

**Sustainable Aviation Fuel
Biomass Assessment:
Municipal Solid Waste**

Prepared for
Alaska Department of Transportation



707 SW Washington Street, Suite 1300
Portland, OR 97205
503-224-3445 | www.masonbruce.com
Julu 30, 2026

Introduction

Municipal solid waste (MSW) consists of everyday items we use and then throw away. This comes from our homes, schools, hospitals, and businesses. In most cases, MSW is an unutilized resource relegated to landfills. Potential utilization of MSW or landfill gas could reduce landfill burden and create value from materials that are currently underutilized; however, this memo does not establish commercial availability, conversion yield, lifecycle carbon intensity, or suitability as a primary feedstock for the ANSyR preferred pathway.¹

Relationship to ANSyR Design Basis

The ANSyR Technical and Economic Analysis evaluates a large-scale Port MacKenzie-centered Fischer–Tropsch Synfuel Refinery. This memo is a preliminary resource screen and does not modify the ANSyR proposed feedstock slate, production volume, lifecycle carbon-intensity result, capital cost estimate, or pathway selection. Any use of the resource described here would require separate technical, commercial, permitting, lifecycle, ASTM/pathway, and integration analysis before inclusion in the ANSyR design basis.

Description of the Resource

MSW is most easily sourced from landfills. Municipal solid waste may provide two resource streams potentially relevant to SAF or synfuel development: source-separated organic material and landfill gas. Use of either stream would require separate technical evaluation of collection, sorting, contamination, conversion pathway, gas cleanup, lifecycle treatment, and integration with the ANSyR process design. Landfill gas is a natural byproduct from the decomposition of organic materials in landfills. Landfill gas is composed of roughly 50 percent methane (the primary component of natural gas), 50 percent carbon dioxide (CO₂) and a small amount of non-methane organic compounds.

Quantity of the Resource

Waste management in Alaska differs from the rest of the United States in that nearly one-third of Alaskans live in rural communities with no access to Class 1 (high volume) landfills.² Landfills currently operating in Alaska include:

- Nine Class 1 landfills (receive more than 20 tons of municipal solid waste [MSW] per day);
- 13 Class 2 landfills (receive between five and 20 tons of MSW per day); and
- 184 Class 3 village landfills (receive less than five tons of MSW per day).³

The nine Class 1 landfills contain the greatest volume of MSW in the state and are in the most populous areas.

Alaska Class 1 landfills received a combined total of approximately 726,000 tons of MSW in 2023 (Figure 1). Of this total, approximately 407,000 tons were delivered to Class 1 landfills in the Anchorage, Mat-Su, and Kenai Peninsula regions, the focal areas of this memo. Additionally, five Class 3 landfills operate in or near these regions. Reported MSW figures include all waste types. EPA reports that organic waste, which produces landfill gas, accounts for about 50% of total MSW.⁴

Landfill gas production at the Anchorage Regional Landfill is stated to be 3.17 million cubic feet per day.

¹ This resource assessment memo provides only an overview of resource quantity and price information. It is not an assessment of feasibility to use the resource to produce sustainable aviation fuel.

² Waste360. "Alaska's Unique Solid Waste Management Tactics." <https://www.waste360.com/waste-management-business/alaska-s-unique-solid-waste-management-tactics>

³ Alaska Department of Environmental Conservation. (2024, April 1). "Response to Senate Resources Committee questions on SB 175 and HB 143." <https://dec.alaska.gov/>

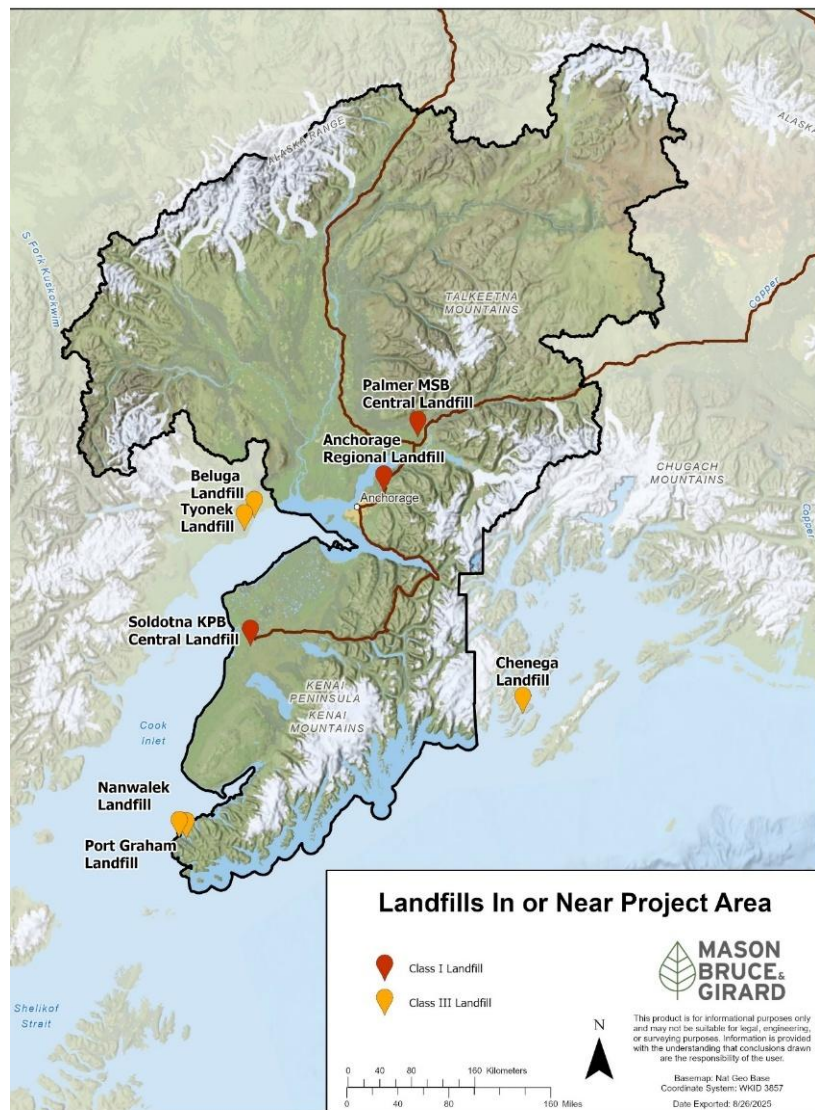
⁴ <https://www.epa.gov/sustainable-management-food/composting>

Table 1. Alaska Class 1 landfill MSW volume, 2023.

Location	Landfill	Region	Annual tons MSW, 2023	Estimated Organic Waste tons, 2023
Focal area	Anchorage Regional Landfill	Anchorage	297,000	149,391
	Palmer MSB Central Landfill	Matanuska-Susitna	64,754	32,571
	Soldotna KPB Central Landfill	Kenai Peninsula	45,149	22,710
	Focal area total		406,903	204,672
Other regions of Alaska	Fairbanks South Cushman Landfill	Fairbanks North Star	94,320*	47,443
	Fort Wainwright Landfill	Fairbanks North Star	28,451	14,311
	Juneau Capitol Disposal Landfill	Southeast	22,345	11,240
	Kodiak KIB Landfill	Kodiak Island	9,479	4,768
	Oxbow Landfill	North Slope	159,334	80,145
	Unalaska Landfill	Aleutians West	5,141	2,586
Statewide total			725,973	365,164

*7,860 tons reported from 7/1/24 – 7/31/24.

Figure 1. Class 1 and 3 landfills in the Anchorage, Mat-Su, and Kenai Peninsula regions.



The Anchorage Regional Landfill, Palmer MSB Central Landfill, and Soldotna KPB Central Landfill collectively received 406,903 tons of MSW in 2023. Anchorage Regional Landfill accounts for nearly three-quarters (73%) of total waste.

Within the focal area, the Anchorage Regional Landfill is the largest, accounting for 73% of landfill deliveries in the area, 297,000 tons annually. The Anchorage Regional Landfill is developing plans to utilize MSW in a large-scale waste-to-energy project. Currently, a portion of the landfill gas produced at the facility is used by Doyon Utilities for a small-scale gas-to-energy project, the remaining gas is flared.⁵

Estimated Cost of Delivery

The cost of organic material delivery to Port MacKenize ranges from \$24 per ton from Palmer to \$98 from Soldotna, due to differences in trucking distances. Utilization of MSW from Class 2 and 3 landfills and more distant parts of Alaska would be more expensive than what is reported here, due to the need to develop sorting capability at these landfills, the lack of scale these smaller facilities provide, and transport distances.

⁵ Based on information from and interview and email correspondence with a representative from the Municipality of Anchorage Solid Waste Services in June and July 2025.

Cost of delivery of landfill gas depends on delivery method. Delivery of landfill by trucking compressed gas would cost approximately \$48 per ton, \$64 per ton, or \$196 per ton from Plamer, Anchorage, and Soldotna, respectively. Trucks transporting compressed gas are more expensive to operate than trucks carrying organic waste, due to higher capital costs for equipment and costs related to permitting, driver training, and insurance. However, landfill gas and organic waste have different energy content, and the type and intensity of further processing needed to be a viable source of biomass for use in SAF production will be different also. Other potential delivery methods would require substantial but quantified capital investments and may not be feasible. These include delivery by rail or pipeline.

Table 2. Annual tons MSW, by landfill, 2023, analysis area.

Landfill	Annual tons MSW, 2023	Percent of total MSW
Anchorage Regional Landfill	297,000	73%
Palmer MSB Central Landfill	64,754	16%
Soldotna KPB Central Landfill	45,149	11%
Total	406,903	100%

Methods

Quality Estimates

MSW volume estimates are based on Alaska Department of Environmental Conservation data.⁶ All data reported are annual values for 2023, except for the Fairbanks South Cushman Landfill, for which we annualize data for July 2024. We assume MSW volumes are generally stable over time.

Cost Estimates

In developing costs estimates, we assume organic material is sorted at transfer facilities affiliated with the Soldotna landfill and on site at the Palmer and Anchorage landfills at no additional cost compared to normal operations. Only organic material would be transported to Port MacKenzie. Trucking costs are based on data from the EPA, updated to 2025 dollars.⁷ Costs for trucking compressed gas come from fleet data provided, showing that trucks used for compressed gas transport cost about twice as much to operate as non-specialized trucks.⁸

⁶ DEC. "Solid Waste Information Management System (SWIMS)." <https://dec.alaska.gov/Applications/EH/SWIMS/Default.aspx>. Data for 2023, expect for the Fairbank South Cushman Landfill for which we annualize data for July 2024.

⁷ <https://www.epa.gov/sites/default/files/2016-03/documents/r02002.pdf>

⁸ <https://www.fleetworks.ai/resources/rate-per-mile-trucking>