



Date Prepared/Revised
DEP USE ONLY
Date Received

FORM G (B)
AIR RESOURCES PROTECTION
NMOC EMISSIONS ESTIMATE AND CONTROL PLAN

General Reference: 25 Pa Code §§ 121.7, 123.31, 131.2, 273.217, 273.218, 277.217, 279.218, 281.217, 281.218.

CHECK whether NEW or EXISTING / EXPANSION municipal waste landfill

If existing: Permit # _____

Proposed waste throughput in tons/day _____

Proposed operating schedule:

_____ days/yr (OD) Mon.-Fri. _____ to _____
Sat. _____ to _____
Total: _____ (hrs/yr) (OH)

INSTRUCTIONS/APPLICABILITY: The purpose of this form is to obtain information necessary to determine whether the proposed facility will be operated in such a manner as to prevent VOC emissions from the facility from causing air pollution or causing an exceedance of ambient air quality standards, and to determine if VOC emissions and controls comply with applicable emission standards. The facility may also be required to fulfill the NSPS requirements of 40 CFR Part 60, Subparts WWW and Cc.

I. POTENTIAL / ACTUAL VOC EMISSIONS FROM EXISTING DISPOSAL FACILITIES

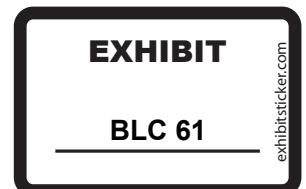
A. Summarize Existing Disposal Facilities Potential/Actual VOC Emissions as NMOC Expressed as Hexane

Number of existing cells _____. For each existing cell provide the following data summary:

Cell	Average Refuse Disposed Megagrams/Year	Years Opened (A)	Years Closed * (B)	PER (VOC)** tons	AER (VOC)*** tons
1					
2					
3					
4					
5					
6					
7					
8					
9					

Total PER (VOC) _____
TPER (VOC)

* If the cell is not closed, B equals 0
** PER: potential emission rate at current year
*** AER: actual emission rate at current year



1. Existing Disposal Facilities Potential VOC Emissions

For each cell, calculate the PER (VOC) as follows:

PER (VOC) = Potential VOC emissions (tons/year) / cell as NMOC expressed as Hexane

$$= 2 R_i L_o \left[e^{-kB} - e^{-kA} \right] C_{NMOC} \times 10^{-9} \left(\frac{1050.2}{273 + T} \right) \frac{1 \times 10^6 \text{ g}}{\text{Mg}} \times \frac{\text{lb.}}{454 \text{ g}} \times \frac{\text{ton}}{2000 \text{ lb.}}$$

k = Landfill gas generation rate constant (1/yr) = .05/yr or _____ (provide proposed EPA method 2E derivation)

L_o = Methane generation potential (m³/Mg) = 170 m³CH₄/Mg refuse or _____ (provide proposed EPA method 2E derivation)

C_{NMOC} = NMOC gas concentration as hexane equivalent NMOC (ppmv) = 4000 ppmv or _____ (provide proposed EPA method 25C derivation)

R_i = Average annual disposal rate (Megagrams)

A = years since waste was first disposed in landfill cell (years)

B = years since landfill cell was closed (years) (B=0 for active cell/landfill)

e = base log = 2.718

T = temperature of landfill gas in °C. If unknown, use 25°C.

2. Existing Disposal Facilities Actual VOC Emissions

For each cell, calculate the AER (VOC) as follows:

$$\begin{aligned} \text{AER (VOC)} &= \text{actual VOC emissions (tons/year) /cell as NMOC expressed as hexane} \\ &= \text{PER (VOC)} \times (1 - \text{CE} \times \text{DE}) \end{aligned}$$

where:

PER (VOC) = Potential VOC emission rate

AER (VOC) = Actual VOC emission rate

CE = cell gas collection efficiency = _____ %/100. If gas collection efficiency is unknown, use 75%. If no gas collection system is in operation use 0%.

DE = NMOC gas burner destruction efficiency = _____ %/100. If gas burner destruction efficiency is unknown, use 95%/100 or greater for a flare.

What is Air Quality permit number for system? _____.

B. Malodorous Emissions from Existing Disposal Facility

1. Are odors detectable off the permit boundary? yes no
2. What are the control measures currently being implemented?

Please attach a copy of your approved "Nuisance Minimization and Control Plan."

3. Calculate maximum actual emission rates:

Malodorants	Actual Emission Rate (AER)
Dimethyl sulfide	$54.8 \times \text{AER (VOC)} / C_{\text{NMOC}} = \text{_____ t/yr}$
Hydrogen sulfide	$14.4 \times \text{AER (VOC)} / C_{\text{NMOC}} = \text{_____ t/yr}$
Methyl mercaptan	$5.84 \times \text{AER (VOC)} / C_{\text{NMOC}} = \text{_____ t/yr}$
Other _____	$\text{_____} \times \text{AER (VOC)} / C_{\text{NMOC}} = \text{_____ t/yr}$

II. ESTIMATED ACTUAL VOC EMISSIONS FROM PROPOSED / EXPANDED LANDFILL

A. Determination of Year of Maximum Actual VOC Emissions

Number of proposed/expanded disposal cells: _____. For each proposed disposal cell provide the following Data Summary.

Maximum Estimated AER (VOC) Tons/Year

Cell i Yr (j)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
1							
2							
3							
4							
5							
TOTAL							

$$AER_{ij} = 2 (ADV * OD) L_O \left[e^{-kC_j} - e^{-kT_j} \right] C_{NMOC} \times 10^{-9} \left(\frac{1050.2}{273 + T} \right) \times \frac{1 \times 10^6 \text{ g}}{\text{Mg}} \times \frac{\text{lb.}}{454 \text{ g}} \times \frac{\text{ton}}{2000 \text{ lb.}} (1 - CE_i * DE_i)$$

- k = Landfill gas generation constant (1/yr) = .05/yr or _____ (provide proposed method 2F derivation).
- L_o = Methane gas generation potential (M³/M_s) = 170m³CH₄/M_g refuse or _____ (provide proposed method 2E derivation).
- ADV = Proposed average daily disposal volume _____ Mg/day [.908xADV (tons/day)].
- OD = Proposed operating days/year.
- C_{NMOC} = NMOC gas concentration as hexane equivalent NMOC (ppmv) = 4,000 ppmv or _____ (provide proposed method 25C derivation).
- C_j = Years since cell_i disposal ceases at yr_j.
- T_j = Years since cell_i disposal began from yr_j.
- Ce_i = Cell gas collection efficiency = _____ /100. Use 75% or _____ and 0% before installed.
- De_i = NMOC gas burner destruction efficiency = _____ /100. If unknown, use 95% or greater for flare.
- T = Temperature of landfill gas. If unknown, use 25°C.

B. Malodorant Emissions from Proposed Disposal / Expanded Facility

- 1. Will odors be detectable off the permit boundary? yes no
- 2. What are the measures to be taken to remediate problem?

- 3. Estimate maximum actual emission rate:

Malodorants	Actual Emission Rate (AER)
Dimethyl sulfide	54.8 x AER (VOC) / C _{NMOC} = _____ t/yr
Hydrogen sulfide	14.4 x AER (VOC) / C _{NMOC} = _____ t/yr
Methyl mercaptan	5.84 x AER (VOC) / C _{NMOC} = _____ t/yr
Other _____	_____ x AER (VOC) / C _{NMOC} = _____ t/yr

III. AIR TOXIC COMPOUNDS

Will the proposed facility emit air toxic compounds identified in Section 112 of the 1990 CAAA? yes no

If yes, identify the air toxic contaminants by compound _____

Will the air toxic compounds identified be detectable off the permit boundary? yes no