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Niagara Falls, New York 14304
United States
www.ghd.com

Your ref: DEC ID 7-3126-00070
Our ref: 12645193

04 September 2025

Trendon P. Choe
Department of Environmental Conservation
Division of Environmental Permits
5786 Widewaters Parkway
Syracuse, NY 13214-1867

RE: 7-3126-00070, Syracuse Haulers Waste Removal Inc., 6223 Thompson Rd, Syracuse, NY, Onondaga County – Solid Waste Management – Permit Modification – CLCPA Comments – Response to CLCPA Comments Letter

Dear Trendon,

The New York State Department of Environmental Conservation (DEC)'s letter dated July 18, 2025 was reviewed, which contained comments regarding the 7(3) portions of the CLCPA analysis for the above referenced facility. The CLCPA analysis was submitted to the DEC on September 30, 2024.

An initial meeting was held with the DEC on July 30, 2025 to better understand and receive guidance on potential mitigation measures that can be implemented to reduce emissions in the disadvantaged communities as part of this permit modification.

A list of mitigation measures were considered and evaluated from a quantitative and quality standpoint. A subsequent meeting was held with the DEC on August 25, 2025 to review the mitigation measures and receive initial feedback. There were no significant concerns or questions. DEC requested that the presentation slides along with the revised CLCPA evaluation tables be submitted for review, which are provided as Attachment 1 and Attachment 2 respectively.

The proposed mitigation measures include:

1. **Load consolidation:** For every 3.3 vehicles coming into the site with recyclables, after the materials are managed at the site, approximately one larger vehicle leaves the site. As part of this expansion project, approximately 2.3 vehicles are reduced, which would otherwise be required to continue traveling to their regular destination. The resulting load consolidation is shown in the evaluation tables as a credit in emissions.
2. **Frequent vehicle upgrades:** As part of this expansion project, Syracuse Haulers will commit to upgrading their vehicle fleet more frequently than currently implemented. On average, they will upgrade their vehicles every six years instead of every ten years. This will result in lower emissions in the DAC due to higher fuel economy. The resulting vehicle upgrades is shown in the evaluation tables with an increased fuel economy in the modified mobile emissions from 2025 to 2050 and a lower fuel economy in the existing mobile emissions from 2025 to 2050.
3. **Alternative employee transportation:** Currently, there are 93 full-time employees at the site. As part of the expansion project, an additional 12 full-time employees will be employed at the site, primarily from the DAC. A program will be established to encourage all employees to use alternative modes of transportation, such as carpooling and public transportation, in an effort to reduce the use of individual vehicles on the roads in the DAC. The resulting reduction of indirect emissions from mobile sources is

shown in the evaluation tables through no net change/increase in mobile emissions by light duty vehicles from 2025 to 2050. This is a conservative estimate as the implementation of such a program has the potential to reduce emissions even further than existing.

4. **Electric vehicles:** Replacing two diesel vehicles with two electric vehicles in 2050 will be considered, provided the electric vehicle options are commercially available and proven in service at that time. The vehicle replacement is shown in the evaluation tables as a credit in emissions.
5. **Plant trees/shrubs:** A mitigation condition of the Site Plan Approval from the Town of Dewitt was required in the form of planting trees/shrubs. A zoning compliance letter was granted by the Town of Dewitt for this mitigation measure in July 2025. The landscaping plan includes a combination of 41 trees and shrubs to be planted along the east fence line boundary of the site. This is acceptable as a qualitative mitigation measure but is not considered a significant source of emission reduction.
6. **Compressed natural gas (CNG) vehicles:** The feasibility of replacing several diesel vehicles with CNG vehicles was evaluated. While the evaluation showed a net reduction in GHG emissions from converting one diesel vehicle to CNG to be approximately 15 tons of CO2 emissions per year. The CO2 emission factor for diesel fuel is 22.5 pounds per gallon of diesel combusted, and 16.2 pounds per gallon of CNG combusted, which is a 28% reduction as per the Emission Factors for Greenhouse Gas Inventories (last modified on January 15, 2025). It was determined that the additional costs associated with adding a third fuel source onsite (diesel, electric, and CNG), training required for employees, outweighed the net reduction in emissions. Thus, this mitigation measure is deemed unfeasible at this time.
7. **Purchase renewable electricity:** The National Grid GreenUp Program allows users to have all, or part of their electricity generated from renewable resources. This mitigation measure, or something equivalent to the GreenUp Program, will be implemented by 2030 and is shown in the evaluation tables as a credit in upstream emissions associated with off-site fossil fuel consumption.
8. **Install electric vehicle (EV) charging station:** the feasibility of installing EV charging stations onsite and offsite were considered from a qualitative standpoint. Due to the vehicle traffic onsite for facility operations and restricted site access due to facility operating hours (not open 24/7), it was determined that installing EV charging stations onsite would expose the facility to liability and safety concerns, and thus it is considered unfeasible at this time. In addition, installing EV charging stations offsite within the DAC (parking lot/garage, hotel, hospital, school, etc.) was deemed unfeasible for similar reasons at this time.
9. **Community solar farm:** The National Grid Community Solar Program allows users to subscribe to a share of a local solar farm, which may be installed on a property within the DAC. The feasibility of this mitigation measure, or something equivalent to the Solar Program, cannot be quantified at this time as a potential property has not been selected but will be considered at a later time to support options for clean energy projects in the local DAC.
10. **Onsite rooftop solar:** The feasibility of installing rooftop solar panels onsite will be considered in 2050. This is acceptable as a qualitative mitigation measure as it may not directly reduce emissions in the DAC.

In addition to the above proposed mitigation measures, the following revisions were made to the CLCPA analysis to better reflect current operations:

1. **Vehicles already upgraded:** Since the permit application was submitted, Syracuse Haulers has proactively upgraded some of their vehicles to 2024 and 2025 models in the last two years, which have higher fuel economy. In 2023, the average vehicle age was 2016 (excluding vehicles replaced in 2024 or 2025). Currently, the average vehicle age is 2020. The increased vehicle age is reflected in the different fuel economies used in the evaluation tables between existing and modified mobile emissions in 2025.
2. **Remove upstream emissions for electricity:** At the time of the CLCPA analysis in 2024, it was assumed that the upstream emissions associated with electricity consumption were required to be included in the analysis. However, from recent relevant experience, it is understood that the upstream

emissions from the use of electricity acquired from in-state sources is not required to be calculated. Thus, the related GHG emissions have been changed to zero.

3. **Adjust fuel consumption:** At the time of the CLCPA analysis in 2024, it was assumed that the fuel consumption would increase for all vehicles by a factor of 1.67 to account for the increase in processing capacity from increase 18,894 to 32,116 tons annually. However, after doing a deeper dive on the types of vehicles, their mileage and fuel consumption, it is now confirmed that the increase in fuel consumption is only anticipated for certain vehicle types (i.e., outgoing tractors to dump trailers intended for outbound material, and incoming roll-off trucks). The evaluation tables have been revised accordingly.
4. **Reduce facility heating:** At the time of the CLCPA analysis in 2024, it was assumed that the expanded building will be heated similar to the existing building, for which an additional two unit heaters would be required. However, it is now confirmed that there are no plans to heat the expanded area. The CLCPA evaluation tables have been revised to show no net increase in emissions associated with heaters.
5. **Update emissions factors:** The Emission Factors for Greenhouse Gas Inventories was last modified on January 15, 2025 in which several changes have been made since the 2023 version was used as part of the CLCPA analysis submission in 2024. For example, the 100-year global warming potential (GWP) of CH4 has increased from 25 to 28 and N2O has changed from 298 to 265. In addition, the Mobile Combustion CH4 and N2O for Non-Road Vehicles with respect to diesel and gasoline fuel sources have also increased from 2023 to 2025 (see Construction/Mining Equipment - Diesel Off-Road Trucks in Table 5 and Passenger Cars 2007-2022 in Table 4). These changes have been made in the evaluation tables accordingly.
6. **Update Hazardous Air Pollutant (HAP) emissions:** At the time of the CLCPA analysis in 2024, the 2023 version of the Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool was used to estimate HAP emissions. The evaluation tables have been updated to reflect the current 2024 AFLEET tool.

The DEC letter dated July 25, 2025 also requests that the CLCPA analysis must consider the delta in GHG and co-pollutants within the DAC before and after the proposed project. The table below demonstrates a net decrease in GHG emissions and minimal increase in co-pollutants (particulate matter [PM] and HAPs).

Year	Net Change in CO_2 Equivalents (tons/year)	Net Change in HAPs (tons/year)	Net Change in PMs (tons/year)
2028 (Facility Modification)	-203	0.135 (270 lbs/year)	0.092 (184 lbs/year)
2030	-17.8	0.135 (270 lbs/year)	0.092 (184 lbs/year)
2050	-3.2	0.135 (270 lbs/year)	0.092 (184 lbs/year)

In addition, the letter requests for Table 2 – Summary of 2022 Air Monitoring Results – NYSDEC Region 7 from the CLCPA analysis to be revised to reflect changes made by the United States Environmental Protection Agency (EPA) in February 2024 to the National Ambient Air Quality Standards (NAAQS), which sets the level of the primary annual PM2.5 standard at 9.0 micrograms (µg) per cubic meter (m^3). The revised table is presented below for completion purposes.

Compound	Avg. Period	Station	2020 Result	Air Quality Standard	Percent of Standard
PM-2.5	24-hour	Syracuse	15.0 µg/m^3	35 µg/m^3	42.9 percent
PM-2.5	Annual	Syracuse	6.5 µg/m^3	12 µg/m^3	54.2 percent
PM-2.5	24-hour	Syracuse	11.9 µg/m^3	35 µg/m^3	34.0 percent
PM-2.5	Annual	Syracuse	5.2 µg/m^3	9 µg/m^3	57.8 percent
Ozone	8-hour	Syracuse	0.060 ppm	0.070 ppm	85.7 percent

Please let us know if you have any questions or comments.

Regards,

Steve Wilsey
Project Director
+1 716 205-1982
Steven.Wilsey@ghd.com

Copy to: Brian Parker, Steve Perrigo – R7 SMM
Michael Wheeler – R7 DAR
Kerri Pickard-DePriest – DEC OEJ
Kerry McElroy, Megan Corcoran – R7 Communications
Scott Reed, Syracuse Haulers

Attachment 1

GHD Design

Steve Wilsey
Project Director

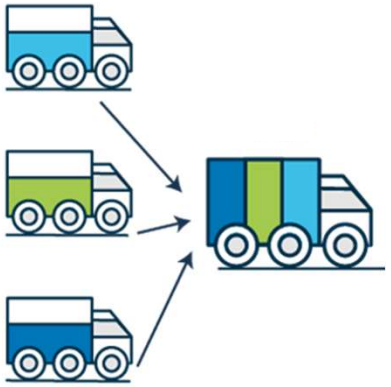
Syracuse Haulers CLCPA – Mitigation Measures

August 25, 2025

Welcome

Mitigation Measures

1. Load consolidation (3.3 incoming smaller trucks replaced with 1 outgoing larger truck).
2. Upgrade vehicles more frequently (every 6 years vs. 10 years on average).
3. Purchase renewable electricity in 2030 onwards (i.e., National Grid Community Solar Program).
4. Establish program to encourage carpooling / public transportation with facility staff in disadvantaged communities.
5. Replace 2 diesel vehicles with 2 electric vehicles in 2050, provided they are commercially available and proven in service.
6. Replace several diesel vehicles with CNG in 2050.
   - Evaluated but not feasible at this time.
7. Onsite tree/shrub planting as part of site plan approval
   - Acceptable as a qualitative mitigation measure but not a significant source of GHG reduction
8. Consider feasibility of contributing to community solar farm in 2050
   - TBD
9. Consider feasibility of placing solar panels onsite in 2050
   - TBD



Revised CLCPA

				Net Change in CO2 Equivalents	Net Change in HAPs	Net Change in PMs				Net Change in CO2 Equivalents	Net Change in HAPs	Net Change in PMs				Net Change in CO2 Equivalents	Net Change in HAPs	Net Change in PMs
				-203.0	0.135	0.092				-17.8	0.135	0.092				-3.2	0.135	0.092
	Existing			Project (2028)			2030						2050					
Emission Source	Existing Total CO_2 Equivalents	Existing HAPs	Existing PM	Mod. Total CO_2 Equivalents	Mod. HAPs	Mod. PM	Existing Total CO_2 Equivalents	Existing HAPs	Existing PM	Mod. Total CO_2 Equivalents	Mod. HAPs	Mod. PM	Existing Total CO_2 Equivalents	Existing HAPs	Existing PM	Mod. Total CO_2 Equivalents	Mod. HAPs	Mod. PM
	(ton/year) [1]	(ton/year)	(ton/year)	(ton/year) [1]	(ton/year)	(ton/year)	(ton/year) [1]	(ton/year)	(ton/year)	(ton/year) [1]	(ton/year)	(ton/year)	(ton/year) [1]	(ton/year)	(ton/year)	(ton/year) [1]	(ton/year)	(ton/year)
Upstream Emissions																		
Off-Site Fossil Fuel Consumption	1,884.2	---	---	1,730.3	---	---	1,884.2	---	---	1,414.1	---	---	1,884.2	---	---	1,414.1	---	---
Direct / Indirect Emissions																		
Mobile Emissions	5,089.0	0.4	0.6	5,040.0	0.6	0.7	4,478.5	0.4	0.6	4,930.7	0.6	0.7	3,683.4	0.4	0.6	4,150.2	0.6	0.7
Furnace	709.8	---	0.0	709.8	---	0.0	709.8	---	0.0	709.8	---	0.0	709.8	---	0.0	709.8	---	0.0
Heaters	385.3	---	0.0	385.3	---	0.0	385.3	---	0.0	385.3	---	0.0	385.3	---	0.0	385.3	---	0.0
Diesel Tank	---	0.0	---	---	0.0	---	---	0.0	---	---	0.0	---	---	0.0	---	---	0.0	---
Existing Totals (TPY)	**8,068**	**0.42**	**0.64**	**7,865**	**0.55**	**0.73**	**7,458**	**0.42**	**0.64**	**7,440**	**0.55**	**0.73**	**6,663**	**0.42**	**0.64**	**6,659**	**0.55**	**0.73**
Existing Totals (lb/yr)	**16,136,605.9**	**832.9**	**1,279.8**	**15,730,655.8**	**1,102.2**	**1,463.9**	**14,915,549.9**	**832.9**	**1,279.8**	**14,879,871.9**	**1,102.2**	**1,463.9**	**13,325,258.3**	**832.9**	**1,279.8**	**13,318,858.9**	**1,102.2**	**1,463.9**

	Existing			Project (2028)			Existing (2030)			Project (2030)			Existing (2050)			Project (2050)		
Emissions Reduction in GHG Due to Diversion	Existing Total CO_2 Equivalents	Existing HAPs	Existing PM	Mod. Total CO_2 Equivalents	Mod. HAPs	Mod. PM	Existing Total CO_2 Equivalents	Existing HAPs	Existing PM	Mod. Total CO_2 Equivalents	Mod. HAPs	Mod. PM	Existing Total CO_2 Equivalents	Existing HAPs	Existing PM	Mod. Total CO_2 Equivalents	Mod. HAPs	Mod. PM
	(ton/year) [1]	(ton/year)	(ton/year)	(ton/year) [1]	(ton/year)	(ton/year)	(ton/year) [1]	(ton/year)	(ton/year)	(ton/year) [1]	(ton/year)	(ton/year)	(ton/year) [1]	(ton/year)	(ton/year)	(ton/year) [1]	(ton/year)	(ton/year)
Landfill Fugitive Emissions	381	0.00	0.01	2,170	0.02	0.04	2,376	0.03	0.04	3,208	0.04	0.06	6,425	0.07	0.12	10,070	0.11	0.18
Net Project Emissions	7,687	0.41	0.63	5,696	0.53	0.69	5,082	0.39	0.60	4,232	0.52	0.67	237	0.35	0.52	-3,410	0.44	0.55
Net Change from Existing				**-1,991**	**0.11**	**0.06**				**-849**	**0.13**	**0.08**				**-3,648**	**0.09**	**0.03**

Thank you

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Attachment 2

Table 1

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC
Summary of Projected Actual Emissions

				Net Change in CO2 Equivalents	Net Change in HAPs	Net Change in PMs				Net Change in CO2 Equivalents	Net Change in HAPs	Net Change in PMs				Net Change in CO2 Equivalents	Net Change in HAPs	Net Change in PMs
				-203.0	0.135	0.092				-17.8	0.135	0.092				-3.2	0.135	0.092
Emission Source	**Existing**			**Project (2028)**			**2030**						**2050**					
	Existing Total CO_2 Equivalents	**Existing HAPs**	**Existing PM**	**Mod. Total CO_2 Equivalents**	**Mod. HAPs**	**Mod. PM**	**Existing Total CO_2 Equivalents**	**Existing HAPs**	**Existing PM**	**Mod. Total CO_2 Equivalents**	**Mod. HAPs**	**Mod. PM**	**Existing Total CO_2 Equivalents**	**Existing HAPs**	**Existing PM**	**Mod. Total CO_2 Equivalents**	**Mod. HAPs**	**Mod. PM**
	(ton/year) [1]	*(ton/year)*	*(ton/year)*	*(ton/year)* [1]	*(ton/year)*	*(ton/year)*	*(ton/year)* [1]	*(ton/year)*	*(ton/year)*	*(ton/year)* [1]	*(ton/year)*	*(ton/year)*	*(ton/year)* [1]	*(ton/year)*	*(ton/year)*	*(ton/year)* [1]	*(ton/year)*	*(ton/year)*
Upstream Emissions																		
Off-Site Fossil Fuel Consumption	1,884.2	---	---	1,730.3	---	---	1,884.2	---	---	1,414.1	---	---	1,884.2	---	---	1,414.1	---	---
Direct / Indirect Emissions																		
Mobile Emissions	5,089.0	0.4	0.6	5,040.0	0.6	0.7	4,478.5	0.4	0.6	4,930.7	0.6	0.7	3,683.4	0.4	0.6	4,150.2	0.6	0.7
Furnace	709.8	---	0.0	709.8	---	0.0	709.8	---	0.0	709.8	---	0.0	709.8	---	0.0	709.8	---	0.0
Heaters	385.3	---	0.0	385.3	---	0.0	385.3	---	0.0	385.3	---	0.0	385.3	---	0.0	385.3	---	0.0
Diesel Tank	---	0.0	---	---	0.0	---	---	0.0	---	---	0.0	---	---	0.0	---	---	0.0	---
Existing Totals (TPY)	**8,068**	**0.42**	**0.64**	**7,865**	**0.55**	**0.73**	**7,458**	**0.42**	**0.64**	**7,440**	**0.55**	**0.73**	**6,663**	**0.42**	**0.64**	**6,659**	**0.55**	**0.73**
Existing Totals (lb/yr)	**16,136,605.9**	**832.9**	**1,279.8**	**15,730,655.8**	**1,102.2**	**1,463.9**	**14,915,549.9**	**832.9**	**1,279.8**	**14,879,871.9**	**1,102.2**	**1,463.9**	**13,325,258.3**	**832.9**	**1,279.8**	**13,318,858.9**	**1,102.2**	**1,463.9**

Emissions Reduction in GHG Due to Diversion	**Existing**			**Project (2028)**			**Existing (2030)**			**Project (2030)**			**Existing (2050)**			**Project (2050)**		
	Existing Total CO_2 Equivalents	**Existing HAPs**	**Existing PM**	**Mod. Total CO_2 Equivalents**	**Mod. HAPs**	**Mod. PM**	**Existing Total CO_2 Equivalents**	**Existing HAPs**	**Existing PM**	**Mod. Total CO_2 Equivalents**	**Mod. HAPs**	**Mod. PM**	**Existing Total CO_2 Equivalents**	**Existing HAPs**	**Existing PM**	**Mod. Total CO_2 Equivalents**	**Mod. HAPs**	**Mod. PM**
	(ton/year) [1]	*(ton/year)*	*(ton/year)*	*(ton/year)* [1]	*(ton/year)*	*(ton/year)*	*(ton/year)* [1]	*(ton/year)*	*(ton/year)*	*(ton/year)* [1]	*(ton/year)*	*(ton/year)*	*(ton/year)* [1]	*(ton/year)*	*(ton/year)*	*(ton/year)* [1]	*(ton/year)*	*(ton/year)*
Landfill Fugitive Emissions	381	0.00	0.01	2,170	0.02	0.04	2,376	0.03	0.04	3,208	0.04	0.06	6,425	0.07	0.12	10,070	0.11	0.18
Net Project Emissions	7,687	0.41	0.63	5,696	0.53	0.69	5,082	0.39	0.60	4,232	0.52	0.67	237	0.35	0.52	-3,410	0.44	0.55
Net Change from Existing				**-1,991**	**0.11**	**0.06**				**-849**	**0.13**	**0.08**				**-3,648**	**0.09**	**0.03**

Notes:

[1] - Total greenhouse gas emissions are expressed as tons of carbon dioxide equivalents (tons CO_2 eq)

t - Trace

Table 2

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC
Existing Mobile Emissions

	CO_2	CH_4	N_2O	
CO_2 emissions (Diesel Fuel - Non-Road) [1] =	22.5	0.002	0.001	lb / gallon of diesel combusted
CO_2 emissions (Motor Gasoline - Non-Road) [1] =	19.4	0.006	0.003	lb / gallon of gasoline combusted
CO_2 emissions (Motor Gasoline - On-Road) [1] =	19.4	0.002	0.011	lb / gallon of gasoline combusted

Annual (January 1 - December 31)

Direct Emissions From Non-Stationary Sources

Transport of Waste From Clients to Transfer Station (2025)

Equipment Needed	Activity	Annual Distance [2] (miles)	Estimated Fuel Economy [3] (miles / gal)	Annual Fuel Consumption (gal / year)	Idling Factor [4] (%)	Annual Fuel Consumption (gal / year) (mmbtu / year)	Annual CO_2 Emissions [1] (tons / year)	Annual CH_4 Emissions [1] (tons / year)	Annual N_2O Emissions [1] (tons / year)	Total CO_2 Equivalents [11] (tons / year)	Total HAP Emissions [12] (tons / year)	Total PM Emissions [12] (tons / year)
Packer/Refuse Trucks	Transport Home Waste to Transfer Station	2,136,042	6.7	318,812	0	318,812	**3,588.1**	**0.32**	**0.20**	**3,667.2**	**0.2425**	**0.4615**
Tractors Outgoing (600s)	Tractors to haul our dump trailers and other trailers mostly intended for	47,883	6.6	7,217	0	7,217	**81.2**	**0.01**	**0.00**	**83.0**	**0.0023**	**0.0039**
Roll-Off Trucks Incoming (400s)	Transport Home Waste to Transfer Station	338,122	6.7	50,466	0	50,466	**568.0**	**0.05**	**0.03**	**580.5**	**0.0161**	**0.0272**
						Totals	**4,237.3**	**0.4**	**0.2**	**4,330.7**	**0.2608**	**0.4926**

Transport of Waste From Clients to Transfer Station (2030)

Equipment Needed	Activity	Annual Distance [2] (miles)	Estimated Fuel Economy [3] (miles / gal)	Annual Fuel Consumption (gal / year)	Idling Factor [4] (%)	Annual Fuel Consumption (gal / year) (mmbtu / year)	Annual CO_2 Emissions [1] (tons / year)	Annual CH_4 Emissions [1] (tons / year)	Annual N_2O Emissions [1] (tons / year)	Total CO_2 Equivalents [11] (tons / year)	Total HAP Emissions [12] (tons / year)	Total PM Emissions [12] (tons / year)
Packer/Refuse Trucks	Transport Waste to Transfer Station	2,136,042	8.0	265,735	0	265,735	**2,990.7**	**0.27**	**0.16**	**3,056.7**	**0.06**	**0.10**
Tractors Outgoing (600s)	Tractors to haul our dump trailers and other trailers mostly intended for	47,883	6.6	7,217	0	7,217	**81.2**	**0.01**	**0.00**	**83.0**	**0.07**	**0.12**
Roll-Off Trucks Incoming (400s)	Transport Home Waste to Transfer Station	338,122	6.7	50,466	0	50,466	**568.0**	**0.05**	**0.03**	**580.5**	**0.06**	**0.12**
						Totals	**3,639.9**	**0.3**	**0.2**	**3,720.2**	**0.2**	**0.3**

Transport of Waste From Clients to Transfer Station (2050)

Equipment Needed	Activity	Annual Distance [2] (miles)	Estimated Fuel Economy [3] (miles / gal)	Annual Fuel Consumption (gal / year)	Idling Factor [4] (%)	Annual Fuel Consumption (gal / year) (mmbtu / year)	Annual CO_2 Emissions [1] (tons / year)	Annual CH_4 Emissions [1] (tons / year)	Annual N_2O Emissions [1] (tons / year)	Total CO_2 Equivalents [11] (tons / year)	Total HAP Emissions [12] (tons / year)	Total PM Emissions [12] (tons / year)
Packer/Refuse Trucks	Transport Waste to Transfer Station	2,136,042	8.4	254,291	0	254,291	**2,861.9**	**0.26**	**0.16**	**2,925.0**	**0.06**	**0.10**
Tractors Outgoing (600s)	Tractors to haul our dump trailers and other trailers mostly intended for	47,883	7.15	7,217	0	7,217	**81.2**	**0.01**	**0.00**	**83.0**	**0.07**	**0.12**
Roll-Off Trucks Incoming (400s)	Transport Home Waste to Transfer Station	338,122	7.15	47,290	0	47,290	**532.2**	**0.05**	**0.03**	**544.0**	**0.06**	**0.12**
						Totals	**3,475.4**	**0.3**	**0.2**	**3,552.0**	**0.2**	**0.3**

Sorting, Baling, and C&D Processing

Equipment Needed	Activity	Daily Hours of Operation [5] (hours)	Weekly Hours of Operation [6] (hours)	Operating Weeks (weeks)	Fuel Consumption Per Unit [7] (gal / hr)	Daily Fuel Consumption [All Units] (gal / day)	Total Fuel Consumption [All Units] (gallons)	Annual CO_2 Emissions [1] (tons/year)	Annual CH_4 Emissions [1] (tons/year)	Annual N_2O Emissions [1] (tons/year)	Total CO_2 Equivalents [11] (tons/year)	Total HAP Emissions [12] (tons/year)	Total PM Emissions [12] (tons / year)
Loader	Sorting and Transferring of C&D Waste	5	30	52	6.20	31	9,668	**108.8**	**0.01**	**0.01**	**111.2**	**0.0274**	**0.0183**
Loader	Transfer and Loading into the Sorter	7	42	52	6.20	43	13,535	**152.3**	**0.01**	**0.01**	**155.7**	**0.0536**	**0.0358**
Loader	Transfer of Processed Materials to Baler	3	18	52	6.20	19	5,801	**65.3**	**0.01**	**0.00**	**66.7**	**0.0099**	**0.0066**
Forklift	Transfer of Bales to Storage Areas	3	18	52	1.00	3	936	**10.5**	**0.00**	**0.00**	**10.8**	**0.0047**	**0.0019**
Light-Duty Vehicle	Supervise operations	10	60	52	1.00	10	3,120	**35.1**	**0.00**	**0.00**	**35.9**	**0.0264**	**0.0079**
							Totals	**372.1**	**0.0**	**0.0**	**380.3**	**0.1218**	**0.0703**

Indirect Emissions From Mobile Sources

Equipment Needed	Quantity of workers (# employees)	Operating Days per Week (days)	Total Operating Days [8] (days)	Average Distance to Site (miles)	Estimated Fuel Economy [9] (miles / gal)	Daily Fuel Consumption [All Units] (gal / day)	Annual Fuel Consumption [All Units] (gal / year)	Annual CO_2 Emissions [1] (tons / year)	Annual CH_4 Emissions [1] (tons / year)	Annual N_2O Emissions [1] (tons / year)	Total CO_2 Equivalents [11] (tons / year)	Total HAP Emissions [12] (tons / year)	Total PM Emissions [12] (tons / year)
Light Duty Vehicles	93	6	312	14.9	25.7	107.8	33,645	**325.6**	**0.03**	**0.19**	**378.1**	**0.0339**	**0.0081**
							Totals	**325.6**	**0.0**	**0.2**	**378.1**	**0.0339**	**0.0081**

2025 Subtotal	**4,935.0**	**0.4**	**0.4**	**5,089.0**	**0.4**	**0.6**
2030 Subtotal	**4,337.6**	**0.4**	**0.4**	**4,478.5**	**0.3**	**0.4**
2050 Subtotal	**3,559.6**	**0.3**	**0.4**	**3,683.4**	**0.2**	**0.2**

Notes:

1 CO_2, CH_4 and N_2O emission factors for diesel fuel and gasoline combustion referenced from https://www.epa.gov/climateleadership/ghg-emission-factors-hub
2 Distance from customers to Syracuse Haulers Transfer Station is estimated as 100 miles
3 Based on an engineering estimate and an analysis of past fuel usage by this equipment; average of loaded and unloaded conditions
4 Idling factor added to account for wait time, where vehicle is immobile.
5 A workday consists of one 12-hour shift; however, equipment is only operating for a total of 3 to 10 hours during a 12-hour shift
6 Operating schedule is 6 days per week (12 hours/day Monday through Saturday)
7 Based on an engineering estimate and an analysis of past fuel usage by this equipment; since no fuel usage data is available for on-site forklifts and light-duty trucks, an assumption of 1.0 gallons per hour of gasoline was utilized
8 Total Operating Days = (6 days per week) x (52 weeks per year)
9 For light-duty vehicles (cars, minivans, sport utility vehicles, and pickup trucks), USEPA projects average real-world fuel economy for Model Year 2020 to be 25.7 miles per gallon
10 Annual Emissions = (Annual Fuel Consumption [gal/yr]) x (Emission Factor from note 1 [lb per gallon of fuel combusted])
11 20-yr GWP values assumed to calculate CO2 equivalents: CO_2 = 1, CH_4 = 84, N_2O = 264.
12 HAP emissions calculated using https://afleet.es.anl.gov/afleet/. Future HAP and PM emissions are expected to decrease over time, however AFLEET is not capable of estimating future vehicle make emissions.
13 https://afdc.energy.gov/vehicles/electric_emissions.html
14 https://afdc.energy.gov/files/u/publication/casestudy_cng_refuse_feb2014.pdf?f418a58254
15 https://www.energy.ca.gov/sites/default/files/2023-03/CEC-600-2023-010.pdf
16 Table VM-1 - Highway Statistics 2023 - Policy | Federal Highway Administration
17 Table VM-1 - Highway Statistics 2021 - Policy | Federal Highway Administration
18 Table VM-1 - Highway Statistics 2018 - Policy | Federal Highway Administration

Table 3

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC
Modification Mobile Emissions

	CO_2	CH_4	N_2O	
CO_2 emissions (Diesel Fuel) [1] =	22.5	0.002	0.001	lb / gallon of diesel combusted
CO_2 emissions (Motor Gasoline) [1] =	19.4	0.006	0.003	lb / gallon of gasoline combusted
CO_2 emissions (Motor Gasoline - On-Road) [1] =	19.4	0.002	0.011	lb / gallon of gasoline combusted
CO_2 emissions (Compressed Natural Gas - CNG) [1] =	16.2	0.001	0.000	lb / gallon of CNG combusted

Annual (January 1 - December 31)

Direct Emissions From Non-Stationary Sources

Transport of Waste From Homes to Transfer Station (2028)

Equipment Needed	Activity	Annual Distance [2] (miles)	Estimated Fuel Economy [3] (miles / gal)	Annual Fuel Consumption [13] (gal / year)	Idling Factor [4] (%)	Annual Fuel Consumption (gal / year) (mmbtu / year)	Annual CO_2 Emissions [1] (tons / year)	Annual CH_4 Emissions [1] (tons / year)	Annual N_2O Emissions [1] (tons / year)	Total CO_2 Equivalents [11] (tons / year)	Total HAP Emissions [12] (tons / year)	Total PM Emissions [12] (tons / year)
Packer/Refuse Trucks	Transport Waste to Transfer Station (2028)	2,136,042	8.0	265,735	0	265,735	**2,990.7**	**0.27**	**0.16**	**3,056.7**	**0.2425**	**0.4615**
Tractors Outgoing (600s)	Tractors to haul our dump trailers and other trailers mostly intended for outbound material)	81,391	6.6	12,267	0	12,267	**138.1**	**0.01**	**0.01**	**141.1**	**0.0039**	**0.0066**
Roll-Off Trucks Incoming (400s)	Consolidation in Outgoing Tractors	-231,512	9.4	-24,614	0	-24,614	**-277.0**	**-0.02**	**-0.02**	**-283.1**	**-0.0110**	**-0.0187**
Roll-Off Trucks Incoming (400s)	Transport Home Waste to Transfer Station (2028)	806,833	9.4	85,782	0	85,782	**965.4**	**0.09**	**0.05**	**986.7**	**0.0383**	**0.0649**
						Totals	**3,817.2**	**0.3**	**0.2**	**3,901.4**	**0.2737**	**0.5143**

Transport of Waste From Homes to Transfer Station (2030)

Equipment Needed	Activity	Annual Distance [2] (miles)	Estimated Fuel Economy [3] (miles / gal)	Annual Fuel Consumption [13] (gal / year)	Idling Factor [4] (%)	Annual Fuel Consumption (gal / year) (mmbtu / year)	Annual CO_2 Emissions [1] (tons / year)	Annual CH_4 Emissions [1] (tons / year)	Annual N_2O Emissions [1] (tons / year)	Total CO_2 Equivalents [11] (tons / year)	Total HAP Emissions [12] (tons / year)	Total PM Emissions [12] (tons / year)
Packer/Refuse Trucks	Transport Waste to Transfer Station (2030)	2,136,042	8.3	257,354	0	257,354	**2,896.4**	**0.26**	**0.16**	**2,960.3**	**0.2014**	**0.4239**
Tractors Outgoing (600s)	Tractors to haul our dump trailers and other trailers mostly intended for outbound material)	81,391	7.3	11,150	0	11,150	**125.5**	**0.01**	**0.01**	**128.2**	**0.0030**	**0.0045**
Roll-Off Trucks Incoming (400s)	Consolidation of Outgoing Tractors	-231,512	9.4	-24,614	0	-24,614	**-277.0**	**-0.02**	**-0.02**	**-283.1**	**-0.0086**	**-0.0126**
Roll-Off Trucks Incoming (400s)	Transport Home Waste to Transfer Station (2030)	806,833	9.4	85,782	0	85,782	**965.4**	**0.09**	**0.05**	**986.7**	**0.0299**	**0.0439**
Packer/Refuse Trucks	Converting 5 of 200/300/500s vehicles to CNG	-187,372	8.0	-23,310	0	-23,310	**-262.3**	**-0.02**	**-0.01**	**-268.1**		
Packer/Refuse Trucks	Converting 5 of 200/300/500s vehicles to CNG	187,372	8.0	23,310	0	23,310	**189.1**	**0.01**	**0.00**	**190.3**		
Packer/Refuse Trucks	Converting 5 of 200/300/500s vehicles to Electric	-187,372	8.0	-23,310	0	-23,310	**-262.3**	**-0.02**	**-0.01**	**-268.1**		
						Totals	**3,710.3**	**0.3**	**0.2**	**3,792.1**	**0.2257**	**0.4597**

Transport of Waste From Homes to Transfer Station (2050)

Equipment Needed	Activity	Annual Distance [2] (miles)	Estimated Fuel Economy [3] (miles / gal)	Annual Fuel Consumption [13] (gal / year)	Idling Factor [4] (%)	Annual Fuel Consumption (gal / year) (mmbtu / year)	Annual CO_2 Emissions [1] (tons / year)	Annual CH_4 Emissions [1] (tons / year)	Annual N_2O Emissions [1] (tons / year)	Total CO_2 Equivalents [11] (tons / year)	Total HAP Emissions [12] (tons / year)	Total PM Emissions [12] (tons / year)
Packer/Refuse Trucks	Transport Waste to Transfer Station (2050)	2,136,042	10.3	207,383	0	207,383	**2,334.0**	**0.21**	**0.13**	**2,385.4**	**0.1686**	**0.4242**
Tractors Outgoing (600s)	Tractors to haul our dump trailers and other trailers mostly intended for	81,391	10.3	7,902	0	7,902	**88.9**	**0.01**	**0.00**	**90.9**	**0.0029**	**0.0042**
Roll-Off Trucks Incoming (400s)	Consolidation of Outgoing Tractors	-231,512	10.3	-22,477	0	-22,477	**-253.0**	**-0.02**	**-0.01**	**-258.5**	**-0.0081**	**-0.0120**
Roll-Off Trucks Incoming (400s)	Transport Home Waste to Transfer Station (2050)	806,833	10.3	78,333	0	78,333	**881.6**	**0.08**	**0.05**	**901.0**	**0.0283**	**0.0417**
Packer/Refuse Trucks	Converting 5 of 200/300/500s vehicles to CNG	-187,372	7.9	-23,726	0	-23,726	**-267.0**	**-0.02**	**-0.01**	**-272.9**		
Packer/Refuse Trucks	Converting 5 of 200/300/500s vehicles to CNG	149,898	7.9	18,981	0	18,981	**154.0**	**0.01**	**0.00**	**155.0**		
Packer/Refuse Trucks	Converting 2 of 200/300/500s vehicles to Electric	-74,949	8.0	-9,324	0	-9,324	**-104.9**	**-0.01**	**-0.01**	**-107.3**	**-0.0059**	**-0.0149**
						Totals	**2,946.6**	**0.3**	**0.2**	**3,011.6**	**0.1858**	**0.4432**

	CO_2	CH_4	N_2O	
CO_2 emissions (Diesel Fuel) [1] =	22.5	0.002	0.001	lb / gallon of diesel combusted
CO_2 emissions (Motor Gasoline) [1] =	19.4	0.006	0.003	lb / gallon of gasoline combusted
CO_2 emissions (Motor Gasoline - On-Road) [1] =	19.4	0.002	0.011	lb / gallon of gasoline combusted

Existing Sorting, Baling, and C&D Processing

Equipment Needed	Activity	Daily Hours of Operation [5] (hours)	Weekly Hours of Operation [6] (hours)	Operating Weeks (weeks)	Fuel Consumption Per Unit [7] (gal / hr)	Daily Fuel Consumption [All Units] (gal / day)	Total Fuel Consumption [All Units] (gallons)	Annual CO_2 Emissions [1] (tons/year)	Annual CH_4 Emissions [1] (tons/year)	Annual N_2O Emissions [1] (tons/year)	Total CO_2 Equivalents [11] (tons/year)	Total HAP Emissions [12] (tons/year)	Total PM Emissions [12] (tons / year)
Loader	Sorting and Transferring of C&D Waste	5	30	52	6.20	31	9,668	**108.8**	**0.01**	**0.01**	**111.2**	**0.0274**	**0.0183**
Loader	Transfer and Loading into the Sorter	7	42	52	6.20	43	13,535	**152.3**	**0.01**	**0.01**	**155.7**	**0.0536**	**0.0358**
Loader	Transfer of Processed Materials to Baler	3	18	52	6.20	19	5,801	**65.3**	**0.01**	**0.00**	**66.7**	**0.0099**	**0.0066**
Forklift	Transfer of Bales to Storage Areas	3	18	52	1.00	3	936	**10.5**	**0.00**	**0.00**	**10.8**	**0.0047**	**0.0019**
Light-Duty Vehicle	Supervise operations	10	60	52	1.00	10	3,120	**35.1**	**0.00**	**0.00**	**35.9**	**0.0264**	**0.0079**
							Totals	**372.1**	**0.0**	**0.0**	**380.3**	**0.1218**	**0.0703**

Modification - Sorting, Baling, and C&D Processing

Equipment Needed	Activity	Daily Hours of Operation [5] (hours)	Weekly Hours of Operation [6] (hours)	Operating Weeks (weeks)	Fuel Consumption Per Unit [7] (gal / hr)	Daily Fuel Consumption [All Units] (gal / day)	Total Fuel Consumption [All Units] (gallons)	Annual CO_2 Emissions [1] (tons/year)	Annual CH_4 Emissions [1] (tons/year)	Annual N_2O Emissions [1] (tons/year)	Total CO_2 Equivalents [11] (tons/year)	Total HAP Emissions [12] (tons/year)	Total PM Emissions [12] (tons / year)
Loader	Sorting and Transferring of C&D Waste	5	30	52	6.20	31	9,668	**108.8**	**0.01**	**0.01**	**111.2**	**0.0274**	**0.0183**
Loader	Transfer and Loading into the Sorter	7	42	52	6.20	43	13,535	**152.3**	**0.01**	**0.01**	**155.7**	**0.0536**	**0.0358**
Loader	Transfer of Processed Materials to Baler	3	18	52	6.20	19	5,801	**65.3**	**0.01**	**0.00**	**66.7**	**0.0099**	**0.0066**
Forklift	Transfer of Bales to Storage Areas	3	18	52	1.00	3	936	**10.5**	**0.00**	**0.00**	**10.8**	**0.0047**	**0.0019**
Light-Duty Vehicle	Supervise operations	10	60	52	1.00	10	3,120	**35.1**	**0.00**	**0.00**	**35.9**	**0.0264**	**0.0079**
							Totals	**372.1**	**0.0**	**0.0**	**380.3**	**0.1218**	**0.0703**

Indirect Emissions From Mobile Sources

Equipment Needed	Quantity of workers (# employees)	Operating Days per Week (days)	Total Operating Days [8] (days)	Average Distance to Site (miles)	Estimated Fuel Economy [9] (miles / gal)	Daily Fuel Consumption [All Units] (gal / day)	Annual Fuel Consumption [All Units] (gal / year)	Annual CO_2 Emissions [1] (tons / year)	Annual CH_4 Emissions [1] (tons / year)	Annual N_2O Emissions [1] (tons / year)	Total CO_2 Equivalents [11] (tons / year)	Total HAP Emissions [12] (tons / year)	Total PM Emissions [12] (tons / year)
Light Duty Vehicles	93	6	312	14.9	25.7	107.8	33,645	**325.6**	**0.03**	**0.19**	**378.1**	**0.0339**	**0.0081**
							Totals	**325.6**	**0.03**	**0.19**	**378.1**	**0.0339**	**0.0081**

2028 Subtotal	**4,886.9**	**0.4**	**0.4**	**5,040.0**	**0.6**	**0.7**
2030 Subtotal	**4,780.0**	**0.4**	**0.4**	**4,930.7**	**0.5**	**0.6**
2050 Subtotal	**4,016.4**	**0.4**	**0.4**	**4,150.2**	**0.5**	**0.6**

Notes:

1 CO_2, CH_4 and N_2O emission factors for diesel fuel and gasoline combustion referenced from https://www.epa.gov/climateleadership/ghg-emission-factors-hub
2 Distance from customers to Syracuse Haulers Transfer Station is estimated as 100 miles
3 Average Fuel Economy by Federal Highway Administration Highway Statistics 2023
4 Idling factor added to account for wait time, where vehicle is immobile.
5 A workday consists of one 12-hour shift; however, equipment is only operating for a total of 3 to 10 hours during a 12-hour shift
6 Operating schedule is 6 days per week (12 hours/day Monday through Saturday)
7 Based on an engineering estimate and an analysis of past fuel usage by this equipment; since no fuel usage data is available for on-site forklifts and light-duty trucks, an assumption of 1.0 gallons per hour of gasoline was utilized
8 Total Operating Days = (6 days per week) x (52 weeks per year)
9 For light-duty vehicles (cars, minivans, sport utility vehicles, and pickup trucks), USEPA projects average real-world fuel economy for Model Year 2020 to be 25.7 miles per gallon
10 Annual Emissions = (Annual Fuel Consumption [gal/yr]) x (Emission Factor from note 1 [lb per gallon of fuel combusted])
11 20-yr GWP values assumed to calculate CO2 equivalents: CO_2 = 1, CH_4 = 84, N_2O = 264.
12 HAP emissions calculated using https://afleet.es.anl.gov/afleet/
13 Annual fuel consumption estimated using current annual fuel use and percent thruput increase to 32,000 TPY.
14 https://afdc.energy.gov/vehicles/electric_emissions.html
15 https://afdc.energy.gov/files/u/publication/casestudy_cng_refuse_feb2014.pdf?f418a58254
16 https://www.energy.ca.gov/sites/default/files/2023-03/CEC-600-2023-010.pdf
17 Table VM-1 - Highway Statistics 2023 - Policy | Federal Highway Administration
18 Table VM-1 - Highway Statistics 2021 - Policy | Federal Highway Administration
19 Table VM-1 - Highway Statistics 2018 - Policy | Federal Highway Administration

Table 4

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC
Off-Site Fossil Fuel Consumption

Existing Off-Site Fossil Fuel Consumption					
Energy	Amount Imported (MMBTU/yr) or (kWh)	Emission Factor (g / MMBTU) or (lb/kWh)	GHG Emissions (Off-Site Fossil Fuel Usage)		
			Emission	lb/year	tpy
Electricity Consumption	404,712	275	CO2e	245,004	123
Diesel	48,277	24,214	CO2e	2,577,104	1,289
Natural Gas	10,061	42,661	CO2e	946,216	473
			Total CO2 Equ.	3,768,324	1,884

Modification Off-Site Fossil Fuel Consumption					
Energy	Amount Imported (MMBTU/yr) or (kWh)	Emission Factor (g / MMBTU) or (lb/kWh)	GHG Emissions (Off-Site Fossil Fuel Usage)		
			Emission	lb/year	tpy
Electricity Consumption	1,044,418	275	CO2e	632,269	0
Electricity Consumption	1,044,418	275	CO2e	632,269	-316
Diesel	45,530	24,214	CO2e	2,430,495	1,215
Natural Gas	10,952	42,661	CO2e	1,030,007	515
			Total CO2 Equ.	4,725,040	1,414

Notes:

1 The yearly electrical use for the facility is taken from meter readings provided by Syracuse Haulers Waste Removal Inc. for the period of MONTH YEAR through MONTH YEAR. NYUP (NPCC Upstate NY) sources included Oil (0.5%), Gas (29.2%) and other Fossil Fuels (0.3%), while the remaining sources are a mixture of renewable sources. https://www.epa.gov/egrid/power-profiler#/NYUP

Table 5

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC
Summary of Natural Gas Usage and Emissions

Hours of Operation	**3,360**	Hours
Heat Content	**1,000**	Btu/scf
Amount of Natural Gas combusted in furnace in the office	**11.760**	MMscf

Emission Calculations:					
				Lbs/yr	Tons/yr
PM=	7.60 lb. X MMSCF	11.760000 MMSCF NG X	=	**89.376**	**0.04469**
SO_X =	0.6 lb. X MMSCF	11.760000 MMSCF NG X	=	**7.056**	**0.00353**
NO_X =	94 lb. X MMSCF	11.760000 MMSCF NG X	=	**1105.440**	**0.55272**
VOC =	5.5 lb. X MMSCF	11.760000 MMSCF NG X	=	**64.680**	**0.03234**
CO =	40 lb. X MMSCF	11.760000 MMSCF NG X	=	**470.400**	**0.23520**
CO_2 =	120,000 lb. X MMSCF	11.760000 MMSCF NG X	=	**1,411,200.000**	**705.60000**
CH_4 =	2.3 lb. X MMSCF	11.760000 MMSCF NG X	=	**27.048**	**0.01352**
N_2O =	2.2 lb. X MMSCF	11.760000 MMSCF NG X	=	**25.872**	**0.01294**

* Emissions factors from AP-42 7/98 Section 1.4

Table 6A - Existing

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC
Summary of Natural Gas Usage and Emissions

Hours of Operation	**3,360**	Hours
Heat Content	**1,000**	Btu/scf
Average amount of Natural Gas combusted per Heater	**0.709**	MMscf/Heater
Number of Heaters	**9**	Heater
Amount of Natural Gas combusted in Heaters	**6.384**	MMscf

Emission Calculations:					
				Lbs/yr	Tons/yr
PM=	7.60 lb. X / MMSCF	6.384000 MMSCF NG X	=	**48.518**	**0.02426**
SO_{X} =	0.6 lb. X / MMSCF	6.384000 MMSCF NG X	=	**3.830**	**0.00192**
NO_{X} =	100 lb. X / MMSCF	6.384000 MMSCF NG X	=	**638.400**	**0.31920**
VOC =	5.5 lb. X / MMSCF	6.384000 MMSCF NG X	=	**35.112**	**0.01756**
CO =	84 lb. X / MMSCF	6.384000 MMSCF NG X	=	**536.256**	**0.26813**
CO_2 =	120,000 lb. X / MMSCF	6.384000 MMSCF NG X	=	**766,080.000**	**383.04000**
CH_4 =	2.3 lb. X / MMSCF	6.384000 MMSCF NG X	=	**14.683**	**0.00734**
N_2O =	2.2 lb. X / MMSCF	6.384000 MMSCF NG X	=	**14.045**	**0.00702**

* Emissions factors from AP-42 7/98 Section 1.4

Table 6B - Modification

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC
Summary of Natural Gas Usage and Emissions

Hours of Operation	**3,360**	Hours
Heat Content	**1,000**	Btu/scf
Average amount of Natural Gas combusted per Heater	**0.709**	MMscf/Heater
Number of Heaters	**9**	Heater
Amount of Natural Gas combusted in Heaters	**6.384**	MMscf

Emission Calculations:					
				Lbs/yr	Tons/yr
PM=	7.60 lb. X MMSCF	6.384000 MMSCF NG X	=	**48.518**	**0.02426**
$SO_{X=}$	0.6 lb. X MMSCF	6.384000 MMSCF NG X	=	**3.830**	**0.00192**
$NO_{X=}$	100 lb. X MMSCF	6.384000 MMSCF NG X	=	**638.400**	**0.31920**
VOC =	5.5 lb. X MMSCF	6.384000 MMSCF NG X	=	**35.112**	**0.01756**
CO =	84 lb. X MMSCF	6.384000 MMSCF NG X	=	**536.256**	**0.26813**
CO_2 =	120,000 lb. X MMSCF	6.384000 MMSCF NG X	=	**766,080.000**	**383.04000**
CH_4 =	2.3 lb. X MMSCF	6.384000 MMSCF NG X	=	**14.683**	**0.00734**
N_2O =	2.2 lb. X MMSCF	6.384000 MMSCF NG X	=	**14.045**	**0.00702**

* Emissions factors from AP-42 7/98 Section 1.4

Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC
TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification	Diesel Fuel Storage
City	Syracuse
State	New York
Company	Syracuse Haulers Waste Removal Inc.
Type of Tank	Horizontal Tank
Description	Horizontal Tank

Tank Dimensions

Shell Length (ft)	28.00
Diameter (ft)	8.00
Volume (gal)	15,000
Turnovers	22.46
Net Throughput (gal/yr)	336,882
Is tank heated (y/n)	N
Is tank underground (y/n)	N

Paint Characteristics

Shell Color/Shade	Blue/Blue
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig)	-0.03
Pressure Settings (psig)	0.03

Meteorological Data used in Emissions Calculations: Syracuse, New York (Avg Atmospheric Pressure = 14.37 psia)

Horizontal Tank
Syracuse, New York

CALCULATED VALUES

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min	Max	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min	Max	Vapor Mol Weight g/mol	Liquid Mass Fraction	Vapor Mass Fraction	Mol Weight g/mol	Basis for Vapor Pressure Calculations
Distillate Fuel Oil #2	All	49.16	44.483175	53.831574	47.6	0.0044	0.0037	0.0053	130.0000	1	1	188.00	

Table 7

Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC
TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Horizontal Tank
Rochester, New York

Annual Emission Calculations	**AP-42 EQUATIONS**		**CALCULATIONS**				
Standing Losses (lb)	$L_S = 365\ V_V\ W_V\ K_E\ K_S$	L_S =	1.1192	lbs			
V_V = Vapor Space Volume (cu ft)		V_V =	896.4545	cu ft			
W_V = Vapor Density (lb/cu ft)		W_V =	0.0001	lb / cu ft			
K_E = Vapor Space Expansion Factor		K_E =	0.0327				
K_S = Vented Vapor Saturation Factor		K_S =	0.9991				
Tank Vapor Space Volume							
V_V = Vapor Space Volume (cu ft)	$V_V = [(Pi/4)\ D_E^2]\ H_{VO}$	V_V =	896.4545	cu ft			
D = Tank Diameter (ft)							
D_E = Effective Diameter (ft)	$D_E = (L * D/(pi/4))^{\wedge}1/2$	D_E =	16.8923	ft			
H_{VO} = Vapor Space Outage (ft)	$H_{VO} = H_E/2$ for horizontal tank	H_{VO} =	4.0000	ft			Vertical Tank: $H_{VO} = H_S - H_L + H_{RO}$
Hs = Tank Shell Length (ft)							
Vapor Density							
W_V = Vapor Density (lb/cu ft)	$W_V = M_v\ P_{VA} / R\ T_{LA}$	W_V =	0.0001	lb / cu ft			0 deg F = 459.67 R
M_V = Vapor Molecular Weight		M_V =	130.0000	lb/lb-mole			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)							
T_{LA} = Daily Avg. Liquid Surface Temp. (deg. R)	$T_{LA} = 0.44\ T_{AA} + 0.56\ T_B + 0.0079*alpha*I$	T_{LA} =	508.8274	R =	9.53	deg C	
T_{AA} = Daily Average Ambient Temp. (deg. F)	$T_{AA} = T_{AX} + T_{AN} / 2$	T_{AA} =	47.5750	deg F =	507.24	R	
Ideal Gas Constant R (psia cuft / (lb-mol-deg R))			10.7310				
T_B = Liquid Bulk Temperature (deg. R)	$T_B = T_{AA} + 6\ alpha - 1$	T_B =	507.264985				
Tank Paint Solar Absorptance (Shell)			0.17				As per Table 7.1-6: White/White = .17
I = Daily Total Solar Insulation Factor (Btu/sqft day)			1,169.910	Btu/sqft d			I_{AVG} = 1,165 Btu/ft^2-d as per sources mentioned on page 6-5 of TANKS user manual

Table 7

Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Vapor Space Expansion Factor

As per sources listed on page 6-5 of TANKS user manual:

K_E = Vapor Space Expansion Factor	$K_E = [\text{delta } T_V/T_{LA}]+ [(\text{delta}P_V-\text{delta } P_B)/(P_A-P_{VA})]$	K_E =	0.0327		T_{AX} =	516.36167
delta T_V = Daily Vapor Temperature Range (deg. R)	$\text{delta } T_V = 0.72(T_{AX}-T_{AN})+0.028*\text{alpha}*I]$	delta T_V =	18.6968	R	T_{AN} =	498.1283
delta P_V = Daily Vapor Pressure Range (psia)		delta P_V =	0.0016	psia		
delta P_B = Breather Vent Press. Setting Range (psia)		delta P_B =	0.06	psia		
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)						
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)						
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)						
Daily Avg. Liquid Surface Temp. (deg R)			508.8274	R		
Daily Min. Liquid Surface Temp. (deg R)	$T_{LN} = T_{LA} - 0.25 \text{ delta } T_V$	T_{LN} =	504.1531746	R	44.4831746	
Daily Max. Liquid Surface Temp. (deg R)	$T_{LX} = T_{LA} + 0.25 \text{ delta } T_V$	T_{LX} =	513.5016	R	53.8315736	
delta T_A = Daily Ambient Temp. Range (deg. R)		delta T_A =	18.2334	R		

Vented Vapor Saturation Factor

Vented Vapor Saturation Factor	$K_S = 1/[1+ (.053*P_{VA}*H_{VO})]$	K_S =	0.9991			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)						
Vapor Space Outage (ft)						

Working Losses (lb)

	$L_W = 0.0010 M_V P_{VA} Q K_N K_P$	L_W =	4.5880	lbs		
M_V = Vapor Molecular Weight		M_V =	130.0000	lb/lb-mole		Q = annual net throughput = tank capacity [bbl] * annual turnover rate, bbl/yr
P_{VA} = Vapor Pressure at Daily Average Liquid Surface Temperature (psia)			0.0044			K_N = working loss turnover (saturation) factor, dimensionless; see Figure 7.1-18
Q = Annual Net Throughput (gal/yr)	1 bbl/yr = 42 US gal/yr	Q =	8,021.00	bbl/yr		for turnovers >36, $K_N = (180 + N)/6N$
Annual Turnovers		N =	22.46			for turnovers <36, K_N = 1
K_N = Turnover Factor	$K_N = (180 + N)/6N$	K_N =	1.00			K_P = working loss product factor, dimensionless
Tank Diameter (ft)						for crude oils K_P = 0.75
Working Loss Product Factor		K_P =	1.00			for all other organic liquids, K_P = 1
Total Losses (lb)		L_T =	5.7072	lbs		

Emissions Report for: Annual

Horizontal Tank
Rochester, New York

CALCULATED VALUES

Losses (lbs)		
Working Loss	*Breathing Loss*	*Total Emissions*
4.59	1.12	5.71

Table 8

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of Landfill Gas Fugitive Emissions

Existing and Expansion Landfill Areas

Year	*Total LFG Generated* (cfm)	*Collection Efficiency* (%)	*LFG to Collection System* (cfm)	*Fugitive LFG* (cfm)	*Fugitive LFG* (ft^3/yr)	*Fugitive LFG* (m^3/yr)	*Fugitive NMOC Emissions* (TPY)	*Fugitive VOC Emissions* (TPY)	*Fugitive HAP Emissions* (TPY)	*Fugitive CH_4 Emissions* (TPY)	*Oxidized CO_2 Emissions* (TPY)	*Fugitive Biogenic CO_2 Emissions* (TPY)	*Total Anthropogenic GHG Emissions* (TPY)
2024	4	75%	3	1	544,330	15,414	0.0	0.01	0.00	4.3	3.9	15.8	367
2028	24	75%	18	6	3,095,950	87,668	0.2	0.08	0.02	24.6	22.4	89.8	2,085
2030	35	75%	26	9	4,576,844	129,602	0.3	0.12	0.04	36.3	33.2	132.7	3,082
2050	109	75%	82	27	14,368,111	406,860	0.9	0.37	0.11	114.0	104.2	416.7	9,677

Notes:

Total landfill gas (LFG) Generated in average cubic feet per minute (cfm) from USEPA LandGEM Model run (version 3.02)

Collection efficiency of 75% assumed for gas collection system

LFG to Collection System = (Total LFG Generated) * (Collection Efficiency (%))

Fugitive LFG = (Total LFG Generated) * (100% - Collection Efficiency (%))

Fugitive LFG (ft^3/yr) = (Fugitive LFG (cfm)) * (60 minutes per hour) * (8,760 hours per year)

Fugitive LFG (m^3/yr) = (Fugitive LFG (ft^3/yr)) / (35.3147 cubic feet per cubic meter)

NMOC concentration of 595 ppm referenced from USEPA AP-42, Chapter 2.4 (11/98)

Conversion from NMOC in ppm to mg/m^3 = $\frac{595 \text{ ppm} \times 86.18 \text{ molecular wt}}{24.47}$ = 2,095.9 mg/m^3

Fugitive NMOC Emissions (lb/yr) = [Fugitive LFG (m^3/yr)] * [2,095.9 mg of NMOC per m^3 of LFG] * [2.2046 $x10^{-6}$ pounds per mg]

Fugitive NMOC Emissions (TPY) = (Fugitive NMOC Emissions (lb/yr)) / (2000 pounds per ton)

Fugitive VOC Emissions = Fugitive NMOC Emissions (tons/yr) * 39% (VOCs are 39% of total NMOC according to USEPA AP-42, Chapter 2.4 (11/98)

Total Fugitive HAP Emissions determined from sum of individual speciated HAPs (see Tables 10,13, 16, and 19)

Fugitive CH_4 emissions (TPY) = [Fugitive LFG (ft^3/yr)] * [50% CH_4] * [0.0423 lb CH4 / ft^3 CH_4] * [75% oxidation factor] / [2,000 lb/ton]

Oxidized CO_2 emissions (TPY) = [Fugitive LFG (ft^3/yr)] * [50% CH_4] * [0.116 lb CO_2 / ft^3 CH_4] * [25% oxidized] / [2,000 lb/ton]

Fugitive Biogenic emissions (TPY) = { [Fugitive LFG (ft^3/yr)] * [50% CO_2] * [0.116 lb CO_2 / ft^3 CO_2] / [2,000 lb/ton] } + Oxidized CO_2 Emissions

Total Fugitive Anthropogenic GHG Emissions (tons CO_2 equivalents / year) = [Fugitive CH4 Emissions (TPY)] * 84

Equations:

$(mg/m^3) = \frac{(ppm) \times (\text{Molecular weight (g / mol)}) \times (1 \text{ atm})}{(298.15 \text{ K}) \times (0.08206 \text{ L*atm/K*mol})}$ (assuming standard conditions of 1 atmosphere and 25° Celsius)

(lb/yr) = (Fugitive LFG Emission rate [m^3/year]) x (mg/m^3) x (2.205 x 10^{-6} [lb/mg])

$(TPY) = \frac{(lb/yr)}{(2{,}000 \text{ lb/ton})}$

Table 9

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of Flare GHG Emissions (2024)

LFG to Flares = 1.6 MMscf

	MMscf Combusted	Estimated Actual 2021 Emissions (TPY)					
		Oxidation CO_2	Oxidation CH_4	Oxidation N_2O	Escape CH_4	Collected CO_2	*Anthropogenic GHG*
Flares	2	46.9	0.0	0.0	0.2	47.4	14.9
Total Emissions (TPY)		46.9	0.0	0.0	0.2	47.4	14.9
Total Emissions (lb/yr)		9.37E+04	5.76E+00	1.13E+00	3.45E+02	9.47E+04	2.98E+04

Flare Combustion Factors

	Pounds per MMScf		
	CO_2	CH_4	N_2O
Flare	57,396.8	3.5	0.69

Notes:

Oxidation CO_2 Combustion emission factor referenced from Table C-1 of 40 CFR Part 98, Subpart C
Oxidation CH_4 Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Oxidation N_2O Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Collected CO_2 Portion of collected LFG that already contains CO_2

Flare	Enclosed	
Heating value	500	Btu/scf
LFG CH_4 Concentration	50	%
CH_4 Density	0.0423	pounds per cubic foot (referenced from 40 CFR Part 98, Subpart HH)
CO_2 concentration	50	%
CO_2 density	0.116	pounds per cubic foot

Emission Factor Development

Flares - CH_4 Oxidation Emission Factors

	EF (kg/MMBtu)	GWP (20 year)
CO_2	52.07	1
CH_4	3.20E-03	84
N_2O	6.30E-04	264

Table 10

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of Fugitive HAP Emissions (2024)

Total LFG Generated =	4	cfm
LFG Collection Efficiency =	85%	
Average LFG Collected =	4	cfm
Fugitive Emission Estimates =	1	cfm
Hours of Operation =	8,760	

CAS #	LFG Constituent	Molecular Weight	Median [1] ppmv	Uncontrolled Emissions lb/hr	lb/yr	TPY	mg/m^3
71-55-6	1,1,1-Trichloroethane	133.41	0.48	0.000	0.05	0.00	2.62
79-34-5	1,1,2,2-Tetrachloroethane	167.85	1.11	0.000	0.16	0.00	7.62
75-34-3	1,1-Dichloroethane	98.97	2.35	0.000	0.19	0.00	9.51
75-35-4	1,1-Dichloroethene	96.94	0.20	0.000	0.02	0.00	0.79
107-06-2	1,2-Dichloroethane	98.96	0.41	0.000	0.03	0.00	1.66
78-87-5	1,2-Dichloropropane	112.99	0.18	0.000	0.02	0.00	0.83
107-13-1	Acrylonitrile	53.06	6.33	0.000	0.28	0.00	13.73
75-15-0	Carbon disulfide	76.13	0.58	0.000	0.04	0.00	1.80
56-23-5	Carbon tetrachloride	153.84	0.00	0.000	0.00	0.00	0.03
463-58-1	Carbonyl sulfide	60.07	0.49	0.000	0.02	0.00	1.20
108-90-7	Chlorobenzene	112.56	0.25	0.000	0.02	0.00	1.15
75-00-3	Chloroethane	64.52	1.25	0.000	0.07	0.00	3.30
67-66-3	Chloroform	119.39	0.03	0.000	0.00	0.00	0.15
74-87-3	Chloromethane [2]	50.49	1.21	0.000	0.05	0.00	2.50
106-46-7	Dichlorobenzene	147.00	0.21	0.000	0.03	0.00	1.26
75-09-2	Dichloromethane	84.94	14.30	0.000	1.01	0.00	49.65
100-41-4	Ethylbenzene	106.16	4.61	0.000	0.41	0.00	20.00
106-93-4	Ethylene dibromide [2]	187.88	0.001	0.000	0.00	0.00	0.01
110-54-3	Hexane	86.18	6.57	0.000	0.47	0.00	23.14
7439-97-6	Mercury	200.61	0.000292	0.000	0.00	0.00	0.00
108-10-1	Methyl isobutyl ketone	100.16	1.87	0.000	0.16	0.00	7.66
127-18-4	Perchloroethylene	165.83	3.73	0.000	0.52	0.00	25.28
79-01-6	Trichloroethene	131.40	2.82	0.000	0.31	0.00	15.15
75-01-4	Vinyl chloride	62.50	7.34	0.000	0.38	0.00	18.75
1330-20-7	Xylene	106.16	12.10	0.000	1.07	0.00	52.50
71-43-2	Benzene [3]	78.11	1.91	0.000	0.12	0.00	6.10
108-88-3	Toluene [3]	92.13	39.30	0.000	3.02	0.00	147.99
	Total HAPs					0.00	

Notes:

[1] Concentration of individual HAPs were taken from AP-42, Chapter 2.4, 11/98

[2] Not designated as a HAP in Chapter 2.4 of AP-42 (11/98), but is listed in the USEPA National Emission Inventory (NEI) database

[3] Used 'No or unknown co-disposal' concentration

Equations:

$$(mg/m^3) = \frac{\text{(Molecular weight) x (1 atm) x (Median ppmv)}}{\text{(298.15 K) x (0.08206 L*atm/K*mol)}}$$

$$(lb/hr) = \frac{(mg/m^3) \times (2.205 \times 10^{-6}\ [lb/mg]) \times (\text{Fugitive LFG Emission rate } [ft^3/min]) \times (60\ min/hr)}{(35.3147\ ft^3/m^3)}$$

$$(lb/yr) = (lb/hr) \times (8{,}760\ hours/yr)$$

$$(TPY) = \frac{(lb/yr)}{(2{,}000\ lb/ton)}$$

Table 11

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of LFG Flare Emissions (2024)

Total LFG to Flares in 2021 = 1.63E+06 ft^3
Average flow = 3.1 cfm

Flare Type	LFG Combusted MMscf	Estimated Actual Emissions for 2021 (TPY)					
		PM	NMOC	CO	NO_X	SO_2	VOC
Open	1.63	0.01	0.01	0.13	0.03	0.01	0.00
Total Emissions (TPY)		0.01	0.01	0.13	0.03	0.01	0.00
Total Emissions (lb/yr)		13.88	17.24	253.11	55.52	12.52	6.72

Flare Emission Factors

	Pounds per Million Standard Cubic Feet				
	PM	NMOC	CO	NO_X	SO_2
Open Flare	8.50	10.55	155.0	34.0	7.67

Notes:

PM 17 lb/10^6 dscf methane per AP-42, section 2.4 (8/24)
NMOC Based on 2,400 ppm per AP-42, section 2.4 (8/24), and 98% destruction eff
CO Based on AP-42, Section 13.5 (02/2018)
NO_X Based on AP-42, Section 13.5 (02/2018)
SO_2 46.9 ppm TRS concentration and 0% destruction efficiency, AP-42, section
VOC 39% of NMOC per AP-42, section 2.4 (11/98)
Heat Value 500 Btu/scf

Emission Factor Development

Open Flare

- based on AP-42, Section 13.5

CO: 0.31 lb/MMBtu
NOx: 0.068 lb/MMBtu

LFG Data:

NMOC: 2400 ppm
TRS: 46.9 ppm
CH_4: 50.0% of total LFG
VOC: 39.0% of NMOC
DE (of NMOC) 98.0 %

Table 12

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of Flare GHG Emissions (2028)

LFG to Flares = 9.3 MMscf

	MMscf Combusted	Estimated Actual 2021 Emissions (TPY)					
		Oxidation CO_2	Oxidation CH_4	Oxidation N_2O	Escape CH_4	Collected CO_2	*Anthropogenic GHG*
Flares	9	266.5	0.0	0.0	1.0	269.3	84.7
Total Emissions (TPY)		266.5	0.0	0.0	1.0	269.3	84.7
Total Emissions (lb/yr)		5.33E+05	3.28E+01	6.45E+00	1.96E+03	5.39E+05	1.69E+05

Flare Combustion Factors

	Pounds per MMScf		
	CO_2	CH_4	N_2O
Flare	57,396.8	3.5	0.69

Notes:

Oxidation CO_2 Combustion emission factor referenced from Table C-1 of 40 CFR Part 98, Subpart C
Oxidation CH_4 Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Oxidation N_2O Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Collected CO_2 Portion of collected LFG that already contains CO_2

Flare	Enclosed	
Heating value	500	Btu/scf
LFG CH_4 Concentration	50	%
CH_4 Density	0.0423	pounds per cubic foot (referenced from 40 CFR Part 98, Subpart HH)
CO_2 concentration	50	%
CO_2 density	0.116	pounds per cubic foot

Emission Factor Development

Flares - CH_4 Oxidation Emission Factors

	EF (kg/MMBtu)	GWP (20 year)
CO_2	52.07	1
CH_4	3.20E-03	84
N_2O	6.30E-04	264

Table 13

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of Fugitive HAP Emissions (2028)

Total LFG Generated =	24	cfm
LFG Collection Efficiency =	85%	
Average LFG Collected =	20	cfm
Fugitive Emission Estimates =	4	cfm
Hours of Operation =	8,760	

CAS #	LFG Constituent	Molecular Weight	Median [1] ppmv	Uncontrolled Emissions lb/hr	lb/yr	TPY	mg/m^3
71-55-6	1,1,1-Trichloroethane	133.41	0.48	0.000	0.30	0.00	2.62
79-34-5	1,1,2,2-Tetrachloroethane	167.85	1.11	0.000	0.88	0.00	7.62
75-34-3	1,1-Dichloroethane	98.97	2.35	0.000	1.10	0.00	9.51
75-35-4	1,1-Dichloroethene	96.94	0.20	0.000	0.09	0.00	0.79
107-06-2	1,2-Dichloroethane	98.96	0.41	0.000	0.19	0.00	1.66
78-87-5	1,2-Dichloropropane	112.99	0.18	0.000	0.10	0.00	0.83
107-13-1	Acrylonitrile	53.06	6.33	0.000	1.59	0.00	13.73
75-15-0	Carbon disulfide	76.13	0.58	0.000	0.21	0.00	1.80
56-23-5	Carbon tetrachloride	153.84	0.00	0.000	0.00	0.00	0.03
463-58-1	Carbonyl sulfide	60.07	0.49	0.000	0.14	0.00	1.20
108-90-7	Chlorobenzene	112.56	0.25	0.000	0.13	0.00	1.15
75-00-3	Chloroethane	64.52	1.25	0.000	0.38	0.00	3.30
67-66-3	Chloroform	119.39	0.03	0.000	0.02	0.00	0.15
74-87-3	Chloromethane [2]	50.49	1.21	0.000	0.29	0.00	2.50
106-46-7	Dichlorobenzene	147.00	0.21	0.000	0.15	0.00	1.26
75-09-2	Dichloromethane	84.94	14.30	0.001	5.76	0.00	49.65
100-41-4	Ethylbenzene	106.16	4.61	0.000	2.32	0.00	20.00
106-93-4	Ethylene dibromide [2]	187.88	0.001	0.000	0.00	0.00	0.01
110-54-3	Hexane	86.18	6.57	0.000	2.68	0.00	23.14
7439-97-6	Mercury	200.61	0.000292	0.000	0.00	0.00	0.00
108-10-1	Methyl isobutyl ketone	100.16	1.87	0.000	0.89	0.00	7.66
127-18-4	Perchloroethylene	165.83	3.73	0.000	2.93	0.00	25.28
79-01-6	Trichloroethene	131.40	2.82	0.000	1.76	0.00	15.15
75-01-4	Vinyl chloride	62.50	7.34	0.000	2.17	0.00	18.75
1330-20-7	Xylene	106.16	12.10	0.001	6.09	0.00	52.50
71-43-2	Benzene [3]	78.11	1.91	0.000	0.71	0.00	6.10
108-88-3	Toluene [3]	92.13	39.30	0.002	17.16	0.01	147.99
	Total HAPs					0.02	

Notes:

[1] Concentration of individual HAPs were taken from AP-42, Chapter 2.4, 11/98

[2] Not designated as a HAP in Chapter 2.4 of AP-42 (11/98), but is listed in the USEPA National Emission Inventory (NEI) database

[3] Used 'No or unknown co-disposal' concentration

Equations:

$$(mg/m^3) = \frac{\text{(Molecular weight) x (1 atm) x (Median ppmv)}}{\text{(298.15 K) x (0.08206 L*atm/K*mol)}}$$

$$(lb/hr) = \frac{(mg/m^3) \times (2.205 \times 10^{-6}\ [lb/mg]) \times \text{(Fugitive LFG Emission rate [ft}^3\text{/min])} \times \text{(60 min/hr)}}{(35.3147\ ft^3/m^3)}$$

$$(lb/yr) = (lb/hr) \times (8{,}760\ hours/yr)$$

$$(TPY) = \frac{(lb/yr)}{(2{,}000\ lb/ton)}$$

Table 14

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of LFG Flare Emissions (2028)

Total LFG to Flares in 2021 = 9.29E+06 ft^3
Average flow = 17.7 cfm

Flare Type	LFG Combusted MMscf	Estimated Actual Emissions for 2021 (TPY)					
		PM	NMOC	CO	NO_X	SO_2	VOC
Open	9.29	0.04	0.05	0.72	0.16	0.04	0.02
Total Emissions (TPY)		0.04	0.05	0.72	0.16	0.04	0.02
Total Emissions (lb/yr)		78.95	98.03	1,439.62	315.79	71.20	38.23

Flare Emission Factors

	Pounds per Million Standard Cubic Feet				
	PM	NMOC	CO	NO_X	SO_2
Open Flare	8.50	10.55	155.0	34.0	7.67

Notes:

PM 17 lb/10^6 dscf methane per AP-42, section 2.4 (8/24)
NMOC Based on 2,400 ppm per AP-42, section 2.4 (8/24), and 98% destruction eff
CO Based on AP-42, Section 13.5 (02/2018)
NO_X Based on AP-42, Section 13.5 (02/2018)
SO_2 46.9 ppm TRS concentration and 0% destruction efficiency, AP-42, section
VOC 39% of NMOC per AP-42, section 2.4 (11/98)
Heat Value 500 Btu/scf

Emission Factor Development

Open Flare

- based on AP-42, Section 13.5

CO:	0.31	lb/MMBtu
NOx:	0.068	lb/MMBtu

LFG Data:

NMOC:	2400	ppm
TRS:	46.9	ppm
CH_4:	50.0%	of total LFG
VOC:	39.0%	of NMOC
DE (of NMOC)	98.0	%

Table 15

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of Flare GHG Emissions (2030)

LFG to Flares = 13.7 MMscf

	MMscf Combusted	Estimated Actual 2021 Emissions (TPY)					
		Oxidation CO_2	Oxidation CH_4	Oxidation N_2O	Escape CH_4	Collected CO_2	*Anthropogenic GHG*
Flares	14	394.0	0.0	0.0	1.5	398.2	125.3
Total Emissions (TPY)		394.0	0.0	0.0	1.5	398.2	125.3
Total Emissions (lb/yr)		7.88E+05	4.84E+01	9.54E+00	2.90E+03	7.96E+05	2.51E+05

Flare Combustion Factors

	Pounds per MMScf		
	CO_2	CH_4	N_2O
Flare	57,396.8	3.5	0.69

Notes:

Oxidation CO_2 Combustion emission factor referenced from Table C-1 of 40 CFR Part 98, Subpart C
Oxidation CH_4 Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Oxidation N_2O Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Collected CO_2 Portion of collected LFG that already contains CO_2

Flare	Enclosed	
Heating value	500	Btu/scf
LFG CH_4 Concentration	50	%
CH_4 Density	0.0423	pounds per cubic foot (referenced from 40 CFR Part 98, Subpart HH)
CO_2 concentration	50	%
CO_2 density	0.116	pounds per cubic foot

Emission Factor Development

Flares - CH_4 Oxidation Emission Factors

	EF (kg/MMBtu)	GWP (20 year)
CO_2	52.07	1
CH_4	3.20E-03	84
N_2O	6.30E-04	264

Table 16

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of Fugitive HAP Emissions (2030)

Total LFG Generated =	35	cfm
LFG Collection Efficiency =	85%	
Average LFG Collected =	30	cfm
Fugitive Emission Estimates =	5	cfm
Hours of Operation =	8,760	

CAS #	LFG Constituent	Molecular Weight	Median [1] ppmv	Uncontrolled Emissions lb/hr	lb/yr	TPY	mg/m^3
71-55-6	1,1,1-Trichloroethane	133.41	0.48	0.000	0.45	0.00	2.62
79-34-5	1,1,2,2-Tetrachloroethane	167.85	1.11	0.000	1.31	0.00	7.62
75-34-3	1,1-Dichloroethane	98.97	2.35	0.000	1.63	0.00	9.51
75-35-4	1,1-Dichloroethene	96.94	0.20	0.000	0.14	0.00	0.79
107-06-2	1,2-Dichloroethane	98.96	0.41	0.000	0.28	0.00	1.66
78-87-5	1,2-Dichloropropane	112.99	0.18	0.000	0.14	0.00	0.83
107-13-1	Acrylonitrile	53.06	6.33	0.000	2.35	0.00	13.73
75-15-0	Carbon disulfide	76.13	0.58	0.000	0.31	0.00	1.80
56-23-5	Carbon tetrachloride	153.84	0.00	0.000	0.00	0.00	0.03
463-58-1	Carbonyl sulfide	60.07	0.49	0.000	0.21	0.00	1.20
108-90-7	Chlorobenzene	112.56	0.25	0.000	0.20	0.00	1.15
75-00-3	Chloroethane	64.52	1.25	0.000	0.57	0.00	3.30
67-66-3	Chloroform	119.39	0.03	0.000	0.03	0.00	0.15
74-87-3	Chloromethane [2]	50.49	1.21	0.000	0.43	0.00	2.50
106-46-7	Dichlorobenzene	147.00	0.21	0.000	0.22	0.00	1.26
75-09-2	Dichloromethane	84.94	14.30	0.001	8.51	0.00	49.65
100-41-4	Ethylbenzene	106.16	4.61	0.000	3.43	0.00	20.00
106-93-4	Ethylene dibromide [2]	187.88	0.001	0.000	0.00	0.00	0.01
110-54-3	Hexane	86.18	6.57	0.000	3.97	0.00	23.14
7439-97-6	Mercury	200.61	0.000292	0.000	0.00	0.00	0.00
108-10-1	Methyl isobutyl ketone	100.16	1.87	0.000	1.31	0.00	7.66
127-18-4	Perchloroethylene	165.83	3.73	0.000	4.33	0.00	25.28
79-01-6	Trichloroethene	131.40	2.82	0.000	2.60	0.00	15.15
75-01-4	Vinyl chloride	62.50	7.34	0.000	3.21	0.00	18.75
1330-20-7	Xylene	106.16	12.10	0.001	9.00	0.00	52.50
71-43-2	Benzene [3]	78.11	1.91	0.000	1.05	0.00	6.10
108-88-3	Toluene [3]	92.13	39.30	0.003	25.37	0.01	147.99
	Total HAPs					0.04	

Notes:

[1] Concentration of individual HAPs were taken from AP-42, Chapter 2.4, 11/98

[2] Not designated as a HAP in Chapter 2.4 of AP-42 (11/98), but is listed in the USEPA National Emission Inventory (NEI) database

[3] Used 'No or unknown co-disposal' concentration

Equations:

$$(mg/m^3) = \frac{\text{(Molecular weight) x (1 atm) x (Median ppmv)}}{\text{(298.15 K) x (0.08206 L*atm/K*mol)}}$$

$$(lb/hr) = \frac{(mg/m^3) \times (2.205 \times 10^{-6}\ [lb/mg]) \times \text{(Fugitive LFG Emission rate [ft}^3\text{/min])} \times \text{(60 min/hr)}}{(35.3147\ ft^3/m^3)}$$

$$(lb/yr) = (lb/hr) \times (8{,}760\ hours/yr)$$

$$(TPY) = \frac{(lb/yr)}{(2{,}000\ lb/ton)}$$

Table 17

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of LFG Flare Emissions (2030)

Total LFG to Flares in 2021 = 1.37E+07 ft^3
Average flow = 26.1 cfm

Flare Type	LFG Combusted MMscf	Estimated Actual Emissions for 2021 (TPY)					
		PM	NMOC	CO	NO_X	SO_2	VOC
Open	13.73	0.06	0.07	1.06	0.23	0.05	0.03
Total Emissions (TPY)		0.06	0.07	1.06	0.23	0.05	0.03
Total Emissions (lb/yr)		116.71	144.93	2,128.23	466.84	105.26	56.52

Flare Emission Factors

	Pounds per Million Standard Cubic Feet				
	PM	NMOC	CO	NO_X	SO_2
Open Flare	8.50	10.55	155.0	34.0	7.67

Notes:

PM 17 lb/10^6 dscf methane per AP-42, section 2.4 (8/24)
NMOC Based on 2,400 ppm per AP-42, section 2.4 (8/24), and 98% destruction eff
CO Based on AP-42, Section 13.5 (02/2018)
NO_X Based on AP-42, Section 13.5 (02/2018)
SO_2 46.9 ppm TRS concentration and 0% destruction efficiency, AP-42, section
VOC 39% of NMOC per AP-42, section 2.4 (11/98)
Heat Value 500 Btu/scf

Emission Factor Development

Open Flare

- based on AP-42, Section 13.5

CO:	0.31	lb/MMBtu
NOx:	0.068	lb/MMBtu

LFG Data:

NMOC:	2400	ppm
TRS:	46.9	ppm
CH_4:	50.0%	of total LFG
VOC:	39.0%	of NMOC
DE (of NMOC)	98.0	%

Table 18

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of Flare GHG Emissions (2050)

LFG to Flares = 43.1 MMscf

	MMscf Combusted	Estimated Actual 2021 Emissions (TPY)					
		Oxidation CO_2	Oxidation CH_4	Oxidation N_2O	Escape CH_4	Collected CO_2	*Anthropogenic GHG*
Flares	43	1,237.0	0.1	0.0	4.6	1,250.0	393.2
Total Emissions (TPY)		1,237.0	0.1	0.0	4.6	1,250.0	393.2
Total Emissions (lb/yr)		2.47E+06	1.52E+02	2.99E+01	9.12E+03	2.50E+06	7.86E+05

Flare Combustion Factors

	Pounds per MMScf		
	CO_2	CH_4	N_2O
Flare	57,396.8	3.5	0.69

Notes:

Oxidation CO_2 Combustion emission factor referenced from Table C-1 of 40 CFR Part 98, Subpart C
Oxidation CH_4 Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Oxidation N_2O Combustion emission factor referenced from Table C-2 of 40 CFR Part 98, Subpart C
Collected CO_2 Portion of collected LFG that already contains CO_2

Flare	Enclosed	
Heating value	500	Btu/scf
LFG CH_4 Concentration	50	%
CH_4 Density	0.0423	pounds per cubic foot (referenced from 40 CFR Part 98, Subpart HH)
CO_2 concentration	50	%
CO_2 density	0.116	pounds per cubic foot

Emission Factor Development

Flares - CH_4 Oxidation Emission Factors

	EF (kg/MMBtu)	GWP (20 year)
CO_2	52.07	1
CH_4	3.20E-03	84
N_2O	6.30E-04	264

Table 19

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of Fugitive HAP Emissions (2050)

Total LFG Generated =	109	cfm
LFG Collection Efficiency =	85%	
Average LFG Collected =	93	cfm
Fugitive Emission Estimates =	16	cfm
Hours of Operation =	8,760	

CAS #	LFG Constituent	Molecular Weight	Median [1] ppmv	Uncontrolled Emissions lb/hr	lb/yr	TPY	mg/m^3
71-55-6	1,1,1-Trichloroethane	133.41	0.48	0.000	1.41	0.00	2.62
79-34-5	1,1,2,2-Tetrachloroethane	167.85	1.11	0.000	4.10	0.00	7.62
75-34-3	1,1-Dichloroethane	98.97	2.35	0.001	5.12	0.00	9.51
75-35-4	1,1-Dichloroethene	96.94	0.20	0.000	0.43	0.00	0.79
107-06-2	1,2-Dichloroethane	98.96	0.41	0.000	0.89	0.00	1.66
78-87-5	1,2-Dichloropropane	112.99	0.18	0.000	0.45	0.00	0.83
107-13-1	Acrylonitrile	53.06	6.33	0.001	7.39	0.00	13.73
75-15-0	Carbon disulfide	76.13	0.58	0.000	0.97	0.00	1.80
56-23-5	Carbon tetrachloride	153.84	0.00	0.000	0.01	0.00	0.03
463-58-1	Carbonyl sulfide	60.07	0.49	0.000	0.65	0.00	1.20
108-90-7	Chlorobenzene	112.56	0.25	0.000	0.62	0.00	1.15
75-00-3	Chloroethane	64.52	1.25	0.000	1.77	0.00	3.30
67-66-3	Chloroform	119.39	0.03	0.000	0.08	0.00	0.15
74-87-3	Chloromethane [2]	50.49	1.21	0.000	1.34	0.00	2.50
106-46-7	Dichlorobenzene	147.00	0.21	0.000	0.68	0.00	1.26
75-09-2	Dichloromethane	84.94	14.30	0.003	26.72	0.01	49.65
100-41-4	Ethylbenzene	106.16	4.61	0.001	10.77	0.01	20.00
106-93-4	Ethylene dibromide [2]	187.88	0.001	0.000	0.00	0.00	0.01
110-54-3	Hexane	86.18	6.57	0.001	12.46	0.01	23.14
7439-97-6	Mercury	200.61	0.000292	0.000	0.00	0.00	0.00
108-10-1	Methyl isobutyl ketone	100.16	1.87	0.000	4.12	0.00	7.66
127-18-4	Perchloroethylene	165.83	3.73	0.002	13.61	0.01	25.28
79-01-6	Trichloroethene	131.40	2.82	0.001	8.15	0.00	15.15
75-01-4	Vinyl chloride	62.50	7.34	0.001	10.09	0.01	18.75
1330-20-7	Xylene	106.16	12.10	0.003	28.26	0.01	52.50
71-43-2	Benzene [3]	78.11	1.91	0.000	3.28	0.00	6.10
108-88-3	Toluene [3]	92.13	39.30	0.009	79.65	0.04	147.99
	Total HAPs					0.11	

Notes:

[1] Concentration of individual HAPs were taken from AP-42, Chapter 2.4, 11/98

[2] Not designated as a HAP in Chapter 2.4 of AP-42 (11/98), but is listed in the USEPA National Emission Inventory (NEI) database

[3] Used 'No or unknown co-disposal' concentration

Equations:

$$(mg/m^3) = \frac{\text{(Molecular weight)} \times \text{(1 atm)} \times \text{(Median ppmv)}}{\text{(298.15 K)} \times \text{(0.08206 L*atm/K*mol)}}$$

$$(lb/hr) = \frac{(mg/m^3) \times (2.205 \times 10^{-6}\ [lb/mg]) \times \text{(Fugitive LFG Emission rate } [ft^3/min]) \times \text{(60 min/hr)}}{(35.3147\ ft^3/m^3)}$$

$$(lb/yr) = (lb/hr) \times (8{,}760\ hours/yr)$$

$$(TPY) = \frac{(lb/yr)}{(2{,}000\ lb/ton)}$$

Table 20

CLCPA Assessment
Syracuse Haulers Waste Removal Inc.
Haulers Facility, LLC

Summary of LFG Flare Emissions (2050)

Total LFG to Flares in 2021 = 4.31E+07 ft^3
Average flow = 82.0 cfm

Flare Type	LFG Combusted MMscf	Estimated Actual Emissions for 2021 (TPY)					
		PM	NMOC	CO	NO_X	SO_2	VOC
Open	43.10	0.18	0.23	3.34	0.73	0.17	0.09
Total Emissions (TPY)		0.18	0.23	3.34	0.73	0.17	0.09
Total Emissions (lb/yr)		366.39	454.96	6,681.17	1,465.55	330.44	177.44

Flare Emission Factors

	Pounds per Million Standard Cubic Feet				
	PM	NMOC	CO	NO_X	SO_2
Open Flare	8.50	10.55	155.0	34.0	7.67

Notes:

PM 17 lb/10^6 dscf methane per AP-42, section 2.4 (8/24)
NMOC Based on 2,400 ppm per AP-42, section 2.4 (8/24), and 98% destruction eff
CO Based on AP-42, Section 13.5 (02/2018)
NO_X Based on AP-42, Section 13.5 (02/2018)
SO_2 46.9 ppm TRS concentration and 0% destruction efficiency, AP-42, section
VOC 39% of NMOC per AP-42, section 2.4 (11/98)
Heat Value 500 Btu/scf

Emission Factor Development

Open Flare

- based on AP-42, Section 13.5

CO:	0.31	lb/MMBtu
NOx:	0.068	lb/MMBtu

LFG Data:

NMOC:	2400	ppm
TRS:	46.9	ppm
CH_4:	50.0%	of total LFG
VOC:	39.0%	of NMOC
DE (of NMOC)	98.0	%