incorporated. The plan is posted online at www.Opala.org.

5. Relevant City Council Resolutions and Bills

RESOLUTION NO.	DESCRIPTION	STATUS
15-167	To establish a city policy to expedite the closure of the WGSL and the implementation of sustainable waste management practices.	Resolution adopted 7/8/15.
16-147	Authorizes the City to enter into an agreement with the State for the allotment of funds for a glass recycling program.	Resolution adopted 7/6/16.
17-340	Urging the City to develop composting facilities.	Resolution adopted 2/28/18.
18-35	Requesting the Office of the City Auditor to evaluate the use and impacts of single-use food service containers and plastic bags.	Resolution adopted 2/14/18.

19-101	Requesting ENV to prepare a report evaluating operations of Leeward Coast refuse drop-off facilities and recommending improvements thereto.	Resolution adopted 8/7/19.
20-211	Encouraging the City to support a circular economy, etc.	Resolution adopted 9/9/20.
20-292	Efficiency improvements at the City's drop-off facilities.	Resolution adopted 12/9/20.
21-102	Urging the City to assess the City's capability to implement a C&D waste recycling program.	Resolution introduced 4/21/21.
21-103	Requesting the City to evaluate potential landfill sites for compliance with Act 73.	Resolution introduced 4/21/21.
21-105	Adopting the Climate Action Plan	Resolution adopted 6/2/21.

BILL NO.	DESCRIPTION	STATUS
40 (2019)	Addresses single-use plastic goods and plastic bags.	Bill enacted as Ordinance 19-30 on 12/15/19.
64 (2019)	Relating to illegal dumping.	Bill enacted as Ordinance 20-4 on 3/5/20 effective 7/1/20.
62 (2020)	Relating to food waste collection.	Bill postponed in committee on 3/22/21.
63 (2020)	Relating to composting.	Bill postponed in committee on 10/21/20.
98 (2020)	Relating to food waste recycling requirements for food establishments.	Bill passed first reading 1/27/21.
9 (2021)	Relating to expenditures from the solid waste special fund.	Bill introduced 3/2/21.
15 (2021)	Relating to the solid waste special fund.	Bill enacted as Ordinance 21-18 effective 7/1/21.

All resolutions and bills, and video of Council meetings, can be found at the City website, www.honolulu.gov

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City Attendees:

Department of Environmental Services (ENV)

Manuel Lanuevo, Chief Refuse Division
Markus Owens, Public Information Officer
Ahmad Sadri, Energy Recovery Administrator
Henry Gabriel, Recycling Branch Head
Joshua Nagashima, Assistant Refuse Collection Administrator
Miya Devoogd, Planner V
Julie Ann Leano, Planner V

Department of Planning and Permitting (DPP)

Franz Kraintz, Planner VI

Other: Tina Alder, District Manager, Waste Management of Hawaii Inc.
John Katahira, The Limtiaco Consulting Group

Public: Cynthia Rezenthes (NB #36)
Chris Goodin, Ko Olina Community Association
JohnnieMae Perry (NB #24)
Priam Kanealii (NB #24)
Evan Miyaki
Katherine Kamada
Linda

Questions and Answers

Q: When will Admin determine who they will select for the new committee to review potential new landfill sites?
A: ENV created a preliminary pool of Landfill Advisory Committee candidates who represent diverse specialties in the governmental, commercial, and other non-governmental sectors. The Mayor's Office has reviewed the list and ENV has begun contacting these individuals, who will accept or decline the invitation by early September 2021.

C: PVT Landfill's expansion was not denied. Due to the Act, they withdrew their permits.
A: DPP clarified that PVT Landfill withdrew their expansion permit applications due to the passage of Act 73.

C: The Landfill Mind Map is difficult to read.
A: The slides that will be posted along with these meeting notes will contain a more readable version of the mind map.

Q: The boundary amendment is on hold. However, has ENV decided if it will do an EIS or SEIS for the boundary amendment petition for WGSL? When does ENV intend to start working on the EIS process? When does ENV anticipate finishing the EIS process?
A: ENV had planned to begin the environmental review process for the DBA but that is on hold at this time pending further development of future landfill siting activities. ENV had not determined the form that the environmental review would take.

Q: Is it typical to have these wide ranges in waste tonnages vary from month to month?
A: The variation in landfill tonnage in April, May and June 2021 was due to the once in 6-year major overhaul of H-POWER turbine generator #1, which lasted from May 1 to June 18, 2021. A normal month is about 4,000 tons MSW, 12,000 tons ash and 4,000 tons residue. May and June had high MSW and low ash and residue due to the outage.

C: Suggest that the City reroute contaminants such as asbestos to military disposal sites instead of WGSL. Military should be familiar with the disposal of ordnance.
A: The City is developing a policy for military asbestos containing materials (ACM) disposal. The initial decision was to deny these profiles but after consulting with MCBH it was determined that MCBH policy is to not accept contractor wastes including ACM at MCBH landfill and that MCBH Landfill's solid waste permit and operating plans would need to be updated. In the meantime, ENV is approving military ACM profiles at WGSL while we coordinate with MCBH and DOH.

Q: How do tiny islands disposal of their waste such as Antigua, Costa Rica? City investigate other countries' waste disposal and landfill methods?
A: Guam uses a landfill. When ENV last discussed with Bahamas years ago they were considering waste to energy (WTE) technology but ENV believes they are still using landfill at this time. Neighboring Hawaiian islands are also using landfill. WTE technology was considered by Hawaii County but at the time they did not have economies of scale and the costs were too high. WTE is a good option for remote islands to consider due to high tip fees, high cost of land, high energy costs and limited space for landfills.

Q: Do you think plasma arc gasification is feasible on Oahu?
A: Oahu had a 1 ton per day medical waste plasma arc facility but it shut down 10-15 years ago. Based on the latest information from the Solid Waste Association of North America (SWANA) and ENV's technical consultants:

- There are currently no operating commercial-scale plasma arc gasification facilities in North America. The Ottawa, Canada and St. Lucie County, Florida projects both failed to proceed past the planning, financing and permitting stage and are not active.
- Mostly used overseas (i.e. Japan) for hazardous waste (very high tip fee), auto shredder fluff, ash, or other homogenous wastes
- 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
- Still faces major obstacles including:
    - inability to scale up to commercial-scale, excessively high cost, lot of downtime
    - inability to obtain financing and regulatory permits,
    - needing large amounts of power purchased and imported from the utility to power the plasma torches, and
    - high maintenance demands and limited life

Until these challenges are resolved, plasma arc technology is not being considered by the City for commercial-scale trash processing. As the City proceeds with developing the future site to be named, the Hawaii Revised Statues Chapter 343 environmental review process requires an alternatives analysis to be conducted that will identify feasible alternative options to a landfill.

Q: Have you looked at new technology like FastOX?
A: ENV was not familiar with FastOX. After reviewing materials available online, FastOX appears to be plasma arc technology.

C: A list of abbreviations should always be displayed.
A: ENV agreed to display abbreviations in some fashion, such as spelling them out or adding a key of abbreviations to the slides. We have been making an effort to spell out the abbreviations in the meeting notes the first time they are used.