

Report to the Joint Standing Committee on the Environment and Natural Resources

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Maine Solid Waste Generation And Disposal Capacity Report for Calendar Year 2017

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I Introduction

This report is submitted to the Joint Standing Committee on Environment and Natural Resources pursuant to 38 M.R.S. § 2124-A. It provides an overview of Maine's solid waste generation, diversion, and disposal activities for 2017, and an evaluation of Maine's progress toward our municipal solid waste (MSW) reduction and recycling goals. The report also includes a projection of the solid waste disposal needs of Maine for the next 5, 10, and 20 years, and how the current fill rate at each solid waste landfill is projected to affect the expected lifespan of that landfill.

II. Solid Waste Management in Maine - 2017 Highlights

- The total amount of municipal solid waste (MSW) and construction and demolition debris (CDD) generated in Maine and managed through licensed solid waste facilities in 2017 was 1,403,249 tons. Overall disposal of MSW decreased from 759,638 to 721,646 tons, resulting in a decrease in the per capita disposal amount from 0.571 to 0.540 tons per person from 2016 to 2017.
- In 2017, Maine's MSW recycling rate (exclusive of construction and demolition debris) was 38.09%, a small increase from the 2016 rate of 36.79% (calculated using the best available data).
- The tonnage of food scraps and other organic materials reported as diverted from disposal and sent to composting or anaerobic digestion increased to 17,572 tons in 2017 from 16,716 tons in 2016, a 5.12% increase.
- Based on the currently licensed and operating disposal facilities and management systems, the disposal capacity for Maine generated MSW and its residual streams remains adequate into the near-term future. This includes three waste-to-energy (WTE) facilities, seven municipally-owned landfills, one active state-owned landfill, and one commercially-owned landfill.

III. Generation and Management of Solid Waste in 2017

A. Overview of the management of Maine's solid waste in 2017

Solid waste in Maine is generated by residential, commercial, institutional and industrial entities, and is categorized as municipal solid waste (MSW), construction and demolition debris (CDD), landclearing debris (LCD), and special wastes. MSW is the typical solid wastes generated by household and normal commercial sources. Special wastes are solid wastes that that are "generated by sources other than household and typical commercial establishments that exists in such an unusual quantity or in such a chemical or physical state, or any combination thereof, that may disrupt or impair effective waste management or threaten the public health, human safety or the environment and requires special handling, transportation and disposal procedures" (see Appendix A for relevant definitions).

In Maine, solid waste is managed by a combination of municipal, commercial, and private industrial waste handling services and facilities. Once collected, solid waste may be temporarily stored, transported, recycled, processed, composted, anaerobically digested, beneficially used in place of virgin materials and as fuel, combusted at waste-to-energy (WTE) facilities, or landfilled. Maine's *Solid Waste Management Regulations* (06-096 CMR 400 – 419) set risk-based standards for the handling of solid waste with the ultimate purpose of protecting public health and the environment.

38 M.R.S. § 2101, Maine's *Solid Waste Management Hierarchy*, sets an integrated approach to solid waste management as State policy. This "Hierarchy" sets waste reduction as the highest priority, followed by reuse, recycling, composting, volume reduction through waste-to-energy incineration, and landfilling as the management option of last resort. Separately examining the management of MSW, CDD and special wastes can help Maine's policymakers identify opportunities to effect positive changes to divert materials from disposal and move the management of various components of the solid waste stream up the Hierarchy. Tables 1 and 2 present a summary of the amounts and disposition of MSW, CDD and LCD generated in Maine and managed as solid waste in 2017.

MSW disposition	tons
Maine MSW landfilled in state	241,587
Maine MSW disposed of through incineration in state (amount destroyed through combustion)	344,233
Maine MSW incinerator ash landfilled (all in-state)	102,397
Maine MSW disposed of out-of-state	33,429
subtotal Maine MSW (exclusive of CDD) disposed	721,646
Paper, cardboard, plastics, metals, glass and textiles recycled - (voluntarily reported by materials processors and brokers)	201,837
Other MSW recycled [electronics, white goods, other metals not reported by brokers (includes vehicles), tires, and vehicle batteries]	224,648
Reported MSW composted (includes anaerobically digested food scraps with residuals recycled	17,572
subtotal Maine MSW recycled & composted	444,056
total Maine MSW generated (exclusive of CDD)	1,165,702
Maine's MSW Recycling Rate (exclusive of CDD) = 38.09%	

Table 1 - Maine MSW management - calendar year 2017

Waste type and disposition	tons				
Mixed CDD disposed of in state*	170,971				
Mixed CDD disposed of out of-state	4,547				
subtotal Maine CDD disposed	175,517				
Processed CDD recycled in to new wood products	9,240				
Processed CDD and land-clearing debris beneficially used as fuel	26,143				
Processed CDD and land-clearing debris beneficially used (e.g., as mulch, erosion control mix, and in asphalt production)	26,646				
Subtotal Maine CDD recycled & beneficially reused	62,029				
Total Maine CDD and land-clearing debris managed as solid waste	237 , 547				
Maine's CDD & land-clearing debris diversion from disposal rate (includes recycling and beneficial use) = 26.11%					

* includes only Maine-generated portion of CDD processing wastes from processing facilities located in Maine

The data for calendar year 2017 utilized in this report are collected from a variety of sources, including:

- licensed public and private processing, composting, and disposal facilities' annual reports submitted to the Department (in accordance with 38 M.R.S. §§ 1304-C, 2205, and 2232), and to other states' regulatory agencies (from out-of-state facilities which receive waste from Maine);
- data on the recycling of electronics, tires, vehicle batteries, consumer batteries, mercuryadded lamps and textiles was obtained through a combination of voluntary and mandatory reports from the specialized businesses that manage these consumer products. This includes data reports required by Maine's product stewardship laws, data from hazardous waste manifests, and voluntary reporting by major collectors of these items; and
- voluntary reporting¹ by commercial entities managing recyclables generated in Maine.

Note that data on backyard, school based, and small, on-farm composting operations is not collected, so cannot be included in the calculation of Maine's MSW recycling rate.

¹ The Department is appreciative of the data voluntarily provided by generators/brokers of recyclables and acknowledges the reluctance of others in providing data due to lack of protections from *Freedom of Access Act* requests for information the business may consider as 'confidential business information'.

IV. Progress toward Maine's Waste Reduction and Recycling Goals

A. Maine's municipal solid waste disposal reduction goal

In 2017, Maine's statutory goal for waste reduction was amended to focus on the readily-measurable amount of MSW sent for disposal. 38 M.R.S. § 2132(1-B) states:

State waste disposal reduction goal. It is the goal of the State to reduce the statewide per capita disposal rate of municipal solid waste tonnage to 0.55 tons disposed per capita by January 1, 2019 and to further reduce the statewide per capita disposal rate by an additional 5% every 5 years thereafter. The baseline for calculating this reduction is the 2014 solid waste generation and disposal capacity data gathered by the department.

In 2014, Maine generated and sent for disposal (landfilling and WTE incineration) 757,049 tons of MSW, exclusive of CDD. This established the baseline per capita disposal rate at 0.5697 tons per person (Maine's estimated 2014 population was 1,328,903).² Maine's per capita disposal rate fell to 0.5402 tons per person, a 5.2 % decrease in MSW disposed per capita in 2017 compared to the 2014 baseline year. (Note that the waste reduction goal set to be achieved by January 1, 2019 was achieved by January 1, 2018. However, anticipated decreases in recycling in 2018 may result in an increase in per capita disposal.)

B. Maine's municipal solid waste recycling rate

38 M.R.S. § 2132.1 sets Maine's statewide goal for the recycling of municipal solid waste:

1. State recycling goal. It is the goal of the State to recycle or compost, by January 1, 2021, 50% of the municipal solid waste tonnage generated each year within the State.

In 2017, Maine's recycling rate for MSW (exclusive of CDD) was 38.09%, an increase from the 2016 rate of 36.79%. The MSW recycling rate is calculated by dividing the total amount of MSW recycled and composted by the total amount of MSW generated in-state in accordance with 38 M.R.S. § 2132 (3) based on the best available data. The Department obtains accurate and complete MSW disposal data from annual facility reports to the Department and adjacent jurisdictions (NH & NB). Data on materials composted and recycled is not comprehensive due to limited reporting requirements.³ Recycling data are obtained from voluntary reporting on materials recycled from the primary brokers of recyclables in Maine and from annual reports of licensed processing facilities.

² U.S. Census Bureau, Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2010 to July 1, 2017 (NST-EST2017-01), <u>https://www.census.gov/data/tables/2017/demo/popest/state-total.html</u>, accessed October 18, 2018.

³ Any compost facilities that accepts less than 5 cubic yards of food scraps monthly and on-farm compost facilities that accept less than 60 cubic yards of food scraps monthly are exempt from Department licensing and annual reporting requirements.

C. Management of Special Wastes

Table 3 shows the types of solid wastes other than MSW, CDD and land-clearing debris generated in Maine, and how each waste type was managed in 2017. Some of the material landfilled is managed in generator-owned and operated facilities with the remainder disposed of at the State's Juniper Ridge Landfill and the commercial Crossroads landfill in Norridgewock.

WASTE TYPE	Composted	Beneficial Use	Land applied	Anaerobic digestion	Combusted	Landfilled
Asbestos/Asbestos Containing Waste	-	-	-	-	-	Х
Ash - Coal, oil and multi-fuel boiler	X	Х	Х	-	-	Х
Ash - MSW Incinerator	-	-	-	-	-	Х
Ash- wood & burn pile/hot loads	-	-	-	-	-	Х
Ash/Liming Agent – Other	-	-	Х	-	-	-
Catch basin grit and street sweepings	-	Х	-	-	-	Х
Contaminated Soils – oil	-	Х	-	-	-	Х
Contaminated Soils - non-petroleum	-	Х	-	-	-	Х
Contaminated soils - other	-	-	-	-	-	Х
Dredge Spoils	-	Х	-	-	-	Х
Fish/Food Process Residue	X	Х	Х	Х	-	Х
Industrial/Industrial Process Waste	-	-	-	-	-	Х
Other Special Wastes	-	-	-	-	Х	Х
Pulp/Papermill Sludge	X	Х	-	-	-	Х
Sandblast Grit	-	Х	-	-	-	Х
Short-Paper Fiber	-	Х	-	-	-	Х
Shredder Residue	-	-	-	-	-	Х
Industrial waste water treatment plant sludge	-	-	Х	-	-	Х
Municipal waste water treatment plant sludge	Х	-	Х	Х	-	Х

Table 3 - Management of Special Wastes

V. Solid Waste Disposal Capacity

A. Current and projected disposal capacity

In 2017, Maine's active solid waste disposal facilities included three WTE facilities, seven municipally-owned landfills, two state-owned landfills, and one commercially owned landfill. There is one other licensed state-owned landfill site, known as Carpenter Ridge, located in T2 R8, that remains undeveloped. That site, with a landfill design for approximately two million cubic yards of special wastes, was acquired by the State in the mid-1990's and is held by the State for development of disposal capacity when needed.

Based on the current operations of the licensed disposal facilities in Maine, the Department projects that disposal capacity for MSW (including CDD) generated in Maine will remain adequate into the near term. This conclusion is based on projections calculated using fill rates and capacity use data reported by licensed facilities in their annual reports on calendar year 2017 activity.

Table 4 shows the current and projected available waste-to-energy (WTE) disposal capacity in Maine, by licensed facility, through 2037.

Waste-to-Energy Facilities	Annual capacity (tons/year)	2017 (tons/year)	2022 (tons/year)	2027 (tons/year)	2037 (tons/year)
MMWAC – Auburn	70,000	70,000	70,000	70,000	70,000
ecomaine – Portland	170,000	170,000	170,000	170,000	170,000
PERC – Orrington*	310,000	304,000	210,000	210,000	210,000
Total Waste-to- Energy Facility capacity in tons	550,000	544,000	450,000	450,000	450,000

Table 4 - Available Licensed MSW Disposal Capacity at Maine's Waste-to-Energy Facilities - as of December 31, 2017

The PERC annual capacity of 310,000 is the engineered capacity of its two boilers operating full time. In 2018, PERC changed its boilers' operating time, resulting in an operational reduction in waste incineration capacity to 210,000 tons annually.

Table 5 shows the current and projected available landfill disposal capacity (cubic yards) in Maine, by licensed facility, through 2037. Table 6 shows the total current and future projected MSW disposal capacity in tons (landfill and WTE incineration). Table 7 shows the solid wastes received by each of the three currently operating WTE facilities, the percentage by generating state, how the waste was managed, and the various residue streams created.

Landfills	2017 Fill rate (yd ³)	2017 available (yd ³)	2022 available (yd ³)	2027 available (yd ³)	2037 available (yd ³)	Years of licensed capacity remaining at current fill rate
State-owned landfi	lls	- 1. T. I.		212,412	1.	
Carpenter Ridge – T2 R8	N/A	not constructed	not constructed	not constructed	not constructed	N/A
Juniper Ridge – Old Town	773,374	11,021,029	7,154,159	3,287,289	0	14.3
Municipal MSW lar	ndfills					
Hatch Hill (Augusta)	61,000	712,500	407,500	102,500	0	11.7
Bath	24,000	376,000	256,000	136000	0	15.7
Brunswick	42,000	150,300	0 (closed)	0 (closed)	0 (closed)	N/A
Presque Isle	20,177	1,382,473	1,281,588	1,180,703	978,933	68.5
Tri-Community (Fort Fairfield)	51,935	1,514,122	1,254,447	1,514,122	475,422	29.2
W-T-E ash landfill	s					
ecomaine	36,050	963,950	783,700	603,450	242,950	26.7
Lewiston	19,132	494,610	398,950	303,290	111,970	25.9
Commercial landfi	ü					
Waste Management - Crossroads – Norridgewock*	435,865	2,574,892	395,567	0	0	5.9
Total remaining licensed landfill capacity (yds ³)	N/A	19,189,876	11,931,911	3,840,065	1,809,275	N/A

Table 5 - Available Licensed Landfill Disposal Capacity and Projected Landfill Life as of December 31, 2017

*Application pending for approximately 7,000,000 cubic yards additional capacity to add 15 operating years

Table 6 - Total Available Solid Waste Disposal Capacity in Tons

Available MSW disposal capacity in tons	2017	2022	2027	2037	
Annual Waste-to-Energy facility capacity in tons	544,000	450,000	450,000	450,000	
Total remaining landfill capacity in tons* (MSW)	13,049,116	8,113,699	2,611,244	1,230,307	
Total Capacity for MSW (tons)	13,593,116	8,563,699	3,061,244	1,680,307	

*Volume to Weight Conversion Factors, U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery, April 2016: 1 cubic yard MSW=0.85 tons

Facility	Total MSW received (tons)	Other wastes received (tons)	Total waste received (tons)	Percent from Maine	Percent from MA	Percent from NH	Waste shipped as by- pass* (tons)	Materials recycled (tons)	Waste combusted (tons)	Ash (tons)	Waste destroyed through combustion (tons)	Percent landfilled**	Percent recycled
ecomaine	171,041	19,189	190,230	97.13%	0.00%	2.87%	7,564	5,046	177,620	42,407	135,213	26.27%	2.65%
Mid Maine Waste Action Corporation	79,951	0	79,951	99.83%	0.00%	0.18%	5,945	3,126	70,879	19,038	51,841	31.25%	3.91%
Penobscot Energy Recovery Company	316,601	4,292	320,893	81.26%	17.41%	1.34%	5,978	7,290	307,625	52,904	254,721	18.35%	2.27%
TOTALS	567,593	23,481	591,074	88.88%	9.45%	1.67%	19,487	15,462	556,124	114,349	441,775	22.64%	2.62%

Table 7 - 2017 Solid Waste Managed by Maine Waste-to-Energy Facilities

B. Factors affecting disposal capacity

In 2017, 1,463,533 cubic yards of landfill capacity in Maine was filled with MSW, CDD, and special wastes, i.e., non-hazardous industrial wastes and wastes requiring special handling (e.g., asbestos). This includes waste from out-of-state sources as well as wastes from Maine, but does not include special wastes disposed of in generator owned landfills affiliated with specific industrial facilities and operations.

Solid wastes generated in other states may be disposed of at the waste-to-energy facilities and the commercially owned landfill in Maine. Almost 89% of the MSW disposed of through combustion in Maine in 2017 was from Maine. All the MSW disposed of in landfills in Maine was generated in Maine, although this includes wastes generated by WTE incinerators and processing facilities in Maine which receive significant amounts of MSW and CDD from other states.

The disposal capacity at the state-owned Juniper Ridge Landfill (JRL) is restricted by license condition to wastes generated in Maine. This includes any wastes generated by processing or combustion facilities in Maine which can accept and manage wastes from other states even though a portion of the waste these facilities generate is a result of managing wastes from other states. For example, PERC received 18.7% of the waste it managed from sources outside of Maine. This means that an estimated 18.7% of the 64,424 tons of PERC wastes landfilled at JRL (12,047 tons) resulted from the management of MSW generated outside of Maine. Similarly, the ReEnergy CDD processing facility in Lewiston received 94% of the 144,239.5 tons of CDD wastes shipped from ReEnergy to the Juniper Ridge Landfill were generated as a result of processing CDD waste from other states. In addition, Aggregate Recycling Corp received 38.9% of the CDD it processed from out-of-state sources, resulting in 13,877 tons of the 35,674 tons of CDD waste landfilled at JRL being generated as a result of processing wastes from outside of Maine.

In 2017, the Municipal Review Committee, Inc. and Fiberight, L.L.C. received a permit from the Department to develop a new solid waste processing facility designed to accept and manage 650 tons of MSW per day. Until April 2018, MSW from the 115 MRC municipalities was disposed of at the Penobscot Energy Recovery Facility (PERC) in Orrington, Maine. When construction of the Fiberight facility was not completed by April 2018, MRC redirected MSW from its communities to JRL and the privately-owned Crossroads landfill in Norridgewock. This change will impact landfill fill rates in 2018 and 2019. Once the Fiberight facility is fully operational for a complete calendar year (anticipated to 2020), it will be possible to assess whether the amount of bypass and processing residue resulting from its operations will significantly alter the amounts of solid waste destined for landfilling in comparison to previous management of these towns' MSW through the PERC waste-to-energy facility.

VI. Solid Waste Industry Consolidation in 2017

38 M.R.S. § 2124-A requires that this annual *Waste Generation and Disposal Capacity Report* include "…an analysis of consolidation of ownership in the disposal, collection, recycling and hauling of solid waste". In Maine, collection, processing and disposal services for discarded materials are provided by a mix of public and private entities. The analysis of consolidation in Maine's solid waste industry is intended to identify the potential for unfavorable impacts on competition, i.e., conditions that may either create a decrease in services or a monopolistic situation.

In its 2012 session, the Maine Legislature transferred responsibility for conducting this analysis from the State Planning Office to the Department, but did not provide any resources for performing a comprehensive review. Given the constraint of fulfilling this assignment without the benefit of additional resources, the Department has performed an anecdotal review of the solid waste industry in Maine and found that there were no significant changes in facilities and services operating in Maine in 2017.

Readily available information on activity in the solid waste industry in Maine in 2018 indicates that competition in the industry may be more limited than in previous years. Casella Waste Services, a vertically-integrated waste management services company providing collection, transportation, recycling and disposal services, acquired 2 smaller Maine-based waste haulers, reducing the number of companies available to provide services in Maine. Casella also entered into agreements with other solid waste service providers [the Municipal Review Committee, Waste Management Disposal Services of Maine, and the Penobscot Energy Recovery Company] that redirected MSW previously disposed of through incineration at PERC to the state-owned Juniper Ridge landfill. It is not possible to tell if these private contractual agreements act to restrict waste management options and/or potentially create monopolistic conditions. Due to these recent developments, the Legislature should consider directing resources to more quantitively assess consolidation in the solid waste industry in Maine, including the authority to compel release of records as needed to complete a comprehensive assessment.

VII. Disposal Fees and Supracompetitive Prices

A. Disposal Fees

Disposal expenses are comprised of collection, consolidation and transportation costs, and include tipping fees on the disposal of waste at a facility, with the tipping fee often being a major share of those costs. Current tipping fees vary at each facility, but generally range from \$40 to \$85 per ton at Maine's waste-to-energy facilities and landfills.

The State's operating services agreement with Casella Waste Systems Inc. for the state-owned Juniper Ridge Landfill includes a ceiling for tipping fees, which varies by waste type. This sets an upper limit on how much can be charged for wastes delivered to that landfill. Casella can offer customers a lower tipping fee, but cannot exceed the fees set in the operating services agreement. This cap is exclusive of any fees the State may establish by legislation on wastes being disposed of in the landfill.

In 2016 the Department issued license #S-022458-WK-A-N to the Municipal Review Committee (MRC) (a non-profit managing MSW issues for 115 Maine towns and cities) and Fiberight, LLC (Fiberight) to develop a mixed solid waste processing facility in Hampden, Maine. This facility is designed to process 650 tons per day of mixed MSW into recyclables, renewable fuels and solid waste residues for off-site disposal. Until April 2018, MSW from the 115 MRC municipalities was disposed of at the Penobscot Energy Recovery Facility (PERC) in Orrington, Maine. Beginning in April 2018, MRC directed MSW from its communities to JRL and the Crossroads landfill in Norridgewock until the Fiberight plant is operational. MRC has provided its communities the option of maintaining management of their MSW through incineration rather than through the least-preferred landfilling option by paying a \$50 per ton premium over the per ton cost to landfill MSW, exacerbating the current market economics that incentivize landfilling over incineration.

B. Supracompetitive Prices

Supracompetitive, as applied to 'prices,' means prices that are higher than they would be in a normally functioning, competitive market; usually resulting from overconcentration, collusion, or some form of monopolistic, oppressive practice. 38 M.R. S § 2124-A requires the Department to determine whether changes in the amount of available landfill capacity have generated, or have the potential to generate, supracompetitive prices and if so, provide recommendations for legislative or regulatory changes as necessary.

Currently, the combined and available disposal capacity at all the operating municipal, commercial and state owned landfills within Maine does not appear to have generated, nor does it appear in the near term to have the potential to generate, supracompetitive disposal fees. In looking ahead, however, prices could become supracompetitive if disposal facilities no longer have capacity to serve regional needs or if waste processing capacity declines.

Appendix A - Definitions and Acronyms

The following definitions are provided to assist the reader in reviewing this document:

- Beneficial Use to use or reuse a solid waste or waste derived product as a raw material substitute in manufacturing, as construction material or construction fill, as fuel, or in agronomic utilization.
- Construction/Demolition Debris (CDD) solid waste resulting from construction, remodeling, repair, and demolition of structures. It includes but is not limited to: building materials, discarded furniture, asphalt, wall board, pipes, and metal conduits. It excludes: partially filled containers of glues, tars, solvents, resins, paints, or caulking compounds; friable asbestos; and other special wastes..
- Disposal the discharge, deposit, dumping, spilling, leaking, placing or incineration of any solid waste into or on any land, air or water so that the solid waste or any constituent thereof may enter the environment or be emitted into the air, or discharged into any waters, including ground waters. This term does not include beneficial use activities approved or exempted under the Solid Waste Management Regulations.
- Handle to store, transfer, collect, separate, salvage, process, recycle, reduce, recover, incinerate, dispose of, treat, or beneficially use.
- Land clearing debris solid wastes resulting from the clearing of land and consisting solely of brush, stumps, soil material, and rocks.
- Municipal Solid Waste (MSW) solid waste emanating from household and normal commercial sources. Municipal solid waste includes front end process residue from the processing of municipal solid waste.
- Recycling the collection, separation, recovery and sale or reuse of materials that would otherwise be disposed of or processed as waste, and the creation and recovery of reusable materials to create new products; the incineration or use of recovered materials as a fuel for the generation of electricity is not recycling.
- Solid waste useless, unwanted or discarded solid material with insufficient liquid content to be free flowing, including but not limited to rubbish, garbage, refuse-derived fuel, scrap materials, junk, refuse, inert fill material, and landscape refuse, but does not include hazardous waste, biomedical waste, septic tank sludge, or agricultural wastes.
- Special Waste wastes that are generated by other than domestic and typical commercial establishments that exist in such an unusual quantity or in such a chemical or physical state that require special handling, transportation and disposal procedures.

- Supracompetitive when applied to prices means prices that are higher than they would be in a normally functioning, competitive market -- usually as a result of overconcentration, collusion or some form of monopolistic, oppressive practice.
- Waste-to-Energy facilities (WTE) facilities which receive municipal solid waste, and through processing and combustion, recover energy and convert it into electricity, while reducing the volume of waste requiring disposal.