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Subpart HH - Municipal Solid Waste Landfills

 A printer-friendly version (pdf) (33 pp, 5,467K) of GHG reporting instructions for this subpart

Please select a help topic from the list below:


- Using Subpart HH Calculation Spreadsheets
- Using e-GGRT to Prepare Your Subpart HH Report
 - Subpart HH Summary Information for this Facility
 - Subpart HH Waste Information
 - Subpart HH Emissions Information
- Carry forward of data from previous subpart HH submissions into RY2011 forms
- Subpart HH - Inputs Whose Reporting Deadline Was Deferred Until 2013

- Subpart HH Rule Guidance
- Subpart HH Rule Language (eCFR)

Additional Resources:

- Part 98 Terms and Definitions
- Frequently Asked Questions (FAQs)
- Webinar Slides

Using Subpart HH Calculation Spreadsheets

 These optional spreadsheets are provided to assist reporters in calculating emissions and in keeping records of these calculations.

Reporters are required to keep records of these calculations under 40 CFR 98.3(g) and additional subpart-specific provisions, but are not required to use these spreadsheets or to submit any spreadsheets to EPA.

Spreadsheets may include inputs to emission equations, reporting of which EPA deferred some until 2015. (See 76 FR 53057, published August 25, 2011, <http://www.gpo.gov/fdsys/pkg/FR-2011-08-25/pdf/2011-21727.pdf>).

Overview

This help page provides guidance for working with the supplemental Subpart HH calculation spreadsheets. The guidance provides step-by-step instructions for the following tasks:

- Selecting the Appropriate Calculation Spreadsheet
- Downloading a Calculation Spreadsheet
- General Information on Using a Calculation Spreadsheet
- Using the Equation HH-1 Calculation Spreadsheet
- Using the Equation HH-2, HH-3 Calculation Spreadsheet
- Using the Equation HH-4 Calculation Spreadsheet
- Using the Equation HH-5 Calculation Spreadsheet
- Using the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet

Specific information on each of the calculation spreadsheets is provided below:

Calculation Spreadsheet (click to download)	Calculation Result	Spreadsheet Applicability	Instructions (click to view)
Equation HH-1 Calculation Spreadsheet.xls	Modeled methane generation rate in reporting year	All landfills	HH-1 Help

Equation HH-2, HH-3 Calculation Spreadsheet.xls	Quantity of waste placed in the landfill in year x (wet basis)	Landfills where historical waste disposal quantity data are not readily available	HH-2, HH-3 Help
Equation HH-4 Calculation Spreadsheet.xls	Annual quantity of recovered CH ₄	Landfills with landfill gas collection systems	HH-4 Help
Equation HH-5 Calculation Spreadsheet.xls	Methane generation, adjusted for oxidation, from the landfill in the reporting year	All landfills	HH-5 Help
Equation HH-6, HH-7, HH-8 Calculation Spreadsheet.xls	Methane generation, adjusted for oxidation, from the landfill in the reporting year (by Equation HH-7) and Methane emissions from the landfill in the reporting year by two different ways (by Equation HH-6 and by Equation HH-8)	Landfills with landfill gas collection systems	HH-6, HH-7, HH-8 Help

Selecting the Appropriate Calculation Spreadsheet

For all landfills subject to the reporting requirements of Subpart HH, calculate annual modeled CH₄ generation using the Equation HH-1 Calculation Spreadsheet and according to the requirements in 98.343(a)(1) through 98.343(a)(3). Equation HH-1 is provided below.

(Equation HH-1)	$G_{CH_4} = \left[\sum_{x=S}^{T-1} \left\{ W_x \times MCF \times DOC \times DOC_F \times F \times \frac{16}{12} \times \left(e^{-k(T-x-1)} - e^{-k(T-x)} \right) \right\} \right]$
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Per 98.343(a)(3), beginning in the first emissions reporting year, and each year thereafter, waste quantities must be determined using scales or the working capacity for each vehicle/container, for loads other than cars, light-duty trucks, and loads that cannot be measured with scales due to physical or operational limitations. If scales are in place at the landfill, they must be used to determine waste quantities for the first emissions reporting year and each year thereafter. Scales and/or working capacity may also have been used for any previous years for which waste disposal quantities were measured. Tipping receipts and company records may also be used to determine waste disposal quantities prior to 2010. For the range of years prior to 2010, for which measurement data, tipping receipts or company records are not available, estimate historical annual waste disposal quantities using one of the following methods:

1. Assume all prior year's waste disposal quantities are the same as the waste quantity in the first year for which waste quantities were measured and data are available.
2. Use Equation HH-2 and the Equation HH-2, HH-3 Calculation Spreadsheet which is based on the estimated population served by the landfill in each year and the values for average per capita waste disposal rate.
3. Use Equation HH-3 and the Equation HH-2, HH-3 Calculation Spreadsheet which is based on the landfill capacity or, for operating landfills, the amount of waste-in-place, and the number of years waste was received to estimate a constant average waste disposal quantity.

Equations HH-2 and HH-3 are provided below.

(Equation HH-2)	$W_x = POP_x \times WDR_x$
(Equation HH-3)	$W_x = \frac{LFC}{(YrData - YrOpen + 1)}$

For landfills that do not collect and destroy landfill gas, adjust the modeled annual CH₄ generation (result of Equation HH-1) to account for soil oxidation (CH₄ that is converted to CO₂ as it passes through the landfill cover before being emitted) using the Equation HH-5 Calculation Spreadsheet. The resulting value represents both CH₄ generation (adjusted for oxidation) and CH₄ emissions for landfills that do not collect and destroy landfill gas. For landfills that do collect and control landfill gas, the result of Equation HH-4 and the Equation HH-5 Calculation Spreadsheet represents only CH₄ generation (adjusted for oxidation). Equation HH-5 is provided below.

(Equation HH-5)	$MG = G_{CH_4} \times (1 - OX)$
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For landfills that collect and control landfill gas, calculate the annual quantity of CH₄ recovered and destroyed using Equation HH-4 and the Equation HH-4 Calculation Spreadsheet which is based on continuous monitoring of gas flow rate and continuous or weekly monitoring of CH₄ concentration, temperature, pressure, and moisture content of the collected gas prior to the destruction device. Equation HH-4 is provided below.

(Equation HH-4)	$R = \sum_{n=1}^N \left((V)_n \times (K_{MC})_n \times \frac{(C)_n}{100\%} \times 0.0423 \times \frac{520^\circ R}{(T)_n} \times \frac{(P)_n}{1 \text{ atm}} \times \frac{0.454}{1,000} \right)$
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Facilities that collect and control landfill gas must then calculate CH₄ generation (adjusted for oxidation) and CH₄ emissions in two ways each and report all four results. CH₄ generation (adjusted for oxidation) and CH₄ emissions should be calculated by:

1. First using Equation HH-5 and the Equation HH-5 Calculation Spreadsheet to determine CH₄ generation (adjusted for oxidation) and then using Equation HH-6 and the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet which subtracts the measured amount of CH₄ recovered from the modeled annual CH₄ generation (with adjustments for soil oxidation and destruction efficiency of the destruction device).
2. Using Equations HH-7 and HH-8 and the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet which applies a gas collection efficiency to the measured amount of CH₄ recovered and accounts for CH₄ that is emitted through the landfill surface (adjusted for soil oxidation). Default collection efficiencies that take into account collection system coverage and landfill cover materials are specified in Table HH-3 found in a separate tab within the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet. If a single measurement location is used to determine gas recovery for multiple destruction devices, the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet also provides equations for computing destruction efficiency and fraction of hours destruction devices were operating in the "MultiDD_per_MeasLocation" tab.

Equation HH-5 is provided above. Equations HH-6, HH-7 and HH-8 are provided below.

(Equation HH-6)	$\text{Emissions} = \left[(G_{CH_4} - R) \times (1 - OX) + R \times (1 - (DE \times f_{Dest})) \right]$
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(Equation HH-7)	$MG = \frac{R}{CE \times f_{Rec}} \times (1 - OX)$
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(Equation HH-8)	$\text{Emissions} = \left[\left(\frac{R}{CE \times f_{Rec}} - R \right) \times (1 - OX) + R \times (1 - (DE \times f_{Dest})) \right]$
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The Equation HH-6, HH-7, HH-8 Calculation Spreadsheet also provides alternate equations to implement Equations HH-6, HH-7, and HH-8 when multiple gas recovery measurement locations are used (in tab "Equation HH-6,HH-7,HH-8_Multi"). These alternate forms of Equations HH-6, HH-7, and HH-8 are provided below.

(Equation HH-6)	$\text{Emissions} = \left[\left(G_{CH_4} - \sum_{n=1}^N R_n \right) \times (1 - OX) + \sum_{n=1}^N \left\{ R_n \times (1 - (DE_n \times f_{Dest,n})) \right\} \right]$
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(Equation HH-7)	$MG = \frac{1}{CE} \sum_{n=1}^N \left[\frac{R_n}{f_{Rec,n}} \right] \times (1 - OX)$
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(Equation HH-8)

$$\text{Emissions} = \left[\left(\frac{1}{\text{CE}} \left\{ \sum_{n=1}^N \left[\frac{R_n}{f_{\text{Rec},n}} \right] \right\} - \sum_{n=1}^N R_n \right) \times (1 - \text{OX}) + \sum_{n=1}^N \left\{ R_n \times (1 - (\text{DE}_n \times f_{\text{Dest},n})) \right\} \right]$$

Downloading a Calculation Spreadsheet

Calculation spreadsheets for Subpart HH may be downloaded by clicking one of the links in the first column of the table below. Users may also jump to instructions for each calculation spreadsheet by clicking one of the links in the fourth column.

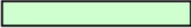



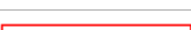
Calculation Spreadsheet (click to download)	Calculation Result	Spreadsheet Applicability	Instructions (click to view)
Equation HH-1 Calculation Spreadsheet.xls	Modeled methane generation rate in reporting year	All landfills	HH-1 Help
Equation HH-2, HH-3 Calculation Spreadsheet.xls	Quantity of waste placed in the landfill in year x (wet basis)	Landfills where historical waste disposal quantity data are not readily available	HH-2, HH-3 Help
Equation HH-4 Calculation Spreadsheet.xls	Annual quantity of recovered CH ₄	Landfills with landfill gas collection systems	HH-4 Help
Equation HH-5 Calculation Spreadsheet.xls	Methane generation, adjusted for oxidation, from the landfill in the reporting year	All landfills	HH-5 Help
Equation HH-6, HH-7, HH-8 Calculation Spreadsheet.xls	Methane generation, adjusted for oxidation, from the landfill in the reporting year (by Equation HH-7) and Methane emissions from the landfill in the reporting year and Methane emissions from the landfill in the reporting year by two different ways (by Equation HH-6 and by Equation HH-8)	Landfills with landfill gas collection systems	HH-6, HH-7, HH-8 Help

Using a Calculation Spreadsheet to Make Calculations

The guidance provided in this section applies to each of the calculation spreadsheets for Subpart HH. Additional guidance is provided for each individual calculation spreadsheet in the sections below.

Color Coding

The calculation spreadsheets contain green input cells, gray informational cells and red-bordered results cells. Users should use green input cells to enter all data specific to their facility, unit, or process. As you progress through a reporting form, you may notice some green input cells changing to black deactivated cells. Black deactivated cells are not applicable to the user based on previous data entries in the form. Users should not enter data into these cells. Gray informational cells contain parameter names, column and row headings, equation constants and subtotals. Calculation results are displayed in red-bordered results cells. Values displayed in red-bordered cells with yellow fill should be entered into another cell within the same calculation spreadsheet or in another calculation spreadsheet as directed by spreadsheet instructions. Values displayed in red-bordered cells with white fill should be entered directly into e-GGRT. All cells that are not green input cells are locked and cannot be modified.

	Green input cell (data entry)
	Black deactivated cell (not applicable, no data required)
	Gray informational cells (locked)
	Red-bordered/yellow fill results cells (enter into another spreadsheet)
	Red-bordered/white fill results cells (enter into e-GGRT)

Stop and Warning Messages

The calculation spreadsheets will display a stop message if the user enters a value that is invalid or a warning message if the user enters a value outside the EPA estimated range for a particular data element. For invalid data entries, the stop messages will not allow a user to proceed and the user must reenter valid data before moving forward. For data entries that are outside the EPA estimated range for a particular data element, the warning messages will allow a user to proceed if the user deems the entered value to be accurate.

Using the Equation HH-1 Calculation Spreadsheet

Calculate the annual modeled CH₄ generation using Equation HH-1 and the Equation HH-1 Calculation Spreadsheet for a landfill. Use the appropriate parameter values for k, DOC, MCF, DOC_F, and F shown in Table HH-1 within the calculation spreadsheet. For years when waste composition data are not available, use either the bulk waste or the modified bulk MSW parameter values for k and DOC in Table HH-1 for the total quantity of waste disposed in those years.

If, prior to 2010, the quantity of waste disposed each year (W_x) is estimated using Equation HH-2 or HH-3, use the Equation HH-2, HH-3 Calculation Spreadsheet first and enter the resulting W_x values in the appropriate column in the Equation HH-1 Calculation Spreadsheet.

Equation HH-1 is provided below:

(Equation HH-1)	$G_{CH_4} = \left[\sum_{x=S}^{T-1} \left\{ W_x \times MCF \times DOC \times DOC_F \times F \times \frac{16}{12} \times \left(e^{-k(T-x-1)} - e^{-k(T-x)} \right) \right\} \right]$
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Begin by entering the facility name, your name, the unit name or identifier, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	Municipal Solid Waste Landfill

Next, enter the requested information in the green input cells in the Input Data table.

Input Data

[S] = Start year of calculation. Use the year 1960 or the opening year of the landfill, whichever is more recent.	1960	
[T] = Reporting year for which emissions are calculated.	2010	
[MCF] = Methane correction factor (fraction). Use the default value of 1 unless there is active aeration of waste within the landfill during the reporting year. If there is active aeration of waste within the landfill during the reporting year, use either the default value of 1 or select an alternative value no less than 0.5 based on site-specific aeration parameters.	1.	The default value for MCF is 1
[DOC] = Degradable organic carbon from Table HH-1 of this subpart or measurement data, if available [fraction (metric tons C/metric ton waste)].		
[DOC _F] = Fraction of DOC dissimilated (fraction). Use the default value of 0.5.	0.5	
[F] = Fraction by volume of CH ₄ in landfill gas from measurement data on a dry basis, if available (fraction); default is 0.5.	0.5	The default value for F is 0.5
[16/12] = Constant	16/12	
[k] = Rate constant from Table HH-1 of this subpart (yr ⁻¹). Select the most applicable k value for the majority of the past 10 years (or operating life, whichever is shorter).		

[x] = Year in which waste was disposed.	[W _x] = Quantity of waste disposed in the landfill in year x from measurement data, tipping fee receipts, or other company records (metric tons, as received (wet weight)).	[G _{CH₄}] in year T from waste disposed in year x (metric tons CH ₄). Value is calculated for years between S and T-1, inclusive.
1960		0.0
1961		0.0
1962		0.0
1963		0.0

The calculation spreadsheet will calculate the modeled CH₄ generation from the landfill in the reporting year. The calculated value will be displayed in a red-bordered cell with yellow fill at the bottom of the spreadsheet. This value should be entered in the Equation HH-5 Calculation Spreadsheet for this landfill.

Annual Modeled CH₄ Generation (metric tons) from Equation HH-1

[G _{CH₄}] = Modeled methane generation rate in reporting year T (metric tons CH ₄).	0.00
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Use this value in Equation HH-5

Using the Equation HH-2, HH-3 Calculation Spreadsheet

Estimate historical annual waste disposal quantities for the range of years prior to 2010 in which measurement data was not available using proxy year measurement data or the Equation HH-2, HH-3 Calculation Spreadsheet. This spreadsheet is only needed when following the methodologies in 98.343(a)(4)(ii) or 98.343(a)(4)(iii). This spreadsheet performs the calculation using Equation HH-2 or Equation HH-3, which are provided below. Equation HH-2 is based on the estimated population served by the landfill in each year and the values for average per capita waste disposal rate and should be used when applying the methodology described in 98.343(a)(4)(ii); Equation HH-3 is based on the landfill capacity or, for operating landfills, the amount of waste-in-place to estimate a constant average waste disposal quantity and should be used when applying the methodology described in 98.343(a)(4)(iii). The result from either equation is entered into the Equation HH-1 Calculation Spreadsheet for this landfill.

(Equation HH-2)	$W_x = POP_x \times WDR_x$
(Equation HH-3)	$W_x = \frac{LFC}{(YrData - YrOpen + 1)}$


Begin by entering the facility name, your name, the unit name or identifier, the reporting period, any additional comments, and the equation you wish to use (HH-2 or HH-3) in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	Municipal Solid Waste Landfill
Equation Used	

Next, enter the requested information in the green input cells in the Annual Calculated W_x table for either Equation HH-2 or HH-3, but not both.


Annual Calculated W_x Using Equation HH-2

[x] = Year in which waste was disposed.	[POP] _x = Population served by the landfill in year x from city population, census data, or other estimates (capita).	[VDR] _x = Average per capita waste disposal rate for year x from Table HH-2 (metric tons per capita per year, wet basis).	[W] _x = Quantity of waste placed in the landfill in year x (metric tons, wet basis).
1960		0.63	0.0
1961		0.64	0.0
1962		0.64	0.0
1963		0.65	0.0
1964		0.65	0.0
1965		0.66	0.0
1966		0.66	0.0
1967		0.67	0.0
1968		0.68	0.0
1969		0.68	0.0
1970		0.69	0.0
1971		0.69	0.0
1972		0.7	0.0
1973		0.71	0.0
1974		0.71	0.0
1975		0.72	0.0
1976		0.73	0.0
1977		0.73	0.0
1978		0.74	0.0
1979		0.75	0.0
1980		0.75	0.0
1981		0.76	0.0
1982		0.77	0.0
1983		0.77	0.0
1984		0.78	0.0
1985		0.79	0.0
1986		0.79	0.0
1987		0.8	0.0
1988		0.8	0.0
1989		0.83	0.0
1990		0.82	0.0
1991		0.76	0.0
1992		0.74	0.0
1993		0.76	0.0
1994		0.75	0.0
1995		0.7	0.0
1996		0.68	0.0
1997		0.69	0.0
1998		0.75	0.0
1999		0.75	0.0
2000		0.8	0.0
2001		0.91	0.0
2002		1.02	0.0
2003		1.02	0.0
2004		1.01	0.0
2005		0.98	0.0
2006		0.95	0.0
2007		0.95	0.0
2008		0.95	0.0
2009		0.95	0.0
2010			0.0
2011			0.0
2012			0.0
2013			0.0
2014			0.0
2015			0.0

 Use these values in Equation HH-1

Annual Calculated W_x Using Equation HH-3

[LFC] = Landfill capacity or, for operating landfills, capacity of the landfill used (or the total quantity of waste-in-place) at the end of the year prior to the year when waste disposal data are available from design drawings or engineering estimates (metric tons)	[YrData] = Year in which the landfill last received waste or, for operating landfills, the year prior to the first reporting year when waste disposal data is first available from company records, or best available data.	[YrOpen] = Year in which the landfill first received waste from company records or best available data. If no data are available for estimating YrOpen for a closed landfill, use 30 years as the default operating life of the landfill.	[W_x] = Quantity of waste placed in the landfill in year x (metric tons, wet basis).
			0.0

 Use this value in Equation HH-1

The calculation spreadsheet will calculate the quantity of waste placed in the landfill in year x using either Equation HH-2 or HH-3.

If Equation HH-2 was used, the calculated values will be displayed in red-bordered cells with yellow fill in the fourth column of the Annual Calculated W_x Using Equation HH-2 table. These values should be entered in the Equation HH-1 Calculation Spreadsheet for this landfill (see above).

If Equation HH-3 was used, the calculated value will be displayed in a red-bordered cell with yellow fill in the fourth column of the Annual Calculated W_x Using Equation HH-3 table. This value should be entered in the Equation HH-1 Calculation Spreadsheet for this landfill (see above).

Using the Equation HH-4 Calculation Spreadsheet

For landfills that collect and control landfill gas, calculate the annual quantity of CH_4 recovered and destroyed using Equation HH-4 and the Equation HH-4 Calculation Spreadsheet. If you do not continuously monitor according to paragraph 98.343(b)(1), you must determine the volumetric flow rate, CH_4 concentration, temperature, pressure, and moisture content of the landfill gas that is collected and routed to a destruction device (before any treatment equipment) according to the requirements in paragraphs 98.343(b)(2)(i) through 98.343(b)(2)(iii). Equation HH-4 is provided below.

(Equation HH-4)	$R = \sum_{n=1}^N \left((V)_n \times (K_{MC})_n \times \frac{(C)_n}{100\%} \times 0.0423 \times \frac{520^\circ R}{(T)_n} \times \frac{(P)_n}{1 \text{ atm}} \times \frac{0.454}{1,000} \right)$
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Begin by entering the facility name, your name, the unit name or identifier, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ID:	
Reporting Period:	
Comments:	
Unit Type:	Municipal Solid Waste Landfill

Next, enter the requested information in the green input cells in the Input Data table. Based on your entries in the first Input Data table, required cells will be activated to green input cells in the second Input Data table.

Click image to expand

Input Data

Basis for (V) _i		
Basis for (C) _i		
[N] = Total number of measurement periods in a year. Use daily averaging periods for a continuous monitoring system and N = 365 (or N = 366 for leap years). For weekly sampling, as provided in paragraph (b)(2) of this section, use N=52.		100
[n] = Index for Measurement Period	[V] _i = Cumulative volumetric flow for the measurement period in actual cubic feet (acft). If the flow rate meter automatically corrects for temperature and pressure, replace 520°R(T _i) × (P _i /1 atm) with "1"	[C] _i = Average CH ₄ concentration of landfill gas for the measurement period (volume %)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
	[T] _i = Average temperature at which flow is measured for the measurement period (°R)	[P] _i = Average pressure at which flow is measured for the measurement period (atm)
	[f _{moist}] _i = Average moisture content of landfill gas during the measurement period, volumetric basis (cubic feet water per cubic feet landfill gas)	[K _{moist}] _i = Moisture correction term for the measurement period, volumetric basis, as follows: (K _{moist}) _i = 1 when (V) _i and (C) _i are both measured on a dry basis or if both are measured on a wet basis; (K _{moist}) _i = [1 - f _{moist}] _i when (V) _i is measured on a wet basis and (C) _i is measured on a dry basis; and (K _{moist}) _i = 1 / [1 - f _{moist}] _i when (V) _i is measured on a dry basis and (C) _i is measured on a wet basis.
		[R] = Equation value R for period n

The calculation spreadsheet will calculate the annual quantity of CH₄ recovered from the landfill. The calculated value will be displayed in a red-bordered cell with yellow fill at the bottom of the spreadsheet. This value should be entered in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet for this landfill.

Methane Recovery (metric tons) from Equation HH-4

[R] = Annual quantity of recovered CH₄
(metric tons CH₄).

Use this value in Equation HH-6, HH-7, HH-8

Using the Equation HH-5 Calculation Spreadsheet

Calculate the annual CH₄ generation (adjusted for oxidation) using Equation HH-5 and the Equation HH-5 Calculation Spreadsheet for a landfill. For landfills that do not have landfill gas collection systems, the annual CH₄ emissions are equal to the CH₄ generation (MG) calculated using Equation HH-5 (calculate CH₄ emissions using the Equation HH-6 Calculation Spreadsheet for landfills with landfill gas collection systems). Equation HH-5 is provided below.

(Equation HH-5)

$$MG = G_{CH4} \times (1 - OX)$$

Begin by entering the facility name, your name, the unit name or identifier, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ID:	
Reporting Period:	
Comments:	
Unit Type:	Municipal Solid Waste Landfill

Next, enter the requested information in the green input cells in the Input Data table, including the result of Equation HH-1 as calculated using the Equation HH-1 Calculation Spreadsheet.

Input Data

[G _{CH4}] = Modeled methane generation rate in reporting year from Equation HH-1 (metric tons CH ₄).	
[OX] = Oxidation fraction. Use the default value of 0.1.	0.1

The calculation spreadsheet will calculate the CH₄ generation (adjusted for oxidation) from the landfill in the reporting year. For landfills that do not have landfill gas collection systems, the annual CH₄ emissions are equal to the annual CH₄ generation (adjusted for oxidation). The calculated value will be displayed in a red-bordered cell with white fill at the bottom of the spreadsheet. This value should be entered into e-GGRT for this landfill.

Methane Generation Adjusted for Oxidation (metric tons) from Equation HH-5

[MG] = Methane generation, adjusted for oxidation, from the landfill in the reporting year (metric tons CH ₄).	0.00
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Enter this value in e-GGRT

NOTE: Facilities that collect and control landfill gas must calculate CH₄ generation (adjusted for oxidation) and CH₄ emissions in two ways each and report all four results. Calculate CH₄ generation (adjusted for oxidation) using both Equation HH-5 (above) and Equation HH-7 (below). Calculate CH₄ emissions using both Equation HH-6 and Equation HH-8 (both are below). Calculation spreadsheets are provided for each of these equations. Enter all resulting values into e-GGRT.

Using the Equation HH-6 Tab in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet

Calculate the annual CH₄ emissions from the modeled CH₄ generation and measured CH₄ recovery using Equation HH-6 and the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet for a landfill. This tab only applies to landfills with landfill gas collection systems with a single gas recovery measurement location. If multiple gas recovery measurement locations are used, see "Using the Equation HH-6, HH-7, HH-8_Multi Tab in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet." Equation HH-6 is provided below.

(Equation HH-6)	Emissions = $\left[\left(G_{\text{CH}_4} - R \right) \times \left(1 - \text{OX} \right) + R \times \left(1 - \left(\text{DE} \times f_{\text{Dest}} \right) \right) \right]$
-----------------	---

Begin by entering the facility name, your name, the unit name or identifier, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	Municipal Solid Waste Landfill

Next, enter the requested information in the green input cells in the Input Data table, including the result of Equation HH-1 as calculated using the Equation HH-1 Calculation Spreadsheet and the result of Equation HH-4 as calculated using the Equation HH-4 Calculation Spreadsheet. If gas recovery measurements are made at a single location for multiple destruction devices, use the "MultiDD_per_MeasLocation" tab in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet to determine appropriate values for the destruction efficiency DE and the fraction of hours the destruction device was operating fDest. See section below for further explanation on using the "MultiDD_per_MeasLocation" tab.


Input Data

[G _{CH₄}] = Modeled methane generation rate in reporting year from Equation HH-1 or the quantity of recovered CH ₄ from Equation HH-4, whichever is greater (metric tons CH ₄).	
[R] = Quantity of recovered CH ₄ from Equation HH-4 (metric tons CH ₄).	
[OX] = Oxidation fraction. Use the default value of 0.1.	0.1
[DE] = Destruction efficiency (lesser of manufacturer's specified destruction efficiency and 0.99). If the gas is transported offsite for destruction, use DE = 1.	
[f _{Dest}] = Fraction of hours the destruction device was operating (annual operating hours / 8760 hours per year). If the gas is destroyed in a back-up flare (or similar device) or if the gas is transported off-site for destruction, used f _{Dest} = 1.	

The calculation spreadsheet will calculate the CH₄ emissions from the landfill in the reporting year. The calculated value will be displayed in a red-bordered cell with white fill at the bottom of the spreadsheet. This value should be entered into e-GGRT for this landfill.

Methane Emissions (metric tons) from Equation HH-6

[Emissions] = Methane emissions from the landfill in the reporting year (metric tons CH ₄).	0.00
---	------

 Enter this value in e-GGRT

Using the Equation HH-7, HH-8 Tab in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet

Calculate CH₄ generation and CH₄ emissions from a landfill using measured CH₄ recovery and estimated gas collection efficiency. These calculations employ Equations HH-7 and HH-8 and the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet. This tab only applies to landfills with landfill gas collection systems with a single gas recovery measurement location. If multiple gas recovery measurement locations are used, see "Using the Equation HH-6, HH-7, HH-8_Multi Tab in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet." Equations HH-7 and HH-8 are provided below.

(Equation HH-7)	$MG = \frac{R}{CE \times f_{Rec}} \times (1 - OX)$
(Equation HH-8)	$Emissions = \left[\left(\frac{R}{CE \times f_{Rec}} - R \right) \times (1 - OX) + R \times (1 - (DE \times f_{Dest})) \right]$

Begin by entering the facility name, your name, the unit name or identifier, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	Municipal Solid Waste Landfill

Then, enter the requested information in the green input cells in the Input Data for Calculating Weighted Average for CE table to estimate the collection efficiency at the landfill, taking into account system coverage, operation, and cover system materials from Table HH-3. Table HH-3 may be found in a separate tab within the Equation HH-7, HH-8 Calculation Spreadsheet. The calculated area-weighted collection efficiency will be displayed in a red-bordered cell with yellow fill below the table. This value should be entered into the Input Data table below. If area by soil cover type information is not available, use a default value of 0.75 for all areas under active influence of the collection system.

Input Data for Calculating Weighted Average for CE (if multiple cover systems are present)

Surface Area, square meters		Landfill gas collection efficiency (Value from Table HH-3)	
[A1] = Area with no waste in-place		Not applicable: do not use this area in the calculation	Not applicable: do not use this area in the calculation
[A2] = Area without active gas collection, regardless of cover type		CE2: 0%	0%
[A3] = Area with daily soil cover and active gas collection		CE3: 60%	60%
[A4] = Area with an intermediate soil cover, or a final soil cover not meeting the criteria for A5 below, and active gas collection		CE4: 75%	75%
[A5] = Area with a final soil cover of 3 feet or thicker of clay and/or geomembrane cover system and active gas collection		CE5: 95%	95%
Area weighted average collection efficiency for landfills			

Use this value as CE, below

Next, enter the requested information in the green input cells in the Input Data table, including the result of Equation HH-4 as calculated using the Equation HH-4 Calculation Spreadsheet. If gas recovery measurements are made at a single location for multiple destruction devices, use the "MultiDD_per_MeasLocation" tab in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet to determine appropriate values for the destruction efficiency DE and the fraction of hours the destruction device was operating f_{Dest} .

Input Data

[R] = Quantity of recovered CH ₄ from Equation HH-4 (metric tons CH ₄).		<p>Enter value calculated above, or value from Table HH-3, or enter default value of 0.75</p>
[CE] = Collection efficiency estimated at landfill, taking into account system coverage, operation, and cover system materials from Table HH-3 of this subpart. If area by soil cover type information is not available, use default value of 0.75 (CE4 in table HH-3 of this subpart) for all areas under active influence of the collection system.		
[f _{Rec}] = Fraction of hours the recovery system was operating (annual operating hours/8760 hours per year).		
[OX] = Oxidation fraction. Use the default value of 0.1.	0.1	
[DE] = Destruction efficiency (lesser of manufacturer's specified destruction efficiency and 0.99). If the gas is transported offsite for destruction, use DE = 1.		
[f _{Dest}] = Fraction of hours the destruction device was operating (annual operating hours / 8760 hours per year). If the gas is destroyed in a back-up flare (or similar device) or if the gas is transported off-site for destruction, used $f_{Dest} = 1$.		

The calculation spreadsheet will calculate the CH₄ generation and CH₄ emissions from this landfill in the reporting year. The calculated values will be displayed in red-bordered cells with white fill at the bottom of the spreadsheet. These values should be entered into e-GGRT for this landfill.

Methane Generation Adjusted for Oxidation (metric tons) from Equation HH-7

[MG] = Methane generation, adjusted for oxidation, from the landfill in the reporting year (metric tons CH₄).

Enter this value in e-GGRT

Methane Emissions (metric tons) from Equation HH-8

[Emissions] = Methane emissions from the landfill in the reporting year (metric tons CH₄).

Enter this value in e-GGRT

Using the Equation HH-6, HH-7, HH-8 Multi Tab in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet

The Equation HH-6, HH-7, HH-8_Multi tab in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet provides the appropriate application of Equations HH-6, HH-7, and HH-8 when multiple gas recovery measurement locations are used at a single MSW landfill facility. Equations HH-6, HH-7 and HH-8 suitable for facilities with multiple landfill gas recovery measurement locations are provided below.

(Equation HH-6)	$\text{Emissions} = \left[\left(G_{\text{CH}_4} - \sum_{n=1}^M R_n \right) \times (1 - \text{OX}) + \sum_{n=1}^M \left\{ R_n \times \left(1 - (\text{DE}_n \times f_{\text{Dest},n}) \right) \right\} \right]$
(Equation HH-7)	$\text{MG} = \frac{1}{\text{CE}} \sum_{n=1}^N \left[\frac{R_n}{f_{\text{Rec},n}} \right] \times (1 - \text{OX})$
(Equation HH-8)	$\text{Emissions} = \left[\left(\frac{1}{\text{CE}} \left\{ \sum_{n=1}^N \left[\frac{R_n}{f_{\text{Rec},n}} \right] \right\} - \sum_{n=1}^N R_n \right) \times (1 - \text{OX}) + \sum_{n=1}^N \left\{ R_n \times \left(1 - (\text{DE}_n \times f_{\text{Dest},n}) \right) \right\} \right]$

Begin by entering the facility name, your name, the unit name or identifier, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ID:	
Reporting Period:	
Comments:	
Unit Type:	Municipal Solid Waste Landfill

Then, enter the requested information in the green input cells in the Input Data table, including the result of Equation HH-1 as calculated using the Equation HH-1 Calculation Spreadsheet, the result of Equation HH-4 as calculated using the Equation HH-4 Calculation Spreadsheet for each of the different gas recovery measurement locations, and the result of the collection efficiency at the landfill taking into account system coverage, operation, and cover system materials from Table HH-3 using the Equation HH-7, HH-8 tab of the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet.

Input Data

This calculation spreadsheet can be used for up to 10 monitoring locations.

[N] = Number of measurement locations	3			
[TotAnnualHrs] = The total number of hours in the reporting year (hours) Enter 8,760 (or 8,784 for leap year)	8,760			
[G_{CH4}] = Modeled methane generation rate in reporting year from Equation HH-1 or the quantity of recovered CH ₄ from Equation HH-4 for all locations, whichever is greater (metric tons CH ₄).	200,000			
[CE] = Collection efficiency estimated at landfill, taking into account system coverage, operation, and cover system materials from Table HH-3 of this subpart. If area by soil cover type information is not available, use default value of 0.75 (CE4 in table HH-3 of this subpart) for all areas under active influence of the collection system.	0.9			Enter value calculated in Table HH-3 tab
[OX] = Oxidation fraction. Use the default value of 0.1	0.1			
[n] = Measurement location index:	[(R)_n] = Quantity of recovered CH ₄ from Equation HH-4 (metric tons CH ₄) for this measurement location.	[(DE)_n] = destruction efficiency for this measurement location.	[(f_{dest})_n] = fraction hours destruction occurs for this measurement location.	[(CollOpHrs)_n] = collection system operating hours for this measurement location.
1	40,000	0.99	0.97	4,000
2	30,000	0.98	0.98	8,600
3	50,000	0.95	0.95	8,700
4				
5				
6				
7				
8				
9				
10				

Enter data for each measurement location

The calculation spreadsheet will calculate the CH₄ generation and CH₄ emissions from this landfill in the reporting year. The calculated values will be displayed in red-bordered cells with white fill at the bottom of the spreadsheet. These values should be entered into e-GGRT for this landfill.

Methane Emissions (metric tons) from Equation HH-6

[Emissions] = Methane emissions from the landfill in the reporting year (metric tons CH ₄).	79,651.00
--	-----------

Enter this value in e-GGRT

Methane Generation Adjusted for Oxidation (metric tons) from Equation HH-7

[MG] = Methane generation, adjusted for oxidation, from the landfill in the reporting year (metric tons CH ₄).	168,502.97
---	------------

Enter this value in e-GGRT

Methane Emissions (metric tons) from Equation HH-8

[Emissions] = Methane emissions from the landfill in the reporting year (metric tons CH ₄).	56,153.97
--	-----------

Enter this value in e-GGRT

Using the MultiDD_per_MeasLocation Tab in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet

The MultiDD_per_MeasLocation tab in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet provides the appropriate calculation of destruction efficiency DE and fraction of hours the destruction device was operating fDest for when a single gas recovery measurement location is used but the gas is destroyed via multiple destruction devices.

Begin by entering the facility name, your name, the unit name or identifier, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	Municipal Solid Waste Landfill

Then, enter the requested information in the green input cells in the Input Data table.

Input Data

This calculation spreadsheet can be used for up to 10 destruction devices for a given measurement location.

Enter data for each destruction device	[NDD] = Number of destruction devices associated with this measurement location; treat gas sent off-site as one destruction device	3.	
	[CollOpHrs] = The total hours the gas collection system associated with this measurement location was operating during the reporting year (hours)	8,725.	
	[TotAnnualHrs] = The total number of hours in the reporting year (hours) Enter 8,760 (or 8,784 for leap year)	8,760.	
	[n] = Destruction device index	[(DE)_n] = destruction efficiency (lesser of manufacturer's specified destruction efficiency and 0.99). If the gas is transported offsite for destruction, use DE = 1.	[(DestOpHrs)_n] = Total total hours the destruction device was operating during the reporting year while the collection system was also operating or, for gas sent off-site, the total hours the gas collection system was operating (hours)
	1	0.99	8,000
	2	0.98	8,400
	3	0.95	8,500
	4		
	5		
	6		
7			
8			
9			
10			

The calculation spreadsheet will calculate the destruction efficiency DE and the fraction of hours the destruction devices were operating fDest. The calculated values will be displayed in red-bordered cells with white fill at the bottom of the spreadsheet. These values should be entered into the appropriate input data tables for Equations HH-6, HH-7, and HH-8 in the Equation HH-6, HH-7, HH-8 Calculation Spreadsheet.

Intermediate Output

[(DE)_{ave}] = average destruction efficiency	0.9733
[(f_{Dest})] = fraction hours, on average, destruction devices were operated	0.9513

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Using e-GGRT to Prepare Your Subpart HH Report

Subpart HH applies to municipal solid waste (MSW) landfills that accepted waste on or after January 1, 1980.

This page provides an overview of sub-topics that are central to Subpart HH reporting:

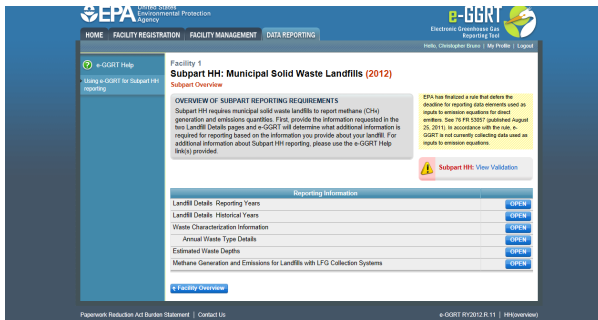
- [Summary Information for this Facility](#)
- [Waste Information](#)
- [Emissions Information](#)
- [Validation Report](#)
- [Carry forward of data from previous submissions into RY2012 forms](#)

If you previously reported for Reporting Year (RY) 2011, the Agency has carried some of your RY2011 data forward and entered it in your RY2012 forms to reduce reporting burden. It is still your responsibility to review and assure that all the information in your submission is correct, but the Agency believes that most of the data which is carried forward is unlikely to change significantly from year to year. For more information about carry forward data, please see the [Carry forward of data from previous submissions into RY2012 forms help content](#).

The end of this page contains links you can use for more information on these topics.

If you reported in RY2011, most historical data will be prepopulated in your RY2012 report. See the [Carry forward of data from previous submissions into RY2012 forms](#) for details.

Click image to expand



Summary Information for this Facility

The following MSW landfill information is collected for Subpart HH:

- Indicate if the landfill was open or closed in 2012. A landfill is considered open if it is actively receiving waste in the reporting year. A landfill that closed during the reporting year, but also received waste during the reporting year is considered open for the particular reporting year. A landfill is considered closed if it did not receive waste in the reporting year.
 - If the landfill was open in 2012, indicate the year in which the landfill first started accepting waste for disposal.
 - If the landfill was open in 2012, indicate the year in which the landfill is expected to close.
 - If the landfill was closed prior to and not during 2012, indicate the last year that the landfill accepted waste and the capacity of that landfill.

2012 Waste Disposal Quantity Method

If the landfill was open in 2012, select the method that was used to determine the quantity of waste received at the landfill in the current reporting year for loads other than cars, light duty trucks, and loads that cannot be measured with scales due to physical or operational limitations. Choose from one of the following methods (from §98.343(a)(3)):

- Used scales to weigh each load before off-loading at the landfill and either used scales to weigh individual loads after off-loading or used a representative tare weight for the weight of the vehicle/container after off-loading at the landfill. According to §98.343(a)(3)(i)(B), the tare weight is determined by weighing no less than five of each type of vehicle or container after it has off-loaded the waste.
- Used vehicle/container working capacity, for example by using volumetric capacity and waste density measurements, for each container/vehicle used to haul waste to the landfill (§98.343(a)(3)(ii)). The working capacity means the maximum volume of mass of waste that is actually placed in the landfill from an individual or representative container (such as a tank, truck, or roll-off bin) used to convey wastes to the landfill, taking into account that the container may not be able to be 100 percent filled and/or 100 percent emptied for each load.



Per §98.343(a)(3), beginning in the first emissions reporting year, and each year thereafter, waste quantities must be determined using one of the methods listed above. If scales are in place at the landfill, they must be used to determine waste quantities for the first emissions reporting year and each year after.

Additional information about the facility is also collected in this section. Please go to [Subpart HH Summary Information for this Facility](#) for more details.

Waste Information

If you reported prior to RY2012, the historical waste information should be automatically populated and you will only need to enter data for RY2011 based on the instructions below. For more on the historical migration of data, see [Carry forward of data from previous submissions into RY2012 forms](#).

For the reporting year 2012 and each year in which you indicated on the "Landfill Details Historical Years" page (see [Summary Information for this Facility](#)) that a waste quantity was determined using scales, you will be prompted to enter the following information:

- Indicate if a missing data procedure was used to determine the annual waste quantity for that year. Missing data procedures may be found in §98.345.
 - If a missing data procedure was used, enter the number of days that substitute data was used to determine the waste quantity.
- Identify each of the waste types comprising that year's waste quantity. A facility must use one of the 3 options from Table HH-1: Bulk waste option, Modified bulk MSW option, or Waste composition option. If the Modified bulk MSW or Waste Composition option is chosen, check all applicable boxes within that option:
 - Bulk waste option
 - Modified bulk MSW option:
 - Bulk MSW waste (excluding inerts and C&D waste)
 - Bulk C&D waste
 - Inerts (e.g. glass, plastics, metal, cement)

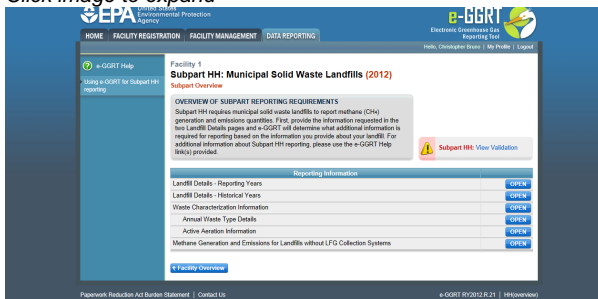
- Waste composition option:
 - Food waste
 - Garden
 - Sewage sludge
 - Paper
 - Wood and straw
 - Textiles
 - Diapers
 - Bulk waste
 - Inerts (e.g., glass, plastics, metal, cement)

Additional information about the waste disposed at the facility is also collected in this section. Please go to [Subpart HH Waste Information](#) for more details.

Emissions Information

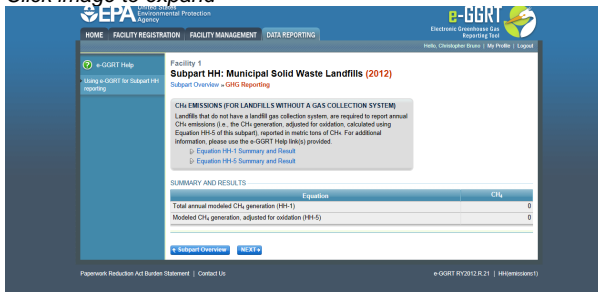
If there is no Gas Collection System at your Landfill:

Click image to expand



From the Subpart Overview page, click the OPEN button located opposite "Methane Generation and Emissions for Landfills without LFG Collection Systems."

Click image to expand



This page displays a summary of the CH₄ data calculated by e-GGRT. Click NEXT to move on to the "Equation HH-1 Summary and Result" page.

For each equation:

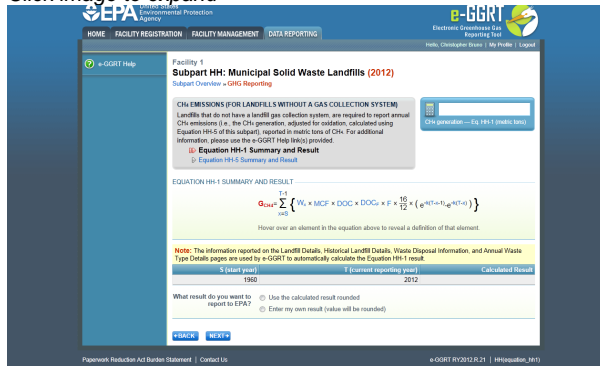
- Hover over an element in the equation to read a definition of that element as needed.
- On these equation pages, you will have the option to use the result calculated by e-GGRT or enter your own result by clicking on one of the following radio buttons at the bottom of the page:
 - "Use the calculated result rounded"
 - "Enter my own result (value will be rounded)"

Equation HH-1 Summary and Result

After clicking the NEXT button, you will be brought to the "Equation HH-1 Summary and Result" page. On this page, e-GGRT will calculate the annual modeled methane generation (G_{CH_4}) in metric tons per year (the output of Equation HH-1) for each waste type identified in the "Waste Characterization Information" section. e-GGRT will calculate your total annual modeled CH₄ generation with Equation TT-Q by summing each waste type, rounding the value according to e-GGRT rounding rules, and storing both the rounded and unrounded values in the database.

e-GGRT will also allow you to report the modeled annual methane generation (G_{CH_4}) in metric tons per year (the output of Equation HH-1). To enter a value, click the "Enter my own result" button and enter your result in the box that shows up below the question. e-GGRT will store your estimated value of modeled annual methane generation (G_{CH_4}) in metric tons per year (the output of Equation HH-1), round the value to the nearest metric ton, and store the rounded value and the facility-entered unrounded value in the database.

Click image to expand




Click NEXT to move on to the "Equation HH-5 Summary and Result" page.

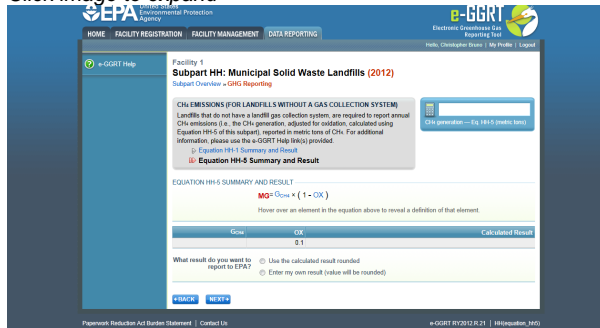
Equation HH-5 Summary and Result

On this page, e-GGRT will calculate the landfill's annual methane generation adjusted for oxidation using Equation HH-5. e-GGRT will then round the result according to e-GGRT rounding rules, and store both the rounded and unrounded values in the database.

You may use this result or enter your own value by clicking the "Enter my own result" button. Enter your result in the box that shows up below the question. e-GGRT will store your estimated value, round the value according to e-GGRT rounding rules, and store both the rounded and unrounded value in the database.

 Note that for landfills with no gas collection system, the methane generation quantity that results from the HH-5 calculation (or the value that you entered) will serve as the landfill's total methane emissions and be used for total, facility-wide emissions rollups.

Click image to expand

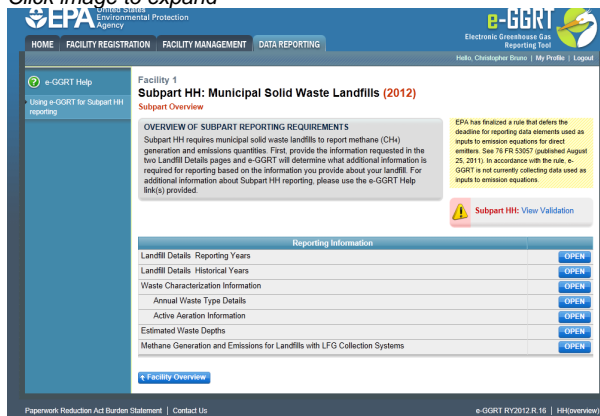


When you have entered the information, click NEXT. This will take you to the summary page where you can click SAVE. Then click Subpart Overview to return to the Subpart Overview page.

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If there is a Gas Collection System at your Landfill:

Click image to expand



Emissions Reporting Overview

From the Subpart HH Overview page, click the OPEN button located opposite “Methane Generation and Emissions for Landfills with LFG Collection Systems.”

Click image to expand

The screenshot shows the EPA e-GGRT web application interface. The main content area is titled "Subpart HH: Municipal Solid Waste Landfills (2012)". Below the title, there is a section for "CH₄ EMISSIONS (FOR LANDFILLS WITH A GAS COLLECTION SYSTEM)" with instructions and a list of equations (HH-1 through HH-8) to review. A "SUMMARY AND RESULT" table is displayed, showing values for total annual modeled CH₄ generation (HH-1) as 0 and annual quantity of recovered CH₄ generation (HH-3) as 0.26. The "LANDFILL GAS COLLECTED FOR DESTRUCTION" section contains a form with various input fields and checkboxes, including annual volume (10000 scf), missing data procedures, CH₄ concentration, and destruction details.

Equation	CH ₄
Total annual modeled CH ₄ generation (HH-1)	0
Annual quantity of recovered CH ₄ generation (HH-3)	0.26
Total annual modeled CH ₄ generation (HH-4)	
Modeled CH ₄ generation, adjusted for oxidation (HH-5)	0
CH ₄ emissions from the landfill in the reporting year (HH-6)	
Measured CH ₄ generation, adjusted for oxidation (HH-7)	
CH ₄ emissions from the landfill in the reporting year (HH-8)	

LANDFILL GAS COLLECTED FOR DESTRUCTION

Annual volume of landfill gas collected for destruction: 10000 (scf)

A missing data procedure was used to determine the volume of landfill gas collected for destruction: (check if true)

Number of days substitute data procedure was used to determine the volume of landfill gas collected for destruction: (days)

Annual average CH₄ concentration of landfill gas collected for destruction: 0 (percent)

A missing data procedure was used to determine CH₄ concentration of landfill gas collected for destruction: (check if true)

If CH₄ is monitored daily, the number of days substitute data was used to determine the annual average CH₄ concentration of landfill gas collected for destruction: (days)

If CH₄ is monitored weekly, the number of weeks substitute data was used to determine the annual average CH₄ concentration of landfill gas collected for destruction: (weeks)

Was temperature incorporated into internal calculations run by the collection system's monitoring equipment? Yes No

Was pressure incorporated into internal calculations run by the collection system's monitoring equipment? Yes No

Was landfill gas flow measured on a wet or dry basis? Wet basis Dry basis

Was CH₄ concentration measured on a wet or dry basis? Wet basis Dry basis

Destruction occurred at the facility or off-site? At the facility (on-site) Off-site Both

A back-up destruction device is present: (check if true)

Annual operating hours for the primary destruction device: 500 (hours)

Annual operating hours for the back-up destruction device: 30 (hours)

Destruction efficiency used: 0.7 (decimal fraction)

On the first page, the following information is collected:

- Total volumetric flow of landfill gas collected for destruction (in scf)
- Indicate if a missing data procedure was used to determine the volume of the landfill gas collected for destruction (information about appropriate procedures for estimating missing data is found in §98.345.
 - If a missing data procedure was used, enter the number of days when substitute data were used to determine the volume of the landfill gas collected for destruction
- Annual average concentration of CH₄ of landfill gas collected for destruction
- Indicate if a missing data procedure was used to determine the concentration of CH₄ in landfill gas collected for destruction (information about appropriate procedures for estimating missing data are found in §98.345.
 - If a missing data procedure was used and the CH₄ concentration is monitored continuously, enter the number of days substitute data were used to determine the annual average CH₄ concentration of landfill gas collected for destruction
 - If a missing data procedure was used and the CH₄ concentration is monitored weekly, enter the number of weeks substitute data were used to determine the annual average CH₄ concentration of landfill gas collected for destruction
 - In the case of multiple measurement locations, you may enter values for both days and weeks when CH₄ concentration is measured continuously at some locations and weekly at others.
- Indicate (yes/no) if temperature was incorporated into internal calculations run by the collection system's monitoring equipment
 - If temperature was not incorporated into the internal calculations run by the collection system's monitoring equipment, enter the average monthly temperature at which the landfill gas flow was measured (in degrees Rankine) for each month of the reporting

- year.
- Indicate (yes/no) if pressure was incorporated into internal calculations run by the collection system's monitoring equipment
 - If pressure was not incorporated into the internal calculations run by the collection system's monitoring equipment, enter the average monthly pressure at which the landfill gas flow was measured (in atmospheres) for each month of the reporting year.
- Indicate whether landfill gas flow was measured on a wet or a dry basis and whether CH₄ concentration was measured on a wet or a dry basis
 - If landfill gas flow was measured on a wet basis and CH₄ concentration was measured on a dry basis, or gas flow was measured on a dry basis and CH₄ concentration was measured on a wet basis, provide the monthly average moisture content (expressed as a decimal fraction) for each month of the reporting year.
- Indicate whether landfill gas destruction occurred at the facility (on-site), off-site, or both. If any landfill gas destruction occurred at the facility (you answered 'at the facility' or 'both' to the previous questions), provide the following information:
 - Indicate if a back-up destruction device is present at the facility.
 - The annual operating hours for the primary destruction device.
 - The annual operating hours for the back-up destruction device if present.
 - The destruction efficiency used in Equations HH-6 and HH-8 as a decimal fraction for the primary and back-up devices.

When you have entered the information, click SAVE. You will be brought back to the top of the "GHG Reporting" page at which time you may check over the information entered. When you have completed your check, click NEXT to be taken to the next page for data input.


Emissions Reporting Equations

For each equation:

- Hover over an element in the equation to read a definition of that element as needed.
- The equation may be calculated by e-GGRT itself or by using a spreadsheet tool provided. Spreadsheets are also available for calculating inputs to the equations. For example, use the Subpart TT-1, TT-2/TT-3, and TT-4a/TT-4b spreadsheets to calculate inputs to Equation TT-6 as needed.
- If a spreadsheet tool is available for download on the page, download the spreadsheet tool by clicking the link labeled "Use TT-n or HH-n spreadsheet to calculate."
- Fill in the spreadsheet completely using the instructions provided in the tool.
- After completing the spreadsheet, copy the value of CH₄ calculated by the spreadsheet to this page in the corresponding box.
- On most equation pages, you will have the option to use the result calculated by e-GGRT or enter your own result by clicking on one of the following radio buttons at the bottom of the page:
 - "Use the calculated result rounded"
 - "Enter my own result (value will be rounded)"

There will be a series of pages for these equations. You will have to click the NEXT button to get to the next equation page or you can use the links in the gray box at the top of each page to hop from equation to equation.

Equations include: HH-1, HH-3, HH-4, HH-5, HH-6, HH-7, and HH-8.

 You will be allowed to elect to use either the rounded result of Equation HH-6 (as calculated and rounded by e-GGRT, unless entered by the user) or the rounded result of Equation HH-8 (as calculated and rounded by e-GGRT, unless entered by the user) to roll up into your total CO₂-e emissions from facility subparts as required by 98.3(c)(4)(i). If you make no election, e-GGRT will use the larger of the two rounded values.

Additional information about emissions at the facility is also collected in this section. Please go to [Subpart HH Emissions Information](#) for more details.


Validation Report

You can use the Validation Report to assist with the completeness and quality of your reporting data.

You should use the Validation Report to check your work. The Validation Report performs two types of checks:

- Data Completeness: Data required for reporting that are missing or incomplete.
- Data Quality: Data that are outside of the expected range of values.

You may view the Validation Report at any time.

 Note that the Validation Report is intended to assist users in entering data, but it is not an indication that the reporter has entered all necessary information, nor is it an indication that the reporter is in compliance with part 98. Furthermore a negative finding on the validation report is not a guarantee that a data element was entered incorrectly.

RY2010 and RY2011 Data Carry-over

If you reported historical data prior to RY2012, your data will automatically be migrated to your RY2012 report. This includes data for the historical waste quantity estimation method, landfill gas collection system, waste disposal information, and waste type details. Historical data should be

verified for completeness and accuracy. Please go to [Carry forward of data from previous submissions into RY2012 forms](#) for more details.

[Click image to expand](#)

HISTORICAL WASTE QUANTITY ESTIMATION METHOD AND PERIOD (YEARS PRIOR TO RY2011)

Please provide the following information regarding the methods used to determine historical annual waste disposal quantities.

Were scales used to determine the annual waste quantity for any years prior to 2011 (for loads other than cars, light duty trucks, and loads that cannot be measured with scales due to physical or operational limitations)?

Yes
 No

Please indicate the first and last year of the period that scales were used prior to 2011.

Scales period start: 2002 (year)
Scales period end: 2010 (year)

Please provide the following information regarding the methods used to determine historical annual waste disposal quantities prior to the range of years associated with any waste determination method selected above.

Were tipping receipts, company records, or measured working capacities used to determine waste disposal quantity for any years prior to 2011?

Yes
 No

If, prior to the years in which the methods identified above were used, historical annual waste disposal quantities were estimated using one of the three methods outlined in 86 SACS(4)(i), i.e. constant quantity, Equation HH-2, or Equation HH-3, please select the method used to estimate those historical annual waste disposal quantities, specify the range of years the method was used, and describe the reason the method was used. Otherwise, select "None."

Indicate the method used for estimating all annual waste quantities that are not determined with the methods above or through tipping receipts or company records

Method #1: Assume all prior year's waste disposal quantities are the same as the waste quantity in the first year for which waste quantities are available.
 Method #2: Use the estimated population served by the landfill in each year, the values for national average per capita waste generation, and fraction of generated waste disposed of in solid waste disposal sites (Equation HH-2).
 Method #3: Use the landfill capacity or, for operating landfills, the amount of waste-in-place to estimate a constant average waste disposal quantity (Equation HH-3).

[Back to Top](#)

See Also

- [Screen Errors](#)
- [Subpart HH Summary Information for this Facility](#)
- [Subpart HH Waste Information](#)
- [Subpart HH Emissions Information](#)
- [Subpart Validation Report](#)

Subpart HH Summary Information for this Facility

This page provides a step-by-step description of how to enter summary information on municipal solid waste (MSW) landfills as required by Subpart HH of the Greenhouse Gas Reporting Program.

Adding or Updating Summary Information for this Facility

[Click image to expand](#)

Facility 1
Subpart HH: Municipal Solid Waste Landfills (2012)
Subpart Overview

OVERVIEW OF SUBPART REPORTING REQUIREMENTS
Subpart HH requires municipal solid waste landfills to report methane (CH₄) generation and emissions quantities. First, provide the information requested in the Subpart HH Details pages and e-GBRT will determine what additional information is required for reporting based on the information you provide about your landfill. For additional information about Subpart HH reporting, please use the e-GBRT Help link(s) provided.

EPA has created a site that serves the deadline for reporting 2012 emissions used as a guide to enter emissions for 2012. See 76 FR 53057 (published August 25, 2011) for more information. EPA is currently collecting data used as inputs to emission equations.

Subpart HH: View Validation

Reporting Information	
Landfill Details Reporting Years	OPEN
Landfill Details Historical Years	OPEN
Waste Characterization Information	OPEN
Annual Waste Type Details	OPEN
Estimated Waste Depths	OPEN
Methane Generation and Emissions for Landfills with LFG Collection Systems	OPEN

[Facility Overview](#)

To add or modify Subpart HH reporting years summary information for this MSW landfill, press the OPEN button located opposite "Landfill Details Reporting Years."

Landfill Details Reporting Years must be populated before other information about the landfill and its emissions can be entered.

[Click image to expand](#)

Facility 1
Subpart HH: Municipal Solid Waste Landfills (2012)
 Subpart Overview | Landfill Details | Reporting Years

LANDFILL DETAILS REPORTING YEARS
 The information in this form is necessary to determine which annual reporting requirements apply to your landfill. For example, additional questions and forms will appear if you select "Yes" to the question, "Does the landfill have a gas collection system?" The answers you provide on this screen will determine what greenhouse gas reporting elements are made available on your Subpart HH Overview page. For additional information about the facility information required by Subpart HH, please use the e-GGRT Help (link) provided.

In 2012, was the landfill open or * Open (actively accepting waste) closed? Closed (no longer accepting waste)

First year the landfill accepted waste: 2000 (year)
 Estimated year of landfill closure: 2020 (year)

FIRST YEAR OF EMISSIONS REPORTING
 Data reporting requirements vary slightly for years prior to the first year the landfill was required to report under Part 98. The system has automatically set the first year of emissions reporting to be equal to the first year an annual GHG report was submitted and certified for this facility. (For some reports you believe to be incorrect, you can change the first year of emissions reporting and select the Apply Changes button. The tables that follow on the page will be refreshed accordingly.)
 First year of emissions reporting: 2012

WASTE QUANTITIES DETERMINED SINCE FIRST YEAR OF REPORTING
 Please select each method used to determine the total annual waste disposal quantity for each year since the first year of emissions reporting, and enter the quantity of waste determined using each method. If you used scales or working capacities to estimate waste quantities, the quantity of waste estimated by other methods must be separately reported. The system will automatically calculate the total annual waste quantity by summing reported values across all methods.

Year	Used Scales?	Used Working Capacity?	Other?	Total Waste Quantity
2012	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2000

If you changed the method used for determining waste disposal quantities during the reporting year, answer the question above by reporting the method used at the end of the reporting year. In addition, please provide an explanation of why you changed the method, e.g., you installed scales at your facility mid-year. Please provide this explanation in the Subpart A text box that requests an explanation of changes to calculation methodologies.

Landfill capacity: 200000 (metric tons)
 Pallets, crates, and other items are present (such as pallets or crates) at the landfill: (check if true)
 Leachate recirculation was used during the reporting year: (check if true)
 If leachate recirculation was used, the typical frequency of use: Used several times a year for the past 10 years
 Scales are present at the landfill in the reporting year: (check if true)

COVER MATERIALS
 Identify each cover material used and report the surface area in square meters for each cover type selected.
 Identify each type of cover material used:
 Organic cover
 Sand cover
 Clay cover: 10000 (square meters)
 Other soil mixture
 Total surface area of the landfill containing waste: 10000 (square meters)

LANDFILL GAS COLLECTION SYSTEM
 Does the landfill have a landfill* Yes No gas collection system?
 If the landfill has a landfill gas collection system, indicate the manufacturer of the gas collection system, the capacity of the system in actual cubic feet per minute (acfm), and the number of units present at the landfill. For manufacturer of the gas collection system, indicate the entity that designed the gas collection system and the entity that installed the gas collection system. If this information is not available, report the manufacturer of the device. Do not use this space to indicate the manufacturer of the hoses or the pipes at the landfill. Also do not use this space to indicate the brand of measurement equipment used to monitor landfill gas flow or methane concentration.
 Manufacturer of the gas collection system: Lexipet Manufacturing
 Capacity of the gas collection system: 50000 (acfm)
 Number of units: 25 (units)
 Annual operating hours: 600 (hours)

The following MSW landfill information is collected for Subpart HH:

- Indicate if the landfill was open or closed in 2012. A landfill is considered open if it is actively receiving waste in the reporting year. A landfill that closed during the reporting year, but also received waste during the reporting year is considered open for the particular reporting year. A landfill is considered closed if it did not receive waste in the reporting year.
 - If the landfill was open in 2012, indicate the year in which the landfill first started accepting waste for disposal.
 - If the landfill was open in 2012, indicate the year in which the landfill is expected to close.
 - If the landfill was closed prior to and not during 2012, indicate the last year that the landfill accepted waste and the capacity of that landfill.

2012 Waste Disposal Quantity Method

If the landfill was open in 2012, select the method that was used to determine the quantity of waste received at the landfill in the current reporting year for loads other than cars, light duty trucks, and loads that cannot be measured with scales due to physical or operational limitations. Choose from one of the following methods (from §98.343(a)(3)):

- Used scales to weigh each load before off-loading at the landfill and either used scales to weigh individual loads after off-loading or used a representative tare weight for the weight of the vehicle/container after off-loading at the landfill. According to §98.343(a)(3)(i)(B), the tare weight is determined by weighing no less than five of each type of vehicle or container after it has off-loaded the waste.
- Used vehicle/container working capacity, for example by using volumetric capacity and waste density measurements, for each container/vehicle used to haul waste to the landfill (§98.343(a)(3)(ii)). The working capacity means the maximum volume of mass of waste that is actually placed in the landfill from an individual or representative container (such as a tank, truck, or roll-off bin) used to convey wastes to the landfill, taking into account that the container may not be able to be 100 percent filled and/or 100 percent emptied for each load.



Per §98.343(a)(3), beginning in the first emissions reporting year, and each year thereafter, waste quantities must be determined using one of the methods listed above. If scales are in place at the landfill, they must be used to determine waste quantities for the first emissions reporting year and each year after.

Click image to expand

FIRST YEAR OF EMISSIONS REPORTING

Data reporting requirements vary slightly for years prior to the first year the landfill was required to report under Part 98. The system has automatically set the first year of emissions reporting to be equal to the first year an annual GHG report was submitted and certified for this facility. If for some reason you believe it to be incorrect, you can change the first year of emissions reporting and select the Apply Changes button. The tables that follow lower on the page will be refreshed accordingly.

First year of emissions reporting: 2012

WASTE QUANTITIES/METHODS SINCE FIRST YEAR OF REPORTING

Please select each method used to determine the total annual waste disposal quantity for each year since the first year of emissions reporting, and enter the quantity of waste determined using each method. If you used scales or working capacities to estimate waste quantities, the quantity of waste estimated by either method must be separately reported. The system will automatically calculate the total annual waste quantity by summing reported values across all methods.

RY	Used Scales?	Used Working Capacity?	Other?	Total Waste Quantity
2012	<input checked="" type="checkbox"/>	<input type="checkbox"/>		2000

If you changed the method used for determining waste disposal quantities during the reporting year, answer the question above by reporting the method used at the end of the reporting year. In addition, please provide an explanation as to why you changed methods, e.g., you installed scales at your facility mid-year. Please provide this explanation in the Subpart A text box that requests an explanation of changes to calculation methodologies.

If you changed methods used for determining the waste disposal quantities during the reporting year, answer the question above by reporting the method used at the end of the reporting year. In addition, provide an explanation as to why you changed methods, for example, scales were installed at your facility mid-year. Please provide this explanation in the Subpart A text box that requests an explanation of changes to calculation methodologies.

After entering information on waste disposal quantities and methods, enter the landfill capacity in metric tons.

Indicate if passive vents and/or flares are present (other than as part of a gas collection system, as defined below) (check the box if passive vents and/or flares are present).

Indicate if leachate recirculation is used at the landfill during the emissions reporting year (check the box if leachate recirculation is used).

If leachate recirculation is used, indicate the typical frequency with which it is used over the past 10 years. Choose one of the following:

- Used several times a year for the past 10 years
- Used at least once a year for the past 10 years
- Used occasionally (but not every year) over the past 10 years

Indicate if scales are present at the landfill in the reporting year (check box if scales are present).

Cover Materials

Identify each type of cover material in use at the landfill. Indicate the surface area of the landfill containing waste in square meters associated with the following types of cover material (more than one type of cover may be selected):

- Organic
- Clay
- Sand
- Other soil mixture (this should be selected for any cover type other than organic, clay, or sand)

Landfill Gas Collection System

A landfill gas collection system means a system of pipes used to collect landfill gas from different locations in the landfill by means of a fan or similar mechanical draft equipment to a single location for treatment or use. A single landfill may have multiple gas collection systems. Landfill gas collection systems do not include "passive" systems, whereby landfill gas flows naturally to the surface of the landfill where an opening or pipe (vent) is installed to allow for natural gas flow.

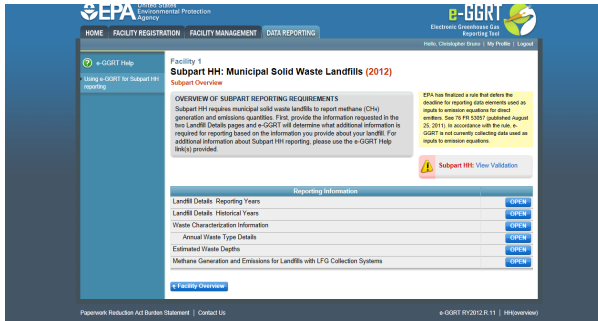
Indicate if the landfill has a gas collection system on the "Landfill Details Reporting Year" page (check the box if there is a gas collection system).

If the landfill has a landfill gas collection system, indicate the manufacturer of the gas collection system, the capacity of the system in actual cubic feet per minute (acfm), the number of wells present at the landfill, and the annual operating hours for the system. For manufacturer of the gas collection system, indicate the entity that designed the gas collection system and the entity that installed the gas collection system. If this information is not available, report the manufacturer of the blower. Do not use this space to indicate the manufacturer of the flares in the place at the landfill. Also do not use this space to indicate the brand of measurement equipment used to monitor landfill gas flow or methane concentration.

Historical Waste Disposal Quantity Methods

To add or modify Subpart HH historical years summary information for this MSW landfill, press the OPEN button located opposite "Landfill Details Historical Years."

Click image to expand



If you reported prior to RY2012, the historical waste disposal quantity methods should be automatically populated in the "Landfill Details Historical Years" page, and you will only need to enter data for RY 2012 based on the instructions below. For more on the historical migration of data, see [Carry forward of data from previous submissions into RY2012 forms](#). There are several means by which the quantities of waste disposed of prior to 2012 may have been determined or estimated for purposes of the Greenhouse Gas Reporting Program: (1) determined using scales; (2) estimated from tipping receipts, other company records, or measured working capacities; or (3) estimated from one of the methods found in Section 98.343(a)(4), i.e., methods #1, 2, and 3 listed below. Reporters must indicate which method(s) was used to determine or estimate historical waste disposal quantities and the range of years in which that method was used.

Indicate (yes/no) if scales were used to determine waste disposal quantities for loads other than cars, light duty trucks, and loads that cannot be measured with scales due to physical or operational limitations prior to 2012.

If scales were used, indicate the year they started being used and the year they stopped being used.

Indicate (yes/no) if tipping receipts, other company records, or measured working capacities were used to estimate waste disposal quantities prior to 2012.

If tipping receipts, other company records, or measured working capacities were used to estimate waste disposal quantities prior to 2012, indicate the year in which they started being used and the year in which they stopped being used.

Indicate the method used to estimate all annual waste quantities that were not determined with scales or estimated through tipping receipts, other company records, or measured working capacities. Per §98.343(a)(4), one of the following methods may be used to estimate waste quantities, if none of these methods were used, select "None." If all waste quantities were either determined using scales or estimated using tipping receipts, other company records, or measured working capacities, select "None":

- **Method #1:** Assume all prior year's waste disposal quantities are the same as the waste quantity in the first year for which the waste quantities are available.

Click image to expand

EPA Environmental Protection Agency | **e-GGRT** Electronic Generation Skid Reporting Tool

HOME | FACILITY REGISTRATION | FACILITY MANAGEMENT | DATA REPORTING

Facility 1 | **Subpart HH: Municipal Solid Waste Landfills (2012)**

Subpart Overview | Landfill Details | Historical Years

LANDFILL DETAILS HISTORICAL YEARS

The information in this form contains questions about the annual quantities of waste disposed of at your landfill and the methods used to determine those quantities. Historical years include any years prior to 2012. The first year reporting was required under Part 611.

HISTORICAL WASTE QUANTITY ESTIMATION METHOD AND PERIOD YEARS PRIOR TO RY2012

Please provide the following information regarding the methods used to determine historical annual waste disposal quantities:

Were scales used to determine the annual waste quantity for any years prior to 2012 for scales used that were not covered by physical or operational limitations? Yes No

Physical or operational limitations? Yes No

Please indicate the first and last year of the period that scales were used prior to 2012:

Scales period start: 2003 (year)

Scales period end: 2005 (year)

Please provide the following information regarding the methods used to determine historical annual waste disposal quantities prior to the range of years associated with any waste determination method selected above:

Were working capacities used to determine waste disposal quantity for any years prior to 2012? Yes No

Working capacities period start: 2003 (year)

Working capacities period end: 2012 (year)

Please provide the following information regarding the methods used to determine historical annual waste disposal quantities prior to the range of years associated with any waste determination method and working capacities selected above:

Were tipping receipts, company records, or measured working capacities used to determine waste disposal quantity for any years prior to 2012? Yes No

Tipping receipts/company records period start: 2003 (year)

Tipping receipts/company records period end: 2005 (year)

If prior to the years in which the methods identified above were used, historical annual waste disposal quantities were estimated using one of the three methods outlined in 611.245(a)(4), i.e., constant quantity, Equation HH-2, or Equation HH-3, please select the method used to estimate those historical annual waste disposal quantities, specify the range of years the method was used, and describe the reason the method was used. Otherwise, select "None".

Indicate the method used for estimating annual waste quantities that are not determined with the methods above or through tipping receipts or company records:

Method #1: Assume all prior year's waste disposal quantities are the same as the waste quantity in the first year for which waste quantities are available.

Method #2: Use the estimated population served by the landfill in each year, the values for national average per capita waste generation, and fraction of generated waste disposed of in solid waste disposal sites (Equation HH-2).

Method #3: Use the landfill capacity or, for operating landfills, the amount of waste-in-place to estimate a constant average waste disposal quantity (Equation HH-3).

None

Estimation method period start: 2003 (year)

Estimation method period end: 2011 (year)

Reason for using the estimation method selected: Reason

WASTE QUANTITIES AND METHODS

Press the Generate Grid button (below) to generate a table based on the information entered above so that waste disposal quantities and associated estimation methodologies for each historical year of disposal can be reported.

METHODS USED TO DETERMINE HISTORICAL WASTE STREAM QUANTITY

Use the Table below to enter waste disposal quantities for the associated estimation methodologies used for each historical year of disposal. To change the year(s) that a specific method was used, edit the appropriate start and/or end date in the Historical Waste Quantity Estimation Method and Period (Years Prior to RY2012) section above and then press the Generate Grid button.

If you used more than one method to estimate waste quantities within the same year, the quantity of waste estimated must be reported separately for each and working capacity. For all other methods used in a given year, report the combined annual waste disposal quantity as "Other". The system will automatically calculate the total annual waste quantity by summing reported values across all three method categories.

RY	Methods	Scales Quantity	Working Capacity Quantity	Other	Total Waste Quantity
2011	Working Capacities/Other	Clear All Quantities	Clear All Quantities	Clear All Quantities	0
2010	Working Capacities/Other				0
2009	Working Capacities/Other				0
2008	Working Capacities/Other				0
2007	Working Capacities/Other				0
2006	Working Capacities/Other				0
2005	Scales/Working Capacities/Other				0
2004	Scales/Other				0
2003	Scales/Other				0
2002	Scales/Other				0
2001	Scales/Other				0
2000	Scales/Other				0

Subpart Overview | FACILITY | HOME

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- **Method #2:** Use the estimated population served by the landfill in each year, the values for national average per capita waste generation, and fraction of generated waste disposed of in solid waste disposal sites (Equation HH-2).
 - If this method is selected, report the population served by the landfill for each year the Equation HH-2 of this subpart is applied.

Click image to expand

EPA Environmental Protection Agency | **e-GBRT** Electronic Greenhouse Gas Reporting Tool

HOME | FACILITY REGISTRATION | FACILITY MANAGEMENT | DATA REPORTING

Facility 1
Subject HH: Municipal Solid Waste Landfills (2012)
 Subject Overview | Landfill Details | Historical Years

LANDFILL DETAILS HISTORICAL YEARS
 The information in this form contains questions about the annual quantities of waste disposal of all your landfills and the methods used to determine those quantities. Historical years include any years prior to 2012. The first year reporting was required under Part 610.

HISTORICAL WASTE QUANTITY ESTIMATION METHOD(S) AND PERIOD YEARS PRIOR TO 2012
 Please provide the following information regarding the methods used to determine historical annual waste disposal quantities:

Were scales used to determine the amount waste quantity for any years prior to 2012 for (select one):
 Yes
 No
 and scales that cannot be covered with scales due to physical or operational limitations?
 Yes
 No

Please indicate the first and last year of the period that scales were used prior to 2012:
 Scales period start: 2002 (year)
 Scales period end: 2005 (year)

Please provide the following information regarding the methods used to determine historical annual waste disposal quantities prior to the range of years associated with any waste determination method selected above:

Were working capacities used to determine waste disposal quantity for any years prior to 2012?
 Yes
 No

Working capacities period start: 2002 (year)
 Working capacities period end: 2012 (year)

Please provide the following information regarding the methods used to determine historical annual waste disposal quantities prior to the range of years associated with any waste determination method and working capacities selected above:

Were tipping receipts, company records, or measured working capacities used to determine waste disposal quantity for any years prior to 2012?
 Yes
 No

Tipping receipts/company records period start: 2002 (year)
 Tipping receipts/company records period end: 2005 (year)

As prior to the years in which the methods identified above were used, historical annual waste disposal quantities were estimated using one of the three methods outlined in the 3A5(A)(1), i.e., constant quantity, Equation HH-2, or Equation HH-3, please select the method used to estimate those historical annual waste disposal quantities, specify the range of years the method was used, and describe the reason the method was used. (Optional, select "None")

Indicate the method used to estimate annual waste quantities that are not determined with the methods above or through tipping receipts or company records:
 Method #1: Assume all prior year's waste disposal quantities are the same as the waste quantity in the first year for which waste quantities are available.
 Method #2: Use the estimated population served by the landfill in each year, the values for national average per capita waste generation, and fraction of generated waste disposed of in landfills to estimate annual waste disposal quantities (Equation HH-3).
 Method #3: Use the landfill capacity or, for operating landfills, the amount of waste-in-place to estimate a constant average waste disposal quantity (Equation HH-3).
 None

Estimation method period start: 2002 (year)
 Estimation method period end: 2011 (year)
 Reason for using the estimation method selected:

WASTE QUANTITIES AND METHOD
 Press the Generate Grid button (below) to generate a table based on the information entered above so that waste disposal quantities and associated estimation methodologies for each historical year of disposal can be reported.

ESTIMATED POPULATION SERVED BY LANDFILL
 Because you have indicated that Method #2 (Equation HH-3) was used to estimate annual waste quantities, please provide the estimated population served by the landfill in each year the method was used (to change the year(s) displayed below edit the Method #2 start and/or end date above and use the Generate Grid button).

Year	Population
Year 2011	
Year 2010	
Year 2009	
Year 2008	
Year 2007	
Year 2006	
Year 2005	
Year 2004	
Year 2003	
Year 2002	
Year 2001	
Year 2000	

METHODS USED TO DETERMINE HISTORICAL WASTE STREAM QUANTITY
 Use the Table below to enter waste disposal quantities for the associated estimation methodologies used for each historical year of disposal. To change the year(s) that a specific method was used, edit the appropriate start and/or end date in the Response Waste Quantity Estimation Method and Period Years Prior to RY(2012) section above and then press the Generate Grid button.

If you used more than one method to estimate waste quantities within the same year, the quantity of waste estimated must be reported separately for scales and working capacity. For all other methods used in a given year, report the combined annual waste disposal quantity in Other. The system will automatically calculate the total annual waste quantity by summing reported values across all three method categories.

RY	Methods	Scales Quantity	Working Capacity Quantity	Other	Total Waste Quantity
		Clear All Quantities	Clear All Quantities	Clear All Quantities	
2011	Working Capacity/Other				0
2010	Working Capacity/Other				0
2009	Working Capacity/Other				0
2008	Working Capacity/Other				0
2007	Working Capacity/Other				0
2006	Working Capacity/Other				0
2005	Scales/Working Capacity/Other				0
2004	Scales/Other				0
2003	Scales/Other				0
2002	Scales/Other				0
2001	Scales/Other				0
2000	Scales/Other				0

Subject Overview | FACILITY | SAVE

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- **Method #3:** Use the landfill capacity or, for operating landfills, the amount of waste-in-place to estimate a constant average waste disposal quantity per Equation HH-3. The amount of waste-in place is the capacity of the landfill used at the end of the year prior to the year when waste disposal data are available. The waste-in-place numbers may be derived from design drawings or engineering estimates.
 - If this method is selected to be the method by which historical waste disposal quantities were estimated, indicate the capacity of the landfill in metric tons.

Click image to expand

Subpart HH: Municipal Solid Waste Landfills (2012)

LANDFILL DETAILS HISTORICAL YEARS

The information in this form contains questions about the annual quantities of waste disposed of at your landfill and the methods used to determine those quantities. Historical years include any years prior to 2012. The first year reporting was required under Part 611.

HISTORICAL WASTE QUANTITY ESTIMATION METHOD AND PERIOD YEARS PRIOR TO 2012:

Please provide the following information regarding the methods used to determine historical annual waste disposal quantities:

Were scales used to determine waste quantity for any years prior to 2012 for scales used only for scales and scales that cannot be associated with scales due to physical or operational limitations? Yes No

Scales period start: 2003 (year)

Scales period end: 2005 (year)

Were working capacities used to determine waste disposal quantities for any years prior to 2012? Yes No

Working capacities period start: 2003 (year)

Working capacities period end: 2012 (year)

Were tipping receipts, company records, or measured working capacities used to determine waste disposal quantities for any years prior to 2012? Yes No

Tipping receipts/company records period start: 2003 (year)

Tipping receipts/company records period end: 2005 (year)

If prior to the years in which the methods identified above were used, historical annual waste disposal quantities were estimated using one of the three methods outlined in §§ 345.01(a), (b), or (c), please select the method used to estimate those historical annual waste disposal quantities, specify the range of years the method was used, and describe the reason the method was used. Otherwise, select "None".

Indicate the method used for estimating all annual waste quantities that are not determined with the methods above or through tipping receipts or company records:

Method #1: Assume all prior year's waste disposal quantities are the same as the waste quantity in the first year for which waste quantities are available.

Method #2: Use the estimated population served by the landfill in each year, the values for national average per capita waste generation, and fraction of generated waste disposed of in landfills (Equation 10-3).

Method #3: Use the landfill capacity or, for operating landfills, the amount of waste in-place to estimate a constant average waste disposal quantity (Equation 10-3).

None

Estimation method period start: 2003 (year)

Estimation method period end: 2011 (year)

Reason for using the estimation method selected: Reason

Because you have indicated that Method #3 (Equation 10-3) was used to estimate annual waste quantities, please provide the value of landfill capacity (LFC) used in the calculation:

Landfill capacity (LFC) for operating landfills, capacity of the landfill used for the total quantity of waste in place: []

WASTE QUANTITIES AND METHODS

Press the Overview Grid button below to generate a table based on the information entered above on that waste disposal quantities and associated estimation methodologies for each historical year of disposal can be reported.

METHODS USED TO DETERMINE HISTORICAL WASTE STREAM QUANTITY

Use the table below to enter waste disposal quantities for the associated estimation methodologies used for each historical year of disposal. To change the year(s) that a specific method was used, edit the appropriate start and/or end date in the Historical Waste Quantity Estimation Method and Period Years Prior to 2012 section above and then press the Overview Grid button.

If you used more than one method to estimate waste quantities within the same year, the quantity of waste estimated must be reported separately for scales and working capacity. For all other methods used in a given year, report the combined annual waste disposal quantity as Other. The system will automatically calculate the total annual waste quantity by summing reported values across all three method categories.

Year	Methods	Scales Quantity	Working Capacity Quantity	Other	Total Waste Quantity
2011	Working Capacity, Other				0
2010	Working Capacity, Other				0
2009	Working Capacity, Other				0
2008	Working Capacity, Other				0
2007	Working Capacity, Other				0
2006	Working Capacity, Other				0
2005	Scales, Working Capacity, Other				0
2004	Scales, Other				0
2003	Scales, Other				0
2002	Scales, Other				0
2001	Scales, Other				0
2000	Scales, Other				0

Subpart Overview | **SEARCH** | **SAVE**

If one of the above methods was used (i.e., "None" was not selected), indicate the year in which the method started being used and the year in which it stopped being used.

If one of the above methods was used (i.e., "None" was not selected), indicate the reason for which this particular method was selected.

When you have entered the required information, click SAVE. You will be brought back to the top of the Landfill Details page at which time you may check over the information you entered. When you have completed your check, click SUBPART OVERVIEW to return to the Subpart Overview page.

[Back to Top](#)

See Also

- [Screen Errors](#)
- [Using e-GGRT to Prepare Your Subpart HH Report](#)
- [Subpart HH Waste Information](#)
- [Subpart HH Emissions Information](#)
- [Subpart Validation Report](#)

Subpart HH Waste Information

This page provides a step-by-step description of how to enter and edit information on the waste disposed of in municipal solid waste (MSW) landfills as required by Subpart HH of the Greenhouse Gas Reporting Program (GHGRP).

Click image to expand

The screenshot shows the EPA e-GGRT interface for Subpart HH reporting. The main heading is "Subpart HH: Municipal Solid Waste Landfills (2012)". Below this, there is a section titled "OVERVIEW OF SUBPART REPORTING REQUIREMENTS" which explains that Subpart HH requires municipal solid waste landfills to report methane (CH₄) generation and emissions quantities. A table titled "Reporting Information" lists several sections, each with an "OPEN" button:

Reporting Information	
Landfill Details Reporting Years	OPEN
Landfill Details Historical Years	OPEN
Waste Characterization Information	OPEN
Annual Waste Type Details	OPEN
Estimated Waste Depths	OPEN
Methane Generation and Emissions for Landfills with LFG Collection Systems	OPEN

From the Subpart HH Overview page, press the OPEN button located opposite “Waste Characterization Information.”

Click image to expand

e-GRRT Help
Help e-GRRT for Subpart HH Reporting

Facility 1
Subject HH: Municipal Solid Waste Landfills (2012)
Subject Overview - Waste Characterization Information

WASTE CHARACTERIZATION INFORMATION
Use the page to provide information about (1) missing data procedures used to determine the annual waste quantities reported for each quantity determined according to the methods described in §§ 34.30(a), and (2) the type of waste disposed. For additional information about the data reported on this page, please see the e-GRRT Help links provided.

2012 WASTE QUANTITY

Total annual waste disposal quantity for 2012

A missing data procedure was used to determine 2012 waste quantity (check if true)

Number of days substitute data was used to determine the 2012 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

2011 WASTE QUANTITY

Total annual waste disposal quantity for 2011

A missing data procedure was used to determine 2011 waste quantity (check if true)

Number of days substitute data was used to determine the 2011 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

Identify each of the waste types that comprises the 2011 waste quantity: food waste garden sewage sludge paper wood and straw textiles dirt/silt bulk waste metals (e.g., glass, plastic, metal, cement)

2010 WASTE QUANTITY

Total annual waste disposal quantity for 2010

A missing data procedure was used to determine 2010 waste quantity (check if true)

Number of days substitute data was used to determine the 2010 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

Identify each of the waste types that comprises the 2010 waste quantity: Bulk MSW waste (including metals and CAD waste) Bulk CAD waste Metals (e.g., glass, plastic, metal, cement)

2009 WASTE QUANTITY

Total annual waste disposal quantity for 2009

A missing data procedure was used to determine 2009 waste quantity (check if true)

Number of days substitute data was used to determine the 2009 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

2008 WASTE QUANTITY

Total annual waste disposal quantity for 2008

A missing data procedure was used to determine 2008 waste quantity (check if true)

Number of days substitute data was used to determine the 2008 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

2007 WASTE QUANTITY

Total annual waste disposal quantity for 2007

A missing data procedure was used to determine 2007 waste quantity (check if true)

Number of days substitute data was used to determine the 2007 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

2006 WASTE QUANTITY

Total annual waste disposal quantity for 2006

A missing data procedure was used to determine 2006 waste quantity (check if true)

Number of days substitute data was used to determine the 2006 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

2005 WASTE QUANTITY

Total annual waste disposal quantity for 2005

A missing data procedure was used to determine 2005 waste quantity (check if true)

Number of days substitute data was used to determine the 2005 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

2004 WASTE QUANTITY

Total annual waste disposal quantity for 2004

A missing data procedure was used to determine 2004 waste quantity (check if true)

Number of days substitute data was used to determine the 2004 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

2003 WASTE QUANTITY

Total annual waste disposal quantity for 2003

A missing data procedure was used to determine 2003 waste quantity (check if true)

Number of days substitute data was used to determine the 2003 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

2002 WASTE QUANTITY

Total annual waste disposal quantity for 2002

A missing data procedure was used to determine 2002 waste quantity (check if true)

Number of days substitute data was used to determine the 2002 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

2001 WASTE QUANTITY

Total annual waste disposal quantity for 2001

A missing data procedure was used to determine 2001 waste quantity (check if true)

Number of days substitute data was used to determine the 2001 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option

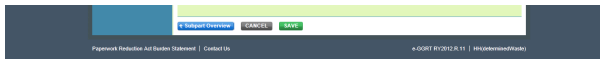
2000 WASTE QUANTITY

Total annual waste disposal quantity for 2000

A missing data procedure was used to determine 2000 waste quantity (check if true)

Number of days substitute data was used to determine the 2000 waste quantity

Identify the option used (from Table H1-1) to select the waste type(s) disposed of at the landfill: Bulk waste option Modified bulk MSW option Waste composition option



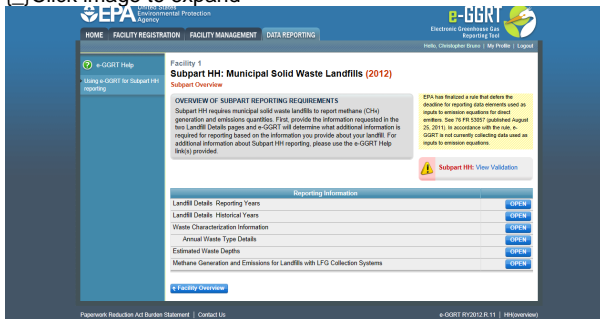
If you reported prior to RY2012, the historical waste information should be automatically populated and you will only need to enter data for RY2011 based on the instructions below. For more on the historical migration of data, see [Carry forward of data from previous submissions into RY2012 forms](#).

For the reporting year 2012 and each year in which you indicated on the “Landfill Details Historical Years” page (see [Summary Information for this Facility](#)) that a waste quantity was determined using scales, you will be prompted to enter the following information:

- Indicate if a missing data procedure was used to determine the annual waste quantity for that year. Missing data procedures may be found in §98.345.
 - If a missing data procedure was used, enter the number of days that substitute data was used to determine the waste quantity.
- Identify each of the waste types comprising that year’s waste quantity. A facility must use one of the 3 options from Table HH-1: Bulk waste option, Modified bulk MSW option, or Waste composition option. If the Modified bulk MSW or Waste Composition option is chosen, check all applicable boxes within that option:
 - Bulk waste option
 - Modified bulk MSW option:
 - Bulk MSW waste (excluding inerts and C&D waste)
 - Bulk C&D waste
 - Inerts (e.g. glass, plastics, metal, cement)
 - Waste composition option:
 - Food waste
 - Garden
 - Sewage sludge
 - Paper
 - Wood and straw
 - Textiles
 - Diapers
 - Bulk waste
 - Inerts (e.g., glass, plastics, metal, cement)

When you have entered the missing data and waste type information for each year listed, click SAVE. You will be brought back to the top of the Waste Disposal Information page at which time you may check over the information you entered. When you have completed your check, click SUBPART OVERVIEW to return to the Subpart Overview page.

{ } Click image to expand



From the Subpart HH Overview page, press the OPEN button located opposite “Annual Waste Type Details.”

Click image to expand

If you reported prior to RY2012, the historical waste information should be automatically populated and you will only need to enter data for RY2011 based on the instructions below. For more on the historical migration of data, see [Carry forward of data from previous submissions into RY2012 forms](#).

For each Year entered on the "Waste Characterization Information" page, you will be prompted to enter the percent by weight for each waste type used in Equation HH-1 expressed as a decimal fraction.

For each combination of Year and Waste Type entered on the "Waste Characterization Information" page, you will be prompted to enter the following information:

- The value for degradable organic carbon (DOC) used in Equation HH-1 as a decimal fraction.
- A value for the fraction of DOC dissimilated (DOC_p) of 0.5 to be used in Equation HH-1. (e-GGRT will pre-populate this entry with a value of 0.5 and not permit the facility to change it.)
- The value of the decay rate (k) used in Equation HH-1.
- The fraction of CH_4 in the landfill gas (F) if that fraction is based on a measured value rather than using the default value of 0.5. (Check the box if the default value was not used.) For each year the default value was used, a set value of 0.5 will be entered into the webform automatically by e-GGRT.
- The Methane Correction Factor (MCF) if an MCF other than the default of 1 was used. (Check the box if the default value was not used.) An MCF value other than the default may only be used if active aeration is in use at your landfill, in which case you must enter information about the aeration system. For each year the default value was used, a set value of 1.0 will be entered into the webform automatically by e-GGRT.

Both F and MCF are terms found in Equation HH-1 for calculating the modeled methane generation rate at the landfill.

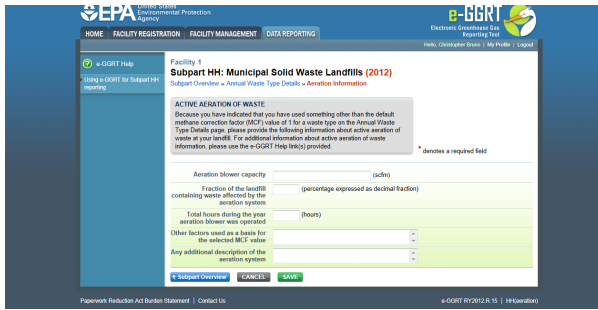
When you have entered the information, click SAVE. You will be brought back to the top of the "Waste Type Details" page at which time you may check over the information you entered. When you have completed your check, click the NEXT YEAR button at the bottom of the page to add information for the previous year. Repeat this process for each historical year that you are required to enter data. Once all years have data and all data has been saved, click SUBPART OVERVIEW to return to the Subpart Overview page.

If you indicated that an MCF value other than the default was used for any year/waste type combination, the "Active Aeration Information" page will become available on the Subpart HH Overview screen.

Click image to expand

From the Subpart HH Overview page, press the OPEN button located opposite "Active Aeration Information."

Click image to expand



Because you indicated that a value other than the default was used for Methane Correction Factor (MCF), you must enter the following information about the aeration system in use at your landfill:

- The aeration blower capacity in standard cubic feet per minute (scfm). Include the total capacity of all blowers.
- The fraction of the landfill containing waste that is affected by the aeration as a percentage expressed as a decimal fraction between 0 and 1
- The total number of hours during the year in which the aeration blower was operated
- Other factors that were used as a basis for the MCF value that was used in the calculation
- Any additional description of the aeration system that the facility would like to provide (e.g., the number of blowers and other relevant information).

When you have entered the required information, click SAVE. You will be brought back to the top of the "Aeration Information" page at which time you may check over the information you entered. When you have completed your check, click SUBPART OVERVIEW to return to the Subpart Overview page.

[Back to Top](#)

See Also

[Screen Errors](#)

[Using e-GGRT to Prepare Your Subpart HH Report](#)

[Subpart HH Summary Information for this Facility](#)

[Subpart HH Emissions Information](#)

[Subpart Validation Report](#)

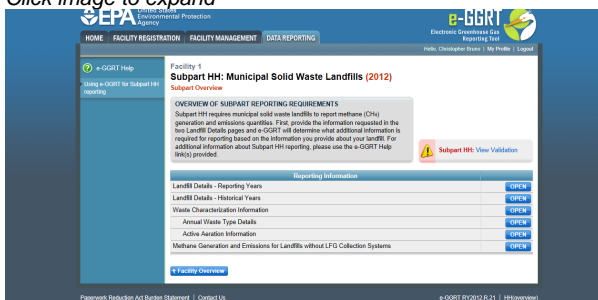
Subpart HH Emissions Information

This page provides a step-by-step description of how to enter data on the methane generation and emissions from municipal solid waste (MSW) landfills as required by Subpart HH of the Greenhouse Gas Reporting Program (GHGRP).

Before entering emissions information, you must provide detailed information about your MSW landfill including whether or not your landfill has a Gas Collection System (see "Landfill Details Reporting Years" [Summary Information for this Facility](#))

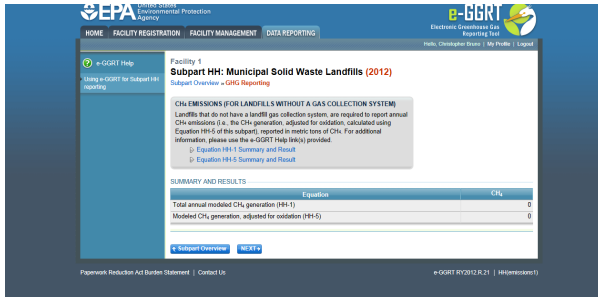
If there is no Gas Collection System at your Landfill:

[Click image to expand](#)



From the Subpart Overview page, click the OPEN button located opposite "Methane Generation and Emissions for Landfills without LFG Collection Systems."

[Click image to expand](#)



This page displays a summary of the CH₄ data calculated by e-GGRT. Click NEXT to move on to the "Equation HH-1 Summary and Result" page.

For each equation:

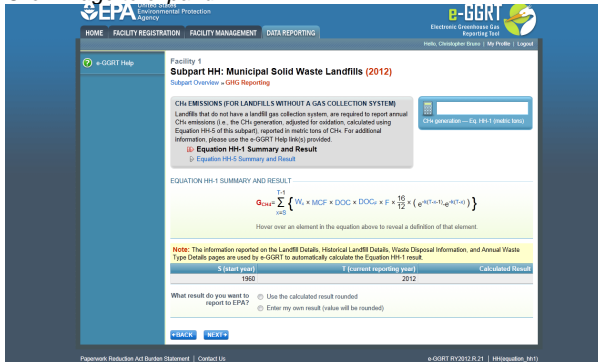
- Hover over an element in the equation to read a definition of that element as needed.
- On these equation pages, you will have the option to use the result calculated by e-GGRT or enter your own result by clicking on one of the following radio buttons at the bottom of the page:
 - "Use the calculated result rounded"
 - "Enter my own result (value will be rounded)"

Equation HH-1 Summary and Result

After clicking the NEXT button, you will be brought to the "Equation HH-1 Summary and Result" page. On this page, e-GGRT will calculate the annual modeled methane generation (G_{CH₄}) in metric tons per year (the output of Equation HH-1) for each waste type identified in the "Waste Characterization Information" section. e-GGRT will calculate your total annual modeled CH₄ generation with Equation TT-Q by summing each waste type, rounding the value according to e-GGRT rounding rules, and storing both the rounded and unrounded values in the database.

e-GGRT will also allow you to report the modeled annual methane generation (G_{CH₄}) in metric tons per year (the output of Equation HH-1). To enter a value, click the "Enter my own result" button and enter your result in the box that shows up below the question. e-GGRT will store your estimated value of modeled annual methane generation (G_{CH₄}) in metric tons per year (the output of Equation HH-1), round the value to the nearest metric ton, and store the rounded value and the facility-entered unrounded value in the database.

Click image to expand



Click NEXT to move on to the "Equation HH-5 Summary and Result" page.

Equation HH-5 Summary and Result

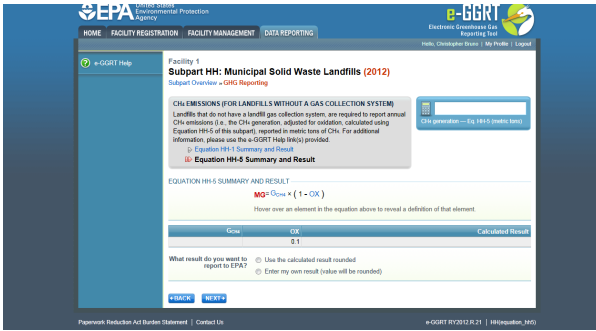
On this page, e-GGRT will calculate the landfill's annual methane generation adjusted for oxidation using Equation HH-5. e-GGRT will then round the result according to e-GGRT rounding rules, and store both the rounded and unrounded values in the database.

You may use this result or enter your own value by clicking the "Enter my own result" button. Enter your result in the box that shows up below the question. e-GGRT will store your estimated value, round the value according to e-GGRT rounding rules, and store both the rounded and unrounded value in the database.



Note that for landfills with no gas collection system, the methane generation quantity that results from the HH-5 calculation (or the value that you entered) will serve as the landfill's total methane emissions and be used for total, facility-wide emissions rollups.

Click image to expand

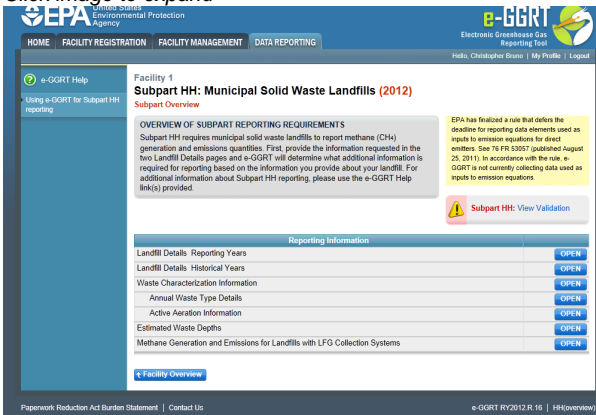


When you have entered the information, click NEXT. This will take you to the summary page where you can click SAVE. Then click Subpart Overview to return to the Subpart Overview page.

[Back to Top](#)

If there is a Gas Collection System at your Landfill:

Click image to expand



Emissions Reporting Overview

From the Subpart HH Overview page, click the OPEN button located opposite “Methane Generation and Emissions for Landfills with LFG Collection Systems.”

Click image to expand

EPA United States Environmental Protection Agency | **e-GGRT** Electronic Greenhouse Gas Reporting Tool

HOME | FACILITY REGISTRATION | FACILITY MANAGEMENT | DATA REPORTING

Facility 1
Subpart HH: Municipal Solid Waste Landfills (2012)
 Subpart Overview | GHG Reporting

CH₄ EMISSIONS (FOR LANDFILLS WITH A GAS COLLECTION SYSTEM)
 Landfills that have a landfill gas collection system are required to report two sets of CH₄ generation and CH₄ emissions values. CH₄ generation, adjusted for oxidation, must be reported as calculated using both Equations HH-5 and HH-7, and CH₄ emissions must be reported as calculated using both Equations HH-6 and HH-8. For additional information, please use the e-GGRT Help link(s) provided.

Select a specific equation below to review the equation summary and result that will appear in your annual GHG report. Alternatively, select the NEXT or BACK buttons at the bottom of each equation summary and result page to move consecutively through the equations.

- Equation HH-1 Summary and Result
- Equation in table HH-3 Summary and Result
- Equation HH-4 Summary and Result
- Equation HH-5 Summary and Result
- Equation HH-6 Summary and Result
- Equation HH-7 Summary and Result
- Equation HH-8 Summary and Result

SUMMARY AND RESULT

Equation	CH ₄
Total annual modeled CH ₄ generation (HH-1)	0
Annual quantity of recovered CH ₄ generation (HH-3)	0.26
Total annual modeled CH ₄ generation (HH-4)	0
Modeled CH ₄ generation, adjusted for oxidation (HH-5)	0
CH ₄ emissions from the landfill in the reporting year (HH-6)	
Measured CH ₄ generation, adjusted for oxidation (HH-7)	
CH ₄ emissions from the landfill in the reporting year (HH-8)	

LANDFILL GAS COLLECTED FOR DESTRUCTION

Annual volume of landfill gas collected for destruction: 10000 (scf)

A missing data procedure was used to determine the volume of landfill gas collected for destruction? (check if true)

Number of days substitute data procedure was used to determine the volume of landfill gas collected for destruction: (days)

Annual average CH₄ concentration of landfill gas collected for destruction: 0 (percent)

A missing data procedure was used to determine CH₄ concentration of landfill gas collected for destruction? (check if true)

If CH₄ is monitored daily, the number of days substitute data was used to determine the annual average CH₄ concentration of landfill gas collected for destruction: (days)

If CH₄ is monitored weekly, the number of weeks substitute data was used to determine the annual average CH₄ concentration of landfill gas collected for destruction: (weeks)

Was temperature incorporated into internal calculations run by the collection system's monitoring equipment? Yes No

Was pressure incorporated into internal calculations run by the collection system's monitoring equipment? Yes No

Was landfill gas flow measured on a wet or dry basis? Wet basis Dry basis

Was CH₄ concentration measured on a wet or dry basis? Wet basis Dry basis

Destruction occurred at the facility or off-site? At the facility (on-site) Off-site Both

A back-up destruction device is present? (check if true)

Annual operating hours for the primary destruction device: 500 (hours)

Annual operating hours for the back-up destruction device: 30 (hours)

Destruction efficiency used: 0.7 (decimal fraction)

Subpart Overview | CANCEL | SAVE | NEXT

Paperwork Reduction Act Burden Statement | Contact Us | e-GGRT RY2012 R-18 | HH6emissions2

On the first page, the following information is collected:

- Total volumetric flow of landfill gas collected for destruction (in scf)
- Indicate if a missing data procedure was used to determine the volume of the landfill gas collected for destruction (information about appropriate procedures for estimating missing data is found in §98.345.
 - If a missing data procedure was used, enter the number of days when substitute data were used to determine the volume of the landfill gas collected for destruction
- Annual average concentration of CH₄ of landfill gas collected for destruction
- Indicate if a missing data procedure was used to determine the concentration of CH₄ in landfill gas collected for destruction (information about appropriate procedures for estimating missing data are found in §98.345.
 - If a missing data procedure was used and the CH₄ concentration is monitored continuously, enter the number of days substitute data were used to determine the annual average CH₄ concentration of landfill gas collected for destruction
 - If a missing data procedure was used and the CH₄ concentration is monitored weekly, enter the number of weeks substitute data were used to determine the annual average CH₄ concentration of landfill gas collected for destruction
 - In the case of multiple measurement locations, you may enter values for both days and weeks when CH₄ concentration is measured continuously at some locations and weekly at others.
- Indicate (yes/no) if temperature was incorporated into internal calculations run by the collection system's monitoring equipment
 - If temperature was not incorporated into the internal calculations run by the collection system's monitoring equipment, enter the average monthly temperature at which the landfill gas flow was measured (in degrees Rankine) for each month of the reporting year.
- Indicate (yes/no) if pressure was incorporated into internal calculations run by the collection system's monitoring equipment
 - If pressure was not incorporated into the internal calculations run by the collection system's monitoring equipment, enter the average monthly pressure at which the landfill gas flow was measured (in atmospheres) for each month of the reporting year.
- Indicate whether landfill gas flow was measured on a wet or a dry basis and whether CH₄ concentration was measured on a wet or a dry basis
 - If landfill gas flow was measured on a wet basis and CH₄ concentration was measured on a dry basis, or gas flow was measured on a dry basis and CH₄ concentration was measured on a wet basis, provide the monthly average moisture content (expressed

- as a decimal fraction) for each month of the reporting year.
- Indicate whether landfill gas destruction occurred at the facility (on-site), off-site, or both. If any landfill gas destruction occurred at the facility (you answered 'at the facility' or 'both' to the previous questions), provide the following information:
 - Indicate if a back-up destruction device is present at the facility.
 - The annual operating hours for the primary destruction device.
 - The annual operating hours for the back-up destruction device if present.
 - The destruction efficiency used in Equations HH-6 and HH-8 as a decimal fraction for the primary and back-up devices.

When you have entered the information, click SAVE. You will be brought back to the top of the "GHG Reporting" page at which time you may check over the information entered. When you have completed your check, click NEXT to be taken to the next page for data input.

Emissions Reporting Equations

For each equation:

- Hover over an element in the equation to read a definition of that element as needed.
- The equation may be calculated by e-GGRT itself or by using a spreadsheet tool provided. Spreadsheets are also available for calculating inputs to the equations. For example, use the Subpart TT-1, TT-2/TT-3, and TT-4a/TT-4b spreadsheets to calculate inputs to Equation TT-6 as needed.
- If a spreadsheet tool is available for download on the page, download the spreadsheet tool by clicking the link labeled "Use TT-n or HH-n spreadsheet to calculate."
- Fill in the spreadsheet completely using the instructions provided in the tool.
- After completing the spreadsheet, copy the value of CH₄ calculated by the spreadsheet to this page in the corresponding box.
- On most equation pages, you will have the option to use the result calculated by e-GGRT or enter your own result by clicking on one of the following radio buttons at the bottom of the page:
 - "Use the calculated result rounded"
 - "Enter my own result (value will be rounded)"

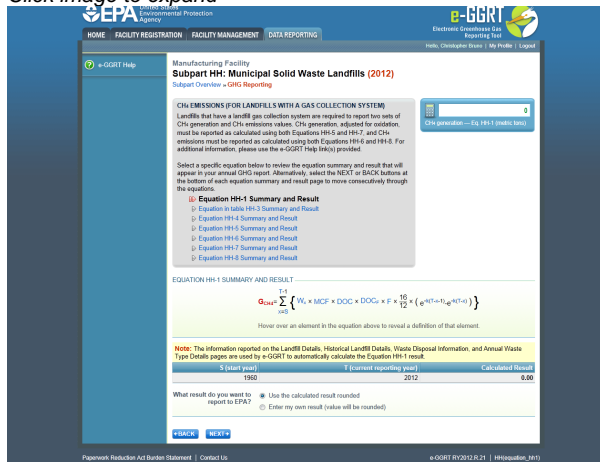
There will be a series of pages for these equations. You will have to click the NEXT button to get to the next equation page or you can use the links in the gray box at the top of each page to hop from equation to equation.

Equation HH-1 Summary and Result

After clicking the NEXT button, you will be brought to the "Equation HH-1 Summary and Result" page. On this page, e-GGRT will calculate the annual modeled methane generation (G_{CH₄}) in metric tons per year (the output of Equation HH-1) for each waste type identified in the "Waste Characterization Information" section. e-GGRT will calculate your total annual modeled CH₄ generation with Equation TT-Q by summing each waste type, rounding the value according to e-GGRT rounding rules, and storing both the rounded and unrounded values in the database.

e-GGRT will also allow you to report the modeled annual methane generation (G_{CH₄}) in metric tons per year (the output of Equation HH-1). To enter a value, click the "Enter my own result" button and enter your result in the box that shows up below the question. e-GGRT will store your estimated value of modeled annual methane generation (G_{CH₄}) in metric tons per year (the output of Equation HH-1), round the value to the nearest metric ton, and store the rounded value and the facility-entered unrounded value in the database.

Click image to expand



Click NEXT to move on to the "Equation in Table HH-3 Summary and Result" page.

Equation in Table HH-3 Summary and Result

On this page, e-GGRT will calculate the estimated gas collection efficiency ("CEave1") using the equation provided within Table HH-3 to Subpart HH of Part 98 (Landfill Gas Collection Efficiencies) and round the result to two digits right of the decimal. If you have filled in the "Estimated Waste Depths" page, e-GGRT will pre-populate the "Equation in Table HH-3 Summary and Result" page for you and show a calculated result.

You may use this result or enter your own value by clicking the "Enter my own result" button. Enter your result in the box that shows up below the question. e-GGRT will store your estimated value, round the value to two digits to the right of the decimal, and store both the rounded and

unrounded value in the database.

[Click image to expand](#)

Manufacturing Facility
Subpart HH: Municipal Solid Waste Landfills (2012)
Subpart Overview » GHG Reporting

CH₄ EMISSIONS FOR LANDFILLS WITH A GAS COLLECTION SYSTEM
Landfills that have a landfill gas collection system are required to report two sets of CH₄ generation and CH₄ emissions values. CH₄ generation, adjusted for oxidation, must be reported as calculated using both Equations HH-3 and HH-4, and CH₄ emissions must be reported as calculated using both Equations HH-4 and HH-5. For additional information, please use the e-GGRT Help link(s) provided.

Select a specific equation below to review the equation summary and result that will appear in your annual GHG report. Alternatively, select the NEXT or BACK buttons at the bottom of each equation summary and result page to move consecutively through the equations.

- Equation HH-1 Summary and Result
- Equation in table HH-3 Summary and Result
- Equation HH-4 Summary and Result
- Equation HH-5 Summary and Result
- Equation HH-6 Summary and Result
- Equation HH-7 Summary and Result
- Equation HH-8 Summary and Result

EQUATION IN TABLE HH-3 SUMMARY AND RESULT
CEvent¹ (A2 × CE2 + A3 × CE3 + A4 × CE4 + A5 × CE5 + J / A2 + A3 + A4 + A5)
Hover over an element in the equation above to reveal a definition of that element.

A2	A3	A4	A5	Calculated Result
200.00	4,000.00	6,000.00	1,000.00	6.70

What result do you want to report to EPA?
 Use the calculated result rounded.
 Enter my own result (value will be rounded).

Pageview: Reduction Act: Back: Statement | Contact Us | e-GGRT RY2012 R.21 | HH-equation_H3

Click NEXT to move on to the "Equation HH-4 Summary and Result" page.

Equation HH-4 Summary and Result

On this page, you will be required to provide the annual quantity in metric tons of recovered CH₄ calculated using Equation HH-4. Use the calculation spreadsheet link provided under the data entry box to do this calculation, and then enter the value into the box highlighted in red. e-GGRT will store your estimated value, round the value according to e-GGRT rounding rules, and store both the rounded and unrounded value in the database.

[Click image to expand](#)

Manufacturing Facility
Subpart HH: Municipal Solid Waste Landfills (2012)
Subpart Overview » GHG Reporting

CH₄ EMISSIONS FOR LANDFILLS WITH A GAS COLLECTION SYSTEM
Landfills that have a landfill gas collection system are required to report two sets of CH₄ generation and CH₄ emissions values. CH₄ generation, adjusted for oxidation, must be reported as calculated using both Equations HH-3 and HH-4, and CH₄ emissions must be reported as calculated using both Equations HH-4 and HH-5. For additional information, please use the e-GGRT Help link(s) provided.

Select a specific equation below to review the equation summary and result that will appear in your annual GHG report. Alternatively, select the NEXT or BACK buttons at the bottom of each equation summary and result page to move consecutively through the equations.

- Equation HH-1 Summary and Result
- Equation in table HH-3 Summary and Result
- Equation HH-4 Summary and Result
- Equation HH-5 Summary and Result
- Equation HH-6 Summary and Result
- Equation HH-7 Summary and Result
- Equation HH-8 Summary and Result

EQUATION HH-4 SUMMARY AND RESULT
$$R = \sum_{n=1}^n ((V_n) * (K_{ocn})) * \left(\frac{C_n}{100\%}\right) * 0.0425 * \frac{50000}{(1 - 1.04^n)} * \left(\frac{0.454}{1,000}\right)$$

Hover over an element in the equation above to reveal a definition of that element.

Note: The e-GGRT system cannot calculate the result of Equation HH-4 because the input parameters to Equation HH-4 are not required to be reported. Therefore, you must calculate the value of Equation HH-4 and enter the result below.

Annual quantity of recovered CH₄ (metric tons CH₄)
[Use Subpart HH-4 equation spreadsheets to calculate](#)
Spreadsheets are also available for calculating inputs to Equation HH-4.

Pageview: Reduction Act: Back: Statement | Contact Us | e-GGRT RY2012 R.21 | HH-equation_H4

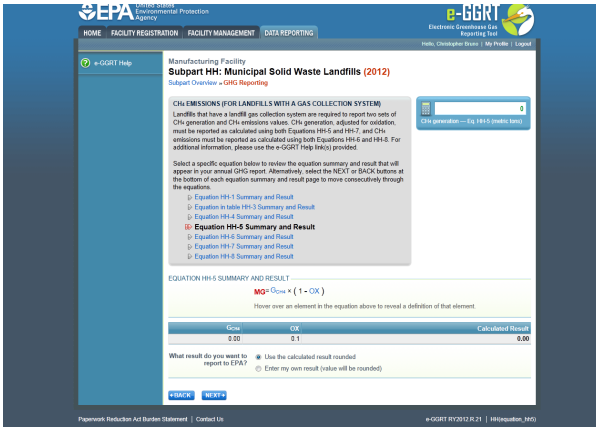
Click NEXT to move on to the "Equation HH-5 Summary and Result" page.

Equation HH-5 Summary and Result

On this page, e-GGRT will calculate the landfill's annual methane generation adjusted for oxidation using Equation HH-5. e-GGRT will then round the result according to e-GGRT rounding rules, and store both the rounded and unrounded values in the database.

You may use this result or enter your own value by clicking the "Enter my own result" button. Enter your result in the box that shows up below the question. e-GGRT will store your estimated value, round the value according to e-GGRT rounding rules, and store both the rounded and unrounded value in the database.

[Click image to expand](#)



Click NEXT to move on to the "Equation HH-6 Summary and Result" page.

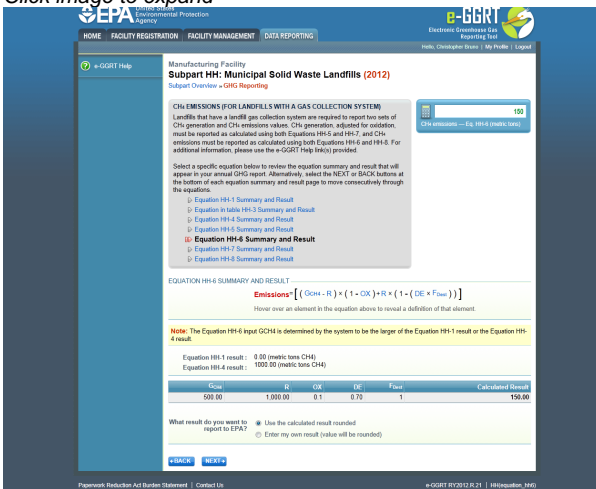
Equation HH-6 Summary and Result

On this page, e-GGRT will calculate the landfill's annual methane emissions (the output of Equation HH-6), round the value according to e-GGRT rounding rules, and store both the rounded and unrounded values in the database.

You may use this result or enter your own value by clicking the "Enter my own result" button. Enter your result in the box that shows up below the question. e-GGRT will store your estimated value, round the value according to e-GGRT rounding rules, and store both the rounded and unrounded value in the database.

e-GGRT will also use your annual report as an indication of which of the modeled (HH-1) or measured (HH-4) methane generation value (G_{CH_4}) was used in calculation Equation HH-6.

Click image to expand



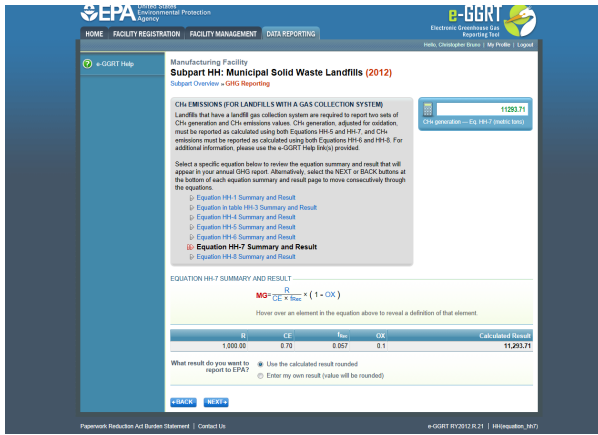
Click NEXT to move on to the "Equation HH-7 Summary and Result" page.

Equation HH-7 Summary and Result

On this page, e-GGRT will calculate the landfill's annual methane generation adjusted for oxidation (output of Equation HH-7), round the value according to e-GGRT rounding rules, and store both the rounded and unrounded values in the database.

You may use this result or enter your own value by clicking the "Enter my own result" button. Enter your result in the box that shows up below the question. e-GGRT will store your estimated value, round the value according to e-GGRT rounding rules, and store both the rounded and unrounded value in the database.

Click image to expand



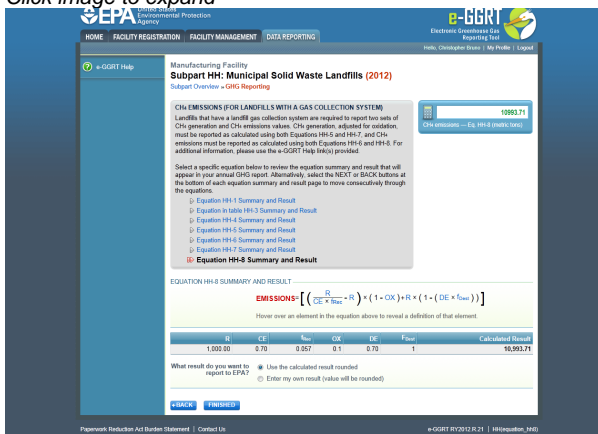
Click NEXT to move on to the "Equation HH-8 Summary and Result" page.

Equation HH-8 Summary and Result

On this page, e-GGRT will calculate the landfill's annual methane emissions (output of Equation HH-8), round the value according to e-GGRT rounding rules, and store both the rounded and unrounded values in the database.

You may use this result or enter your own value by clicking the "Enter my own result" button. Enter your result in the box that shows up below the question. e-GGRT will store your estimated value, round the value according to e-GGRT rounding rules, and store both the rounded and unrounded value in the database.

Click image to expand



Note for Equations HH-6, HH-7, and HH-8: The calculation spreadsheet file for Equations HH-6, HH-7, and HH-8 has several tabs which are appropriate for different numbers of destruction devices and monitoring/measurement locations at the landfill. Please consult the "Using Subpart HH Calculation Spreadsheets" help screens to ensure appropriate use of the various tabs.

When finished with the equation pages, click FINISHED on the "Equation HH-8 Summary and Result" page. This will bring you back to the emissions overview information page. You will see that the "Summary and Results" section of that page is filled in with the information stored from the equation pages.

Click image to expand

Manufacturing Facility
Subpart HH: Municipal Solid Waste Landfills (2012)
 Subpart Overview - GHG Reporting

CH₄ EMISSIONS FOR LANDFILLS WITH A GAS COLLECTION SYSTEM
 Landfills that have a landfill gas collection system are required to report two sets of CH₄ generation and CH₄ emissions values. CH₄ generation, adjusted for oxidation, must be reported as calculated using both Equations HH-6 and HH-7, and CH₄ emissions must be reported as calculated using both Equations HH-6 and HH-8. For additional information, please see the e-GGRT Help link(s) provided.

Select a specific equation below to review the equation summary and result that will appear in your annual GHG report. Alternatively, select the NEXT or BACK buttons at the bottom of each equation summary, and scroll page to move consecutively through the equations.

- Equation HH-1 Summary and Result
- Equation in table HH-3 Summary and Result
- Equation HH-4 Summary and Result
- Equation HH-5 Summary and Result
- Equation HH-6 Summary and Result
- Equation HH-7 Summary and Result
- Equation HH-8 Summary and Result

SUMMARY AND RESULT	Equation	CH ₄
Total annual modeled CH ₄ generation (HH-1)		0
Annual quantity of recovered CH ₄ generation (HH-3)		0.7
Total annual modeled CH ₄ generation (HH-4)		1,000
Modeled CH ₄ generation, adjusted for oxidation (HH-5)		0
CH ₄ emissions from the landfill in the reporting year (HH-6)		300
Modeled CH ₄ generation, adjusted for oxidation (HH-7)		22,607.43
CH ₄ emissions from the landfill in the reporting year (HH-8)		21,987.43

LANDFILL GAS COLLECTED FOR DESTRUCTION
 Annual volume of landfill gas collected for destruction: 10000 (mcf)

A missing data procedure was used to determine the CH₄ concentration of landfill gas collected for destruction. (check if true)

Number of days substitute data procedure was used to determine the CH₄ concentration of landfill gas collected for destruction: 0 (days)

Annual average CH₄ concentration of landfill gas collected for destruction: 0 (percent)

A missing data procedure was used to determine the CH₄ concentration of landfill gas collected for destruction. (check if true)

If CH₄ is monitored daily, the number of days substitute data was used to determine the annual average CH₄ concentration of landfill gas collected for destruction: 0 (days)

If CH₄ is monitored weekly, the number of weeks substitute data was used to determine the annual average CH₄ concentration of landfill gas collected for destruction: 0 (weeks)

Was temperature incorporated into internal calculations used by the collection system's monitoring equipment? Yes No

Was pressure incorporated into internal calculations used by the collection system's monitoring equipment? Yes No

Was landfill gas flow measured on a wet or dry basis? Wet basis Dry basis

Was CH₄ concentration measured on a wet or dry basis? Wet basis Dry basis

Destruction occurred at the facility or off-site? At the facility (on-site) Off-site

A back-up destruction device is present. (check if true)

Annual operating hours for the primary destruction device: 600 (hours)

Annual operating hours for the back-up destruction device: 30 (hours)

Destruction efficiency used: 0.7 (decimal fraction)

[Subpart Overview](#) [CANCEL](#) [SAVE](#) [HELP](#)

i You will be allowed to elect to use either the rounded result of Equation HH-6 (as calculated and rounded by e-GGRT, unless entered by the user) or the rounded result of Equation HH-8 (as calculated and rounded by e-GGRT, unless entered by the user) to roll up into your total CO₂-e emissions from facility subparts as required by 98.3(c)(4)(i). If you make no election, e-GGRT will use the larger of the two rounded values.

When you have entered the information, click SAVE. You will be brought back to the top of the “GHG Reporting” page at which time you may check over the information entered. When you have completed your check, click Subpart Overview to return to the Subpart Overview page.

Facility 1
Subpart HH: Municipal Solid Waste Landfills (2012)
 Subpart Overview

OVERVIEW OF SUBPART REPORTING REQUIREMENT S
 Subpart HH requires municipal solid waste landfills to report methane (CH₄) generation and emissions quantities. First, provide the information requested in the two Landfill Details pages and e-GGRT will determine what additional information is required for reporting based on the information you provide about your landfill. For additional information about Subpart HH reporting, please use the e-GGRT Help link(s) provided.

EPA has finalized a rule that defers the deadline for reporting data elements used as inputs to emission equations for direct emitters. See 76 FR 53057 (published August 25, 2011). In accordance with the rule, e-GGRT is not currently collecting data used as inputs to emission equations.

Subpart HH: View Validation

Reporting Information	
Landfill Details: Reporting Years	OPEN
Landfill Details: Historical Y Years	OPEN
Waste Characterization Information	OPEN
Annual Waste Type Details	OPEN
Active Aeration Information	OPEN
Estimated Waste Depths	OPEN
Methane Generation and Emissions for Landfills with LFG Collection Systems	OPEN

[Facility Overview](#)

From the Subpart Overview page, press the OPEN button located opposite “Estimated Waste Depths.”

Click image to expand

For landfills with a gas collection system in place, the following information must be entered on the estimate waste depths (in meters) and surface areas (in square meters) for each area below (as listed in Table HH-3):

- **A1:** Depth and surface area of area with no waste in place. Note: In many cases, the depth of area with no waste in place will be zero.
- **A2:** Depth and surface area of area without active gas collection, regardless of cover type.
- **A3:** Depth and surface area of area with daily soil cover and active gas collection.
- **A4:** Depth and surface area of area with an intermediate soil cover, or a final soil cover not meeting the criteria for A5.
- **A5:** Depth and surface area of area with a final soil cover of 3 feet or thicker of clay and/or geomembrane cover system and active gas collection.

When you have entered the information, click SAVE. You will be brought back to the top of the “GHG Reporting” page at which time you may check over the information you entered. When you have completed your check, click Subpart Overview to return to the Subpart Overview page.

Subpart HH Emissions Totals (When and How to Enter Your "Own Result")

After all data is entered in e-GGRT for subpart HH, e-GGRT automatically uses the greater of the two emissions equation results (Equation HH-6 or Equation HH-8) in the Subpart HH emissions totals. The reporter may override that total if, due to site specific conditions at the landfills, the other equation result is deemed to more accurately reflects total methane emissions at the landfill.

To override the Subpart HH emissions totals:

- Go to the Facility Overview page (click on the blue box at the bottom left corner of the Subpart Overview page)
- Click on “VIEW GHG DETAILS” at the bottom of the blue box with the calculators on the upper right side of the page
- Click “Edit result(s)” under the table titled “GHGDETAILS (source categories subparts C-HH)”
- Choose the row for Subpart HH CH4 and enter the value of the more accurate equation result in the “Own Result” box.
- Click “SAVE” at the bottom of the page

[Back to Top](#)

See Also

[Screen Errors](#)
[Using e-GGRT to Prepare Your Subpart HH Report](#)
[Subpart HH Summary Information for this Facility](#)
[Subpart HH Waste Information](#)
[Subpart Validation Report](#)

Subpart HH - Inputs Whose Reporting Deadline Was Deferred Until 2013

In August 2011, EPA deferred the reporting deadline for inputs to equations until either March 31, 2013 or March 31, 2015 to allow time to fully evaluate the potential impact from the release of this data. EPA has evaluated the 2013 inputs listed in [Table A-6 of subpart A of the GHG reporting rule](#) following the process described in the [Summary of Evaluation of Greenhouse Gas Reporting Program \(GHGRP\) Part 98 “Inputs to Emission Equations” Data Elements Deferred Until 2013](#). EPA does not plan to take further action regarding the 2013 inputs. Therefore, inputs to equations whose reporting was deferred until 2013 must be reported to EPA by April 1, 2013, for reporting years 2010, 2011, and 2012 as applicable. For Subpart HH, the deferred data elements which will now be collected include:

Citation	Data Element
98.346(a)	Year in which the landfill first started accepting waste for disposal

98.346(a)	Last year the landfill accepted waste for landfills using Equation HH-3
98.346(a)	Capacity of the landfill (for closed landfills using Equation HH-3)
98.346(a)	Waste disposal quantity for each year of landfill required to be included when using Equation HH-1 of this subpart (in metric tons, wet weight)
98.346(b)	For years when waste quantity data are determined using the methods in §98.343(a)(3), report the quantity of waste determined using the methods in §98.343(a)(3)(i)
98.346(b)	For years when waste quantity data are determined using the methods in §98.343(a)(3), report the quantity of waste determined using the methods in §98.343(a)(3)(ii)
98.346(b)	For historical waste disposal quantities that were not determined using the methods in §98.343(a)(3), report the population served by the landfill for each year the Equation HH-2 of this subpart is applied
98.346(b)	For historical waste disposal quantities that were not determined using the methods in §98.343(a)(3), report the value of landfill capacity (LFC) used in the calculation (For open landfills using Equation HH-3 of this subpart)
98.346(c)	Waste composition for each year required for Equation HH-1, in percentage by weight, for each waste category listed Table HH-1 of this subpart to calculate the annual modeled CH ₄ generation.
98.346(d)(1)	Degradable organic carbon (DOC) value used
98.346(d)(1)	Each waste type used to calculate CH ₄ generation using Equation HH-1, report the methane correction factor (MCF) values used in the calculations
98.346(d)(1)	Each waste type used to calculate CH ₄ generation using Equation HH-1, report the fraction of DOC dissimilated (DOCF) values used in the calculations
98.346(d)(2)	Decay rate (k) value
98.346(e)	Fraction of CH ₄ in landfill gas (F)
98.346(f)	If multiple cover types are used, report surface area associated with each cover type
98.346(g)	Modeled annual methane generation rate for the reporting year (from Equation HH-1, used in Equation HH-5)
98.346(i)(5)	Annual operating hours for the primary destruction device
98.346(i)(5)	Annual operating hours for the backup destruction device
98.346(i)(5)	Destruction efficiency for the primary destruction device
98.346(i)(5)	Destruction efficiency for the backup destruction device
98.346(i)(6)	Annual quantity of recovered CH ₄ (Equation HH-4)
98.346(i)(7)	Surface area as specified in Table HH-3
98.346(i)(7)	Estimated gas collection system efficiency
98.346(i)(7)	Annual operating hours of the gas collection system (f_{rec} in Equation-HH-7 and HH-8)
98.346(i)(9)	CH ₄ generation value (input to Equation HH-6) Note: per instructions this is LFG generated from Equation HH-1 or LFG recovered from Equation HH-4

Summary of changes in e-GGRT (deployed in February 2013) to accommodate the above data elements

This section contains screenshots and descriptions of changes to the reporting forms in e-GGRT.



The newly collected data elements for RY2012 enable emissions calculations to be executed within e-GGRT for certain subpart equations. As a result, affected Optional Calculation Spreadsheets will become obsolete. The Optional Calculation Spreadsheets associated with the equations below will become obsolete for this subpart beginning RY2012:

- Equation HH-1
- Equation HH-5
- Equation HH-6
- Equation HH-7
- Equation HH-8

Copies of these spreadsheets can be downloaded at the [Calculation Spreadsheet Archive](#).

98.346(a):

For a single landfill at the facility, e-GGRT will require the facility to provide the following information:

- The year in which the landfill first started accepting waste for disposal;
- The last year the landfill accepted waste if the facility classified the landfill as "closed";
- The capacity of the landfill in metric tons;
- The waste disposal quantity in wet weight metric tons for each year of landfilling that is required to be included when using Equation HH-1 of this subpart.



Screen snaps that portray this feature are not yet available

98.346(b):

For each annual waste disposal quantity that was based on the methods of 98.343(a)(3), e-GGRT will require the facility to report:

- The annual waste disposal quantity determined using the methods in 98.343(a)(3)(i) for each year that method was used;
- The annual waste disposal quantity determined using the methods in 98.343(a)(3)(ii) for each year that method was used.

For historical waste disposal quantities that were not determined using the methods in 98.343(a)(3), e-GGRT will require the facility to report:

- The population served by the landfill for each year that Equation HH-2 of this subpart is applied;
- The value of landfill capacity (LFC) used in Equation HH-3 of this subpart).



Screen snaps that portray this feature are not yet available

98.346(c):

For each year, e-GGRT will require that the facility report the percent by weight for each waste type used in Equation HH-1 as specified by the facility, expressed as a decimal fraction.



Screen snaps that portray this feature are not yet available

98.346(d)(1):

For each year and for each waste type specified by the facility, e-GGRT will require that the facility report:

- The value for degradable organic carbon (DOC) used in Equation HH-1 as a decimal fraction;
- A value for the fraction of DOC dissimilated (DOC_F) of 0.5 to be used in Equation HH-1 (e-GGRT will pre-populate this entry with a value of 0.5 and not permit the facility to change it);
- The methane correction factor (MCF) values used in Equation HH-1.

For the annual MCF values, e-GGRT will:

- Set the value to 1.0 for each year of landfilling if the facility indicated that the default value was used in all cases;
- Require the facility to report the value for each year of landfilling if the facility indicated that a value other than the 1.0 default was used.



Screen snaps that portray this feature are not yet available

98.346(d)(2):

For each year and for each waste type specified by the facility, e-GGRT will require that the facility report the value of the decay rate (k) used in Equation HH-1.



Screen snaps that portray this feature are not yet available

98.346(e):

For the annual values of F (fraction by volume of CH₄ in landfill gas), e-GGRT will:

- Set the value to 0.5 for each year of landfilling if the facility indicated that the default value was used in all cases (no additional data entry required by the webform user);
- Require the facility to report the value for each year of landfilling if the facility indicated that a value other than the 0.5 default was used.



Screen snaps that portray this feature are not yet available

98.346(f):

e-GGRT will require the facility to report the surface area of the landfill containing waste in square meters associated with the following types of cover material:

- Organic cover;
- Clay cover;
- Sand cover;
- Other soil mixture (no further specification is needed).



Screen snaps that portray this feature are not yet available

98.346(g):

e-GGRT will calculate the facility's total annual modeled CH₄ generation in metric tons using Equation HH-1 (see 98.343(a)(1)) by summing each waste type-specific Equation HH-1 result, and round the value according to e-GGRT rounding rules. e-GGRT will then store the rounded and unrounded values in the database.



Screen snaps that portray this feature are not yet available

98.346(i)(5):

For landfills with landfill gas collection systems, e-GGRT will require the facility to provide an indication whether destruction occurs "at the facility" or "off-site" or "both". For the landfills that destroy gas onsite, e-GGRT will require the facility to provide:

- The annual operating hours for the primary destruction device;
- The annual operating hours for the back-up destruction device if present;
- The destruction efficiency used in Equations HH-6 and HH-8 as a decimal fraction for the primary and back-up devices.

Note that landfills with gas collection systems that destroy gas onsite are identified by those that report "at the facility" or "both" in the reporting form.



Screen snaps that portray this feature are not yet available

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98.346(i)(6):

For landfills that have landfill gas collection systems, e-GGRT will require the facility to provide the annual quantity in metric tons of recovered CH₄ calculated using Equation HH-4. e-GGRT will round the value according to e-GGRT rounding rules and store the rounded value and the facility-entered unrounded value in the database.



Screen snaps that portray this feature are not yet available

98.346(i)(7):

e-GGRT will require the facility to provide the estimated waste depth in meters and the surface area in square meters for each area specified in Table HH-3. Areas specified in Table HH-3 include:

- A1: Area with no waste in-place
- A2: Area without active gas collection, regardless of cover type.
- A3: Area with daily soil cover and active gas collection

- A4: Area with an intermediate soil cover, or a final soil cover not meeting the criteria for A5 below, and active gas collection
- A5: Area with a final soil cover of 3 feet or thicker of clay and/or geomembrane cover system and active gas collection

Furthermore, for landfills that have landfill gas collection systems, e-GGRT will require the facility to provide the annual operating hours of the gas collection system.

Finally, for landfills that have landfill gas collection systems, e-GGRT will calculate the estimated gas collection system efficiency (“CEave1”) using the equation provided within Table HH-3 to Subpart HH of Part 98 (Landfill Gas Collection Efficiencies) and round the result to two digits to the right of the decimal.

However, e-GGRT will also allow the facility to enter the estimated gas collection system efficiency using the equation provided within Table HH-3. If the facility has elected to enter their own value for the estimated gas collection system efficiency, e-GGRT will store the facility-entered estimated gas collection system efficiency, round the value to two digits to the right of the decimal, and then store the rounded value and the facility-entered unrounded value in the database.



Screen snaps that portray this feature are not yet available

98.346(i)(9):

e-GGRT will include in the facility's annual report an indication of which of the modeled (Equation HH-1) or measured (Equation HH-4) GCH_4 methane generation value was used in calculating Equation HH-6.



Screen snaps that portray this feature are not yet available