INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We Protect Hoosiers and Our Environment.
100 N. Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov

Michael R. Pence
Governor

Thomas W. Easterly
Commissioner

TO: Interested Parties / Applicant

DATE: February 27, 2014

RE: Sycamore Ridge Landfill / 167-32729-00116

FROM: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

Notice of Decision: Approval – Effective Immediately

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the enclosed matter. Pursuant to IC 13-17-3-4 and 326 IAC 2, this permit modification is effective immediately, unless a petition for stay of effectiveness is filed and granted, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

If you wish to challenge this decision, IC 4-21.5-3-7 and IC 13-15-7-3 require that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office Environmental Adjudication, 100 North Senate Avenue, Government Center North, Suite N 501E, Indianapolis, IN 46204, **within eighteen (18) days of the mailing of this notice**. The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

(1) the date the document is delivered to the Office of Environmental Adjudication (OEA);
(2) the date of the postmark on the envelope containing the document, if the document is mailed to OEA by U.S. mail; or
(3) The date on which the document is deposited with a private carrier, as shown by receipt issued by the carrier, if the document is sent to the OEA by private carrier.

The petition must include facts demonstrating that you are either the applicant, a person aggrieved or adversely affected by the decision or otherwise entitled to review by law. Please identify the permit, decision, or other order for which you seek review by permit number, name of the applicant, location, date of this notice and all of the following:

(1) the name and address of the person making the request;
(2) the interest of the person making the request;
(3) identification of any persons represented by the person making the request;
(4) the reasons, with particularity, for the request;
(5) the issues, with particularity, proposed for considerations at any hearing; and
(6) identification of the terms and conditions which, in the judgment of the person making the request, would be appropriate in the case in question to satisfy the requirements of the law governing documents of the type issued by the Commissioner.

Pursuant to 326 IAC 2-7-18(d), any person may petition the U.S. EPA to object to the issuance of a Title V operating permit or modification within sixty (60) days of the end of the forty-five (45) day EPA review period. Such an objection must be based only on issues that were raised with reasonable specificity during the public comment period, unless the petitioner demonstrates that it was impractible to raise such issues, or if the grounds for such objection arose after the comment period.

To petition the U.S. EPA to object to the issuance of a Title V operating permit, contact:

U.S. Environmental Protection Agency
401 M Street
Washington, D.C. 20406

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178. Callers from within Indiana may call toll-free at 1-800-451-6027, ext. 3-0178.

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February 27, 2014

Jerry Kreuzman
Sycamore Ridge Landfill, General Manager
5621 East Cottom Drive
Pimento, Indiana 47866

Re: 167-32729-00116
Significant Permit Modification to
Part 70 Renewal No.: T167-30079-00116

Dear Mr. Kreuzman:

Sycamore Ridge Landfill was issued Part 70 Operating Permit No. T 167-30079-00116 on December 19, 2011 for a stationary municipal landfill. On January 10, 2013, the Office of Air Quality (OAQ) received an application requesting changes to this permit. Pursuant to the provisions of 326 IAC 2-7-12, a significant permit modification to this permit is hereby approved as described in the attached Technical Support Document. All other conditions of the permit shall remain unchanged and in effect. For your convenience, the entire Part 70 Operating Permit as modified will be provided at issuance.

This decision is subject to the Indiana Administrative Orders and Procedures Act – IC 4-21.5-3-5. If you have any questions on this matter, please contact David J. Matousek, OAQ, 100 North Senate Avenue, MC 61-53, Room 1003, Indianapolis, Indiana, 46204-2251, or call at (800) 451-6027, and ask for David J. Matousek or extension (2-8253), or dial (317) 232-8253.

Sincerely,

Nathan Bell, Section Chief
Permits Branch
Office of Air Quality

Attachments:
DJM

cc: File-Vigo County
Vigo County Health Department
U.S. EPA, Region V
Air Compliance and Enforcement Branch

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Commissioner

Part 70 Operating Permit Renewal
OFFICE OF AIR QUALITY

Sycamore Ridge Landfill
5621 East Cottom Drive
Pimento, Indiana 47866

(herein known as the Permittee) is hereby authorized to operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this permit.

The Permittee must comply with all conditions of this permit. Noncompliance with any provisions of this permit is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Noncompliance with any provision of this permit, except any provision specifically designated as not federally enforceable, constitutes a violation of the Clean Air Act. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. An emergency does constitute an affirmative defense in an enforcement action provided the Permittee complies with the applicable requirements set forth in Section B, Emergency Provisions.

This permit is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

Operation Permit No.: T167-30079-00116	
Issued by: Original Signed by: Tripurari P. Sinha, Ph. D., Section Chief Permits Branch Office of Air Quality	Issuance Date: December 19, 2011 Expiration Date: December 19, 2016

First Administrative Amendment No. 167-31434-00116, issued on February 22, 2012; and
Second Administrative Amendment No. 167-32050-00116, issued on June 29, 2012

First Significant Permit Modification No. 167-32729-00116	
Issued by: Nathan Bell, Section Chief Permits Branch Office of Air Quality	Issuance Date: February 27, 2014 Expiration Date: December 19, 2016

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SECTION A SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 through A.3 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(14)] [326 IAC 2-7-1(22)]

The Permittee owns and operates a stationary municipal solid waste landfill.

Source Address:	5621 East Cottom Drive, Pimento, Indiana 47866
General Source Phone Number:	(812) 298-2131
SIC Code:	4953
County Location:	Vigo
Source Location Status:	Attainment for all criteria pollutants
Source Status:	Part 70 Operating Permit Program Minor Source, under PSD Rules Minor Source, Section 112 of the Clean Air Act Not 1 of 28 Source Categories

A.2 Part 70 Source Definition [326 IAC 2-7-1(22)]

This municipal solid waste landfill consists of two (2) plants:

(a) Landfill 1, Sycamore Ridge Landfill, 167-00116, is located at 5621 East Cottom Drive, Pimento, Indiana; and

(b) Landfill 2, Victory Environmental Services, Inc., 167-00116, is located at 12247 South Mill Street, Terre Haute, Indiana.

Since the two (2) Landfills are located on contiguous or adjacent properties, belong to the same industrial grouping, and are under common control of the same entity, they will be considered one (1) source, effective from the date of issuance of this Part 70 permit.

A.3 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(14)]

This stationary source consists of the following emission units and pollution control devices:

(a) One (1) municipal solid waste landfill with a total combined design capacity of 17.230 million megagrams (Mg) (24.76 million cubic meters, or 32.34 million cubic yards). The original landfill (Victory Environmental Services, Inc.) was constructed in 1972. The expanded landfill (Sycamore Ridge Landfill) was constructed in 2003.
[40 CFR 61, Subpart M][40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(b) One (1) Active Gas Collection and Control System, identified as GCCS-VES, for Victory Environmental Services, Inc., including an open flare with a design capacity of 1,200 standard cubic feet per minute with a maximum heat input capacity of 39.6 MMBtu/hr. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-VES was constructed in 2004. [40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(c) One (1) Active Gas Collection and Control System, identified as GCCS-SRL, for Landfill 1 (Sycamore Ridge Landfill), including one (1) LFG Specialties Candlestick Flare, with a maximum capacity of 2,100 scfm of landfill gas with a maximum heat input capacity of 69.0 MMBtu/hr. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-SRL was approved for construction in 2008 and will be expanded based on site conditions. [40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

A.4 Insignificant Activities [326 IAC 2-7-1(21)] [326 IAC 2-7-4(c)] [326 IAC 2-7-5(14)]

This stationary source also includes the following insignificant activities, as defined in 326 IAC 2-7-1(21):

(a) Six (6) portable welders, Unit #3 [326 IAC 6.5]
(b) One (1) 55 gallon drum of transmission fluid, Unit #5
(c) One (1) 300 gallon above ground storage tank (AST) for antifreeze, Unit #7
(d) One (1) 400 gallon AST for hydraulic oil, Unit #8
(e) One (1) 250 gallon AST for used motor oil tank, Unit #10
(f) One (1) 500 gallon AST for propane, Unit #12
(g) Four (4) propane-fired space heaters, Unit #13 [326 IAC 6.5]
(h) Two (2) 35,000 gallon AST for diesel storage, Unit #14
(i) One (1) 26,000 gallon underground storage tank (UST) for leachate, Unit #15
(j) Two (2) 55 gallon drums of Castrol gear oil, Unit #16
(k) Two (2) 250 gallon AST for hydraulic fluid, Unit #17
(l) One (1) 250 gallon AST for gear oil, Unit #18
(m) One (1) 375 gallon AST for transmission fluid, Unit #19
(n) Two (2) portable kerosene heaters, less than 2 MMBtu/hr each, Unit #20 [326 IAC 6.5]
(o) Two (2) 500 gallon used oil tanks and burner, Unit #21[326 IAC 6.5]
(p) One (1) 1,000 gallon gasoline AST with vent, identified as Unit ID #23, with a monthly gasoline throughput of less than ten thousand (10,000) gallons.
[40 CFR 63, Subpart CCCCCC]
(q) One (1) 1,000 gallon AST for on-road diesel, Unit #25
(r) One (1) portable 375 gallon tank for motor oil, Unit #29
(s) One (1) 250 gallon storage tank for transmission fluid, Unit #30
(t) One (1) 300 gallon storage tank for kerosene, Unit #32
(u) Two (2) 200 gallon propane tanks, Unit #33
(v) One (1) 55 gallon drum of transmission oil, Unit #34
(w) One (1) 500 gallon AST for used oil storage for the boiler, Unit #35
(x) Paved and unpaved roads. [326 IAC 6.5]

A.5 Part 70 Permit Applicability [326 IAC 2-7-2]

This stationary source is required to have a Part 70 permit by 326 IAC 2-7-2 (Applicability) because:

(a) It is a major source, as defined in 326 IAC 2-7-1(22);

(b) It is a source in a source category designated by the United States Environmental Protection Agency (U.S. EPA) under 40 CFR 70.3 (Part 70 - Applicability).

SECTION B GENERAL CONDITIONS

B.1 Definitions [326 IAC 2-7-1]

Terms in this permit shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-7) shall prevail.

B.2 Permit Term [326 IAC 2-7-5(2)] [326 IAC 2-1.1-9.5] [326 IAC 2-7-4(a)(1)(D)] [IC 13-15-3-6(a)]

(a) This permit, T167-30079-00116, is issued for a fixed term of five (5) years from the issuance date of this permit, as determined in accordance with IC 4-21.5-3-5(f) and IC 13-15-5-3. Subsequent revisions, modifications, or amendments of this permit do not affect the expiration date of this permit.

(b) If IDEM, OAQ, upon receiving a timely and complete renewal permit application, fails to issue or deny the permit renewal prior to the expiration date of this permit, this existing permit shall not expire and all terms and conditions shall continue in effect, including any permit shield provided in 326 IAC 2-7-15, until the renewal permit has been issued or denied.

B.3 Term of Conditions [326 IAC 2-1.1-9.5]

Notwithstanding the permit term of a permit to construct, a permit to operate, or a permit modification, any condition established in a permit issued pursuant to a permitting program approved in the state implementation plan shall remain in effect until:

(a) the condition is modified in a subsequent permit action pursuant to Title I of the Clean Air Act; or

(b) the emission unit to which the condition pertains permanently ceases operation.

B.4 Enforceability [326 IAC 2-7-7] [IC 13-17-12]

Unless otherwise stated, all terms and conditions in this permit, including any provisions designed to limit the source's potential to emit, are enforceable by IDEM, the United States Environmental Protection Agency (U.S. EPA) and by citizens in accordance with the Clean Air Act.

B.5 Severability [326 IAC 2-7-5(5)]

The provisions of this permit are severable; a determination that any portion of this permit is invalid shall not affect the validity of the remainder of the permit.

B.6 Property Rights or Exclusive Privilege [326 IAC 2-7-5(6)(D)]

This permit does not convey any property rights of any sort or any exclusive privilege.

B.7 Duty to Provide Information [326 IAC 2-7-5(6)(E)]

(a) The Permittee shall furnish to IDEM, OAQ, within a reasonable time, any information that IDEM, OAQ may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. Upon request, the Permittee shall also furnish to IDEM, OAQ copies of records required to be kept by this permit.

(b) For information furnished by the Permittee to IDEM, OAQ, the Permittee may include a claim of confidentiality in accordance with 326 IAC 17.1. When furnishing copies of requested records directly to U. S. EPA, the Permittee may assert a claim of confidentiality in accordance with 40 CFR 2, Subpart B.

B.8 Certification [326 IAC 2-7-4(f)] [326 IAC 2-7-6(1)] [326 IAC 2-7-5(3)(C)]

(a) A certification required by this permit meets the requirements of 326 IAC 2-7-6(1) if:

(1) it contains a certification by a "responsible official" as defined by 326 IAC 2-7-1(35), and

(2) the certification states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(b) The Permittee may use the attached Certification Form, or its equivalent with each submittal requiring certification. One (1) certification may cover multiple forms in one (1) submittal.

(c) A "responsible official" is defined at 326 IAC 2-7-1(35).

B.9 Annual Compliance Certification [326 IAC 2-7-6(5)]

(a) The Permittee shall annually submit a compliance certification report which addresses the status of the source's compliance with the terms and conditions contained in this permit, including emission limitations, standards, or work practices. All certifications shall cover the time period from January 1 to December 31 of the previous year, and shall be submitted no later than July 1 of each year to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

and

United States Environmental Protection Agency, Region V
Air and Radiation Division, Air Enforcement Branch - Indiana (AE-17J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

(b) The annual compliance certification report required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(c) The annual compliance certification report shall include the following:

(1) The appropriate identification of each term or condition of this permit that is the basis of the certification;

(2) The compliance status;

(3) Whether compliance was continuous or intermittent;

(4) The methods used for determining the compliance status of the source, currently and over the reporting period consistent with 326 IAC 2-7-5(3); and

(5) Such other facts, as specified in Sections D of this permit, as IDEM, OAQ may require to determine the compliance status of the source.

The submittal by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

B.10 Preventive Maintenance Plan [326 IAC 2-7-5(12)] [326 IAC 1-6-3]

(a) A Preventive Maintenance Plan meets the requirements of 326 IAC 1-6-3 if it includes, at a minimum:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

The Permittee shall implement the PMPs.

(b) If required by specific condition(s) in Section D of this permit where no PMP was previously required, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMPs) no later than ninety (90) days after issuance of this permit or ninety (90) days after initial start-up, whichever is later, including the following information on each facility:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

If, due to circumstances beyond the Permittee’s control, the PMPs cannot be prepared and maintained within the above time frame, the Permittee may extend the date an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

The PMP extension notification does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

The Permittee shall implement the PMPs.

(c) A copy of the PMPs shall be submitted to IDEM, OAQ upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ may require the Permittee to revise its PMPs whenever lack of proper maintenance causes or is the primary contributor to an exceedance of any limitation on emissions. The PMPs and their submittal do not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(d) To the extent the Permittee is required by 40 CFR Part 60/63 to have an Operation Maintenance, and Monitoring (OMM) Plan for a unit, such Plan is deemed to satisfy the PMP requirements of 326 IAC 1-6-3 for that unit.

B.11 Emergency Provisions [326 IAC 2-7-16]

(a) An emergency, as defined in 326 IAC 2-7-1(12), is not an affirmative defense for an action brought for noncompliance with a federal or state health-based emission limitation.

(b) An emergency, as defined in 326 IAC 2-7-1(12), constitutes an affirmative defense to an action brought for noncompliance with a technology-based emission limitation if the affirmative defense of an emergency is demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that describe the following:

(1) An emergency occurred and the Permittee can, to the extent possible, identify the causes of the emergency;

(2) The permitted facility was at the time being properly operated;

(3) During the period of an emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit;

(4) For each emergency lasting one (1) hour or more, the Permittee notified IDEM, OAQ, within four (4) daytime business hours after the beginning of the emergency, or after the emergency was discovered or reasonably should have been discovered;

Telephone Number: 1-800-451-6027 (ask for Office of Air Quality, Compliance and Enforcement Branch), or
Telephone Number: 317-233-0178 (ask for Office of Air Quality, Compliance and Enforcement Branch)
Facsimile Number: 317-233-6865

(5) For each emergency lasting one (1) hour or more, the Permittee submitted the attached Emergency Occurrence Report Form or its equivalent, either by mail or facsimile to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

within two (2) working days of the time when emission limitations were exceeded due to the emergency.

The notice fulfills the requirement of 326 IAC 2-7-5(3)(C)(ii) and must contain the following:

(A) A description of the emergency;

(B) Any steps taken to mitigate the emissions; and

(C) Corrective actions taken.

The notification which shall be submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(6) The Permittee immediately took all reasonable steps to correct the emergency.

(c) In any enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency has the burden of proof.

(d) This emergency provision supersedes 326 IAC 1-6 (Malfunctions). This permit condition is in addition to any emergency or upset provision contained in any applicable requirement.

(e) The Permittee seeking to establish the occurrence of an emergency shall make records available upon request to ensure that failure to implement a PMP did not cause or contribute to an exceedance of any limitations on emissions. However, IDEM, OAQ may require that the Preventive Maintenance Plans required under 326 IAC 2-7-4(c)(8) be revised in response to an emergency.

(f) Failure to notify IDEM, OAQ by telephone or facsimile of an emergency lasting more than one (1) hour in accordance with (b)(4) and (5) of this condition shall constitute a violation of 326 IAC 2-7 and any other applicable rules.

(g) If the emergency situation causes a deviation from a technology-based limit, the Permittee may continue to operate the affected emitting facilities during the emergency provided the Permittee immediately takes all reasonable steps to correct the emergency and minimize emissions.

B.12 Permit Shield [326 IAC 2-7-15] [326 IAC 2-7-20] [326 IAC 2-7-12]

(a) Pursuant to 326 IAC 2-7-15, the Permittee has been granted a permit shield. The permit shield provides that compliance with the conditions of this permit shall be deemed compliance with any applicable requirements as of the date of permit issuance, provided that either the applicable requirements are included and specifically identified in this permit or the permit contains an explicit determination or concise summary of a determination that other specifically identified requirements are not applicable. The Indiana statutes from IC 13 and rules from 326 IAC, referenced in conditions in this permit, are those applicable at the time the permit was issued. The issuance or possession of this permit shall not alone constitute a defense against an alleged violation of any law, regulation or standard, except for the requirement to obtain a Part 70 permit under 326 IAC 2-7 or for applicable requirements for which a permit shield has been granted.

This permit shield does not extend to applicable requirements which are promulgated after the date of issuance of this permit unless this permit has been modified to reflect such new requirements.

(b) If, after issuance of this permit, it is determined that the permit is in nonconformance with an applicable requirement that applied to the source on the date of permit issuance, IDEM, OAQ, shall immediately take steps to reopen and revise this permit and issue a compliance order to the Permittee to ensure expeditious compliance with the applicable requirement until the permit is reissued. The permit shield shall continue in effect so long as the Permittee is in compliance with the compliance order.

(c) No permit shield shall apply to any permit term or condition that is determined after issuance of this permit to have been based on erroneous information supplied in the permit application. Erroneous information means information that the Permittee knew to be false, or in the exercise of reasonable care should have been known to be false, at the time the information was submitted.

(d) Nothing in 326 IAC 2-7-15 or in this permit shall alter or affect the following:

(1) The provisions of Section 303 of the Clean Air Act (emergency orders), including the authority of the U.S. EPA under Section 303 of the Clean Air Act;

(2) The liability of the Permittee for any violation of applicable requirements prior to or at the time of this permit's issuance;

(3) The applicable requirements of the acid rain program, consistent with Section 408(a) of the Clean Air Act; and

(4) The ability of U.S. EPA to obtain information from the Permittee under Section 114 of the Clean Air Act.

(e) This permit shield is not applicable to any change made under 326 IAC 2-7-20(b)(2) (Sections 502(b)(10) of the Clean Air Act changes) and 326 IAC 2-7-20(c)(2) (trading based on State Implementation Plan (SIP) provisions).

(f) This permit shield is not applicable to modifications eligible for group processing until after IDEM, OAQ, has issued the modifications. [326 IAC 2-7-12(c)(7)]

(g) This permit shield is not applicable to minor Part 70 permit modifications until after IDEM, OAQ, has issued the modification. [326 IAC 2-7-12(b)(8)]

B.13 Prior Permits Superseded [326 IAC 2-1.1-9.5] [326 IAC 2-7-10.5]

(a) All terms and conditions of permits established prior to T167-30079-00116 and issued pursuant to permitting programs approved into the state implementation plan have been either:

(1) incorporated as originally stated,

(2) revised under 326 IAC 2-7-10.5, or

(3) deleted under 326 IAC 2-7-10.5.

(b) Provided that all terms and conditions are accurately reflected in this permit, all previous registrations and permits are superseded by this Part 70 operating permit.

B.14 Termination of Right to Operate [326 IAC 2-7-10] [326 IAC 2-7-4(a)]

The Permittee's right to operate this source terminates with the expiration of this permit unless a timely and complete renewal application is submitted at least nine (9) months prior to the date of expiration of the source's existing permit, consistent with 326 IAC 2-7-3 and 326 IAC 2-7-4(a).

B.15 Permit Modification, Reopening, Revocation and Reissuance, or Termination [326 IAC 2-7-5(6)(C)] [326 IAC 2-7-8(a)] [326 IAC 2-7-9]

(a) This permit may be modified, reopened, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a Part 70 Operating Permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any condition of this permit. [326 IAC 2-7-5(6)(C)] The notification by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(b) This permit shall be reopened and revised under any of the circumstances listed in IC 13-15-7-2 or if IDEM, OAQ determines any of the following:

(1) That this permit contains a material mistake.

(2) That inaccurate statements were made in establishing the emissions standards or other terms or conditions.

(3) That this permit must be revised or revoked to assure compliance with an applicable requirement. [326 IAC 2-7-9(a)(3)]

(c) Proceedings by IDEM, OAQ to reopen and revise this permit shall follow the same procedures as apply to initial permit issuance and shall affect only those parts of this permit for which cause to reopen exists. Such reopening and revision shall be made as expeditiously as practicable. [326 IAC 2-7-9(b)]

(d) The reopening and revision of this permit, under 326 IAC 2-7-9(a), shall not be initiated before notice of such intent is provided to the Permittee by IDEM, OAQ at least thirty (30) days in advance of the date this permit is to be reopened, except that IDEM, OAQ may provide a shorter time period in the case of an emergency. [326 IAC 2-7-9(c)]

B.16 Permit Renewal [326 IAC 2-7-3] [326 IAC 2-7-4] [326 IAC 2-7-8(e)]

(a) The application for renewal shall be submitted using the application form or forms prescribed by IDEM, OAQ and shall include the information specified in 326 IAC 2-7-4. Such information shall be included in the application for each emission unit at this source, except those emission units included on the trivial or insignificant activities list contained in 326 IAC 2-7-1(21) and 326 IAC 2-7-1(40). The renewal application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

Request for renewal shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(b) A timely renewal application is one that is:

(1) Submitted at least nine (9) months prior to the date of the expiration of this permit; and

(2) If the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(c) If the Permittee submits a timely and complete application for renewal of this permit, the source's failure to have a permit is not a violation of 326 IAC 2-7 until IDEM, OAQ takes final action on the renewal application, except that this protection shall cease to apply if, subsequent to the completeness determination, the Permittee fails to submit by the deadline specified, pursuant to 326 IAC 2-7-4(a)(2)(D), in writing by IDEM, OAQ any additional information identified as being needed to process the application.

B.17 Permit Amendment or Modification [326 IAC 2-7-11] [326 IAC 2-7-12]

(a) Permit amendments and modifications are governed by the requirements of 326 IAC 2-7-11 or 326 IAC 2-7-12 whenever the Permittee seeks to amend or modify this permit.

(b) Any application requesting an amendment or modification of this permit shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

Any such application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) The Permittee may implement administrative amendment changes addressed in the request for an administrative amendment immediately upon submittal of the request. [326 IAC 2-7-11(c)(3)]

B.18 Permit Revision Under Economic Incentives and Other Programs [326 IAC 2-7-5(8)] [326 IAC 2-7-12(b)(2)]

(a) No Part 70 permit revision or notice shall be required under any approved economic incentives, marketable Part 70 permits, emissions trading, and other similar programs or processes for changes that are provided for in a Part 70 permit.

(b) Notwithstanding 326 IAC 2-7-12(b)(1) and 326 IAC 2-7-12(c)(1), minor Part 70 permit modification procedures may be used for Part 70 modifications involving the use of economic incentives, marketable Part 70 permits, emissions trading, and other similar approaches to the extent that such minor Part 70 permit modification procedures are explicitly provided for in the applicable State Implementation Plan (SIP) or in applicable requirements promulgated or approved by the U.S. EPA.

B.19 Operational Flexibility [326 IAC 2-7-20] [326 IAC 2-7-10.5]

(a) The Permittee may make any change or changes at the source that are described in 326 IAC 2-7-20(b) or (c) without a prior permit revision, if each of the following conditions is met:

(1) The changes are not modifications under any provision of Title I of the Clean Air Act;

(2) Any preconstruction approval required by 326 IAC 2-7-10.5 has been obtained;

(3) The changes do not result in emissions which exceed the limitations provided in this permit (whether expressed herein as a rate of emissions or in terms of total emissions);

(4) The Permittee notifies the:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

and

United States Environmental Protection Agency, Region V
Air and Radiation Division, Regulation Development Branch - Indiana (AR-18J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

in advance of the change by written notification at least ten (10) days in advance of the proposed change. The Permittee shall attach every such notice to the Permittee's copy of this permit; and

(5) The Permittee maintains records on-site, on a rolling five (5) year basis, which document all such changes and emission trades that are subject to 326 IAC 2-7-20(b)(1) and (c)(1). The Permittee shall make such records available, upon reasonable request, for public review.

Such records shall consist of all information required to be submitted to IDEM, OAQ in the notices specified in 326 IAC 2-7-20(b)(1) and (c)(1).

(b) The Permittee may make Section 502(b)(10) of the Clean Air Act changes (this term is defined at 326 IAC 2-7-1(36)) without a permit revision, subject to the constraint of 326 IAC 2-7-20(a). For each such Section 502(b)(10) of the Clean Air Act change, the required written notification shall include the following:

(1) A brief description of the change within the source;

(2) The date on which the change will occur;

(3) Any change in emissions; and

(4) Any permit term or condition that is no longer applicable as a result of the change.

The notification which shall be submitted is not considered an application form, report or compliance certification. Therefore, the notification by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) Emission Trades [326 IAC 2-7-20(c)]
The Permittee may trade emissions increases and decreases at the source, where the applicable SIP provides for such emission trades without requiring a permit revision, subject to the constraints of Section (a) of this condition and those in 326 IAC 2-7-20(c).

(d) Alternative Operating Scenarios [326 IAC 2-7-20(d)]
The Permittee may make changes at the source within the range of alternative operating scenarios that are described in the terms and conditions of this permit in accordance with 326 IAC 2-7-5(9). No prior notification of IDEM, OAQ, or U.S. EPA is required.

(e) Backup fuel switches specifically addressed in, and limited under, Section D of this permit shall not be considered alternative operating scenarios. Therefore, the notification requirements of part (a) of this condition do not apply.

B.20 Source Modification Requirement [326 IAC 2-7-10.5]

A modification, construction, or reconstruction is governed by the requirements of 326 IAC 2.

B.21 Inspection and Entry [326 IAC 2-7-6] [IC 13-14-2-2] [IC 13-30-3-1] [IC 13-17-3-2]

Upon presentation of proper identification cards, credentials, and other documents as may be required by law, and subject to the Permittee's right under all applicable laws and regulations to assert that the information collected by the agency is confidential and entitled to be treated as such, the Permittee shall allow IDEM, OAQ, U.S. EPA, or an authorized representative to perform the following:

(a) Enter upon the Permittee's premises where a Part 70 source is located, or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

(b) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, have access to and copy any records that must be kept under the conditions of this permit;

(c) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, inspect any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit;

(d) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, sample or monitor substances or parameters for the purpose of assuring compliance with this permit or applicable requirements; and

(e) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, utilize any photographic, recording, testing, monitoring, or other equipment for the purpose of assuring compliance with this permit or applicable requirements.

B.22 Transfer of Ownership or Operational Control [326 IAC 2-7-11]

(a) The Permittee must comply with the requirements of 326 IAC 2-7-11 whenever the Permittee seeks to change the ownership or operational control of the source and no other change in the permit is necessary.

(b) Any application requesting a change in the ownership or operational control of the source shall contain a written agreement containing a specific date for transfer of permit responsibility, coverage and liability between the current and new Permittee. The application shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

Any such application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) The Permittee may implement administrative amendment changes addressed in the request for an administrative amendment immediately upon submittal of the request. [326 IAC 2-7-11(c)(3)]

B.23 Annual Fee Payment [326 IAC 2-7-19] [326 IAC 2-7-5(7)] [326 IAC 2-1.1-7]

(a) The Permittee shall pay annual fees to IDEM, OAQ within thirty (30) calendar days of receipt of a billing. Pursuant to 326 IAC 2-7-19(b), if the Permittee does not receive a bill from IDEM, OAQ the applicable fee is due April 1 of each year.

(b) Except as provided in 326 IAC 2-7-19(e), failure to pay may result in administrative enforcement action or revocation of this permit.

(c) The Permittee may call the following telephone numbers: 1-800-451-6027 or 317-233-4230 (ask for OAQ, Billing, Licensing, and Training Section), to determine the appropriate permit fee.

B.24 Credible Evidence [326 IAC 2-7-5(3)] [326 IAC 2-7-6] [62 FR 8314] [326 IAC 1-1-6]

For the purpose of submitting compliance certifications or establishing whether or not the Permittee has violated or is in violation of any condition of this permit, nothing in this permit shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether the Permittee would have been in compliance with the condition of this permit if the appropriate performance or compliance test or procedure had been performed.

SECTION C SOURCE OPERATION CONDITIONS

Entire Source

Emission Limitations and Standards [**326 IAC 2-7-5(1)]**

C.1 Particulate Emission Limitations For Processes with Process Weight Rates Less Than One Hundred (100) Pounds per Hour [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2(e)(2), particulate emissions from any process not exempt under 326 IAC 6-3-1(b) or (c) which has a maximum process weight rate less than 100 pounds per hour and the methods in 326 IAC 6-3-2(b) through (d) do not apply shall not exceed 0.551 pounds per hour.

C.2 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-1 (Applicability) and 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.3 Open Burning [326 IAC 4-1] [IC 13-17-9]

The Permittee shall not open burn any material except as provided in 326 IAC 4-1-3, 326 IAC 4-1-4 or 326 IAC 4-1-6. The previous sentence notwithstanding, the Permittee may open burn in accordance with an open burning approval issued by the Commissioner under 326 IAC 4-1-4.1.

C.4 Incineration [326 IAC 4-2] [326 IAC 9-1-2]

The Permittee shall not operate an incinerator except as provided in 326 IAC 4-2 or in this permit. The Permittee shall not operate a refuse incinerator or refuse burning equipment except as provided in 326 IAC 9-1-2 or in this permit.

C.5 Fugitive Dust Emissions [326 IAC 6-4]

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions). 326 IAC 6-4-2(4) is not federally enforceable.

C.6 Fugitive Particulate Matter Emission Limitations [326 IAC 6-5]

Pursuant to 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive particulate matter emissions shall be controlled according to the fugitive dust control plan submitted on February 16, 1999. The provisions of 326 IAC 6-5 are not federally enforceable. The plan consists of:

(a) Roads - Dust will be controlled by sweeping on-site paved road areas and by the application of water to paved and unpaved roads as needed to minimize the fugitive dust emissions leading to and from the working face of the landfill and other areas of activity on the landfill.

(b) Cover Stockpiles - Soil cover stockpiles will be wetted with water as needed if they present fugitive dust concerns. In the event soil stockpiles present a continuing fugitive dust concern, a temporary stand of vegetation will be established.

(c) Completed Fill Areas - Areas of the facility that are at intermediate grade with intermediate cover will be vegetated as needed to minimize fugitive dust concerns. Those areas of the facility at final grade will be closed in accordance with 329 IAC 10 and vegetation established as required to minimize fugitive dust.

C.7 Asbestos Abatement Projects [326 IAC 14-10] [326 IAC 18] [40 CFR 61, Subpart M]

(a) Notification requirements apply to each owner or operator. If the combined amount of regulated asbestos containing material (RACM) to be stripped, removed or disturbed is at least 260 linear feet on pipes or 160 square feet on other facility components, or at least thirty-five (35) cubic feet on all facility components, then the notification requirements of 326 IAC 14-10-3 are mandatory. All demolition projects require notification whether or not asbestos is present.

(b) The Permittee shall ensure that a written notification is sent on a form provided by the Commissioner at least ten (10) working days before asbestos stripping or removal work or before demolition begins, per 326 IAC 14-10-3, and shall update such notice as necessary, including, but not limited to the following:

(1) When the amount of affected asbestos containing material increases or decreases by at least twenty percent (20%); or

(2) If there is a change in the following:

(A) Asbestos removal or demolition start date;

(B) Removal or demolition contractor; or

(C) Waste disposal site.

(c) The Permittee shall ensure that the notice is postmarked or delivered according to the guidelines set forth in 326 IAC 14-10-3(2).

(d) The notice to be submitted shall include the information enumerated in 326 IAC 14-10-3(3).

All required notifications shall be submitted to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

The notice shall include a signed certification from the owner or operator that the information provided in this notification is correct and that only Indiana licensed workers and project supervisors will be used to implement the asbestos removal project. The notifications do not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(e) Procedures for Asbestos Emission Control
The Permittee shall comply with the applicable emission control procedures in 326 IAC 14-10-4 and 40 CFR 61.145(c). Per 326 IAC 14-10-1, emission control requirements are applicable for any removal or disturbance of RACM greater than three (3) linear feet on pipes or three (3) square feet on any other facility components or a total of at least 0.75 cubic feet on all facility components.

(f) Demolition and Renovation
The Permittee shall thoroughly inspect the affected facility or part of the facility where the demolition or renovation will occur for the presence of asbestos pursuant to 40 CFR 61.145(a).

(g) Indiana Licensed Asbestos Inspector
The Permittee shall comply with 326 IAC 14-10-1(a) that requires the owner or operator, prior to a renovation/demolition, to use an Indiana Licensed Asbestos Inspector to thoroughly inspect the affected portion of the facility for the presence of asbestos. The requirement to use an Indiana Licensed Asbestos inspector is not federally enforceable.

Testing Requirements [**326 IAC 2-7-6(1)]**

C.8 Performance Testing [326 IAC 3-6]

(a) For performance testing required by this permit, a test protocol, except as provided elsewhere in this permit, shall be submitted to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

no later than thirty-five (35) days prior to the intended test date. The protocol submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(b) The Permittee shall notify IDEM, OAQ of the actual test date at least fourteen (14) days prior to the actual test date. The notification submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) Pursuant to 326 IAC 3-6-4(b), all test reports must be received by IDEM, OAQ not later than forty-five (45) days after the completion of the testing. An extension may be granted by IDEM, OAQ if the Permittee submits to IDEM, OAQ a reasonable written explanation not later than five (5) days prior to the end of the initial forty-five (45) day period.

Compliance Requirements [**326 IAC 2-1.1-11]**

C.9 Compliance Requirements [326 IAC 2-1.1-11]

The commissioner may require stack testing, monitoring, or reporting at any time to assure compliance with all applicable requirements by issuing an order under 326 IAC 2-1.1-11. Any monitoring or testing shall be performed in accordance with 326 IAC 3 or other methods approved by the commissioner or the U. S. EPA.

Compliance Monitoring Requirements [**326 IAC 2-7-5(1)**] [**326 IAC 2-7-6(1)]**

C.10 Compliance Monitoring [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

(a) For new units:

Unless otherwise specified in the approval for the new emission units(s), compliance monitoring for new emission units shall be implemented on and after the date of initial start-up.

(b) For existing units:

Unless otherwise specified in this permit, for all monitoring requirements not already legally required, the Permittee shall be allowed up to ninety (90) days from the date of permit issuance to begin such monitoring. If due to circumstances beyond the Permittee's control, any monitoring equipment required by this permit cannot be installed and operated no later than ninety (90) days after permit issuance, the Permittee may extend the compliance schedule related to the equipment for an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

in writing, prior to the end of the initial ninety (90) day compliance schedule, with full justification of the reasons for the inability to meet this date.

The notification which shall be submitted by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

C.11 Instrument Specifications [326 IAC 2-1.1-11] [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

(a) When required by any condition of this permit, an analog instrument used to measure a parameter related to the operation of an air pollution control device shall have a scale such that the expected maximum reading for the normal range shall be no less than twenty percent (20%) of full scale. The analog instrument shall be capable of measuring values outside of the normal range.

(b) The Permittee may request that the IDEM, OAQ approve the use of an instrument that does not meet the above specifications provided the Permittee can demonstrate that an alternative instrument specification will adequately ensure compliance with permit conditions requiring the measurement of the parameters.

Corrective Actions and Response Steps [**326 IAC 2-7-5**] [**326 IAC 2-7-6]**

C.12 Emergency Reduction Plans [326 IAC 1-5-2] [326 IAC 1-5-3]

Pursuant to 326 IAC 1-5-2 (Emergency Reduction Plans; Submission):

(a) The Permittee shall maintain the most recently submitted written emergency reduction plans (ERPs) consistent with safe operating procedures.

(b) Upon direct notification by IDEM, OAQ that a specific air pollution episode level is in effect, the Permittee shall immediately put into effect the actions stipulated in the approved ERP for the appropriate episode level. [326 IAC 1-5-3]

C.13 Risk Management Plan [326 IAC 2-7-5(12)] [40 CFR 68]

If a regulated substance, as defined in 40 CFR 68, is present at a source in more than a threshold quantity, the Permittee must comply with the applicable requirements of 40 CFR 68.

C.14 Response to Excursions or Exceedances [326 IAC 2-7-5] [326 IAC 2-7-6]

Upon detecting an excursion where a response step is required by the D Section or an exceedance of a limitation in this permit:

(a) The Permittee shall take reasonable response steps to restore operation of the emissions unit (including any control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing excess emissions.

(b) The response shall include minimizing the period of any startup, shutdown or malfunction. The response may include, but is not limited to, the following:

(1) initial inspection and evaluation;

(2) recording that operations returned or are returning to normal without operator action (such as through response by a computerized distribution control system); or

(3) any necessary follow-up actions to return operation to normal or usual manner of operation.

(c) A determination of whether the Permittee has used acceptable procedures in response to an excursion or exceedance will be based on information available, which may include, but is not limited to, the following:

(1) monitoring results;

(2) review of operation and maintenance procedures and records; and/or

(3) inspection of the control device, associated capture system, and the process.

(d) Failure to take reasonable response steps shall be considered a deviation from the permit.

(e) The Permittee shall record the reasonable response steps taken.

C.15 Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2-7-5] [326 IAC 2-7-6]

(a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall submit a description of its response actions to IDEM, OAQ, no later than seventy-five (75) days after the date of the test.

(b) A retest to demonstrate compliance shall be performed no later than one hundred eighty (180) days after the date of the test. Should the Permittee demonstrate to IDEM, OAQ that retesting in one hundred eighty (180) days is not practicable, IDEM, OAQ may extend the retesting deadline

(c) IDEM, OAQ reserves the authority to take any actions allowed under law in response to noncompliant stack tests.

The response action documents submitted pursuant to this condition do require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

C.16 Emission Statement [326 IAC 2-7-5(3)(C)(iii)] [326 IAC 2-7-5(7)] [326 IAC 2-7-19(c)] [326 IAC 2-6]

Pursuant to 326 IAC 2-6-3(b)(3), starting in 2006 and every three (3) years thereafter, the Permittee shall submit by July 1 an emission statement covering the previous calendar year. The emission statement shall contain, at a minimum, the information specified in 326 IAC 2-6-4(c) and shall meet the following requirements:

(a) Indicate estimated actual emissions of all pollutants listed in 326 IAC 2-6-4(a);

(b) Indicate estimated actual emissions of regulated pollutants as defined by 326 IAC 2-7-1 (32) ("Regulated pollutant, which is used only for purposes of Section 19 of this rule") from the source, for purpose of fee assessment.

The statement must be submitted to:

Indiana Department of Environmental Management
Technical Support and Modeling Section, Office of Air Quality
100 North Senate Avenue
MC 61-50 IGCN 1003
Indianapolis, Indiana 46204-2251

The emission statement does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

C.17 General Record Keeping Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-6]

(a) Records of all required monitoring data, reports and support information required by this permit shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. Support information includes the following, where applicable:

(AA) All calibration and maintenance records.

(BB) All original strip chart recordings for continuous monitoring instrumentation.

(CC) Copies of all reports required by the Part 70 permit.

Records of required monitoring information include the following, where applicable:

(AA) The date, place, as defined in this permit, and time of sampling or measurements.

(BB) The dates analyses were performed.

(CC) The company or entity that performed the analyses.

(DD) The analytical techniques or methods used.

(EE) The results of such analyses.

(FF) The operating conditions as existing at the time of sampling or measurement.

These records shall be physically present or electronically accessible at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

(b) Unless otherwise specified in this permit, for all record keeping requirements not already legally required, the Permittee shall be allowed up to ninety (90) days from the date of permit issuance or the date of initial start-up, whichever is later, to begin such record keeping.

C.18 General Reporting Requirements [326 IAC 2-7-5(3)(C)] [326 IAC 2-1.1-11]

(a) The Permittee shall submit the attached Quarterly Deviation and Compliance Monitoring Report or its equivalent. Proper notice submittal under Section B – Emergency Provisions satisfies the reporting requirements of this paragraph. Any deviation from permit requirements, the date(s) of each deviation, the cause of the deviation, and the response steps taken must be reported except that a deviation required to be reported pursuant to an applicable requirement that exists independent of this permit, shall be reported according to the schedule stated in the applicable requirement and does not need to be included in this report. This report shall be submitted not later than thirty (30) days after the end of the reporting period. The Quarterly Deviation and Compliance Monitoring Report shall include a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35). A deviation is an exceedance of a permit limitation or a failure to comply with a requirement of the permit.

(b) The address for report submittal is:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(c) Unless otherwise specified in this permit, any notice, report, or other submission required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(d) Reporting periods are based on calendar years, unless otherwise specified in this permit. For the purpose of this permit, “calendar year” means the twelve (12) month period from January 1 to December 31 inclusive.

Stratospheric Ozone Protection

C.19 Compliance with 40 CFR 82 and 326 IAC 22-1

Pursuant to 40 CFR 82 (Protection of Stratospheric Ozone), Subpart F, except as provided for motor vehicle air conditioners in Subpart B, the Permittee shall comply with applicable standards for recycling and emissions reduction.

SECTION D.1 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description:

(a) One (1) municipal solid waste landfill with a total combined design capacity of 17.230 million megagrams (Mg) (24.76 million cubic meters, or 32.34 million cubic yards). The original landfill (Victory Environmental Services, Inc.) was constructed in 1972. The expanded landfill (Sycamore Ridge Landfill) was constructed in 2003.[40 CFR 61, Subpart M]
[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(b) One (1) Active Gas Collection and Control System, identified as GCCS-VES, for Victory Environmental Services, Inc., including an open flare with a design capacity of 1,200 standard cubic feet per minute with a maximum heat input capacity of 39.6 MMBtu/hr. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-VES was constructed in 2004.
[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(c) One (1) Active Gas Collection and Control System, identified as GCCS-SRL, for Landfill 1 (Sycamore Ridge Landfill), including one (1) LFG Specialties Candlestick Flare, with a maximum capacity of 2,100 scfm of landfill gas with a maximum heat input capacity of 69.0 MMBtu/hr. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-SRL was approved for construction in 2008 and will be expanded based on site conditions.
[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

Insignificant Activities

(a) Six (6) portable welders, Unit #3 [326 IAC 6.5]

(g) Four (4) propane-fired space heaters, Unit #13 [326 IAC 6.5]

(n) Two (2) portable kerosene heaters, less than 2 MMBtu/hr each, Unit #20 [326 IAC 6.5]

(o) Two (2) 500 gallon used oil tanks and burner, Unit #21[326 IAC 6.5]

(x) Paved and unpaved roads. [326 IAC 6.5]

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.1.1 Particulate Matter Limitations except Lake County [326 IAC 6.5]

Pursuant to 326 IAC 6.5-1-2(a), particulate matter emissions from the following operations shall not exceed 0.03 grain per dry standard cubic foot (dscf):

(a) The flare for the gas collection and control system identified as GCCS-VES;

(b) The flare for the gas collection and control system identified as GCCS-SRL;

(c) The six welders identified as Unit #3;

(d) The four propane-fired space heaters identified as Unit #13;

(e) The two portable kerosene heaters identified as Unit #20; and

(f) The two 500 gallon used oil burners associated with Unit #21.

(g) Paved and unpaved roads.

D.1.2 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan (PMP) is required for the facilities listed in this section. Section B – Preventive Maintenance Plan contains the Permittee's obligations with regard to the preventive maintenance plan required by this condition.

SECTION E.1 Standards of Performance for Municipal Solid Waste Landfills [40 CFR 60, Subpart WWW]

Emissions Unit Description:

(a) One (1) municipal solid waste landfill with a total combined design capacity of 17.230 million megagrams (Mg) (24.76 million cubic meters, or 32.34 million cubic yards). The original landfill (Victory Environmental Services, Inc.) was constructed in 1972. The expanded landfill (Sycamore Ridge Landfill) was constructed in 2003.[40 CFR 61, Subpart M]
[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(b) One (1) Active Gas Collection and Control System, identified as GCCS-VES, for Victory Environmental Services, Inc., including an open flare with a design capacity of 1,200 standard cubic feet per minute with a maximum heat input capacity of 39.6 MMBtu/hr. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-VES was constructed in 2004.
[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(c) One (1) Active Gas Collection and Control System, identified as GCCS-SRL, for Landfill 1 (Sycamore Ridge Landfill), including one (1) LFG Specialties Candlestick Flare, with a maximum capacity of 2,100 scfm of landfill gas with a maximum heat input capacity of 69.0 MMBtu/hr. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-SRL was approved for construction in 2008 and will be expanded based on site conditions.
[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

New Source Performance Standards (NSPS) [**40 CFR 60]**

E.1.1 General Provisions Relating to NSPS [326 IAC 12-1] [40 CFR Part 60, Subpart A]

The provisions of 40 CFR Part 60, Subpart A - General Provisions, which are incorporated by reference in 326 IAC 12-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR Part 60, Subpart WWW.

E.1.2 Standards of Performance for Municipal Solid Waste Landfills [40 CFR Part 60, Subpart WWW] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart WWW, the Permittee shall comply with the following provisions of 40 CFR Part 60, Subpart WWW (included as Attachment A), which are incorporated by reference as 326 IAC 12, for the municipal solid waste landfill:

40 CFR 60.750
40 CFR 60.751
40 CFR 60.752
40 CFR 60.753
40 CFR 60.754
40 CFR 60.755
40 CFR 60.756
40 CFR 60.757
40 CFR 60.758
40 CFR 60.759

E.1.3 Operational Standards for Collection and Control Systems [40 CFR 60.753] [326 IAC 12]

In order to comply with 40 CFR 60.752(b)(2)(iii), the Permittee shall:

(a) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55° C and with a nitrogen level less than 20 percent or an oxygen level less than 5 percent, except as indicated below:

(1) Pursuant to Administrative Amendment 167-28653-00116, the landfill gas temperature at well G159 shall not exceed 60 °C (140 °F).

(2) Pursuant to Administrative Amendment 167-31434-00116, the landfill gas temperature at well G104 shall not exceed 60 °C (140 °F).

(3) Pursuant to Administrative Amendment 167-31434-00116, oxygen levels in the landfill gas at wells VEGW05, VEGW06, VEGW07 and VEGW08 shall not exceed 21%.

(4) Pursuant to 2nd Administrative Amendment 167-32050-00116, oxygen levels in the landfill gas at well G101 shall not exceed 12%.

(5) Pursuant to Significant Permit Modification No. 167-32729-00116, oxygen levels in the landfill gas well VEGW04 shall not exceed 21%.

(6) Pursuant to Significant Permit Modification No. 167-32729-00116, the landfill gas temperature at landfill gas wells G102, G108, G111, G120, and G121 shall not exceed 60 °C (140 °F).

Supporting data shows that these alternate operating standards will not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.

SECTION E.2 National Emissions Standards for Hazardous Air Pollutants for Asbestos Requirements [40 CFR 61, Subpart M]

Emissions Unit Description:

(a) One (1) municipal solid waste landfill with a total combined design capacity of 17.230 million megagrams (Mg) (24.76 million cubic meters, or 32.34 million cubic yards). The original landfill (Victory Environmental Services, Inc.) was constructed in 1972. The expanded landfill (Sycamore Ridge Landfill) was constructed in 2003.[40 CFR 61, Subpart M] [40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

National Emission Standards for Hazardous Air Pollutants Requirements (NESHAP) [40 CFR 61]

E.2.1 General Provisions Relating to NESHAP [326 IAC 14-1] [40 CFR Part 61, Subpart A]

The provisions of 40 CFR Part 61, Subpart A – General Provisions, which are incorporated by reference as 326 IAC 14-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR Part 61, Subpart M.

E.2.2 National Emissions Standards for Hazardous Air Pollutants for Asbestos Requirements [40 CFR Part 61, Subpart M] [326 IAC 14-2-1]

Pursuant to 40 CFR Part 61, Subpart M, the Permittee shall comply with the following provisions of 40 CFR Part 61, Subpart M (included as Attachment B), incorporated by reference as 326 IAC 14-2-1, for the municipal solid waste landfill:

40 CFR 61.140
40 CFR 61.141
40 CFR 61.154
40 CFR 61.157

SECTION E.3 National Emissions Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills Requirements [40 CFR 63, Subpart AAAA]

Emissions Unit Description:

(a) One (1) municipal solid waste landfill with a total combined design capacity of 17.230 million megagrams (Mg) (24.76 million cubic meters, or 32.34 million cubic yards). The original landfill (Victory Environmental Services, Inc.) was constructed in 1972. The expanded landfill (Sycamore Ridge Landfill) was constructed in 2003.[40 CFR 61, Subpart M]
[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(b) One (1) Active Gas Collection and Control System, identified as GCCS-VES, for Victory Environmental Services, Inc., including an open flare with a design capacity of 1,200 standard cubic feet per minute with a maximum heat input capacity of 39.6 MMBtu/hr. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-VES was constructed in 2004.
[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(c) One (1) Active Gas Collection and Control System, identified as GCCS-SRL, for Landfill 1 (Sycamore Ridge Landfill), including one (1) LFG Specialties Candlestick Flare, with a maximum capacity of 2,100 scfm of landfill gas with a maximum heat input capacity of 69.0 MMBtu/hr. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-SRL was approved for construction in 2008 and will be expanded based on site conditions.
[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

National Emission Standards for Hazardous Air Pollutants Requirements (NESHAP) [40 CFR 63]

E.3.1 General Provisions Relating to NESHAP [326 IAC 20-1] [40 CFR Part 63, Subpart A]

The provisions of 40 CFR Part 63, Subpart A – General Provisions, which are incorporated by reference as 326 IAC 20-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR 63. Subpart AAAA.

E.3.2 National Emissions Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills Requirements [40 CFR 63, Subpart AAAA] [326 IAC 20-67-1]

Pursuant to 40 CFR 63.1945, the Permittee shall comply with the following provisions of 40 CFR Part 63, Subpart AAAA (included as Attachment C), which are incorporated by reference as 326 IAC 20-67, for the municipal solid waste landfill:

40 CFR 63.1930
40 CFR 63.1935
40 CFR 63.1940
40 CFR 63.1945
40 CFR 63.1950
40 CFR 63.1955(a)-(c)
40 CFR 63.1960
40 CFR 63.1980

SECTION E.4 National Emissions Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities [40 CFR 63, Subpart CCCCCC]

Emissions Unit Description:

Insignificant Activities

(p) One (1) 1,000 gallon gasoline AST with vent, identified as Unit ID #23, with a monthly gasoline throughput of less than ten thousand (10,000) gallons.
[40 CFR 63, Subpart CCCCCC]

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

National Emission Standards for Hazardous Air Pollutants Requirements (NESHAP) [40 CFR 63]

E.4.1 General Provisions Relating to NESHAP [326 IAC 20-1] [40 CFR Part 63, Subpart A]

The provisions of 40 CFR Part 61, Subpart A – General Provisions, which are incorporated by reference as 326 IAC 20-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR Part 63, Subpart CCCCCC.

E.4.2 National Emissions Standards for Hazardous Air Pollutants for Source Categories: Gasoline Dispensing Facilities [40 CFR 63, Subpart CCCCCC]

Pursuant to 40 CFR Part 63, Subpart CCCCCC, the Permittee shall comply with the following provisions of 40 CFR Part 63, Subpart CCCCCC (included as Attachment D), for the gasoline above ground storage tank, identified as Unit ID #23:

(1) 40 CFR 63.11111(a), (b), (i) and (j);
(2) 40 CFR 63.11112;
(3) 40 CFR 63.11113(a), (b), and (c);
(4) 40 CFR 63.11115(a);
(5) 40 CFR 63.11116;
(6) 40 CFR 63.11130;
(7) 40 CFR 63.11131;
(8) 40 CFR 63.11132; and
(9) Table 3

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY

PART 70 OPERATING PERMIT
CERTIFICATION

Source Name: Sycamore Ridge Landfill
Source Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Part 70 Permit No.: T167-30079-00116

This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this permit.

Please check what document is being certified:

☐ Annual Compliance Certification Letter

☐ Test Result (specify): _____

☐ Report (specify): _____

☐ Notification (specify): _____

☐ Affidavit (specify): _____

☐ Other (specify): _____

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature:

Printed Name:

Title/Position:

Phone:

Date:

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH

100 North Senate Avenue
MC 61-53, IGCN 1003
Indianapolis, Indiana 46204-2251
Phone: 317-233-0178
Fax: 317-233-6865

PART 70 OPERATING PERMIT
EMERGENCY OCCURRENCE REPORT

Source Name: Sycamore Ridge Landfill
Source Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Part 70 Permit No.: T167-30079-00116

This form consists of 2 pages Page 1 of 2

☐ This is an emergency as defined in 326 IAC 2-7-1(12)
- The Permittee must notify the Office of Air Quality (OAQ), no later than four (**4**) daytime business hours (1-800-451-6027 or 317-233-0178, ask for Compliance and Enforcement Branch); and
- The Permittee must submit notice in writing or by facsimile no later than two (**2**) days (Facsimile Number: 317-233-6865), and follow the other requirements of 326 IAC 2-7-16.

If any of the following are not applicable, mark N/A

Facility/Equipment/Operation:
Control Equipment:
Permit Condition or Operation Limitation in Permit:
Description of the Emergency
Describe the cause of the Emergency

If any of the following are not applicable, mark N/A **Page 2 of 2**

Date/Time Emergency started:
Date/Time Emergency was corrected:
Was the facility being properly operated at the time of the emergency? ☐ Y ☐ N Describe: Type of Pollutants Emitted: ☐ TSP ☐ PM-10 ☐ SO_2 ☐ VOC ☐ NO_X ☐ CO ☐ Pb ☐ other:
Estimated amount of pollutant(s) emitted during emergency:
Describe the steps taken to mitigate the problem:
Describe the corrective actions/response steps taken:
Describe the measures taken to minimize emissions:
If applicable, describe the reasons why continued operation of the facilities are necessary to prevent imminent injury to persons, severe damage to equipment, substantial loss of capital investment, or loss of product or raw materials of substantial economic value:

Form Completed By: _____

Title/Position: _____

Date: _____

Phone: _____

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY

COMPLIANCE AND ENFORCEMENT BRANCH

PART 70 OPERATING PERMIT

QUARTERLY DEVIATION AND COMPLIANCE MONITORING REPORT

Source Name: Sycamore Ridge Landfill
Source Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Part 70 Permit No.: T167-30079-00116

Months: _____ to _____ Year: _____

This report shall be submitted quarterly based on a calendar year or its equivalent. Proper notice submittal under Section B – Emergency Provisions satisfies the reporting requirements of this paragraph. Any deviation from the requirements of this permit, the date(s) of each deviation, the probable cause of the deviation, and the response steps taken must be reported. A deviation required to be reported pursuant to an applicable requirement that exists independent of the permit shall be reported according to the schedule stated in the applicable requirement and does not need to be included in this report. Additional pages may be attached if necessary. If no deviations occurred, please specify in the box marked "No deviations occurred this reporting period".
☐ NO DEVIATIONS OCCURRED THIS REPORTING PERIOD.
☐ THE FOLLOWING DEVIATIONS OCCURRED THIS REPORTING PERIOD
Permit Requirement (specify permit condition #)
Date of Deviation: **Duration of Deviation:**
Number of Deviations:
Probable Cause of Deviation:
Response Steps Taken:
Permit Requirement (specify permit condition #)
Date of Deviation: **Duration of Deviation:**
Number of Deviations:
Probable Cause of Deviation:
Response Steps Taken:

Permit Requirement (specify permit condition #)	
Date of Deviation:	**Duration of Deviation:**
Number of Deviations:	
Probable Cause of Deviation:	
Response Steps Taken:	
Permit Requirement (specify permit condition #)	
Date of Deviation:	**Duration of Deviation:**
Number of Deviations:	
Probable Cause of Deviation:	
Response Steps Taken:	
Permit Requirement (specify permit condition #)	
Date of Deviation:	**Duration of Deviation:**
Number of Deviations:	
Probable Cause of Deviation:	
Response Steps Taken:	

Form Completed By: _____

Title/Position: _____

Date: _____

Phone: _____

Indiana Department of Environmental Management
Office of Air Quality

Attachment A to a Part 70 Operating Permit

Source Background and Description

Source Name:	Sycamore Ridge Landfill
Source Location:	5621 East Cottom Drive, Pimento, Indiana 47866
County:	Vigo
SIC Code:	4953
Permit No.:	T 167-30079-00116
Permit Reviewer:	Kimberly Cottrell

40 CFR 60, Subpart WWW

40 CFR 60, Subpart WWW - Standards of Performance for Municipal Solid Waste Landfills
SOURCE: 61 FR 9919, Mar. 12, 1996, unless otherwise noted.

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§ 60.750 Applicability, designation of affected facility, and delegation of authority.

(a) The provisions of this subpart apply to each municipal solid waste landfill that commenced construction, reconstruction or modification on or after May 30, 1991. Physical or operational changes made to an existing MSW landfill solely to comply with subpart Cc of this part are not considered construction, reconstruction, or modification for the purposes of this section.
(b) The following authorities shall be retained by the Administrator and not transferred to the State: § 60.754(a)(5).
(c) Activities required by or conducted pursuant to a CERCLA, RCRA, or State remedial action are not considered construction, reconstruction, or modification for purposes of this subpart.
[61 FR 9919, Mar. 12, 1996, as amended at 63 FR 32750, June 16, 1998]

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§ 60.751 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act or in subpart A of this part.
Active collection system means a gas collection system that uses gas mover equipment.
Active landfill means a landfill in which solid waste is being placed or a landfill that is planned to accept waste in the future.
Closed landfill means a landfill in which solid waste is no longer being placed, and in which no additional solid wastes will be placed without first filing a notification of modification as prescribed under § 60.7(a)(4). Once a notification of modification has been filed, and additional solid waste is placed in the landfill, the landfill is no longer closed.
Closure means that point in time when a landfill becomes a closed landfill.
Commercial solid waste means all types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes.
Controlled landfill means any landfill at which collection and control systems are required under this subpart as a result of the nonmethane organic compounds emission rate. The landfill is considered controlled at the time a collection and control system design plan is submitted in compliance with § 60.752(b)(2)(i).
Design capacity means the maximum amount of solid waste a landfill can accept, as indicated in terms of volume or mass in the most recent permit issued by the State, local, or Tribal agency responsible for regulating the landfill, plus any in-place waste not accounted for in the most recent permit. If the owner or operator chooses to convert the design capacity from volume to mass or from mass to volume to demonstrate its design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the calculation must include a site specific density, which must be recalculated annually.
Disposal facility means all contiguous land and structures, other appurtenances, and improvements on

the land used for the disposal of solid waste.
Emission rate cutoff means the threshold annual emission rate to which a landfill compares its estimated emission rate to determine if control under the regulation is required.
Enclosed combustor means an enclosed firebox which maintains a relatively constant limited peak temperature generally using a limited supply of combustion air. An enclosed flare is considered an enclosed combustor.
Flare means an open combustor without enclosure or shroud.
Gas mover equipment means the equipment (i.e., fan, blower, compressor) used to transport landfill gas through the header system.
Household waste means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including, but not limited to, single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas).
Industrial solid waste means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under Subtitle C of the Resource Conservation and Recovery Act, parts 264 and 265 of this title. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste.
Interior well means any well or similar collection component located inside the perimeter of the landfill waste. A perimeter well located outside the landfilled waste is not an interior well.
Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile as those terms are defined under § 257.2 of this title.
Lateral expansion means a horizontal expansion of the waste boundaries of an existing MSW landfill. A lateral expansion is not a modification unless it results in an increase in the design capacity of the landfill.
Modification means an increase in the permitted volume design capacity of the landfill by either horizontal or vertical expansion based on its permitted design capacity as of May 30, 1991. Modification does not occur until the owner or operator commences construction on the horizontal or vertical expansion.
Municipal solid waste landfill or *MSW landfill* means an entire disposal facility in a contiguous geographical space where household waste is placed in or on land. An MSW landfill may also receive other types of RCRA Subtitle D wastes (§ 257.2 of this title) such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste. Portions of an MSW landfill may be separated by access roads. An MSW landfill may be publicly or privately owned. An MSW landfill may be a new MSW landfill, an existing MSW landfill, or a lateral expansion.
Municipal solid waste landfill emissions or *MSW landfill emissions* means gas generated by the decomposition of organic waste deposited in an MSW landfill or derived from the evolution of organic compounds in the waste.
NMOC means nonmethane organic compounds, as measured according to the provisions of § 60.754.
Nondegradable waste means any waste that does not decompose through chemical breakdown or microbiological activity. Examples are, but are not limited to, concrete, municipal waste combustor ash, and metals.
Passive collection system means a gas collection system that solely uses positive pressure within the landfill to move the gas rather than using gas mover equipment.
Sludge means any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility, exclusive of the treated effluent from a wastewater treatment plant.
Solid waste means any garbage, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to

permits under 33 U.S.C. 1342, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (42 U.S.C 2011 et seq.).
Sufficient density means any number, spacing, and combination of collection system components, including vertical wells, horizontal collectors, and surface collectors, necessary to maintain emission and migration control as determined by measures of performance set forth in this part.
Sufficient extraction rate means a rate sufficient to maintain a negative pressure at all wellheads in the collection system without causing air infiltration, including any wellheads connected to the system as a result of expansion or excess surface emissions, for the life of the blower.
[61 FR 9919, Mar. 12, 1996, as amended at 63 FR 32750, June 16, 1998; 64 FR 9262, Feb. 24, 1999]

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§ 60.752 Standards for air emissions from municipal solid waste landfills.

(a) Each owner or operator of an MSW landfill having a design capacity less than 2.5 million megagrams by mass or 2.5 million cubic meters by volume shall submit an initial design capacity report to the Administrator as provided in § 60.757(a). The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions shall be documented and submitted with the report. Submittal of the initial design capacity report shall fulfill the requirements of this subpart except as provided for in paragraphs (a)(1) and (a)(2) of this section.
(1) The owner or operator shall submit to the Administrator an amended design capacity report, as provided for in § 60.757(a)(3).
(2) When an increase in the maximum design capacity of a landfill exempted from the provisions of § 60.752(b) through § 60.759 of this subpart on the basis of the design capacity exemption in paragraph (a) of this section results in a revised maximum design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, the owner or operator shall comply with the provision of paragraph (b) of this section.
(b) Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, shall either comply with paragraph (b)(2) of this section or calculate an NMOC emission rate for the landfill using the procedures specified in § 60.754. The NMOC emission rate shall be recalculated annually, except as provided in § 60.757(b)(1)(ii) of this subpart. The owner or operator of an MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters is subject to part 70 or 71 permitting requirements.
(1) If the calculated NMOC emission rate is less than 50 megagrams per year, the owner or operator shall:
(i) Submit an annual emission report to the Administrator, except as provided for in § 60.757(b)(1)(ii); and
(ii) Recalculate the NMOC emission rate annually using the procedures specified in § 60.754(a)(1) until such time as the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, or the landfill is closed.
(A) If the NMOC emission rate, upon recalculation required in paragraph (b)(1)(ii) of this section, is equal to or greater than 50 megagrams per year, the owner or operator shall install a collection and control system in compliance with paragraph (b)(2) of this section.
(B) If the landfill is permanently closed, a closure notification shall be submitted to the Administrator as provided for in § 60.757(d).
(2) If the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, the owner or operator shall:
(i) Submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year:
(A) The collection and control system as described in the plan shall meet the design requirements of paragraph (b)(2)(ii) of this section.
(B) The collection and control system design plan shall include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of §§ 60.753 through 60.758 proposed by the owner or operator.
(C) The collection and control system design plan shall either conform with specifications for active collection systems in § 60.759 or include a demonstration to the Administrator's satisfaction of the sufficiency of the alternative provisions to § 60.759.
(D) The Administrator shall review the information submitted under paragraphs (b)(2)(i) (A),(B) and (C) of this section and either approve it, disapprove it, or request that additional information be submitted.

Because of the many site-specific factors involved with landfill gas system design, alternative systems may be necessary. A wide variety of system designs are possible, such as vertical wells, combination horizontal and vertical collection systems, or horizontal trenches only, leachate collection components, and passive systems.
(ii) Install a collection and control system that captures the gas generated within the landfill as required by paragraphs (b)(2)(ii)(A) or (B) and (b)(2)(iii) of this section within 30 months after the first annual report in which the emission rate equals or exceeds 50 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the emission rate is less than 50 megagrams per year, as specified in § 60.757(c)(1) or (2).
(A) An active collection system shall:
(*1*) Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control or treatment system equipment;
(*2*) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of:
(*i*) 5 years or more if active; or
(*ii*) 2 years or more if closed or at final grade.
(*3*) Collect gas at a sufficient extraction rate;
(*4*) Be designed to minimize off-site migration of subsurface gas.
(B) A passive collection system shall:
(*1*) Comply with the provisions specified in paragraphs (b)(2)(ii)(A)(*1*), (*2*), and (2)(ii)(A)(*4*) of this section.
(*2*) Be installed with liners on the bottom and all sides in all areas in which gas is to be collected. The liners shall be installed as required under § 258.40.
(iii) Route all the collected gas to a control system that complies with the requirements in either paragraph (b)(2)(iii) (A), (B) or (C) of this section.
(A) An open flare designed and operated in accordance with § 60.18 except as noted in § 60.754(e);
(B) A control system designed and operated to reduce NMOC by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency or parts per million by volume shall be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in § 60.754(d).
(*1*) If a boiler or process heater is used as the control device, the landfill gas stream shall be introduced into the flame zone.
(*2*) The control device shall be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in § 60.756;
(C) Route the collected gas to a treatment system that processes the collected gas for subsequent sale or use. All emissions from any atmospheric vent from the gas treatment system shall be subject to the requirements of paragraph (b)(2)(iii) (A) or (B) of this section.
(iv) Operate the collection and control device installed to comply with this subpart in accordance with the provisions of §§ 60.753, 60.755 and 60.756.
(v) The collection and control system may be capped or removed provided that all the conditions of paragraphs (b)(2)(v) (A), (B), and (C) of this section are met:
(A) The landfill shall be a closed landfill as defined in § 60.751 of this subpart. A closure report shall be submitted to the Administrator as provided in § 60.757(d);
(B) The collection and control system shall have been in operation a minimum of 15 years; and
(C) Following the procedures specified in § 60.754(b) of this subpart, the calculated NMOC gas produced by the landfill shall be less than 50 megagrams per year on three successive test dates. The test dates shall be no less than 90 days apart, and no more than 180 days apart.
(c) For purposes of obtaining an operating permit under title V of the Act, the owner or operator of a MSW landfill subject to this subpart with a design capacity less than 2.5 million megagrams or 2.5 million cubic meters is not subject to the requirement to obtain an operating permit for the landfill under part 70 or 71 of this chapter, unless the landfill is otherwise subject to either part 70 or 71. For purposes of submitting a timely application for an operating permit under part 70 or 71, the owner or operator of a MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters, and not otherwise subject to either part 70 or 71, becomes subject to the

requirements of §§ 70.5(a)(1)(i) or 71.5(a)(1)(i) of this chapter, regardless of when the design capacity report is actually submitted, no later than:
(1) June 10, 1996 for MSW landfills that commenced construction, modification, or reconstruction on or after May 30, 1991 but before March 12, 1996;
(2) Ninety days after the date of commenced construction, modification, or reconstruction for MSW landfills that commence construction, modification, or reconstruction on or after March 12, 1996.
(d) When a MSW landfill subject to this subpart is closed, the owner or operator is no longer subject to the requirement to maintain an operating permit under part 70 or 71 of this chapter for the landfill if the landfill is not otherwise subject to the requirements of either part 70 or 71 and if either of the following conditions are met:
(1) The landfill was never subject to the requirement for a control system under paragraph (b)(2) of this section; or
(2) The owner or operator meets the conditions for control system removal specified in paragraph (b)(2)(v) of this section.
[61 FR 9919, Mar. 12, 1996, as amended at 63 FR 32751, June 16, 1998; 65 FR 18908, Apr. 10, 2000; 71 FR 55127, Sept. 21, 2006]

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§ 60.753 Operational standards for collection and control systems.

Each owner or operator of an MSW landfill with a gas collection and control system used to comply with the provisions of § 60.752(b)(2)(ii) of this subpart shall:
(a) Operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for:
(1) 5 years or more if active; or
(2) 2 years or more if closed or at final grade;
(b) Operate the collection system with negative pressure at each wellhead except under the following conditions:
(1) A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with the annual reports as provided in § 60.757(f)(1);
(2) Use of a geomembrane or synthetic cover. The owner or operator shall develop acceptable pressure limits in the design plan;
(3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes shall be approved by the Administrator;
(c) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55 °C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.
(1) The nitrogen level shall be determined using Method 3C, unless an alternative test method is established as allowed by § 60.752(b)(2)(i) of this subpart.
(2) Unless an alternative test method is established as allowed by § 60.752(b)(2)(i) of this subpart, the oxygen shall be determined by an oxygen meter using Method 3A or 3C except that:
(i) The span shall be set so that the regulatory limit is between 20 and 50 percent of the span;
(ii) A data recorder is not required;
(iii) Only two calibration gases are required, a zero and span, and ambient air may be used as the span;
(iv) A calibration error check is not required;
(v) The allowable sample bias, zero drift, and calibration drift are ±10 percent.
(d) Operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

(e) Operate the system such that all collected gases are vented to a control system designed and operated in compliance with § 60.752(b)(2)(iii). In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within 1 hour; and
(f) Operate the control or treatment system at all times when the collected gas is routed to the system.
(g) If monitoring demonstrates that the operational requirements in paragraphs (b), (c), or (d) of this section are not met, corrective action shall be taken as specified in § 60.755(a)(3) through (5) or § 60.755(c) of this subpart. If corrective actions are taken as specified in § 60.755, the monitored exceedance is not a violation of the operational requirements in this section.
[61 FR 9919, Mar. 12, 1996, as amended at 63 FR 32751, June 16, 1998; 65 FR 61778, Oct. 17, 2000]

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§ 60.754 Test methods and procedures.

(a)(1) The landfill owner or operator shall calculate the NMOC emission rate using either the equation provided in paragraph (a)(1)(i) of this section or the equation provided in paragraph (a)(1)(ii) of this section. Both equations may be used if the actual year-to-year solid waste acceptance rate is known, as specified in paragraph (a)(1)(i), for part of the life of the landfill and the actual year-to-year solid waste acceptance rate is unknown, as specified in paragraph (a)(1)(ii), for part of the life of the landfill. The values to be used in both equations are 0.05 per year for k, 170 cubic meters per megagram for L_O , and 4,000 parts per million by volume as hexane for the C_{NMOC} . For landfills located in geographical areas with a thirty year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorologic site, the k value to be used is 0.02 per year.
(i) The following equation shall be used if the actual year-to-year solid waste acceptance rate is known.

$$M_{NMOC} = \sum_{i=1}^{n} 2\,k\,L_o M_i \left(e^{-kt_i}\right)\left(C_{NMOC}\right)\left(3.6\times10^{-9}\right)$$

where,
M_{NMOC} =Total NMOC emission rate from the landfill, megagrams per year
k=methane generation rate constant, $year^{-1}$
L_o =methane generation potential, cubic meters per megagram solid waste
M_i =mass of solid waste in the i^{th} section, megagrams
t_i =age of the i^{th} section, years
C_{NMOC} =concentration of NMOC, parts per million by volume as hexane
3.6×10^{-9} =conversion factor
The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value for M_i if documentation of the nature and amount of such wastes is maintained
(ii) The following equation shall be used if the actual year-to-year solid waste acceptance rate is unknown.
$M_{NMOC} = 2L_o\ R\ (e^{-kc} - e^{-kt})\ C_{NMOC}\ (3.6 \times 10^{-9})$
Where:
M_{NMOC} =mass emission rate of NMOC, megagrams per year
L_o =methane generation potential, cubic meters per megagram solid waste
R=average annual acceptance rate, megagrams per year
k=methane generation rate constant, $year^{-1}$
t = age of landfill, years
C_{NMOC} =concentration of NMOC, parts per million by volume as hexane
c=time since closure, years; for active landfill c=O and e^{-kc} 1
3.6×10−9=conversion factor
The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value of R, if documentation of the nature and amount of such wastes is maintained.
(2) *Tier 1.* The owner or operator shall compare the calculated NMOC mass emission rate to the standard of 50 megagrams per year.
(i) If the NMOC emission rate calculated in paragraph (a)(1) of this section is less than 50 megagrams per year, then the landfill owner shall submit an emission rate report as provided in § 60.757(b)(1), and shall recalculate the NMOC mass emission rate annually as required under § 60.752(b)(1).

(ii) If the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, then the landfill owner shall either comply with § 60.752(b)(2), or determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the procedures provided in paragraph (a)(3) of this section.

(3) *Tier 2.* The landfill owner or operator shall determine the NMOC concentration using the following sampling procedure. The landfill owner or operator shall install at least two sample probes per hectare of landfill surface that has retained waste for at least 2 years. If the landfill is larger than 25 hectares in area, only 50 samples are required. The sample probes should be located to avoid known areas of nondegradable solid waste. The owner or operator shall collect and analyze one sample of landfill gas from each probe to determine the NMOC concentration using Method 25 or 25C of appendix A of this part. Method 18 of appendix A of this part may be used to analyze the samples collected by the Method 25 or 25C sampling procedure. Taking composite samples from different probes into a single cylinder is allowed; however, equal sample volumes must be taken from each probe. For each composite, the sampling rate, collection times, beginning and ending cylinder vacuums, or alternative volume measurements must be recorded to verify that composite volumes are equal. Composite sample volumes should not be less than one liter unless evidence can be provided to substantiate the accuracy of smaller volumes. Terminate compositing before the cylinder approaches ambient pressure where measurement accuracy diminishes. If using Method 18, the owner or operator must identify all compounds in the sample and, as a minimum, test for those compounds published in the most recent Compilation of Air Pollutant Emission Factors (AP-42), minus carbon monoxide, hydrogen sulfide, and mercury. As a minimum, the instrument must be calibrated for each of the compounds on the list. Convert the concentration of each Method 18 compound to C_{NMOC} as hexane by multiplying by the ratio of its carbon atoms divided by six. If more than the required number of samples are taken, all samples must be used in the analysis. The landfill owner or operator must divide the NMOC concentration from Method 25 or 25C of appendix A of this part by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane. If the landfill has an active or passive gas removal system in place, Method 25 or 25C samples may be collected from these systems instead of surface probes provided the removal system can be shown to provide sampling as representative as the two sampling probe per hectare requirement. For active collection systems, samples may be collected from the common header pipe before the gas moving or condensate removal equipment. For these systems, a minimum of three samples must be collected from the header pipe.

(i) The landfill owner or operator shall recalculate the NMOC mass emission rate using the equations provided in paragraph (a)(1)(i) or (a)(1)(ii) of this section and using the average NMOC concentration from the collected samples instead of the default value in the equation provided in paragraph (a)(1) of this section.

(ii) If the resulting mass emission rate calculated using the site-specific NMOC concentration is equal to or greater than 50 megagrams per year, then the landfill owner or operator shall either comply with § 60.752(b)(2), or determine the site-specific methane generation rate constant and recalculate the NMOC emission rate using the site-specific methane generation rate using the procedure specified in paragraph (a)(4) of this section.

(iii) If the resulting NMOC mass emission rate is less than 50 megagrams per year, the owner or operator shall submit a periodic estimate of the emission rate report as provided in § 60.757(b)(1) and retest the site-specific NMOC concentration every 5 years using the methods specified in this section.

(4) *Tier 3.* The site-specific methane generation rate constant shall be determined using the procedures provided in Method 2E of appendix A of this part. The landfill owner or operator shall estimate the NMOC mass emission rate using equations in paragraph (a)(1)(i) or (a)(1)(ii) of this section and using a site-specific methane generation rate constant k, and the site-specific NMOC concentration as determined in paragraph (a)(3) of this section instead of the default values provided in paragraph (a)(1) of this section. The landfill owner or operator shall compare the resulting NMOC mass emission rate to the standard of 50 megagrams per year.

(i) If the NMOC mass emission rate as calculated using the site-specific methane generation rate and concentration of NMOC is equal to or greater than 50 megagrams per year, the owner or operator shall comply with § 60.752(b)(2).

(ii) If the NMOC mass emission rate is less than 50 megagrams per year, then the owner or operator shall submit a periodic emission rate report as provided in § 60.757(b)(1) and shall recalculate the NMOC mass emission rate annually, as provided in § 60.757(b)(1) using the equations in paragraph (a)(1) of this section and using the site-specific methane generation rate constant and NMOC concentration obtained

in paragraph (a)(3) of this section. The calculation of the methane generation rate constant is performed only once, and the value obtained from this test shall be used in all subsequent annual NMOC emission rate calculations.
(5) The owner or operator may use other methods to determine the NMOC concentration or a site-specific k as an alternative to the methods required in paragraphs (a)(3) and (a)(4) of this section if the method has been approved by the Administrator.
(b) After the installation of a collection and control system in compliance with § 60.755, the owner or operator shall calculate the NMOC emission rate for purposes of determining when the system can be removed as provided in § 60.752(b)(2)(v), using the following equation:
$M_{NMOC} = 1.89 \times 10^{-3} Q_{LFG} C_{NMOC}$
where,
M_{NMOC} = mass emission rate of NMOC, megagrams per year
Q_{LFG} = flow rate of landfill gas, cubic meters per minute
C_{NMOC} = NMOC concentration, parts per million by volume as hexane
(1) The flow rate of landfill gas, Q_{LFG} , shall be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control device using a gas flow measuring device calibrated according to the provisions of section 4 of Method 2E of appendix A of this part.
(2) The average NMOC concentration, C_{NMOC} , shall be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in Method 25C or Method 18 of appendix A of this part. If using Method 18 of appendix A of this part, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42). The sample location on the common header pipe shall be before any condensate removal or other gas refining units. The landfill owner or operator shall divide the NMOC concentration from Method 25C of appendix A of this part by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane.
(3) The owner or operator may use another method to determine landfill gas flow rate and NMOC concentration if the method has been approved by the Administrator.
(c) When calculating emissions for PSD purposes, the owner or operator of each MSW landfill subject to the provisions of this subpart shall estimate the NMOC emission rate for comparison to the PSD major source and significance levels in §§ 51.166 or 52.21 of this chapter using AP-42 or other approved measurement procedures.
(d) For the performance test required in § 60.752(b)(2)(iii)(B), Method 25, 25C, or Method 18 of appendix A of this part must be used to determine compliance with the 98 weight-percent efficiency or the 20 ppmv outlet concentration level, unless another method to demonstrate compliance has been approved by the Administrator as provided by § 60.752(b)(2)(i)(B). Method 3 or 3A shall be used to determine oxygen for correcting the NMOC concentration as hexane to 3 percent. In cases where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane), Method 25A should be used in place of Method 25. If using Method 18 of appendix A of this part, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42). The following equation shall be used to calculate efficiency:
$\text{Control Efficiency} = (NMOC_{in} - NMOC_{out})/(NMOC_{in})$
where,
$NMOC_{in}$ = mass of NMOC entering control device
$NMOC_{out}$ = mass of NMOC exiting control device
(e) For the performance test required in § 60.752(b)(2)(iii)(A), the net heating value of the combusted landfill gas as determined in § 60.18(f)(3) is calculated from the concentration of methane in the landfill gas as measured by Method 3C. A minimum of three 30-minute Method 3C samples are determined. The measurement of other organic components, hydrogen, and carbon monoxide is not applicable. Method 3C may be used to determine the landfill gas molecular weight for calculating the flare gas exit velocity under § 60.18(f)(4).
[61 FR 9919, Mar. 12, 1996, as amended at 63 FR 32751, June 16, 1998; 65 FR 18908, Apr. 10, 2000; 65 FR 61778, Oct. 17, 2000; 71 FR 55127, Sept. 21, 2006]

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§ 60.755 Compliance provisions.

(a) Except as provided in § 60.752(b)(2)(i)(B), the specified methods in paragraphs (a)(1) through (a)(6) of this section shall be used to determine whether the gas collection system is in compliance with §

60.752(b)(2)(ii).
(1) For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with § 60.752(b)(2)(ii)(A)(*1*), one of the following equations shall be used. The k and L_o kinetic factors should be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42) or other site specific values demonstrated to be appropriate and approved by the Administrator. If k has been determined as specified in § 60.754(a)(4), the value of k determined from the test shall be used. A value of no more than 15 years shall be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.
(i) For sites with unknown year-to-year solid waste acceptance rate:
$Q_m = 2L_o R (e^{-kc} - e^{-kt})$
where,
Q_m = maximum expected gas generation flow rate, cubic meters per year
L_o = methane generation potential, cubic meters per megagram solid waste
R = average annual acceptance rate, megagrams per year
k = methane generation rate constant, $year^{-1}$
t = age of the landfill at equipment installation plus the time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure, t is the age of the landfill at installation, years
c = time since closure, years (for an active landfill c = O and $e^{-kc} = 1$)
(ii) For sites with known year-to-year solid waste acceptance rate:

$$Q_M = \sum_{i=1}^{n} 2\,k\,L_o\,M_i\left(e^{-kt_i}\right)$$

where,
Q_M =maximum expected gas generation flow rate, cubic meters per year
k=methane generation rate constant, $year^{-1}$
L_o =methane generation potential, cubic meters per megagram solid waste
M_i =mass of solid waste in the i^{th} section, megagrams
t_i =age of the i^{th} section, years
(iii) If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, the equations in paragraphs (a)(1) (i) and (ii) of this section. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using the equations in paragraphs (a)(1) (i) or (ii) or other methods shall be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.
(2) For the purposes of determining sufficient density of gas collectors for compliance with § 60.752(b)(2)(ii)(A)(*2*), the owner or operator shall design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the Administrator, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.
(3) For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with § 60.752(b)(2)(ii)(A)(*3*), the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under § 60.753(b). If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of positive pressure. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Administrator for approval.
(4) Owners or operators are not required to expand the system as required in paragraph (a)(3) of this section during the first 180 days after gas collection system startup.
(5) For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen as provided in § 60.753(c). If a well exceeds one of these operating parameters, action shall be initiated to correct the exceedance within 5 calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the

exceedance within 120 days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Administrator for approval.
(6) An owner or operator seeking to demonstrate compliance with § 60.752(b)(2)(ii)(A)(*4*) through the use of a collection system not conforming to the specifications provided in § 60.759 shall provide information satisfactory to the Administrator as specified in § 60.752(b)(2)(i)(C) demonstrating that off-site migration is being controlled.
(b) For purposes of compliance with § 60.753(a), each owner or operator of a controlled landfill shall place each well or design component as specified in the approved design plan as provided in § 60.752(b)(2)(i). Each well shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:
(1) 5 years or more if active; or
(2) 2 years or more if closed or at final grade.
(c) The following procedures shall be used for compliance with the surface methane operational standard as provided in § 60.753(d).
(1) After installation of the collection system, the owner or operator shall monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in paragraph (d) of this section.
(2) The background concentration shall be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells.
(3) Surface emission monitoring shall be performed in accordance with section 4.3.1 of Method 21 of appendix A of this part, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions.
(4) Any reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the actions specified in paragraphs (c)(4) (i) through (v) of this section shall be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of § 60.753(d).
(i) The location of each monitored exceedance shall be marked and the location recorded.
(ii) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance.
(iii) If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in paragraph (c)(4)(v) of this section shall be taken, and no further monitoring of that location is required until the action specified in paragraph (c)(4)(v) has been taken.
(iv) Any location that initially showed an exceedance but has a methane concentration less than 500 ppm methane above background at the 10-day re-monitoring specified in paragraph (c)(4) (ii) or (iii) of this section shall be re-monitored 1 month from the initial exceedance. If the 1-month remonitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month remonitoring shows an exceedance, the actions specified in paragraph (c)(4) (iii) or (v) shall be taken.
(v) For any location where monitored methane concentration equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the Administrator for approval.
(5) The owner or operator shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.
(d) Each owner or operator seeking to comply with the provisions in paragraph (c) of this section shall comply with the following instrumentation specifications and procedures for surface emission monitoring devices:
(1) The portable analyzer shall meet the instrument specifications provided in section 3 of Method 21 of appendix A of this part, except that “methane” shall replace all references to VOC.

(2) The calibration gas shall be methane, diluted to a nominal concentration of 500 parts per million in air.
(3) To meet the performance evaluation requirements in section 3.1.3 of Method 21 of appendix A of this part, the instrument evaluation procedures of section 4.4 of Method 21 of appendix A of this part shall be used.
(4) The calibration procedures provided in section 4.2 of Method 21 of appendix A of this part shall be followed immediately before commencing a surface monitoring survey.
(e) The provisions of this subpart apply at all times, except during periods of start-up, shutdown, or malfunction, provided that the duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for treatment or control devices.
[61 FR 9919, Mar. 12, 1996, as amended at 63 FR 32752, June 16, 1998]

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§ 60.756 Monitoring of operations.

Except as provided in § 60.752(b)(2)(i)(B),
(a) Each owner or operator seeking to comply with § 60.752(b)(2)(ii)(A) for an active gas collection system shall install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead and:
(1) Measure the gauge pressure in the gas collection header on a monthly basis as provided in § 60.755(a)(3); and
(2) Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as provided in § 60.755(a)(5); and
(3) Monitor temperature of the landfill gas on a monthly basis as provided in § 60.755(a)(5).
(b) Each owner or operator seeking to comply with § 60.752(b)(2)(iii) using an enclosed combustor shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment.
(1) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ±1 percent of the temperature being measured expressed in degrees Celsius or ±0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts.
(2) A device that records flow to or bypass of the control device. The owner or operator shall either:
(i) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; or
(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.
(c) Each owner or operator seeking to comply with § 60.752(b)(2)(iii) using an open flare shall install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:
(1) A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame.
(2) A device that records flow to or bypass of the flare. The owner or operator shall either:
(i) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; or
(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.
(d) Each owner or operator seeking to demonstrate compliance with § 60.752(b)(2)(iii) using a device other than an open flare or an enclosed combustor shall provide information satisfactory to the Administrator as provided in § 60.752(b)(2)(i)(B) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator shall review the information and either approve it, or request that additional information be submitted. The Administrator may specify additional appropriate monitoring procedures.
(e) Each owner or operator seeking to install a collection system that does not meet the specifications in § 60.759 or seeking to monitor alternative parameters to those required by § 60.753 through § 60.756 shall provide information satisfactory to the Administrator as provided in § 60.752(b)(2)(i) (B) and (C) describing the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator may specify

additional appropriate monitoring procedures.
(f) Each owner or operator seeking to demonstrate compliance with § 60.755(c), shall monitor surface concentrations of methane according to the instrument specifications and procedures provided in § 60.755(d). Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.
[61 FR 9919, Mar. 12, 1996, as amended at 63 FR 32752, June 16, 1998; 65 FR 18909, Apr. 10, 2000]

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§ 60.757 Reporting requirements.

Except as provided in § 60.752(b)(2)(i)(B),
(a) Each owner or operator subject to the requirements of this subpart shall submit an initial design capacity report to the Administrator.
(1) The initial design capacity report shall fulfill the requirements of the notification of the date construction is commenced as required by § 60.7(a)(1) and shall be submitted no later than:
(i) June 10, 1996, for landfills that commenced construction, modification, or reconstruction on or after May 30, 1991 but before March 12, 1996 or
(ii) Ninety days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction on or after March 12, 1996.
(2) The initial design capacity report shall contain the following information:
(i) A map or plot of the landfill, providing the size and location of the landfill, and identifying all areas where solid waste may be landfilled according to the permit issued by the State, local, or tribal agency responsible for regulating the landfill.
(ii) The maximum design capacity of the landfill. Where the maximum design capacity is specified in the permit issued by the State, local, or tribal agency responsible for regulating the landfill, a copy of the permit specifying the maximum design capacity may be submitted as part of the report. If the maximum design capacity of the landfill is not specified in the permit, the maximum design capacity shall be calculated using good engineering practices. The calculations shall be provided, along with the relevant parameters as part of the report. The State, Tribal, local agency or Administrator may request other reasonable information as may be necessary to verify the maximum design capacity of the landfill.
(3) An amended design capacity report shall be submitted to the Administrator providing notification of an increase in the design capacity of the landfill, within 90 days of an increase in the maximum design capacity of the landfill to or above 2.5 million megagrams and 2.5 million cubic meters. This increase in design capacity may result from an increase in the permitted volume of the landfill or an increase in the density as documented in the annual recalculation required in § 60.758(f).
(b) Each owner or operator subject to the requirements of this subpart shall submit an NMOC emission rate report to the Administrator initially and annually thereafter, except as provided for in paragraphs (b)(1)(ii) or (b)(3) of this section. The Administrator may request such additional information as may be necessary to verify the reported NMOC emission rate.
(1) The NMOC emission rate report shall contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures provided in § 60.754(a) or (b), as applicable.
(i) The initial NMOC emission rate report may be combined with the initial design capacity report required in paragraph (a) of this section and shall be submitted no later than indicated in paragraphs (b)(1)(i)(A) and (B) of this section. Subsequent NMOC emission rate reports shall be submitted annually thereafter, except as provided for in paragraphs (b)(1)(ii) and (b)(3) of this section.
(A) June 10, 1996, for landfills that commenced construction, modification, or reconstruction on or after May 30, 1991, but before March 12, 1996, or
(B) Ninety days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction on or after March 12, 1996.
(ii) If the estimated NMOC emission rate as reported in the annual report to the Administrator is less than 50 megagrams per year in each of the next 5 consecutive years, the owner or operator may elect to submit an estimate of the NMOC emission rate for the next 5-year period in lieu of the annual report. This estimate shall include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the 5 years for which an NMOC emission rate is estimated. All data and calculations upon which this estimate is based shall be provided to the Administrator. This estimate shall be revised at least once every 5 years. If the actual waste acceptance rate exceeds the estimated waste acceptance

rate in any year reported in the 5-year estimate, a revised 5-year estimate shall be submitted to the Administrator. The revised estimate shall cover the 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.
(2) The NMOC emission rate report shall include all the data, calculations, sample reports and measurements used to estimate the annual or 5-year emissions.
(3) Each owner or operator subject to the requirements of this subpart is exempted from the requirements of paragraphs (b)(1) and (2) of this section, after the installation of a collection and control system in compliance with § 60.752(b)(2), during such time as the collection and control system is in operation and in compliance with §§ 60.753 and 60.755.
(c) Each owner or operator subject to the provisions of § 60.752(b)(2)(i) shall submit a collection and control system design plan to the Administrator within 1 year of the first report required under paragraph (b) of this section in which the emission rate equals or exceeds 50 megagrams per year, except as follows:
(1) If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided in § 60.754(a)(3) and the resulting rate is less than 50 megagrams per year, annual periodic reporting shall be resumed, using the Tier 2 determined site-specific NMOC concentration, until the calculated emission rate is equal to or greater than 50 megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated emission rate based on NMOC sampling and analysis, shall be submitted within 180 days of the first calculated exceedance of 50 megagrams per year.
(2) If the owner or operator elects to recalculate the NMOC emission rate after determining a site-specific methane generation rate constant (k), as provided in Tier 3 in § 60.754(a)(4), and the resulting NMOC emission rate is less than 50 Mg/yr, annual periodic reporting shall be resumed. The resulting site-specific methane generation rate constant (k) shall be used in the emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report based on the provisions of § 60.754(a)(4) and the resulting site-specific methane generation rate constant (k) shall be submitted to the Administrator within 1 year of the first calculated emission rate exceeding 50 megagrams per year.
(d) Each owner or operator of a controlled landfill shall submit a closure report to the Administrator within 30 days of waste acceptance cessation. The Administrator may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR 258.60. If a closure report has been submitted to the Administrator, no additional wastes may be placed into the landfill without filing a notification of modification as described under § 60.7(a)(4).
(e) Each owner or operator of a controlled landfill shall submit an equipment removal report to the Administrator 30 days prior to removal or cessation of operation of the control equipment.
(1) The equipment removal report shall contain all of the following items:
(i) A copy of the closure report submitted in accordance with paragraph (d) of this section;
(ii) A copy of the initial performance test report demonstrating that the 15 year minimum control period has expired; and
(iii) Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 50 megagrams or greater of NMOC per year.
(2) The Administrator may request such additional information as may be necessary to verify that all of the conditions for removal in § 60.752(b)(2)(v) have been met.
(f) Each owner or operator of a landfill seeking to comply with § 60.752(b)(2) using an active collection system designed in accordance with § 60.752(b)(2)(ii) shall submit to the Administrator annual reports of the recorded information in (f)(1) through (f)(6) of this paragraph. The initial annual report shall be submitted within 180 days of installation and start-up of the collection and control system, and shall include the initial performance test report required under § 60.8. For enclosed combustion devices and flares, reportable exceedances are defined under § 60.758(c).
(1) Value and length of time for exceedance of applicable parameters monitored under § 60.756(a), (b), (c), and (d).
(2) Description and duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow as specified under § 60.756.
(3) Description and duration of all periods when the control device was not operating for a period exceeding 1 hour and length of time the control device was not operating.
(4) All periods when the collection system was not operating in excess of 5 days.

(5) The location of each exceedance of the 500 parts per million methane concentration as provided in § 60.753(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month.
(6) The date of installation and the location of each well or collection system expansion added pursuant to paragraphs (a)(3), (b), and (c)(4) of § 60.755.
(g) Each owner or operator seeking to comply with § 60.752(b)(2)(iii) shall include the following information with the initial performance test report required under § 60.8:
(1) A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for the future collection system expansion;
(2) The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based;
(3) The documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded based on the presence of asbestos or nondegradable material;
(4) The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on nonproductivity and the calculations of gas generation flow rate for each excluded area; and
(5) The provisions for increasing gas mover equipment capacity with increased gas generation flow rate, if the present gas mover equipment is inadequate to move the maximum flow rate expected over the life of the landfill; and
(6) The provisions for the control of off-site migration.
[61 FR 9919, Mar. 12, 1996, as amended at 63 FR 32752, June 16, 1998; 65 FR 18909, Apr. 10, 2000]

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§ 60.758 Recordkeeping requirements.

(a) Except as provided in § 60.752(b)(2)(i)(B), each owner or operator of an MSW landfill subject to the provisions of § 60.752(b) shall keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report which triggered § 60.752(b), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.
(b) Except as provided in § 60.752(b)(2)(i)(B), each owner or operator of a controlled landfill shall keep up-to-date, readily accessible records for the life of the control equipment of the data listed in paragraphs (b)(1) through (b)(4) of this section as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. Records of the control device vendor specifications shall be maintained until removal.
(1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 60.752(b)(2)(ii):
(i) The maximum expected gas generation flow rate as calculated in § 60.755(a)(1). The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the Administrator.
(ii) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in § 60.759(a)(1).
(2) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 60.752(b)(2)(iii) through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts:
(i) The average combustion temperature measured at least every 15 minutes and averaged over the same time period of the performance test.
(ii) The percent reduction of NMOC determined as specified in § 60.752(b)(2)(iii)(B) achieved by the control device.
(3) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 60.752(b)(2)(iii)(B)(*1*) through use of a boiler or process heater of any size: a description of the location at which the collected gas vent stream is introduced into the boiler or process heater over the same time period of the performance testing.
(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 60.752(b)(2)(iii)(A) through use of an open flare, the flare type (i.e., steam-assisted, air-assisted, or nonassisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in § 60.18; continuous records of the flare pilot flame or flare flame monitoring and records of all periods of

operations during which the pilot flame of the flare flame is absent.
(c) Except as provided in § 60.752(b)(2)(i)(B), each owner or operator of a controlled landfill subject to the provisions of this subpart shall keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in § 60.756 as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.
(1) The following constitute exceedances that shall be recorded and reported under § 60.757(f):
(i) For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts (150 million British thermal unit per hour) or greater, all 3-hour periods of operation during which the average combustion temperature was more than 28 oC below the average combustion temperature during the most recent performance test at which compliance with § 60.752(b)(2)(iii) was determined.
(ii) For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under paragraph (b)(3) of this section.
(2) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible continuous records of the indication of flow to the control device or the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under § 60.756.
(3) Each owner or operator subject to the provisions of this subpart who uses a boiler or process heater with a design heat input capacity of 44 megawatts or greater to comply with § 60.752(b)(2)(iii) shall keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater. (Examples of such records could include records of steam use, fuel use, or monitoring data collected pursuant to other State, local, Tribal, or Federal regulatory requirements.)
(4) Each owner or operator seeking to comply with the provisions of this subpart by use of an open flare shall keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under § 60.756(c), and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.
(d) Except as provided in § 60.752(b)(2)(i)(B), each owner or operator subject to the provisions of this subpart shall keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector.
(1) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under § 60.755(b).
(2) Each owner or operator subject to the provisions of this subpart shall keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in § 60.759(a)(3)(i) as well as any nonproductive areas excluded from collection as provided in § 60.759(a)(3)(ii).
(e) Except as provided in § 60.752(b)(2)(i)(B), each owner or operator subject to the provisions of this subpart shall keep for at least 5 years up-to-date, readily accessible records of all collection and control system exceedances of the operational standards in § 60.753, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.
(f) Landfill owners or operators who convert design capacity from volume to mass or mass to volume to demonstrate that landfill design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, as provided in the definition of “design capacity”, shall keep readily accessible, on-site records of the annual recalculation of site-specific density, design capacity, and the supporting documentation. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.
[61 FR 9919, Mar. 12, 1996, as amended at 63 FR 32752, June 16, 1998; 65 FR 18909, Apr. 10, 2000]

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§ 60.759 Specifications for active collection systems.

(a) Each owner or operator seeking to comply with § 60.752(b)(2)(i) shall site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the Administrator as provided in § 60.752(b)(2)(i)(C) and (D):
(1) The collection devices within the interior and along the perimeter areas shall be certified to achieve

comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandibility, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat.
(2) The sufficient density of gas collection devices determined in paragraph (a)(1) of this section shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.
(3) The placement of gas collection devices determined in paragraph (a)(1) of this section shall control all gas producing areas, except as provided by paragraphs (a)(3)(i) and (a)(3)(ii) of this section.
(i) Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under § 60.758(d). The documentation shall provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and shall be provided to the Administrator upon request.
(ii) Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material shall be documented and provided to the Administrator upon request. A separate NMOC emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the NMOC emissions estimate for the entire landfill. Emissions from each section shall be computed using the following equation:

$$Q_i = 2\ k\ L_o\ M_i\ (e^{-kt}\ i)\ (C_{NMOC})\ (3.6 \times 10^{-9})$$

where,
Q_i = NMOC emission rate from the i^{th} section, megagrams per year
k = methane generation rate constant, $year^{-1}$
L_o = methane generation potential, cubic meters per megagram solid waste
M_i = mass of the degradable solid waste in the i^{th} section, megagram
t_i = age of the solid waste in the i^{th} section, years
C_{NMOC} = concentration of nonmethane organic compounds, parts per million by volume
3.6×10^{-9} = conversion factor
(iii) The values for k and C_{NMOC} determined in field testing shall be used if field testing has been performed in determining the NMOC emission rate or the radii of influence (this distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If field testing has not been performed, the default values for k, L_O and C_{NMOC} provided in § 60.754(a)(1) or the alternative values from § 60.754(a)(5) shall be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in paragraph (a)(3)(i) of this section.
(b) Each owner or operator seeking to comply with § 60.752(b)(2)(i)(A) shall construct the gas collection devices using the following equipment or procedures:
(1) The landfill gas extraction components shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration.
(2) Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.
(3) Collection devices may be connected to the collection header pipes below or above the landfill

surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

(c) Each owner or operator seeking to comply with § 60.752(b)(2)(i)(A) shall convey the landfill gas to a control system in compliance with § 60.752(b)(2)(iii) through the collection header pipe(s). The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:

(1) For existing collection systems, the flow data shall be used to project the maximum flow rate. If no flow data exists, the procedures in paragraph (c)(2) of this section shall be used.

(2) For new collection systems, the maximum flow rate shall be in accordance with § 60.755(a)(1).

[61 FR 9919, Mar. 12, 1996, as amended at 63 FR 32753, June 16, 1998; 64 FR 9262, Feb. 24, 1999; 65 FR 18909, Apr. 10, 2000]

Indiana Department of Environmental Management
Office of Air Quality

Attachment B to a Part 70 Operating Permit

Source Background and Description

Source Name:	Sycamore Ridge Landfill
Source Location:	5621 East Cottom Drive, Pimento, Indiana 47866
County:	Vigo
SIC Code:	4953
Permit No.:	T 167-30079-00116
Permit Reviewer:	Kimberly Cottrell

40 CFR 61, Subpart M

40 CFR 61, Subpart M - National Emission Standard for Asbestos
AUTHORITY: 42 U.S.C. 7401, 7412, 7414, 7416, 7601.
SOURCE: 49 FR 13661, Apr. 5, 1984, unless otherwise noted.

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§ 61.140 Applicability.
The provisions of this subpart are applicable to those sources specified in §§ 61.142 through 61.151, 61.154, and 61.155.
[55 FR 48414, Nov. 20, 1990]

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§ 61.141 Definitions.
All terms that are used in this subpart and are not defined below are given the same meaning as in the Act and in subpart A of this part.
Active waste disposal site means any disposal site other than an inactive site.
Adequately wet means sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material, then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wet.
Asbestos means the asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite.
Asbestos-containing waste materials means mill tailings or any waste that contains commercial asbestos and is generated by a source subject to the provisions of this subpart. This term includes filters from control devices, friable asbestos waste material, and bags or other similar packaging contaminated with commercial asbestos. As applied to demolition and renovation operations, this term also includes regulated asbestos-containing material waste and materials contaminated with asbestos including disposable equipment and clothing.
Asbestos mill means any facility engaged in converting, or in any intermediate step in converting, asbestos ore into commercial asbestos. Outside storage of asbestos material is not considered a part of the asbestos mill.
Asbestos tailings means any solid waste that contains asbestos and is a product of asbestos mining or milling operations.
Asbestos waste from control devices means any waste material that contains asbestos and is collected by a pollution control device.
Category I nonfriable asbestos-containing material (ACM) means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy.
Category II nonfriable ACM means any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using the methods specified in appendix E, subpart E, 40 CFR

part 763, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
Commercial asbestos means any material containing asbestos that is extracted from ore and has value because of its asbestos content.
Cutting means to penetrate with a sharp-edged instrument and includes sawing, but does not include shearing, slicing, or punching.
Demolition means the wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility.
Emergency renovation operation means a renovation operation that was not planned but results from a sudden, unexpected event that, if not immediately attended to, presents a safety or public health hazard, is necessary to protect equipment from damage, or is necessary to avoid imposing an unreasonable financial burden. This term includes operations necessitated by nonroutine failures of equipment.
Fabricating means any processing (*e.g.,* cutting, sawing, drilling) of a manufactured product that contains commercial asbestos, with the exception of processing at temporary sites (field fabricating) for the construction or restoration of facilities. In the case of friction products, fabricating includes bonding, debonding, grinding, sawing, drilling, or other similar operations performed as part of fabricating.
Facility means any institutional, commercial, public, industrial, or residential structure, installation, or building (including any structure, installation, or building containing condominiums or individual dwelling units operated as a residential cooperative, but excluding residential buildings having four or fewer dwelling units); any ship; and any active or inactive waste disposal site. For purposes of this definition, any building, structure, or installation that contains a loft used as a dwelling is not considered a residential structure, installation, or building. Any structure, installation or building that was previously subject to this subpart is not excluded, regardless of its current use or function.
Facility component means any part of a facility including equipment.
Friable asbestos material means any material containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 10 percent as determined by a method other than point counting by polarized light microscopy (PLM), verify the asbestos content by point counting using PLM.
Fugitive source means any source of emissions not controlled by an air pollution control device.
Glove bag means a sealed compartment with attached inner gloves used for the handling of asbestos-containing materials. Properly installed and used, glove bags provide a small work area enclosure typically used for small-scale asbestos stripping operations. Information on glove-bag installation, equipment and supplies, and work practices is contained in the Occupational Safety and Health Administration's (OSHA's) final rule on occupational exposure to asbestos (appendix G to 29 CFR 1926.58).
Grinding means to reduce to powder or small fragments and includes mechanical chipping or drilling.
In poor condition means the binding of the material is losing its integrity as indicated by peeling, cracking, or crumbling of the material.
Inactive waste disposal site means any disposal site or portion of it where additional asbestos-containing waste material has not been deposited within the past year.
Installation means any building or structure or any group of buildings or structures at a single demolition or renovation site that are under the control of the same owner or operator (or owner or operator under common control).
Leak-tight means that solids or liquids cannot escape or spill out. It also means dust-tight.
Malfunction means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner so that emissions of asbestos are increased. Failures of equipment shall not be considered malfunctions if they are caused in any way by poor maintenance, careless operation, or any other preventable upset conditions, equipment breakdown, or process failure.
Manufacturing means the combining of commercial asbestos—or, in the case of woven friction products, the combining of textiles containing commercial asbestos—with any other material(s), including commercial asbestos, and the processing of this combination into a product. Chlorine production is considered a part of manufacturing.
Natural barrier means a natural object that effectively precludes or deters access. Natural barriers include physical obstacles such as cliffs, lakes or other large bodies of water, deep and wide ravines, and

mountains. Remoteness by itself is not a natural barrier.
Nonfriable asbestos-containing material means any material containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
Nonscheduled renovation operation means a renovation operation necessitated by the routine failure of equipment, which is expected to occur within a given period based on past operating experience, but for which an exact date cannot be predicted.
Outside air means the air outside buildings and structures, including, but not limited to, the air under a bridge or in an open air ferry dock.
Owner or operator of a demolition or renovation activity means any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition or renovation operation, or both.
Particulate asbestos material means finely divided particles of asbestos or material containing asbestos.
Planned renovation operations means a renovation operation, or a number of such operations, in which some RACM will be removed or stripped within a given period of time and that can be predicted. Individual nonscheduled operations are included if a number of such operations can be predicted to occur during a given period of time based on operating experience.
Regulated asbestos-containing material (RACM) means (a) Friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by this subpart.
Remove means to take out RACM or facility components that contain or are covered with RACM from any facility.
Renovation means altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility component. Operations in which load-supporting structural members are wrecked or taken out are demolitions.
Resilient floor covering means asbestos-containing floor tile, including asphalt and vinyl floor tile, and sheet vinyl floor covering containing more than 1 percent asbestos as determined using polarized light microscopy according to the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy.
Roadways means surfaces on which vehicles travel. This term includes public and private highways, roads, streets, parking areas, and driveways.
Strip means to take off RACM from any part of a facility or facility components.
Structural member means any load-supporting member of a facility, such as beams and load supporting walls; or any nonload-supporting member, such as ceilings and nonload-supporting walls.
Visible emissions means any emissions, which are visually detectable without the aid of instruments, coming from RACM or asbestos-containing waste material, or from any asbestos milling, manufacturing, or fabricating operation. This does not include condensed, uncombined water vapor.
Waste generator means any owner or operator of a source covered by this subpart whose act or process produces asbestos-containing waste material.
Waste shipment record means the shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.
Working day means Monday through Friday and includes holidays that fall on any of the days Monday through Friday.
[49 FR 13661, Apr. 5, 1984; 49 FR 25453, June 21, 1984, as amended by 55 FR 48414, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991; 60 FR 31920, June 19, 1995]

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§ 61.142 Standard for asbestos mills.

(a) Each owner or operator of an asbestos mill shall either discharge no visible emissions to the outside air from that asbestos mill, including fugitive sources, or use the methods specified by § 61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.
(b) Each owner or operator of an asbestos mill shall meet the following requirements:
(1) Monitor each potential source of asbestos emissions from any part of the mill facility, including air

cleaning devices, process equipment, and buildings that house equipment for material processing and handling, at least once each day, during daylight hours, for visible emissions to the outside air during periods of operation. The monitoring shall be by visual observation of at least 15 seconds duration per source of emissions.
(2) Inspect each air cleaning device at least once each week for proper operation and for changes that signal the potential for malfunction, including, to the maximum extent possible without dismantling other than opening the device, the presence of tears, holes, and abrasions in filter bags and for dust deposits on the clean side of bags. For air cleaning devices that cannot be inspected on a weekly basis according to this paragraph, submit to the Administrator, and revise as necessary, a written maintenance plan to include, at a minimum, the following:
(i) Maintenance schedule.
(ii) Recordkeeping plan.
(3) Maintain records of the results of visible emissions monitoring and air cleaning device inspections using a format similar to that shown in Figures 1 and 2 and include the following:
(i) Date and time of each inspection.
(ii) Presence or absence of visible emissions.
(iii) Condition of fabric filters, including presence of any tears, holes, and abrasions.
(iv) Presence of dust deposits on clean side of fabric filters.
(v) Brief description of corrective actions taken, including date and time.
(vi) Daily hours of operation for each air cleaning device.
(4) Furnish upon request, and make available at the affected facility during normal business hours for inspection by the Administrator, all records required under this section.
(5) Retain a copy of all monitoring and inspection records for at least 2 years.
(6) Submit semiannually a copy of visible emission monitoring records to the Administrator if visible emissions occurred during the report period. Semiannual reports shall be postmarked by the 30th day following the end of the six-month period.

Date of inspection (mo/day/yr)	Time of inspection (a.m./p.m.)	Air cleaning device or fugitive source designation or number	Visible emissions observed (yes/no), corrective action taken	Daily operating hours	Inspector's initials

Figure 1. Record of Visible Emission Monitoring

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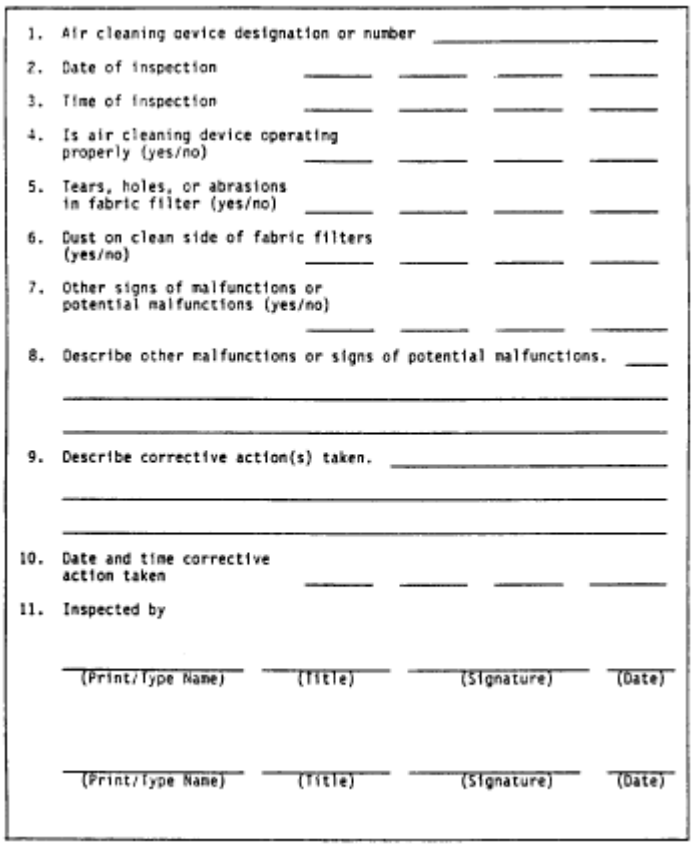

1. Air cleaning device designation or number _____
2. Date of inspection _____ _____ _____ _____
3. Time of inspection _____ _____ _____ _____
4. Is air cleaning device operating properly (yes/no) _____ _____ _____ _____
5. Tears, holes, or abrasions in fabric filter (yes/no) _____ _____ _____ _____
6. Dust on clean side of fabric filters (yes/no) _____ _____ _____ _____
7. Other signs of malfunctions or potential malfunctions (yes/no) _____ _____ _____ _____
8. Describe other malfunctions or signs of potential malfunctions. ____
   _____
   _____
9. Describe corrective action(s) taken. _____
   _____
   _____
10. Date and time corrective action taken _____ _____ _____ _____
11. Inspected by

(Print/Type Name)	(Title)	(Signature)	(Date)
(Print/Type Name)	(Title)	(Signature)	(Date)

Figure 2. Air Cleaning Device Inspection Checklist

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[55 FR 48416, Nov. 20, 1990, as amended at 64 FR 7467, Feb. 12, 1999]

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§ 61.143 Standard for roadways.

No person may construct or maintain a roadway with asbestos tailings or asbestos-containing waste material on that roadway, unless, for asbestos tailings.

(a) It is a temporary roadway on an area of asbestos ore deposits (asbestos mine): or

(b) It is a temporary roadway at an active asbestos mill site and is encapsulated with a resinous or bituminous binder. The encapsulated road surface must be maintained at a minimum frequency of once per year to prevent dust emissions; or

(c) It is encapsulated in asphalt concrete meeting the specifications contained in section 401 of Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-85, 1985, or their equivalent.

[55 FR 48419, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991]

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§ 61.144 Standard for manufacturing.

(a) *Applicability.* This section applies to the following manufacturing operations using commercial asbestos.

(1) The manufacture of cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, or other textile materials.

(2) The manufacture of cement products.

(3) The manufacture of fireproofing and insulating materials.

(4) The manufacture of friction products.

(5) The manufacture of paper, millboard, and felt.

(6) The manufacture of floor tile.

(7) The manufacture of paints, coatings, caulks, adhesives, and sealants.

(8) The manufacture of plastics and rubber materials.

(9) The manufacture of chlorine utilizing asbestos diaphragm technology.
(10) The manufacture of shotgun shell wads.
(11) The manufacture of asphalt concrete.
(b) *Standard.* Each owner or operator of any of the manufacturing operations to which this section applies shall either:
(1) Discharge no visible emissions to the outside air from these operations or from any building or structure in which they are conducted or from any other fugitive sources; or
(2) Use the methods specified by § 61.152 to clean emissions from these operations containing particulate asbestos material before they escape to, or are vented to, the outside air.
(3) Monitor each potential source of asbestos emissions from any part of the manufacturing facility, including air cleaning devices, process equipment, and buildings housing material processing and handling equipment, at least once each day during daylight hours for visible emissions to the outside air during periods of operation. The monitoring shall be by visual observation of at least 15 seconds duration per source of emissions.
(4) Inspect each air cleaning device at least once each week for proper operation and for changes that signal the potential for malfunctions, including, to the maximum extent possible without dismantling other than opening the device, the presence of tears, holes, and abrasions in filter bags and for dust deposits on the clean side of bags. For air cleaning devices that cannot be inspected on a weekly basis according to this paragraph, submit to the Administrator, and revise as necessary, a written maintenance plan to include, at a minimum, the following:
(i) Maintenance schedule.
(ii) Recordkeeping plan.
(5) Maintain records of the results of visible emission monitoring and air cleaning device inspections using a format similar to that shown in Figures 1 and 2 and include the following.
(i) Date and time of each inspection.
(ii) Presence or absence of visible emissions.
(iii) Condition of fabric filters, including presence of any tears, holes and abrasions.
(iv) Presence of dust deposits on clean side of fabric filters.
(v) Brief description of corrective actions taken, including date and time.
(vi) Daily hours of operation for each air cleaning device.
(6) Furnish upon request, and make available at the affected facility during normal business hours for inspection by the Administrator, all records required under this section.
(7) Retain a copy of all monitoring and inspection records for at least 2 years.
(8) Submit semiannually a copy of the visible emission monitoring records to the Administrator if visible emission occurred during the report period. Semiannual reports shall be postmarked by the 30th day following the end of the six-month period.
[49 FR 13661, Apr. 5, 1984, as amended at 55 FR 48419, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991; 64 FR 7467, Feb. 12, 1999]

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§ 61.145 Standard for demolition and renovation.

(a) *Applicability.* To determine which requirements of paragraphs (a), (b), and (c) of this section apply to the owner or operator of a demolition or renovation activity and prior to the commencement of the demolition or renovation, thoroughly inspect the affected facility or part of the facility where the demolition or renovation operation will occur for the presence of asbestos, including Category I and Category II nonfriable ACM. The requirements of paragraphs (b) and (c) of this section apply to each owner or operator of a demolition or renovation activity, including the removal of RACM as follows:
(1) In a facility being demolished, all the requirements of paragraphs (b) and (c) of this section apply, except as provided in paragraph (a)(3) of this section, if the combined amount of RACM is
(i) At least 80 linear meters (260 linear feet) on pipes or at least 15 square meters (160 square feet) on other facility components, or
(ii) At least 1 cubic meter (35 cubic feet) off facility components where the length or area could not be measured previously.
(2) In a facility being demolished, only the notification requirements of paragraphs (b)(1), (2), (3)(i) and (iv), and (4)(i) through (vii) and (4)(ix) and (xvi) of this section apply, if the combined amount of RACM is
(i) Less than 80 linear meters (260 linear feet) on pipes and less than 15 square meters (160 square feet) on other facility components, and

(ii) Less than one cubic meter (35 cubic feet) off facility components where the length or area could not be measured previously or there is no asbestos.
(3) If the facility is being demolished under an order of a State or local government agency, issued because the facility is structurally unsound and in danger of imminent collapse, only the requirements of paragraphs (b)(1), (b)(2), (b)(3)(iii), (b)(4) (except (b)(4)(viii)), (b)(5), and (c)(4) through (c)(9) of this section apply.
(4) In a facility being renovated, including any individual nonscheduled renovation operation, all the requirements of paragraphs (b) and (c) of this section apply if the combined amount of RACM to be stripped, removed, dislodged, cut, drilled, or similarly disturbed is
(i) At least 80 linear meters (260 linear feet) on pipes or at least 15 square meters (160 square feet) on other facility components, or
(ii) At least 1 cubic meter (35 cubic feet) off facility components where the length or area could not be measured previously.
(iii) To determine whether paragraph (a)(4) of this section applies to planned renovation operations involving individual nonscheduled operations, predict the combined additive amount of RACM to be removed or stripped during a calendar year of January 1 through December 31.
(iv) To determine whether paragraph (a)(4) of this section applies to emergency renovation operations, estimate the combined amount of RACM to be removed or stripped as a result of the sudden, unexpected event that necessitated the renovation.
(5) Owners or operators of demolition and renovation operations are exempt from the requirements of §§ 61.05(a), 61.07, and 61.09.
(b) *Notification requirements.* Each owner or operator of a demolition or renovation activity to which this section applies shall:
(1) Provide the Administrator with written notice of intention to demolish or renovate. Delivery of the notice by U.S. Postal Service, commercial delivery service, or hand delivery is acceptable.
(2) Update notice, as necessary, including when the amount of asbestos affected changes by at least 20 percent.
(3) Postmark or deliver the notice as follows:
(i) At least 10 working days before asbestos stripping or removal work or any other activity begins (such as site preparation that would break up, dislodge or similarly disturb asbestos material), if the operation is described in paragraphs (a) (1) and (4) (except (a)(4)(iii) and (a)(4)(iv)) of this section. If the operation is as described in paragraph (a)(2) of this section, notification is required 10 working days before demolition begins.
(ii) At least 10 working days before the end of the calendar year preceding the year for which notice is being given for renovations described in paragraph (a)(4)(iii) of this section.
(iii) As early as possible before, but not later than, the following working day if the operation is a demolition ordered according to paragraph (a)(3) of this section or, if the operation is a renovation described in paragraph (a)(4)(iv) of this section.
(iv) For asbestos stripping or removal work in a demolition or renovation operation, described in paragraphs (a) (1) and (4) (except (a)(4)(iii) and (a)(4)(iv)) of this section, and for a demolition described in paragraph (a)(2) of this section, that will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the Administrator as follows:
(A) When the asbestos stripping or removal operation or demolition operation covered by this paragraph will begin after the date contained in the notice,
(*1*) Notify the Administrator of the new start date by telephone as soon as possible before the original start date, and
(*2*) Provide the Administrator with a written notice of the new start date as soon as possible before, and no later than, the original start date. Delivery of the updated notice by the U.S. Postal Service, commercial delivery service, or hand delivery is acceptable.
(B) When the asbestos stripping or removal operation or demolition operation covered by this paragraph will begin on a date earlier than the original start date,
(*1*) Provide the Administrator with a written notice of the new start date at least 10 working days before asbestos stripping or removal work begins.
(*2*) For demolitions covered by paragraph (a)(2) of this section, provide the Administrator written notice of a new start date at least 10 working days before commencement of demolition. Delivery of updated notice by U.S. Postal Service, commercial delivery service, or hand delivery is acceptable.

(C) In no event shall an operation covered by this paragraph begin on a date other than the date contained in the written notice of the new start date.
(4) Include the following in the notice:
(i) An indication of whether the notice is the original or a revised notification.
(ii) Name, address, and telephone number of both the facility owner and operator and the asbestos removal contractor owner or operator.
(iii) Type of operation: demolition or renovation.
(iv) Description of the facility or affected part of the facility including the size (square meters [square feet] and number of floors), age, and present and prior use of the facility.
(v) Procedure, including analytical methods, employed to detect the presence of RACM and Category I and Category II nonfriable ACM.
(vi) Estimate of the approximate amount of RACM to be removed from the facility in terms of length of pipe in linear meters (linear feet), surface area in square meters (square feet) on other facility components, or volume in cubic meters (cubic feet) if off the facility components. Also, estimate the approximate amount of Category I and Category II nonfriable ACM in the affected part of the facility that will not be removed before demolition.
(vii) Location and street address (including building number or name and floor or room number, if appropriate), city, county, and state, of the facility being demolished or renovated.
(viii) Scheduled starting and completion dates of asbestos removal work (or any other activity, such as site preparation that would break up, dislodge, or similarly disturb asbestos material) in a demolition or renovation; planned renovation operations involving individual nonscheduled operations shall only include the beginning and ending dates of the report period as described in paragraph (a)(4)(iii) of this section.
(ix) Scheduled starting and completion dates of demolition or renovation.
(x) Description of planned demolition or renovation work to be performed and method(s) to be employed, including demolition or renovation techniques to be used and description of affected facility components.
(xi) Description of work practices and engineering controls to be used to comply with the requirements of this subpart, including asbestos removal and waste-handling emission control procedures.
(xii) Name and location of the waste disposal site where the asbestos-containing waste material will be deposited.
(xiii) A certification that at least one person trained as required by paragraph (c)(8) of this section will supervise the stripping and removal described by this notification. This requirement shall become effective 1 year after promulgation of this regulation.
(xiv) For facilities described in paragraph (a)(3) of this section, the name, title, and authority of the State or local government representative who has ordered the demolition, the date that the order was issued, and the date on which the demolition was ordered to begin. A copy of the order shall be attached to the notification.
(xv) For emergency renovations described in paragraph (a)(4)(iv) of this section, the date and hour that the emergency occurred, a description of the sudden, unexpected event, and an explanation of how the event caused an unsafe condition, or would cause equipment damage or an unreasonable financial burden.
(xvi) Description of procedures to be followed in the event that unexpected RACM is found or Category II nonfriable ACM becomes crumbled, pulverized, or reduced to powder.
(xvii) Name, address, and telephone number of the waste transporter.
(5) The information required in paragraph (b)(4) of this section must be reported using a form similiar to that shown in Figure 3.
(c) *Procedures for asbestos emission control.* Each owner or operator of a demolition or renovation activity to whom this paragraph applies, according to paragraph (a) of this section, shall comply with the following procedures:
(1) Remove all RACM from a facility being demolished or renovated before any activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal. RACM need not be removed before demolition if:
(i) It is Category I nonfriable ACM that is not in poor condition and is not friable.
(ii) It is on a facility component that is encased in concrete or other similarly hard material and is adequately wet whenever exposed during demolition; or
(iii) It was not accessible for testing and was, therefore, not discovered until after demolition began and, as a result of the demolition, the material cannot be safely removed. If not removed for safety reasons,

the exposed RACM and any asbestos-contaminated debris must be treated as asbestos-containing waste material and adequately wet at all times until disposed of.
(iv) They are Category II nonfriable ACM and the probability is low that the materials will become crumbled, pulverized, or reduced to powder during demolition.
(2) When a facility component that contains, is covered with, or is coated with RACM is being taken out of the facility as a unit or in sections:
(i) Adequately wet all RACM exposed during cutting or disjoining operations; and
(ii) Carefully lower each unit or section to the floor and to ground level, not dropping, throwing, sliding, or otherwise damaging or disturbing the RACM.
(3) When RACM is stripped from a facility component while it remains in place in the facility, adequately wet the RACM during the stripping operation.
(i) In renovation operations, wetting is not required if:
(A) The owner or operator has obtained prior written approval from the Administrator based on a written application that wetting to comply with this paragraph would unavoidably damage equipment or present a safety hazard; and
(B) The owner or operator uses of the following emission control methods:
(*1*) A local exhaust ventilation and collection system designed and operated to capture the particulate asbestos material produced by the stripping and removal of the asbestos materials. The system must exhibit no visible emissions to the outside air or be designed and operated in accordance with the requirements in § 61.152.
(*2*) A glove-bag system designed and operated to contain the particulate asbestos material produced by the stripping of the asbestos materials.
(*3*) Leak-tight wrapping to contain all RACM prior to dismantlement.
(ii) In renovation operations where wetting would result in equipment damage or a safety hazard, and the methods allowed in paragraph (c)(3)(i) of this section cannot be used, another method may be used after obtaining written approval from the Administrator based upon a determination that it is equivalent to wetting in controlling emissions or to the methods allowed in paragraph (c)(3)(i) of this section.
(iii) A copy of the Administrator's written approval shall be kept at the worksite and made available for inspection.
(4) After a facility component covered with, coated with, or containing RACM has been taken out of the facility as a unit or in sections pursuant to paragraph (c)(2) of this section, it shall be stripped or contained in leak-tight wrapping, except as described in paragraph (c)(5) of this section. If stripped, either:
(i) Adequately wet the RACM during stripping; or
(ii) Use a local exhaust ventilation and collection system designed and operated to capture the particulate asbestos material produced by the stripping. The system must exhibit no visible emissions to the outside air or be designed and operated in accordance with the requirements in § 61.152.
(5) For large facility components such as reactor vessels, large tanks, and steam generators, but not beams (which must be handled in accordance with paragraphs (c)(2), (3), and (4) of this section), the RACM is not required to be stripped if the following requirements are met:
(i) The component is removed, transported, stored, disposed of, or reused without disturbing or damaging the RACM.
(ii) The component is encased in a leak-tight wrapping.
(iii) The leak-tight wrapping is labeled according to § 61.149(d)(1)(i), (ii), and (iii) during all loading and unloading operations and during storage.
(6) For all RACM, including material that has been removed or stripped:
(i) Adequately wet the material and ensure that it remains wet until collected and contained or treated in preparation for disposal in accordance with § 61.150; and
(ii) Carefully lower the material to the ground and floor, not dropping, throwing, sliding, or otherwise damaging or disturbing the material.
(iii) Transport the material to the ground via leak-tight chutes or containers if it has been removed or stripped more than 50 feet above ground level and was not removed as units or in sections.
(iv) RACM contained in leak-tight wrapping that has been removed in accordance with paragraphs (c)(4) and (c)(3)(i)(B)(*3*) of this section need not be wetted.
(7) When the temperature at the point of wetting is below 0 °C (32 °F):
(i) The owner or operator need not comply with paragraph (c)(2)(i) and the wetting provisions of paragraph (c)(3) of this section.

(ii) The owner or operator shall remove facility components containing, coated with, or covered with RACM as units or in sections to the maximum extent possible.
(iii) During periods when wetting operations are suspended due to freezing temperatures, the owner or operator must record the temperature in the area containing the facility components at the beginning, middle, and end of each workday and keep daily temperature records available for inspection by the Administrator during normal business hours at the demolition or renovation site. The owner or operator shall retain the temperature records for at least 2 years.
(8) Effective 1 year after promulgation of this regulation, no RACM shall be stripped, removed, or otherwise handled or disturbed at a facility regulated by this section unless at least one on-site representative, such as a foreman or management-level person or other authorized representative, trained in the provisions of this regulation and the means of complying with them, is present. Every 2 years, the trained on-site individual shall receive refresher training in the provisions of this regulation. The required training shall include as a minimum: applicability; notifications; material identification; control procedures for removals including, at least, wetting, local exhaust ventilation, negative pressure enclosures, glove-bag procedures, and High Efficiency Particulate Air (HEPA) filters; waste disposal work practices; reporting and recordkeeping; and asbestos hazards and worker protection. Evidence that the required training has been completed shall be posted and made available for inspection by the Administrator at the demolition or renovation site.
(9) For facilities described in paragraph (a)(3) of this section, adequately wet the portion of the facility that contains RACM during the wrecking operation.
(10) If a facility is demolished by intentional burning, all RACM including Category I and Category II nonfriable ACM must be removed in accordance with the NESHAP before burning.

NOTIFICATION OF DEMOLITION AND RENOVATION

Operator Project #	Postmark	Date Received	Notification #

I. TYPE OF NOTIFICATION (O=Original R=Revised C=Cancelled):

II. FACILITY INFORMATION (Identify owner, removal contractor, and other operator)

OWNER NAME:
Address:
City: | State: | Zip:
Contact: | Tel:

REMOVAL CONTRACTOR:
Address:
City: | State: | Zip:
Contact: | Tel:

OTHER OPERATOR:
Address:
City: | State: | Zip:
Contact: | Tel:

III. TYPE OF OPERATION (D=Demo O=Ordered Demo R=Renovation E=Emer.Renovation):

IV. IS ASBESTOS PRESENT? (Yes/No):

V. FACILITY DESCRIPTION (Include building name, number and floor or room number):
Bldg Name:
Address:
City: | State: | County:
Site Location:
Building Size: | # of Floors: | Age in Years:
Present Use: | Prior Use:

VI. PROCEDURE, INCLUDING ANALYTICAL METHOD, IF APPROPRIATE, USED TO DETECT THE PRESENCE OF ASBESTOS MATERIAL:

VII. APPROXIMATE AMOUNT OF ASBESTOS, INCLUDING: 1. Regulated ACM to be removed 2. Category I ACM Not Removed 3. Category II ACM Not Removed	RACM To Be Removed	Nonfriable Asbestos Material Not To Be Removed		Indicate Unit of Measurement Below	
		Cat I	Cat II	UNIT	
Pipes				LnFt:	Ln M:
Surface Area				SqFt:	Sq M:
Vol RACM Off Facility Component				CuFt:	Cu M:

VIII. SCHEDULED DATES ASBESTOS REMOVAL (MM/DD/YY) Start: Complete:

IX. SCHEDULED DATES DEMO/RENOVATION (MM/DD/YY) Start: Complete:

Continued on page two

Figure 3. Notification of Demolition and Renovation

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NOTIFICATION OF DEMOLITION AND RENOVATION (continued)

X. DESCRIPTION OF PLANNED DEMOLITION OR RENOVATION WORK, AND METHOD(S) TO BE USED:		
XI. DESCRIPTION OF WORK PRACTICES AND ENGINEERING CONTROLS TO BE USED TO PREVENT EMISSIONS OF ASBESTOS AT THE DEMOLITION AND RENOVATION SITE:		
XII. WASTE TRANSPORTER #1		
Name:		
Address		
City:	State:	Zip:
Contact Person:		Telephone:
WASTE TRANSPORTER #2		
Name:		
Address:		
City:	State:	Zip:
Contact Person:		Telephone:
XIII. WASTE DISPOSAL SITE		
Name:		
Location:		
City:	State:	Zip:
Telephone:		
XIV. IF DEMOLITION ORDERED BY A GOVERNMENT AGENCY, PLEASE IDENTIFY THE AGENCY BELOW:		
Name:	Title:	
Authority:		
Date of Order (MM/DD/YY):	Date Ordered to Begin (MM/DD/YY):	
XV. FOR EMERGENCY RENOVATIONS		
Date and Hour of Emergency (MM/DD/YY):		
Description of the Sudden, Unexpected Event:		
Explanation of how the event caused unsafe conditions or would cause equipment damage or an unreasonable financial burden:		
XVI. DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND OR PREVIOUSLY NONFRIABLE ASBESTOS MATERIAL BECOMES CRUMBLED, PULVERIZED, OR REDUCED TO POWDER.		
XVI. I CERTIFY THAT AN INDIVIDUAL TRAINED IN THE PROVISIONS OF THIS REGULATION (40 CFR PART 61, SUBPART M) WILL BE ON-SITE DURING THE DEMOLITION OR RENOVATION AND HYDROSC THAT THE REQUIRED TRAINING HAS BEEN ACCOMPLISHED BY THIS PERSON WILL BE AVAILABLE FOR INSPECTION DURING NORMAL BUSINESS HOURS. (Required 1 year after promulgation)		
(Signature of Owner/Operator)		(Date)
XVII. I CERTIFY THAT THE ABOVE INFORMATION IS CORRECT.		
(Signature of Owner/Operator)		(Date)

Figure 3. Notification of Demolition and Renovation

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[55 FR 48419, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991]

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§ 61.146 Standard for spraying.

The owner or operator of an operation in which asbestos-containing materials are spray applied shall comply with the following requirements:

(a) For spray-on application on buildings, structures, pipes, and conduits, do not use material containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy, except as provided in paragraph (c) of this section.

(b) For spray-on application of materials that contain more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy, on equipment and machinery, except as provided in paragraph (c) of this section:

(1) Notify the Administrator at least 20 days before beginning the spraying operation. Include the following information in the notice:

(i) Name and address of owner or operator.

(ii) Location of spraying operation.

(iii) Procedures to be followed to meet the requirements of this paragraph.

(2) Discharge no visible emissions to the outside air from spray-on application of the asbestos-containing material or use the methods specified by § 61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.

(c) The requirements of paragraphs (a) and (b) of this section do not apply to the spray-on application of materials where the asbestos fibers in the materials are encapsulated with a bituminous or resinous binder during spraying and the materials are not friable after drying.

(d) Owners or operators of sources subject to this paragraph are exempt from the requirements of §§ 61.05(a), 61.07 and 61.09.

[49 FR 13661, Apr. 5, 1984. Redesignated and amended at 55 FR 48424, Nov. 20, 1990; 60 FR 31920, June 19, 1995]

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§ 61.147 Standard for fabricating.

(a) *Applicability.* This section applies to the following fabricating operations using commercial asbestos:

(1) The fabrication of cement building products.

(2) The fabrication of friction products, except those operations that primarily install asbestos friction materials on motor vehicles.

(3) The fabrication of cement or silicate board for ventilation hoods; ovens; electrical panels; laboratory furniture, bulkheads, partitions, and ceilings for marine construction; and flow control devices for the molten metal industry.

(b) *Standard.* Each owner or operator of any of the fabricating operations to which this section applies shall either:

(1) Discharge no visible emissions to the outside air from any of the operations or from any building or structure in which they are conducted or from any other fugitive sources; or

(2) Use the methods specified by § 61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.

(3) Monitor each potential source of asbestos emissions from any part of the fabricating facility, including air cleaning devices, process equipment, and buildings that house equipment for material processing and handling, at least once each day, during daylight hours, for visible emissions to the outside air during periods of operation. The monitoring shall be by visual observation of at least 15 seconds duration per source of emissions.

(4) Inspect each air cleaning device at least once each week for proper operation and for changes that signal the potential for malfunctions, including, to the maximum extent possible without dismantling other than opening the device, the presence of tears, holes, and abrasions in filter bags and for dust deposits on the clean side of bags. For air cleaning devices that cannot be inspected on a weekly basis according to this paragraph, submit to the Administrator, and revise as necessary, a written maintenance plan to include, at a minimum, the following:

(i) Maintenance schedule.

(ii) Recordkeeping plan.

(5) Maintain records of the results of visible emission monitoring and air cleaning device inspections using a format similar to that shown in Figures 1 and 2 and include the following:

(i) Date and time of each inspection.

(ii) Presence or absence of visible emissions.

(iii) Condition of fabric filters, including presence of any tears, holes, and abrasions.

(iv) Presence of dust deposits on clean side of fabric filters.

(v) Brief description of corrective actions taken, including date and time.

(vi) Daily hours of operation for each air cleaning device.

(6) Furnish upon request and make available at the affected facility during normal business hours for inspection by the Administrator, all records required under this section.

(7) Retain a copy of all monitoring and inspection records for at least 2 years.

(8) Submit semiannually a copy of the visible emission monitoring records to the Administrator if visible emission occurred during the report period. Semiannual reports shall be postmarked by the 30th day following the end of the six-month period.

[49 FR 13661, Apr. 5, 1984. Redesignated and amended at 55 FR 48424, Nov. 20, 1991; 64 FR 7467, Feb. 12, 1999]

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§ 61.148 Standard for insulating materials.

No owner or operator of a facility may install or reinstall on a facility component any insulating materials that contain commercial asbestos if the materials are either molded and friable or wet-applied and friable after drying. The provisions of this section do not apply to spray-applied insulating materials regulated under § 61.146.

[55 FR 48424, Nov. 20, 1990]

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§ 61.149 Standard for waste disposal for asbestos mills.

Each owner or operator of any source covered under the provisions of § 61.142 shall:

(a) Deposit all asbestos-containing waste material at a waste disposal site operated in accordance with the provisions of § 61.154; and

(b) Discharge no visible emissions to the outside air from the transfer of control device asbestos waste to the tailings conveyor, or use the methods specified by § 61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air. Dispose of the asbestos waste from control devices in accordance with § 61.150(a) or paragraph (c) of this section; and

(c) Discharge no visible emissions to the outside air during the collection, processing, packaging, or on-site transporting of any asbestos-containing waste material, or use one of the disposal methods specified in paragraphs (c) (1) or (2) of this section, as follows:

(1) Use a wetting agent as follows:

(i) Adequately mix all asbestos-containing waste material with a wetting agent recommended by the manufacturer of the agent to effectively wet dust and tailings, before depositing the material at a waste disposal site. Use the agent as recommended for the particular dust by the manufacturer of the agent.

(ii) Discharge no visible emissions to the outside air from the wetting operation or use the methods specified by § 61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.

(iii) Wetting may be suspended when the ambient temperature at the waste disposal site is less than −9.5 °C (15 °F), as determined by an appropriate measurement method with an accuracy of ±1 °C (±2 °F). During periods when wetting operations are suspended, the temperature must be recorded at least at hourly intervals, and records must be retained for at least 2 years in a form suitable for inspection.

(2) Use an alternative emission control and waste treatment method that has received prior written approval by the Administrator. To obtain approval for an alternative method, a written application must be submitted to the Administrator demonstrating that the following criteria are met:

(i) The alternative method will control asbestos emissions equivalent to currently required methods.

(ii) The suitability of the alternative method for the intended application.

(iii) The alternative method will not violate other regulations.

(iv) The alternative method will not result in increased water pollution, land pollution, or occupational hazards.

(d) When waste is transported by vehicle to a disposal site:

(1) Mark vehicles used to transport asbestos-containing waste material during the loading and unloading of the waste so that the signs are visible. The markings must:

(i) Be displayed in such a manner and location that a person can easily read the legend.

(ii) Conform to the requirements for 51 cm × 36 cm (20 in × 14 in) upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and

(iii) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph.

Legend
DANGER
ASBESTOS DUST HAZARD
CANCER AND LUNG DISEASE HAZARD
Authorized Personnel Only
Notation
2.5 cm (1 inch) Sans Serif, Gothic or Block
2.5 cm (1 inch) Sans Serif, Gothic or Block
1.9 cm (¾ inch) Sans Serif, Gothic or Block
14 Point Gothic

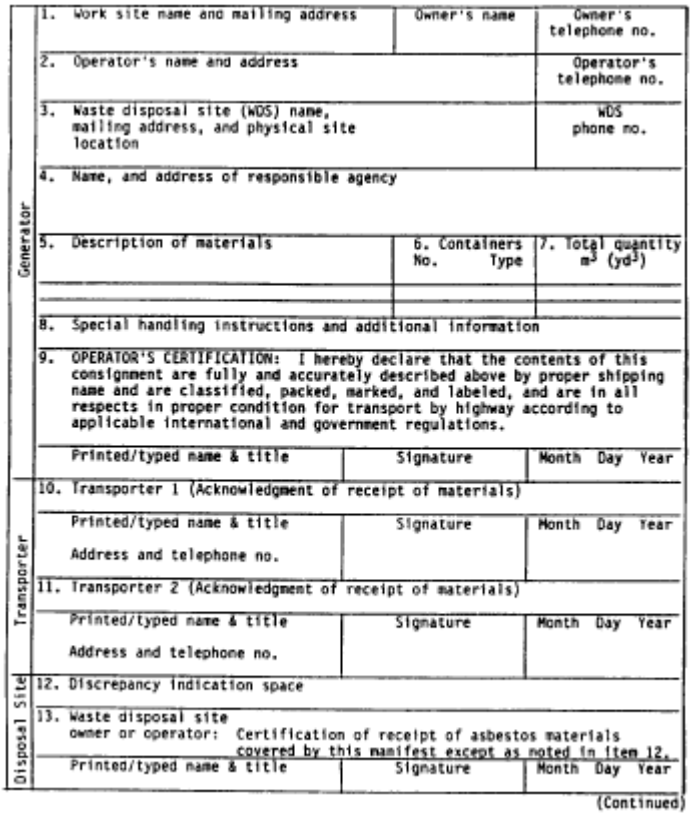
Spacing between any two lines must be a least equal to the height of the upper of the two lines.

(2) For off-site disposal, provide a copy of the waste shipment record, described in paragraph (e)(1) of this section, to the disposal site owner or operator at the same time as the asbestos-containing waste material is delivered to the disposal site.

(e) For all asbestos-containing waste material transported off the facility site:

(1) Maintain asbestos waste shipment records, using a form similar to that shown in Figure 4, and include the following information:

(i) The name, address, and telephone number of the waste generator.
(ii) The name and address of the local, State, or EPA Regional agency responsible for administering the asbestos NESHAP program.
(iii) The quantity of the asbestos-containing waste material in cubic meters (cubic yards).
(iv) The name and telephone number of the disposal site operator.
(v) The name and physical site location of the disposal site.
(vi) The date transported.
(vii) The name, address, and telephone number of the transporter(s).
(viii) A certification that the contents of this consignment are fully and accurately described by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.
(2) For waste shipments where a copy of the waste shipment record, signed by the owner or operator of the designated disposal site, is not received by the waste generator within 35 days of the date the waste was accepted by the initial transporter, contact the transporter and/or the owner or operator of the designated disposal site to determine the status of the waste shipment.
(3) Report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator if a copy of the waste shipment record, signed by the owner or operator of the designated waste disposal site, is not received by the waste generator within 45 days of the date the waste was accepted by the initial transporter. Include in the report the following information:
(i) A copy of the waste shipment record for which a confirmation of delivery was not received, and
(ii) A cover letter signed by the waste generator explaining the efforts taken to locate the asbestos waste shipment and the results of those efforts.
(4) Retain a copy of all waste shipment records, including a copy of the waste shipment record signed by the owner or operator of the designated waste disposal site, for at least 2 years.
(f) Furnish upon request, and make available for inspection by the Administrator, all records required under this section.



Generator

1. Work site name and mailing address | Owner's name | Owner's telephone no.
2. Operator's name and address | Operator's telephone no.
3. Waste disposal site (WDS) name, mailing address, and physical site location | WDS phone no.
4. Name, and address of responsible agency
5. Description of materials | 6. Containers No. Type | 7. Total quantity m^3 (yd^3)
8. Special handling instructions and additional information
9. OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.

Printed/typed name & title | Signature | Month Day Year

Transporter

10. Transporter 1 (Acknowledgment of receipt of materials)

Printed/typed name & title | Signature | Month Day Year
Address and telephone no.

11. Transporter 2 (Acknowledgment of receipt of materials)

Printed/typed name & title | Signature | Month Day Year
Address and telephone no.

Disposal Site

12. Discrepancy indication space
13. Waste disposal site owner or operator: Certification of receipt of asbestos materials covered by this manifest except as noted in item 12.

Printed/typed name & title | Signature | Month Day Year

(Continued)

Figure 4. Waste Shipment Record

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INSTRUCTIONS

Waste Generator Section (Items 1-9)

1. Enter the name of the facility at which asbestos waste is generated and the address where the facility is located. In the appropriate spaces, also enter the name of the owner of the facility and the owner's phone number.

2. If a demolition or renovation, enter the name and address of the company and authorized agent responsible for performing the asbestos removal. In the appropriate spaces, also enter the phone number of the operator.

3. Enter the name, address, and physical site location of the waste disposal site (WDS) that will be receiving the asbestos materials. In the appropriate spaces, also enter the phone number of the WDS. Enter "on-site" if the waste will be disposed of on the generator's property.

4. Provide the name and address of the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program.

5. Indicate the types of asbestos waste materials generated. If from a demolition or renovation, indicate the amount of asbestos that is

   - Friable asbestos material
   - Nonfriable asbestos material

6. Enter the number of containers used to transport the asbestos materials listed in Item 5. Also enter one of the following container codes used in transporting each type of asbestos material (specify any other type of container used if not listed below):

   DM - Metal drums, barrels
   DP - Plastic drums, barrels
   BA - 6 mil plastic bags or wrapping

7. Enter the quantities of each type of asbestos material removed in units of cubic meters (cubic yards).

8. Use this space to indicate special transportation, treatment, storage or disposal or Bill of Lading information. If an alternate waste disposal site is designated, note it here. Emergency response telephone numbers or similar information may be included here.

9. The authorized agent of the waste generator must read and then sign and date this certification. The date is the date of receipt by transporter.

NOTE: The waste generator must retain a copy of this form.

(continued)

Figure 4. Waste Shipment Record

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Transporter Section (Items 10 & 11)

10. & 11. Enter name, address, and telephone number of each transporter used, if applicable. Print or type the full name and title of person accepting responsibility and acknowledging receipt of materials as listed on this waste shipment record for transport. Enter date of receipt and signature.

NOTE: The transporter must retain a copy of this form.

Disposal Site Section (Items 12 & 13)

12. The authorized representative of the WDS must note in this space any discrepancy between waste described on this manifest and waste actually received as well as any improperly enclosed or contained waste. Any rejected materials should be listed and destination of those materials provided. A site that converts asbestos-containing waste material to nonasbestos material is considered a WDS.

13. The signature (by hand) of the authorized WDS agent indicates acceptance and agreement with statements on this manifest except as noted in Item 12. The date is the date of signature and receipt of shipment.

NOTE: The WDS must retain a completed copy of this form. The WDS must also send a completed copy to the operator listed in Item 2.

Figure 4. Waste Shipment Record

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§ 61.150 Standard for waste disposal for manufacturing, fabricating, demolition, renovation, and spraying operations.

Each owner or operator of any source covered under the provisions of §§ 61.144, 61.145, 61.146, and 61.147 shall comply with the following provisions:

(a) Discharge no visible emissions to the outside air during the collection, processing (including incineration), packaging, or transporting of any asbestos-containing waste material generated by the

source, or use one of the emission control and waste treatment methods specified in paragraphs (a) (1) through (4) of this section.
(1) Adequately wet asbestos-containing waste material as follows:
(i) Mix control device asbestos waste to form a slurry; adequately wet other asbestos-containing waste material; and
(ii) Discharge no visible emissions to the outside air from collection, mixing, wetting, and handling operations, or use the methods specified by § 61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air; and
(iii) After wetting, seal all asbestos-containing waste material in leak-tight containers while wet; or, for materials that will not fit into containers without additional breaking, put materials into leak-tight wrapping; and
(iv) Label the containers or wrapped materials specified in paragraph (a)(1)(iii) of this section using warning labels specified by Occupational Safety and Health Standards of the Department of Labor, Occupational Safety and Health Administration (OSHA) under 29 CFR 1910.1001(j)(4) or 1926.1101(k)(8). The labels shall be printed in letters of sufficient size and contrast so as to be readily visible and legible.
(v) For asbestos-containing waste material to be transported off the facility site, label containers or wrapped materials with the name of the waste generator and the location at which the waste was generated.
(2) Process asbestos-containing waste material into nonfriable forms as follows:
(i) Form all asbestos-containing waste material into nonfriable pellets or other shapes;
(ii) Discharge no visible emissions to the outside air from collection and processing operations, including incineration, or use the method specified by § 61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.
(3) For facilities demolished where the RACM is not removed prior to demolition according to §§ 61.145(c)(1) (i), (ii), (iii), and (iv) or for facilities demolished according to § 61.145(c)(9), adequately wet asbestos-containing waste material at all times after demolition and keep wet during handling and loading for transport to a disposal site. Asbestos-containing waste materials covered by this paragraph do not have to be sealed in leak-tight containers or wrapping but may be transported and disposed of in bulk.
(4) Use an alternative emission control and waste treatment method that has received prior approval by the Administrator according to the procedure described in § 61.149(c)(2).
(5) As applied to demolition and renovation, the requirements of paragraph (a) of this section do not apply to Category I nonfriable ACM waste and Category II nonfriable ACM waste that did not become crumbled, pulverized, or reduced to powder.
(b) All asbestos-containing waste material shall be deposited as soon as is practical by the waste generator at:
(1) A waste disposal site operated in accordance with the provisions of § 61.154, or
(2) An EPA-approved site that converts RACM and asbestos-containing waste material into nonasbestos (asbestos-free) material according to the provisions of § 61.155.
(3) The requirements of paragraph (b) of this section do not apply to Category I nonfriable ACM that is not RACM.
(c) Mark vehicles used to transport asbestos-containing waste material during the loading and unloading of waste so that the signs are visible. The markings must conform to the requirements of §§ 61.149(d)(1) (i), (ii), and (iii).
(d) For all asbestos-containing waste material transported off the facility site:
(1) Maintain waste shipment records, using a form similar to that shown in Figure 4, and include the following information:
(i) The name, address, and telephone number of the waste generator.
(ii) The name and address of the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program.
(iii) The approximate quantity in cubic meters (cubic yards).
(iv) The name and telephone number of the disposal site operator.
(v) The name and physical site location of the disposal site.
(vi) The date transported.
(vii) The name, address, and telephone number of the transporter(s).
(viii) A certification that the contents of this consignment are fully and accurately described by proper

shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.
(2) Provide a copy of the waste shipment record, described in paragraph (d)(1) of this section, to the disposal site owners or operators at the same time as the asbestos-containing waste material is delivered to the disposal site.
(3) For waste shipments where a copy of the waste shipment record, signed by the owner or operator of the designated disposal site, is not received by the waste generator within 35 days of the date the waste was accepted by the initial transporter, contact the transporter and/or the owner or operator of the designated disposal site to determine the status of the waste shipment.
(4) Report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator if a copy of the waste shipment record, signed by the owner or operator of the designated waste disposal site, is not received by the waste generator within 45 days of the date the waste was accepted by the initial transporter. Include in the report the following information:
(i) A copy of the waste shipment record for which a confirmation of delivery was not received, and
(ii) A cover letter signed by the waste generator explaining the efforts taken to locate the asbestos waste shipment and the results of those efforts.
(5) Retain a copy of all waste shipment records, including a copy of the waste shipment record signed by the owner or operator of the designated waste disposal site, for at least 2 years.
(e) Furnish upon request, and make available for inspection by the Administrator, all records required under this section.
[55 FR 48429, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991, as amended at 68 FR 54793, Sept. 18, 2003]

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§ 61.151 Standard for inactive waste disposal sites for asbestos mills and manufacturing and fabricating operations.

Each owner or operator of any inactive waste disposal site that was operated by sources covered under § 61.142, 61.144, or 61.147 and received deposits of asbestos-containing waste material generated by the sources, shall:
(a) Comply with one of the following:
(1) Either discharge no visible emissions to the outside air from an inactive waste disposal site subject to this paragraph; or
(2) Cover the asbestos-containing waste material with at least 15 centimeters (6 inches) of compacted nonasbestos-containing material, and grow and maintain a cover of vegetation on the area adequate to prevent exposure of the asbestos-containing waste material. In desert areas where vegetation would be difficult to maintain, at least 8 additional centimeters (3 inches) of well-graded, nonasbestos crushed rock may be placed on top of the final cover instead of vegetation and maintained to prevent emissions; or
(3) Cover the asbestos-containing waste material with at least 60 centimeters (2 feet) of compacted nonasbestos-containing material, and maintain it to prevent exposure of the asbestos-containing waste; or
(4) For inactive waste disposal sites for asbestos tailings, a resinous or petroleum-based dust suppression agent that effectively binds dust to control surface air emissions may be used instead of the methods in paragraphs (a) (1), (2), and (3) of this section. Use the agent in the manner and frequency recommended for the particular asbestos tailings by the manufacturer of the dust suppression agent to achieve and maintain dust control. Obtain prior written approval of the Administrator to use other equally effective dust suppression agents. For purposes of this paragraph, any used, spent, or other waste oil is not considered a dust suppression agent.
(b) Unless a natural barrier adequately deters access by the general public, install and maintain warning signs and fencing as follows, or comply with paragraph (a)(2) or (a)(3) of this section.
(1) Display warning signs at all entrances and at intervals of 100 m (328 ft) or less along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material was deposited. The warning signs must:
(i) Be posted in such a manner and location that a person can easily read the legend; and
(ii) Conform to the requirements for 51 cm×36 cm (20″×14″) upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and
(iii) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph.

Legend	Notation
Asbestos Waste Disposal Site	2.5 cm (1 inch) Sans Serif, Gothic or Block
Do Not Create Dust	1.9 cm (3/4 inch) Sans Serif, Gothic or Block
Breathing Asbestos is Hazardous to Your Health	14 Point Gothic.

Spacing between any two lines must be at least equal to the height of the upper of the two lines.
(2) Fence the perimeter of the site in a manner adequate to deter access by the general public.
(3) When requesting a determination on whether a natural barrier adequately deters public access, supply information enabling the Administrator to determine whether a fence or a natural barrier adequately deters access by the general public.
(c) The owner or operator may use an alternative control method that has received prior approval of the Administrator rather than comply with the requirements of paragraph (a) or (b) of this section.
(d) Notify the Administrator in writing at least 45 days prior to excavating or otherwise disturbing any asbestos-containing waste material that has been deposited at a waste disposal site under this section, and follow the procedures specified in the notification. If the excavation will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the Administrator at least 10 working days before excavation begins and in no event shall excavation begin earlier than the date specified in the original notification. Include the following information in the notice:
(1) Scheduled starting and completion dates.
(2) Reason for disturbing the waste.
(3) Procedures to be used to control emissions during the excavation, storage, transport, and ultimate disposal of the excavated asbestos-containing waste material. If deemed necessary, the Administrator may require changes in the emission control procedures to be used.
(4) Location of any temporary storage site and the final disposal site.
(e) Within 60 days of a site becoming inactive and after the effective date of this subpart, record, in accordance with State law, a notation on the deed to the facility property and on any other instrument that would normally be examined during a title search; this notation will in perpetuity notify any potential purchaser of the property that:
(1) The land has been used for the disposal of asbestos-containing waste material;
(2) The survey plot and record of the location and quantity of asbestos-containing waste disposed of within the disposal site required in § 61.154(f) have been filed with the Administrator; and
(3) The site is subject to 40 CFR part 61, subpart M.
[49 FR 13661, Apr. 5, 1984, as amended at 53 FR 36972, Sept. 23, 1988. Redesignated and amended at 55 FR 48429, Nov. 20, 1990]

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§ 61.152 Air-cleaning.

(a) The owner or operator who uses air cleaning, as specified in §§ 61.142(a), 61.144(b)(2), 61.145(c)(3)(i)(B)(*1*), 61.145(c)(4)(ii), 61.145(c)(11)(i), 61.146(b)(2), 61.147(b)(2), 61.149(b), 61.149(c)(1)(ii), 61.150(a)(1)(ii), 61.150(a)(2)(ii), and 61.155(e) shall:
(1) Use fabric filter collection devices, except as noted in paragraph (b) of this section, doing all of the following:
(i) Ensuring that the airflow permeability, as determined by ASTM Method D737-75, does not exceed 9 m^3 /min/m^2 (30 ft^3 /min/ft^2) for woven fabrics or 11^3 /min/m^2 (35 ft^3 /min/ft^2) for felted fabrics, except that 12 m^3 /min/m^2 (40 ft^3 min/ft^2) for woven and 14 m^3 /min/m^2 (45 ft^3 min/ft^2) for felted fabrics is allowed for filtering air from asbestos ore dryers; and
(ii) Ensuring that felted fabric weighs at least 475 grams per square meter (14 ounces per square yard) and is at least 1.6 millimeters (one-sixteenth inch) thick throughout; and
(iii) Avoiding the use of synthetic fabrics that contain fill yarn other than that which is spun.
(2) Properly install, use, operate, and maintain all air-cleaning equipment authorized by this section. Bypass devices may be used only during upset or emergency conditions and then only for so long as it takes to shut down the operation generating the particulate asbestos material.
(3) For fabric filter collection devices installed after January 10, 1989, provide for easy inspection for faulty bags.
(b) There are the following exceptions to paragraph (a)(1):

(1) After January 10, 1989, if the use of fabric creates a fire or explosion hazard, or the Administrator determines that a fabric filter is not feasible, the Administrator may authorize as a substitute the use of wet collectors designed to operate with a unit contacting energy of at least 9.95 kilopascals (40 inches water gage pressure).
(2) Use a HEPA filter that is certified to be at least 99.97 percent efficient for 0.3 micron particles.
(3) The Administrator may authorize the use of filtering equipment other than described in paragraphs (a)(1) and (b)(1) and (2) of this section if the owner or operator demonstrates to the Administrator's satisfaction that it is equivalent to the described equipment in filtering particulate asbestos material.
[49 FR 13661, Apr. 5, 1984; 49 FR 25453, June 21, 1984, as amended at 51 FR 8199, Mar. 10, 1986. Redesignated and amended at 55 FR 48430, Nov. 20, 1990]

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§ 61.153 Reporting.

(a) Any new source to which this subpart applies (with the exception of sources subject to §§ 61.143, 61.145, 61.146, and 61.148), which has an initial startup date preceding the effective date of this revision, shall provide the following information to the Administrator postmarked or delivered within 90 days of the effective date. In the case of a new source that does not have an initial startup date preceding the effective date, the information shall be provided, postmarked or delivered, within 90 days of the initial startup date. Any owner or operator of an existing source shall provide the following information to the Administrator within 90 days of the effective date of this subpart unless the owner or operator of the existing source has previously provided this information to the Administrator. Any changes in the information provided by any existing source shall be provided to the Administrator, postmarked or delivered, within 30 days after the change.
(1) A description of the emission control equipment used for each process; and
(i) If the fabric device uses a woven fabric, the airflow permeability in m^3 /min/m^2 and; if the fabric is synthetic, whether the fill yarn is spun or not spun; and
(ii) If the fabric filter device uses a felted fabric, the density in g/m^2 , the minimum thickness in inches, and the airflow permeability in m^3 /min/m^2 .
(2) If a fabric filter device is used to control emissions,
(i) The airflow permeability in m^3 /min/m^2 (ft^3 /min/ft^2) if the fabric filter device uses a woven fabric, and, if the fabric is synthetic, whether the fill yarn is spun or not spun; and
(ii) If the fabric filter device uses a felted fabric, the density in g/m^2 (oz/yd^2), the minimum thickness in millimeters (inches), and the airflow permeability in m^3 /min/m^2 (ft^3 /min/ft^2).
(3) If a HEPA filter is used to control emissions, the certified efficiency.
(4) For sources subject to §§ 61.149 and 61.150:
(i) A brief description of each process that generates asbestos-containing waste material; and
(ii) The average volume of asbestos-containing waste material disposed of, measured in m^3 /day (yd^3 /day); and
(iii) The emission control methods used in all stages of waste disposal; and
(iv) The type of disposal site or incineration site used for ultimate disposal, the name of the site operator, and the name and location of the disposal site.
(5) For sources subject to §§ 61.151 and 61.154:
(i) A brief description of the site; and
(ii) The method or methods used to comply with the standard, or alternative procedures to be used.
(b) The information required by paragraph (a) of this section must accompany the information required by § 61.10. Active waste disposal sites subject to § 61.154 shall also comply with this provision. Roadways, demolition and renovation, spraying, and insulating materials are exempted from the requirements of § 61.10(a). The information described in this section must be reported using the format of appendix A of this part as a guide.
(Sec. 114. Clean Air Act as amended (42 U.S.C. 7414))
[49 FR 13661, Apr. 5, 1984. Redesignated and amended at 55 FR 48430, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991]

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§ 61.154 Standard for active waste disposal sites.

Each owner or operator of an active waste disposal site that receives asbestos-containing waste material from a source covered under § 61.149, 61.150, or 61.155 shall meet the requirements of this section:

(a) Either there must be no visible emissions to the outside air from any active waste disposal site where asbestos-containing waste material has been deposited, or the requirements of paragraph (c) or (d) of this section must be met.

(b) Unless a natural barrier adequately deters access by the general public, either warning signs and fencing must be installed and maintained as follows, or the requirements of paragraph (c)(1) of this section must be met.

(1) Warning signs must be displayed at all entrances and at intervals of 100 m (330 ft) or less along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material is deposited. The warning signs must:

(i) Be posted in such a manner and location that a person can easily read the legend; and

(ii) Conform to the requirements of 51 cm × 36 cm (20″×14″) upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and

(iii) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph.

Legend	**Notation**
Asbestos Waste Disposal Site	2.5 cm (1 inch) Sans Serif, Gothic or Block.
Do Not Create Dust	1.9 cm (3/4 inch) Sans Serif, Gothic or Block.
Breathing Asbestos is Hazardous to Your Health	14 Point Gothic.

Spacing between any two lines must be at least equal to the height of the upper of the two lines.

(2) The perimeter of the disposal site must be fenced in a manner adequate to deter access by the general public.

(3) Upon request and supply of appropriate information, the Administrator will determine whether a fence or a natural barrier adequately deters access by the general public.

(c) Rather than meet the no visible emission requirement of paragraph (a) of this section, at the end of each operating day, or at least once every 24-hour period while the site is in continuous operation, the asbestos-containing waste material that has been deposited at the site during the operating day or previous 24-hour period shall:

(1) Be covered with at least 15 centimeters (6 inches) of compacted nonasbestos-containing material, or

(2) Be covered with a resinous or petroleum-based dust suppression agent that effectively binds dust and controls wind erosion. Such an agent shall be used in the manner and frequency recommended for the particular dust by the dust suppression agent manufacturer to achieve and maintain dust control. Other equally effective dust suppression agents may be used upon prior approval by the Administrator. For purposes of this paragraph, any used, spent, or other waste oil is not considered a dust suppression agent.

(d) Rather than meet the no visible emission requirement of paragraph (a) of this section, use an alternative emissions control method that has received prior written approval by the Administrator according to the procedures described in § 61.149(c)(2).

(e) For all asbestos-containing waste material received, the owner or operator of the active waste disposal site shall:

(1) Maintain waste shipment records, using a form similar to that shown in Figure 4, and include the following information:

(i) The name, address, and telephone number of the waste generator.

(ii) The name, address, and telephone number of the transporter(s).

(iii) The quantity of the asbestos-containing waste material in cubic meters (cubic yards).

(iv) The presence of improperly enclosed or uncovered waste, or any asbestos-containing waste material not sealed in leak-tight containers. Report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator (identified in the waste shipment record), and, if different, the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the disposal site, by the following working day, the presence of a

significant amount of improperly enclosed or uncovered waste. Submit a copy of the waste shipment record along with the report.
(v) The date of the receipt.
(2) As soon as possible and no longer than 30 days after receipt of the waste, send a copy of the signed waste shipment record to the waste generator.
(3) Upon discovering a discrepancy between the quantity of waste designated on the waste shipment records and the quantity actually received, attempt to reconcile the discrepancy with the waste generator. If the discrepancy is not resolved within 15 days after receiving the waste, immediately report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator (identified in the waste shipment record), and, if different, the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the disposal site. Describe the discrepancy and attempts to reconcile it, and submit a copy of the waste shipment record along with the report.
(4) Retain a copy of all records and reports required by this paragraph for at least 2 years.
(f) Maintain, until closure, records of the location, depth and area, and quantity in cubic meters (cubic yards) of asbestos-containing waste material within the disposal site on a map or diagram of the disposal area.
(g) Upon closure, comply with all the provisions of § 61.151.
(h) Submit to the Administrator, upon closure of the facility, a copy of records of asbestos waste disposal locations and quantities.
(i) Furnish upon request, and make available during normal business hours for inspection by the Administrator, all records required under this section.
(j) Notify the Administrator in writing at least 45 days prior to excavating or otherwise disturbing any asbestos-containing waste material that has been deposited at a waste disposal site and is covered. If the excavation will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the Administrator at least 10 working days before excavation begins and in no event shall excavation begin earlier than the date specified in the original notification. Include the following information in the notice:
(1) Scheduled starting and completion dates.
(2) Reason for disturbing the waste.
(3) Procedures to be used to control emissions during the excavation, storage, transport, and ultimate disposal of the excavated asbestos-containing waste material. If deemed necessary, the Administrator may require changes in the emission control procedures to be used.
(4) Location of any temporary storage site and the final disposal site.
(Secs. 112 and 301(a) of the Clean Air Act as amended (42 U.S.C. 7412, 7601(a))
[49 FR 13661, Apr. 5, 1990. Redesignated and amended at 55 FR 48431, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991]

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§ 61.155 Standard for operations that convert asbestos-containing waste material into nonasbestos (asbestos-free) material.

Each owner or operator of an operation that converts RACM and asbestos-containing waste material into nonasbestos (asbestos-free) material shall:
(a) Obtain the prior written approval of the Administrator to construct the facility. To obtain approval, the owner or operator shall provide the Administrator with the following information:
(1) Application to construct pursuant to § 61.07.
(2) In addition to the information requirements of § 61.07(b)(3), a
(i) Description of waste feed handling and temporary storage.
(ii) Description of process operating conditions.
(iii) Description of the handling and temporary storage of the end product.
(iv) Description of the protocol to be followed when analyzing output materials by transmission electron microscopy.
(3) Performance test protocol, including provisions for obtaining information required under paragraph (b) of this section.
(4) The Administrator may require that a demonstration of the process be performed prior to approval of the application to construct.
(b) Conduct a start-up performance test. Test results shall include:

(1) A detailed description of the types and quantities of nonasbestos material, RACM, and asbestos-containing waste material processed, *e.g.,* asbestos cement products, friable asbestos insulation, plaster, wood, plastic, wire, etc. Test feed is to include the full range of materials that will be encountered in actual operation of the process.
(2) Results of analyses, using polarized light microscopy, that document the asbestos content of the wastes processed.
(3) Results of analyses, using transmission electron microscopy, that document that the output materials are free of asbestos. Samples for analysis are to be collected as 8-hour composite samples (one 200-gram (7-ounce) sample per hour), beginning with the initial introduction of RACM or asbestos-containing waste material and continuing until the end of the performance test.
(4) A description of operating parameters, such as temperature and residence time, defining the full range over which the process is expected to operate to produce nonasbestos (asbestos-free) materials. Specify the limits for each operating parameter within which the process will produce nonasbestos (asbestos-free) materials.
(5) The length of the test.
(c) During the initial 90 days of operation,
(1) Continuously monitor and log the operating parameters identified during start-up performance tests that are intended to ensure the production of nonasbestos (asbestos-free) output material.
(2) Monitor input materials to ensure that they are consistent with the test feed materials described during start-up performance tests in paragraph (b)(1) of this section.
(3) Collect and analyze samples, taken as 10-day composite samples (one 200-gram (7-ounce) sample collected every 8 hours of operation) of all output material for the presence of asbestos. Composite samples may be for fewer than 10 days. Transmission electron microscopy (TEM) shall be used to analyze the output material for the presence of asbestos. During the initial 90-day period, all output materials must be stored on-site until analysis shows the material to be asbestos-free or disposed of as asbestos-containing waste material according to § 61.150.
(d) After the initial 90 days of operation,
(1) Continuously monitor and record the operating parameters identified during start-up performance testing and any subsequent performance testing. Any output produced during a period of deviation from the range of operating conditions established to ensure the production of nonasbestos (asbestos-free) output materials shall be:
(i) Disposed of as asbestos-containing waste material according to § 61.150, or
(ii) Recycled as waste feed during process operation within the established range of operating conditions, or
(iii) Stored temporarily on-site in a leak-tight container until analyzed for asbestos content. Any product material that is not asbestos-free shall be either disposed of as asbestos-containing waste material or recycled as waste feed to the process.
(2) Collect and analyze monthly composite samples (one 200-gram (7-ounce) sample collected every 8 hours of operation) of the output material. Transmission electron microscopy shall be used to analyze the output material for the presence of asbestos.
(e) Discharge no visible emissions to the outside air from any part of the operation, or use the methods specified by § 61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.
(f) Maintain records on-site and include the following information:
(1) Results of start-up performance testing and all subsequent performance testing, including operating parameters, feed characteristic, and analyses of output materials.
(2) Results of the composite analyses required during the initial 90 days of operation under § 61.155(c).
(3) Results of the monthly composite analyses required under § 61.155(d).
(4) Results of continuous monitoring and logs of process operating parameters required under § 61.155 (c) and (d).
(5) The information on waste shipments received as required in § 61.154(e).
(6) For output materials where no analyses were performed to determine the presence of asbestos, record the name and location of the purchaser or disposal site to which the output materials were sold or deposited, and the date of sale or disposal.
(7) Retain records required by paragraph (f) of this section for at least 2 years.
(g) Submit the following reports to the Administrator:

(1) A report for each analysis of product composite samples performed during the initial 90 days of operation.
(2) A quarterly report, including the following information concerning activities during each consecutive 3-month period:
(i) Results of analyses of monthly product composite samples.
(ii) A description of any deviation from the operating parameters established during performance testing, the duration of the deviation, and steps taken to correct the deviation.
(iii) Disposition of any product produced during a period of deviation, including whether it was recycled, disposed of as asbestos-containing waste material, or stored temporarily on-site until analyzed for asbestos content.
(iv) The information on waste disposal activities as required in § 61.154(f).
(h) Nonasbestos (asbestos-free) output material is not subject to any of the provisions of this subpart. Output materials in which asbestos is detected, or output materials produced when the operating parameters deviated from those established during the start-up performance testing, unless shown by TEM analysis to be asbestos-free, shall be considered to be asbestos-containing waste and shall be handled and disposed of according to §§ 61.150 and 61.154 or reprocessed while all of the established operating parameters are being met.
[55 FR 48431, Nov. 20, 1990]

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§ 61.156 Cross-reference to other asbestos regulations.
In addition to this subpart, the regulations referenced in Table 1 also apply to asbestos and may be applicable to those sources specified in §§ 61.142 through 61.151, 61.154, and 61.155 of this subpart. These cross-references are presented for the reader's information and to promote compliance with the cited regulations.

Table 1—Cross-Reference to Other Asbestos Regulations

Agency	CFR citation	Comment
EPA	40 CFR part 763, subpart E	Requires schools to inspect for asbestos and implement response actions and submit asbestos management plans to States. Specifies use of accredited inspectors, air sampling methods, and waste disposal procedures.
	40 CFR part 427	Effluent standards for asbestos manufacturing source categories.
	40 CFR part 763, subpart G	Protects public employees performing asbestos abatement work in States not covered by OSHA asbestos standard.
OSHA	29 CFR 1910.1001	Worker protection measures-engineering controls, worker training, labeling, respiratory protection, bagging of waste, permissible exposure level.
	29 CFR 1926.1101	Worker protection measures for all construction work involving asbestos, including demolition and renovation-work practices, worker training, bagging of waste, permissible exposure level.
MSHA	30 CFR part 56, subpart D	Specifies exposure limits, engineering controls, and respiratory protection measures for workers in surface mines.
	30 CFR part 57, subpart D	Specifies exposure limits, engineering controls, and respiratory protection measures for workers in underground mines.
DOT	49 CFR parts 171 and 172	Regulates the transportation of asbestos-containing waste material. Requires waste containment and shipping papers.

[55 FR 48432, Nov. 20, 1990, as amended at 60 FR 31920, June 19, 1995; 68 FR 54793, Sept. 18, 2003; 69 FR 43324, July 20, 2004]

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§ 61.157 Delegation of authority.

(a) In delegating implementation and enforcement authority to a State under section 112(d) of the Act, the authorities contained in paragraph (b) of this section shall be retained by the Administrator and not transferred to a State.

(b) Authorities that will not be delegated to States:

(1) Section 61.149(c)(2)
(2) Section 61.150(a)(4)
(3) Section 61.151(c)
(4) Section 61.152(b)(3)
(5) Section 61.154(d)
(6) Section 61.155(a).

[55 FR 48433, Nov. 20, 1990]

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Appendix A to Subpart M of Part 61—Interpretive Rule Governing Roof Removal Operations

I. Applicability of the Asbestos NESHAP

1.1. Asbestos-containing material (ACM) is material containing more than one percent asbestos as determined using the methods specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy. The NESHAP classifies ACM as either “friable” or “nonfriable”. Friable ACM is ACM that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure. Nonfriable ACM is ACM that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

1.2. Nonfriable ACM is further classified as either Category I ACM or Category II ACM. Category I ACM and Category II ACM are distinguished from each other by their potential to release fibers when damaged. Category I ACM includes asbestos-containing gaskets, packings, resilient floor coverings, resilient floor covering mastic, and asphalt roofing products containing more than one percent asbestos. Asphalt roofing products which may contain asbestos include built-up roofing; asphalt-containing single ply membrane systems; asphalt shingles; asphalt-containing underlayment felts; asphalt-containing roof coatings and mastics; and asphalt-containing base flashings. ACM roofing products that use other bituminous or resinous binders (such as coal tars or pitches) are also considered to be Category I ACM. Category II ACM includes all other nonfriable ACM, for example, asbestos-cement (A/C) shingles, A/C tiles, and transite boards or panels containing more than one percent asbestos. Generally speaking, Category II ACM is more likely to become friable when damaged than is Category I ACM. The applicability of the NESHAP to Category I and II ACM depends on: (1) the condition of the material at the time of demolition or renovation, (2) the nature of the operation to which the material will be subjected, (3) the amount of ACM involved.

1.3. Asbestos-containing material regulated under the NESHAP is referred to as “regulated asbestos-containing material” (RACM). RACM is defined in § 61.141 of the NESHAP and includes: (1) friable asbestos-containing material; (2) Category I nonfriable ACM that has become friable; (3) Category I nonfriable ACM that has been or will be sanded, ground, cut, or abraded; or (4) Category II nonfriable ACM that has already been or is likely to become crumbled, pulverized, or reduced to powder. If the coverage threshold for RACM is met or exceeded in a renovation or demolition operation, then all friable ACM in the operation, and in certain situations, nonfriable ACM in the operation, are subject to the NESHAP.

A. Threshold Amounts of Asbestos-Containing Roofing Material

1.A.1. The NESHAP does not cover roofing projects on single family homes or on residential buildings containing four or fewer dwelling units. 40 CFR 61.141. For other roofing renovation projects, if the total asbestos-containing roof area undergoing renovation is less than 160 ft^2 , the NESHAP does not apply, regardless of the removal method to be used, the type of material (Category I or II), or its condition (friable versus nonfriable). 40 CFR 61.145(a)(4). However, EPA would recommend the use of methods that damage asbestos-containing roofing material as little as possible. EPA has determined that where a rotating blade (RB) roof cutter or equipment that similarly damages the roofing material is used to remove Category I nonfriable asbestos-containing roofing material, the removal of 5580 ft^2 of that material will create 160 ft^2 of RACM. For the purposes of this interpretive rule, “RB roof cutter” means an engine-powered roof cutting machine with one or more rotating cutting blades the edges of which are blunt. (Equipment with blades having sharp or tapered edges, and/or which does not use a rotating blade, is used for “slicing” rather than “cutting” the roofing material; such equipment is not included in the term “RB

roof cutter".) Therefore, it is EPA's interpretation that when an RB roof cutter or equipment that similarly damages the roofing material is used to remove Category I nonfriable asbestos-containing roofing material, any project that is 5580 ft^2 or greater is subject to the NESHAP; conversely, it is EPA's interpretation that when an RB roof cutter or equipment that similarly damages the roofing material is used to remove Category I nonfriable asbestos-containing roofing material in a roof removal project that is less than 5580 ft^2 , the project is not subject to the NESHAP, except that notification is always required for demolitions. EPA further construes the NESHAP to mean that if slicing or other methods that do not sand, grind, cut or abrade will be used on Category I nonfriable ACM, the NESHAP does not apply, regardless of the area of roof to be removed.

1.A.2. For asbestos cement (A/C) shingles (or other Category II roofing material), if the area of the roofing material to be removed is at least 160 ft^2 and the removal methods will crumble, pulverize, reduce to powder, or contaminate with RACM (from other ACM that has been crumbled, pulverized or reduced to powder) 160 ft^2 or more of such roofing material, the removal is subject to the NESHAP. Conversely, if the area of the A/C shingles (or other Category II roofing materials) to be removed is less than 160 ft^2 , the removal is not subject to the NESHAP regardless of the removal method used, except that notification is always required for demolitions. 40 CFR 61.145(a). However, EPA would recommend the use of methods that damage asbestos-containing roofing material as little as possible. If A/C shingles (or other Category II roofing materials) are removed without 160 ft^2 or more of such roofing material being crumbled, pulverized, reduced to powder, or contaminated with RACM (from other ACM that has been crumbled, pulverized or reduced to powder), the operation is not subject to the NESHAP, even where the total area of the roofing material to be removed exceeds 160 ft^2 ; provided, however, that if the renovation includes other operations involving RACM, the roof removal operation is covered if the total area of RACM from all renovation activities exceeds 160 ft^2 . *See* the definition of regulated asbestos-containing material (RACM), 40 CFR 61.141.

1.A.3. Only roofing material that meets the definition of ACM can qualify as RACM subject to the NESHAP. Therefore, to determine if a removal operation that meets or exceeds the coverage threshold is subject to the NESHAP, any suspect roofing material (*i.e.* roofing material that may be ACM) should be tested for asbestos. If any such roofing material contains more than one percent asbestos and if the removal operation is covered by the NESHAP, then EPA must be notified and the work practices in § 61.145(c) must be followed. In EPA's view, if a removal operation involves at least the threshold level of suspect material, a roofing contractor may choose not to test for asbestos if the contractor follows the notification and work practice requirements of the NESHAP.

B. A/C Shingle Removal (Category II ACM Removal)

1.B.1. A/C shingles, which are Category II nonfriable ACM, become regulated ACM if the material has a high probability of becoming or has become crumbled, pulverized or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations. 40 CFR 61.141. However, merely breaking an A/C shingle (or any other category II ACM) that is not friable may not necessarily cause the material to become RACM. A/C shingles are typically nailed to buildings on which they are attached. EPA believes that the extent of breakage that will normally result from carefully removing A/C shingles and lowering the shingles to the ground will not result in crumbling, pulverizing or reducing the shingles to powder. Conversely, the extent of breakage that will normally occur if the A/C shingles are dropped from a building or scraped off of a building with heavy machinery would cause the shingles to become RACM. EPA therefore construes the NESHAP to mean that the removal of A/C shingles that are not friable, using methods that do not crumble, pulverize, or reduce the A/C shingles to powder (such as pry bars, spud bars and shovels to carefully pry the material), is not subject to the NESHAP provided that the A/C shingles are properly handled during and after removal, as discussed in this paragraph and the asbestos NESHAP. This interpretation also applies to other Category II nonfriable asbestos-containing roofing materials.

C. Cutting vs. Slicing and Manual Methods for Removal of Category I ACM

1.C.1. Because of damage to the roofing material, and the potential for fiber release, roof removal operations using rotating blade (RB) roof cutters or other equipment that sand, grind, cut or abrade the roof material are subject to the NESHAP. As EPA interprets the NESHAP, the use of certain manual methods (using equipment such as axes, hatchets, or knives, spud bars, pry bars, and shovels, but not saws) or methods that slice, shear, or punch (using equipment such as a power slicer or power plow) does not constitute "cutting, sanding, grinding or abrading." This is because these methods do not destroy the structural matrix or integrity of the material such that the material is crumbled, pulverized or reduced

to powder. Hence, it is EPA's interpretation that when such methods are used, assuming the roof material is not friable, the removal operation is not subject to the regulation.
1.C.2. Power removers or power tear-off machines are typically used to pry the roofing material up from the deck after the roof membrane has been cut. It is EPA's interpretation that when these machines are used to pry roofing material up, their use is not regulated by the NESHAP.
1.C.3. As noted previously, the NESHAP only applies to the removal of asbestos-containing roofing materials. Thus, the NESHAP does not apply to the use of RB cutters to remove non-asbestos built up roofing (BUR). On roofs containing some asbestos-containing and some non-asbestos-containing materials, coverage under the NESHAP depends on the methods used to remove each type of material in addition to other coverage thresholds specified above. For example, it is not uncommon for existing roofs to be made of non-asbestos BUR and base flashings that do contain asbestos. In that situation, EPA construes the NESHAP to be inapplicable to the removal of the non-asbestos BUR using an RB cutter so long as the RB cutter is not used to cut 5580 ft^2 or more of the asbestos-containing base flashing or other asbestos-containing material into sections. In addition, the use of methods that slice, shear, punch or pry could then be used to remove the asbestos flashings and not trigger coverage under the NESHAP.
II. Notification
2.1. Notification for a demolition is always required under the NESHAP. However, EPA believes that few roof removal jobs constitute “demolitions” as defined in the NESHAP (§ 61.141). In particular, it is EPA's view that the removal of roofing systems (i.e., the roof membrane, insulation, surfacing, coatings, flashings, mastic, shingles, and felt underlayment), when such removal is not a part of a demolition project, constitutes a “renovation” under the NESHAP. If the operation is a renovation, and Category I roofing material is being removed using either manual methods or slicing, notification is not required by the NESHAP. If Category II material is not friable and will be removed without crumbling, pulverizing, or reducing it to powder, no notification is required. Also, if the renovation involves less than the threshold area for applicability as discussed above, then no notification is required. However, if a roof removal meets the applicability and threshold requirements under the NESHAP, then EPA (or the delegated agency) must be notified in advance of the removal in accordance with the requirements of § 61.145(b), as follows:
• Notification must be given in writing at least 10 working days in advance and must include the information in § 61.145(b)(4), except for emergency renovations as discussed below.
• The notice must be updated as necessary, including, for example, when the amount of asbestos-containing roofing material reported changes by 20 percent or more.
• EPA must be notified if the start date of the roof removal changes. If the start date of a roof removal project is changed to an earlier date, EPA must be provided with a written notice of the new start date at least 10 working days in advance. If the start date changes to a later date, EPA must be notified by telephone as soon as possible before the original start date and a written notice must be sent as soon as possible.
• For emergency renovations (as defined in § 61.141), where work must begin immediately to avoid safety or public health hazards, equipment damage, or unreasonable financial burden, the notification must be postmarked or delivered to EPA as soon as possible, but no later than the following work day.
III. Emission Control Practices
A. Requirements To Adequately Wet and Discharge No Visible Emission
3.A.1. The principal controls contained in the NESHAP for removal operations include requirements that the affected material be adequately wetted, and that asbestos waste be handled, collected, and disposed of properly. The requirements for disposal of waste materials are discussed separately in section IV below. The emission control requirements discussed in this section III apply only to roof removal operations that are covered by the NESHAP as set forth in Section I above.
3.A.2. For any operation subject to the NESHAP, the regulation (§§ 61.145(c)(2)(i), (3), (6)(i)) requires that RACM be adequately wet (as defined in § 61.141) during the operation that damages or disturbs the asbestos material until collected for disposal.
3.A.3. When using an RB roof cutter (or any other method that sands, grinds, cuts or abrades the roofing material) to remove Category I asbestos-containing roofing material, the emission control requirements of § 61.145(c) apply as discussed in Section I above. EPA will consider a roof removal project to be in compliance with the “adequately wet” and “discharge no visible emission” requirements of the NESHAP if the RB roof cutter is equipped and operated with the following: (1) a blade guard that completely encloses the blade and extends down close to the roof surface; and (2) a device for spraying a fine mist of water

inside the blade guard, and which device is in operation during the cutting of the roof.
B. Exemptions From Wetting Requirements
3.B.1. The NESHAP provides that, in certain instances, wetting may not be required during the cutting of Category I asbestos roofing material with an RB roof cutter. If EPA determines in accordance with § 61.145(c)(3)(i), that wetting will unavoidably damage the building, equipment inside the building, or will present a safety hazard while stripping the ACM from a facility component that remains in place, the roof removal operation will be exempted from the requirement to wet during cutting. EPA must have sufficient written information on which to base such a decision. Before proceeding with a dry removal, the contractor must have received EPA's written approval. Such exemptions will be made on a case-by-case basis.
3.B.2. It is EPA's view that, in most instances, exemptions from the wetting requirements are not necessary. Where EPA grants an exemption from wetting because of the potential for damage to the building, damage to equipment within the building or a safety hazard, the NESHAP specifies alternative control methods (§ 61.145(c)(3)(i)(B)). Alternative control methods include (a) the use of local exhaust ventilation systems that capture the dust, and do not produce visible emissions, or (b) methods that are designed and operated in accordance with the requirements of § 61.152, or (c) other methods that have received the written approval of EPA. EPA will consider an alternative emission control method in compliance with the NESHAP if the method has received written approval from EPA and the method is being implemented consistent with the approved procedures (§ 61.145(c)(3)(ii) or § 61.152(b)(3)).
3.B.3. An exemption from wetting is also allowed when the air or roof surface temperature at the point of wetting is below freezing, as specified in § 61.145(c)(7). If freezing temperatures are indicated as the reason for not wetting, records must be kept of the temperature at the beginning, middle and end of the day on which wetting is not performed and the records of temperature must be retained for at least 2 years. 42 CFR § 61.145(c)(7)(iii). It is EPA's interpretation that in such cases, no written application to, or written approval by the Administrator is needed for using emission control methods listed in § 61.145(c)(3)(i)(B), or alternative emission control methods that have been previously approved by the Administrator. However, such written application or approval is required for alternative emission control methods that have not been previously approved. Any dust and debris collected from cutting must still be kept wet and placed in containers. All of the other requirements for notification and waste disposal would continue to apply as described elsewhere in this notice and the Asbestos NESHAP.
C. Waste Collection and Handling
3.C.1. It is EPA's interpretation that waste resulting from slicing and other methods that do not cut, grind, sand or abrade Category I nonfriable asbestos-containing roofing material is not subject to the NESHAP and can be disposed of as nonasbestos waste. EPA further construes the NESHAP to provide that if Category II roofing material (such as A/C shingles) is removed and disposed of without crumbling, pulverizing, or reducing it to powder, the waste from the removal is not subject to the NESHAP waste disposal requirements. EPA also interprets the NESHAP to be inapplicable to waste resulting from roof removal operations that do not meet or exceed the coverage thresholds described in section I above. Of course, other State, local, or Federal regulations may apply.
3.C.2. It is EPA's interpretation that when an RB roof cutter, or other method that similarly damages the roofing material, is used to cut Category I asbestos containing roofing material, the damaged material from the cut (the sawdust or debris) is considered asbestos containing waste subject to § 61.150 of the NESHAP, provided the coverage thresholds discussed above in section 1 are met or exceeded. This sawdust or debris must be disposed of at a disposal site operated in accordance with the NESHAP. It is also EPA's interpretation of the NESHAP that if the remainder of the roof is free of the sawdust and debris generated by the cutting, or if such sawdust or debris is collected as discussed below in paragraphs 3.C.3, 3.C.4, 3.C.5 and 3.C.6, the remainder of the roof can be disposed of as nonasbestos waste because it is considered to be Category I nonfriable material (as long as the remainder of the roof is in fact nonasbestos material or if it is Category I asbestos material and the removal methods do not further sand, grind, cut or abrade the roof material). EPA further believes that if the roof is not cleaned of such sawdust or debris, *i.e.,* it is contaminated, then it must be treated as asbestos-containing waste material and be handled in accordance with § 61.150.
3.C.3. In order to be in compliance with the NESHAP while using an RB roof cutter (or device that similarly damages the roofing material) to cut Category I asbestos containing roofing material, the dust and debris resulting from the cutting of the roof should be collected as soon as possible after the cutting operation, and kept wet until collected and placed in leak-tight containers. EPA believes that where the

blade guard completely encloses the blade and extends down close to the roof surface and is equipped with a device for spraying a fine mist of water inside the blade guard, and the spraying device is in operation during the cutting, most of the dust and debris from cutting will be confined along the cut. The most efficient methods to collect the dust and debris from cutting are to immediately collect or vacuum up the damaged material where it lies along the cut using a filtered vacuum cleaner or debris collector that meets the requirements of 40 CFR 61.152 to clean up as much of the debris as possible, or to gently sweep up the bulk of the debris, and then use a filtered vacuum cleaner that meets the requirements of 40 CFR 61.152 to clean up as much of the remainder of the debris as possible. On smooth surfaced roofs (nonaggregate roofs), sweeping up the debris and then wet wiping the surface may be done in place of using a filtered vacuum cleaner. It is EPA's view that if these decontamination procedures are followed, the remaining roofing material does not have to be collected and disposed of as asbestos waste. Additionally, it is EPA's view that where such decontamination procedures are followed, if the remaining portions of the roof are non-asbestos or Category I nonfriable asbestos material, and if the remaining portions are removed using removal methods that slice, shear, punch or pry, as discussed in section 1.C above, then the remaining portions do not have to be collected and disposed of as asbestos waste and the NESHAP's no visible emissions and adequately wet requirements are not applicable to the removal of the remaining portions. In EPA's interpretation, the failure of a filtered vacuum cleaner or debris collector to collect larger chunks or pieces of damaged roofing material created by the RB roof cutter does not require the remaining roofing material to be handled and disposed of as asbestos waste, provided that such visible chunks or pieces of roofing material are collected (e.g. by gentle sweeping) and disposed of as asbestos waste. Other methods of decontamination may not be adequate, and should be approved by the local delegated agency.

3.C.4. In EPA's interpretation, if the debris from the cutting is not collected immediately, it will be necessary to lightly mist the dust or debris, until it is collected, as discussed above, and placed in containers. The dust or debris should be lightly misted frequently enough to prevent the material from drying, and to prevent airborne emissions, prior to collection as described above. It is EPA's interpretation of the NESHAP that if these procedures are followed, the remaining roofing material does not have to be collected and disposed of as asbestos waste, as long as the remaining roof material is in fact nonasbestos material or if it is Category I asbestos material and the removal methods do not further sand, grind, cut or abrade the roof material.

3.C.5. It is EPA's interpretation that, provided the roofing material is not friable prior to the cutting operation, and provided the roofing material has not been made friable by the cutting operation, the appearance of rough, jagged or damaged edges on the remaining roofing material, due to the use of an RB roof cutter, does not require that such remaining roofing material be handled and disposed of as asbestos waste. In addition, it is also EPA's interpretation that if the sawdust or debris generated by the use of an RB roof cutter has been collected as discussed in paragraphs 3.C.3, 3.C.4 and 3.C.6, the presence of dust along the edge of the remaining roof material does not render such material “friable” for purposes of this interpretive rule or the NESHAP, provided the roofing material is not friable prior to the cutting operation, and provided that the remaining roofing material near the cutline has not been made friable by the cutting operation. Where roofing material near the cutline has been made friable by the use of the RB cutter (*i.e.* where such remaining roofing material near the cutline can be crumbled, pulverized or reduced to powder using hand pressure), it is EPA's interpretation that the use of an encapsulant will ensure that such friable material need not be treated or disposed of as asbestos containing waste material. The encapsulant may be applied to the friable material after the roofing material has been collected into stacks for subsequent disposal as nonasbestos waste. It is EPA's view that if the encapsulation procedure set forth in this paragraph is followed in operations where roofing material near the cutline has been rendered friable by the use of an RB roof cutter, and if the decontamination procedures set forth in paragraph 3.C.3 have been followed, the NESHAP's no visible emissions and adequately wet requirements would be met for the removal, handling and disposal of the remaining roofing material.

3.C.6. As one way to comply with the NESHAP, the dust and debris from cutting can be placed in leak-tight containers, such as plastic bags, and the containers labeled using warning labels required by OSHA (29 CFR 1926.58). In addition, the containers must have labels that identify the waste generator (such as the name of the roofing contractor, abatement contractor, and/or building owner or operator) and the location of the site at which the waste was generated.

IV. Waste Disposal

A. Disposal Requirements
4.A.1. Section 61.150(b) requires that, as soon as is practical, all collected dust and debris from cutting as well as any contaminated roofing squares, must be taken to a landfill that is operated in accordance with § 61.154 or to an EPA-approved site that converts asbestos waste to nonasbestos material in accordance with § 61.155. During the loading and unloading of affected waste, asbestos warning signs must be affixed to the vehicles.
B. Waste Shipment Record
4.B.1. For each load of asbestos waste that is regulated under the NESHAP, a waste shipment record (WSR) must be maintained in accordance with § 61.150(d). Information that must be maintained for each waste load includes the following:
• Name, address, and telephone number of the waste generator
• Name and address of the local, State, or EPA regional office responsible for administering the asbestos NESHAP program
• Quantity of waste in cubic meters (or cubic yards)
• Name and telephone number of the disposal site operator
• Name and physical site location of the disposal site
• Date transported
• Name, address, and telephone number of the transporter(s)
• Certification that the contents meet all government regulations for transport by highways.
4.B.2. The waste generator is responsible for ensuring that a copy of the WSR is delivered to the disposal site along with the waste shipment. If a copy of the WSR signed by the disposal site operator is not returned to the waste generator within 35 days, the waste generator must contact the transporter and/or the disposal site to determine the status of the waste shipment. 40 CFR 61.150(d)(3). If the signed WSR is not received within 45 days, the waste generator must report, in writing, to the responsible NESHAP program agency and send along a copy of the WSR. 40 CFR 61.150(d)(4). Copies of WSRs, including those signed by the disposal site operator, must be retained for at least 2 years. 40 CFR 61.150(d)(5).
V. Training
5.1. For those roof removals that are subject to the NESHAP, at least one on-site supervisor trained in the provisions of the NESHAP must be present during the removal of the asbestos roofing material. 40 CFR 61.145(c)(8). In EPA's view, this person can be a job foreman, a hired consultant, or someone who can represent the building owner or contractor responsible for the removal. In addition to the initial training requirement, a refresher training course is required every 2 years. The NESHAP training requirements became effective on November 20, 1991.
5.2. Asbestos training courses developed specifically to address compliance with the NESHAP in roofing work, as well as courses developed for other purposes can satisfy this requirement of the NESHAP, as long as the course covers the areas specified in the regulation. EPA believes that Asbestos Hazard Emergency Response Act (AHERA) training courses will, for example, satisfy the NESHAP training requirements. However, nothing in this interpretive rule or in the NESHAP shall be deemed to require that roofing contractors or roofing workers performing operations covered by the NESHAP must be trained or accredited under AHERA, as amended by the Asbestos School Hazard Abatement Reauthorization Act (ASHARA). Likewise, state or local authorities may independently impose additional training, licensing, or accreditation requirements on roofing contractors performing operations covered by the NESHAP, but such additional training, licensing or accreditation is not called for by this interpretive rule or the federal NESHAP.
5.3. For removal of Category I asbestos containing roofing material where RB roof cutters or equipment that similarly damages the asbestos-containing roofing material are used, the NESHAP training requirements (§ 61.145(c)(8)) apply as discussed in Section I above. It is EPA's intention that removal of Category I asbestos-containing roofing material using hatchets, axes, knives, and/or the use of spud bars, pry bars and shovels to lift the roofing material, or similar removal methods that slice, punch, or shear the roof membrane are not subject to the training requirements, since these methods do not cause the roof removal to be subject to the NESHAP. Likewise, it is EPA's intention that roof removal operations involving Category II nonfriable ACM are not subject to the training requirements where such operations are not subject to the NESHAP as discussed in section I above.
[59 FR 31158, June 17, 1994, as amended at 60 FR 31920, June 19, 1995]

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Indiana Department of Environmental Management
Office of Air Quality

Attachment C to a Part 70 Operating Permit

Source Background and Description

Source Name:	Sycamore Ridge Landfill
Source Location:	5621 East Cottom Drive, Pimento, Indiana 47866
County:	Vigo
SIC Code:	4953
Permit No.:	T 167-30079-00116
Permit Reviewer:	Kimberly Cottrell

40 CFR 63, Subpart AAAA

40 CFR 63, Subpart AAAA - National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills

SOURCE: 68 FR 2238, Jan. 16, 2003, unless otherwise noted.

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What This Subpart Covers

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§ 63.1930 What is the purpose of this subpart?

This subpart establishes national emission standards for hazardous air pollutants for existing and new municipal solid waste (MSW) landfills. This subpart requires all landfills described in § 63.1935 to meet the requirements of 40 CFR part 60, subpart Cc or WWW and requires timely control of bioreactors. This subpart also requires such landfills to meet the startup, shutdown, and malfunction (SSM) requirements of the general provisions of this part and provides that compliance with the operating conditions shall be demonstrated by parameter monitoring results that are within the specified ranges. It also includes additional reporting requirements.

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§ 63.1935 Am I subject to this subpart?

You are subject to this subpart if you meet the criteria in paragraph (a) or (b) of this section.

(a) You are subject to this subpart if you own or operate a MSW landfill that has accepted waste since November 8, 1987 or has additional capacity for waste deposition and meets any one of the three criteria in paragraphs (a)(1) through (3) of this section:

(1) Your MSW landfill is a major source as defined in 40 CFR 63.2 of subpart A.

(2) Your MSW landfill is collocated with a major source as defined in 40 CFR 63.2 of subpart A.

(3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to § 60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan that applies to your landfill.

(b) You are subject to this subpart if you own or operate a MSW landfill that has accepted waste since November 8, 1987 or has additional capacity for waste deposition, that includes a bioreactor, as defined in § 63.1990, and that meets any one of the criteria in paragraphs (b)(1) through (3) of this section:

(1) Your MSW landfill is a major source as defined in 40 CFR 63.2 of subpart A.

(2) Your MSW landfill is collocated with a major source as defined in 40 CFR 63.2 of subpart A.

(3) Your MSW landfill is an area source landfill that has a design capacity equal to our greater than 2.5 million Mg and 2.5 million m^3 and that is not permanently closed as of January 16, 2003.

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§ 63.1940 What is the affected source of this subpart?

(a) An affected source of this subpart is a MSW landfill, as defined in § 63.1990, that meets the criteria in § 63.1935(a) or (b). The affected source includes the entire disposal facility in a contiguous geographic space where household waste is placed in or on land, including any portion of the MSW landfill operated as a bioreactor.

(b) A new affected source of this subpart is an affected source that commenced construction or reconstruction after November 7, 2000. An affected source is reconstructed if it meets the definition of reconstruction in 40 CFR 63.2 of subpart A.

(c) An affected source of this subpart is existing if it is not new.

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§ 63.1945 When do I have to comply with this subpart?

(a) If your landfill is a new affected source, you must comply with this subpart by January 16, 2003 or at the time you begin operating, whichever is last.

(b) If your landfill is an existing affected source, you must comply with this subpart by January 16, 2004.

(c) If your landfill is a new affected source and is a major source or is collocated with a major source, you must comply with the requirements in §§ 63.1955(b) and 63.1960 through 63.1980 by the date your landfill is required to install a collection and control system by 40 CFR 60.752(b)(2) of subpart WWW.

(d) If your landfill is an existing affected source and is a major source or is collocated with a major source, you must comply with the requirements in §§ 63.1955(b) and 63.1960 through 63.1980 by the date your landfill is required to install a collection and control system by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or EPA approved and effective State or tribal plan that applies to your landfill or by January 13, 2004, whichever occurs later.

(e) If your landfill is a new affected source and is an area source meeting the criteria in § 63.1935(a)(3), you must comply with the requirements of §§ 63.1955(b) and 63.1960 through 63.1980 by the date your landfill is required to install a collection and control system by 40 CFR 60.752(b)(2) of subpart WWW.

(f) If your landfill is an existing affected source and is an area source meeting the criteria in § 63.1935(a)(3), you must comply with the requirements in §§ 63.1955(b) and 63.1960 through 63.1980 by the date your landfill is required to install a collection and control system by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or EPA approved and effective State or tribal plan that applies to your landfill or by January 16, 2004, whichever occurs later.

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§ 63.1947 When do I have to comply with this subpart if I own or operate a bioreactor?

You must comply with this subpart by the dates specified in § 63.1945(a) or (b) of this subpart. If you own or operate a bioreactor located at a landfill that is not permanently closed as of January 16, 2003 and has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3 , then you must install and operate a collection and control system that meets the criteria in 40 CFR 60.752(b)(2)(v) of part 60, subpart WWW, the Federal plan, or EPA approved and effective State plan according to the schedule specified in paragraph (a), (b), or (c) of this section.

(a) If your bioreactor is at a new affected source, then you must meet the requirements in paragraphs (a)(1) and (2) of this section:

(1) Install the gas collection and control system for the bioreactor before initiating liquids addition.

(2) Begin operating the gas collection and control system within 180 days after initiating liquids addition or within 180 days after achieving a moisture content of 40 percent by weight, whichever is later. If you choose to begin gas collection and control system operation 180 days after achieving a 40 percent moisture content instead of 180 days after liquids addition, use the procedures in § 63.1980(g) and (h) to determine when the bioreactor moisture content reaches 40 percent.

(b) If your bioreactor is at an existing affected source, then you must install and begin operating the gas collection and control system for the bioreactor by January 17, 2006 or by the date your bioreactor is required to install a gas collection and control system under 40 CFR part 60, subpart WWW, the Federal plan, or EPA approved and effective State plan or tribal plan that applies to your landfill, whichever is earlier.

(c) If your bioreactor is at an existing affected source and you do not initiate liquids addition to your bioreactor until later than January 17, 2006, then you must meet the requirements in paragraphs (c)(1) and (2) of this section:

(1) Install the gas collection and control system for the bioreactor before initiating liquids addition.
(2) Begin operating the gas collection and control system within 180 days after initiating liquids addition or within 180 days after achieving a moisture content of 40 percent by weight, whichever is later. If you choose to begin gas collection and control system operation 180 days after achieving a 40 percent moisture content instead of 180 days after liquids addition, use the procedures in § 63.1980(g) and (h) to determine when the bioreactor moisture content reaches 40 percent.

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§ 63.1950 When am I no longer required to comply with this subpart?

You are no longer required to comply with the requirements of this subpart when you are no longer required to apply controls as specified in 40 CFR 60.752(b)(2)(v) of subpart WWW, or the Federal plan or EPA approved and effective State plan or tribal plan that implements 40 CFR part 60, subpart Cc, whichever applies to your landfill.

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§ 63.1952 When am I no longer required to comply with the requirements of this subpart if I own or operate a bioreactor?

If you own or operate a landfill that includes a bioreactor, you are no longer required to comply with the requirements of this subpart for the bioreactor provided you meet the conditions of either paragraphs (a) or (b).
(a) Your affected source meets the control system removal criteria in 40 CFR 60.752(b)(2)(v) of part 60, subpart WWW or the bioreactor meets the criteria for a nonproductive area of the landfill in 40 CFR 60.759(a)(3)(ii) of part 60, subpart WWW.
(b) The bioreactor portion of the landfill is a closed landfill as defined in 40 CFR 60.751, subpart WWW, you have permanently ceased adding liquids to the bioreactor, and you have not added liquids to the bioreactor for at least 1 year. A closure report for the bioreactor must be submitted to the Administrator as provided in 40 CFR 60.757(d) of subpart WWW.
(c) Compliance with the bioreactor control removal provisions in this section constitutes compliance with 40 CFR part 60, subpart WWW or the Federal plan, whichever applies to your bioreactor.

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Standards

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§ 63.1955 What requirements must I meet?

(a) You must fulfill one of the requirements in paragraph (a)(1) or (2) of this section, whichever is applicable:
(1) Comply with the requirements of 40 CFR part 60, subpart WWW.
(2) Comply with the requirements of the Federal plan or EPA approved and effective State plan or tribal plan that implements 40 CFR part 60, subpart Cc.
(b) If you are required by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan to install a collection and control system, you must comply with the requirements in §§ 63.1960 through 63.1985 and with the general provisions of this part specified in table 1 of this subpart.
(c) For approval of collection and control systems that include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions, you must follow the procedures in 40 CFR 60.752(b)(2). If alternatives have already been approved under 40 CFR part 60 subpart WWW or the Federal plan, or EPA approved and effective State or tribal plan, these alternatives can be used to comply with this subpart, except that all affected sources must comply with the SSM requirements in Subpart A of this part as specified in Table 1 of this subpart and all affected sources must submit compliance reports every 6 months as specified in § 63.1980(a) and (b), including information on all deviations that occurred during the 6-month reporting period. Deviations for continuous emission monitors or numerical continuous parameter monitors must be determined using a 3 hour monitoring block average.
(d) If you own or operate a bioreactor that is located at a MSW landfill that is not permanently closed and has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3 , then you must meet the requirements of paragraph (a) and the additional requirements in paragraphs (d)(1) and (2) of this section.
(1) You must comply with the general provisions specified in Table 1 of this subpart and §§ 63.1960

through 63.1985 starting on the date you are required to install the gas collection and control system.
(2) You must extend the collection and control system into each new cell or area of the bioreactor prior to initiating liquids addition in that area, instead of the schedule in 40 CFR 60.752(b)(2)(ii)(A)(*2*).

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General and Continuing Compliance Requirements

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§ 63.1960 How is compliance determined?

Compliance is determined in the same way it is determined for 40 CFR part 60, subpart WWW, including performance testing, monitoring of the collection system, continuous parameter monitoring, and other credible evidence. In addition, continuous parameter monitoring data, collected under 40 CFR 60.756(b)(1), (c)(1), and (d) of subpart WWW, are used to demonstrate compliance with the operating conditions for control systems. If a deviation occurs, you have failed to meet the control device operating conditions described in this subpart and have deviated from the requirements of this subpart. Finally, you must develop a written SSM plan according to the provisions in 40 CFR 63.6(e)(3). A copy of the SSM plan must be maintained on site. Failure to write or maintain a copy of the SSM plan is a deviation from the requirements of this subpart.
[68 FR 2238, Jan. 16, 2003, as amended at 71 FR 20462, Apr. 20, 2006]

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§ 63.1965 What is a deviation?

A deviation is defined in § 63.1990. For the purposes of the landfill monitoring and SSM plan requirements, deviations include the items in paragraphs (a) through (c) of this section.
(a) A deviation occurs when the control device operating parameter boundaries described in 40 CFR 60.758(c)(1) of subpart WWW are exceeded.
(b) A deviation occurs when 1 hour or more of the hours during the 3-hour block averaging period does not constitute a valid hour of data. A valid hour of data must have measured values for at least three 15-minute monitoring periods within the hour.
(c) A deviation occurs when a SSM plan is not developed or maintained on site.
[68 FR 2238, Jan. 16, 2003, as amended at 71 FR 20462, Apr. 20, 2006]

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§ 63.1975 How do I calculate the 3-hour block average used to demonstrate compliance?

Averages are calculated in the same way as they are calculated in 40 CFR part 60, subpart WWW, except that the data collected during the events listed in paragraphs (a), (b), (c), and (d) of this section are not to be included in any average computed under this subpart:
(a) Monitoring system breakdowns, repairs, calibration checks, and zero (low-level) and high-level adjustments.
(b) Startups.
(c) Shutdowns.
(d) Malfunctions.

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Notifications, Records, and Reports

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§ 63.1980 What records and reports must I keep and submit?

(a) Keep records and reports as specified in 40 CFR part 60, subpart WWW, or in the Federal plan, EPA approved State plan or tribal plan that implements 40 CFR part 60, subpart Cc, whichever applies to your landfill, with one exception: You must submit the annual report described in 40 CFR 60.757(f) every 6 months.
(b) You must also keep records and reports as specified in the general provisions of 40 CFR part 60 and this part as shown in Table 1 of this subpart. Applicable records in the general provisions include items such as SSM plans and the SSM plan reports.
(c) For bioreactors at new affected sources you must submit the initial semiannual compliance report and performance test results described in 40 CFR 60.757(f) within 180 days after the date you are required to begin operating the gas collection and control system by § 63.1947(a)(2) of this subpart.
(d) For bioreactors at existing affected sources, you must submit the initial semiannual compliance report and performance test results described in 40 CFR 60.757(f) within 180 days after the compliance date

specified in § 63.1947(b) of this subpart, unless you have previously submitted a compliance report for the bioreactor required by 40 CFR part 60, subpart WWW, the Federal plan, or an EPA approved and effective State plan or tribal plan.
(e) For bioreactors that are located at existing affected sources, but do not initiate liquids addition until later than the compliance date in § 63.1947(b) of this subpart, you must submit the initial semiannual compliance report and performance tests results described in 40 CFR 60.757(f) within 180 days after the date you are required to begin operating the gas collection and control system by § 63.1947(c) of this subpart.
(f) If you must submit a semiannual compliance report for a bioreactor as well as a semiannual compliance report for a conventional portion of the same landfill, you may delay submittal of a subsequent semiannual compliance report for the bioreactor according to paragraphs (f)(1) through (3) of this section so that the reports may be submitted on the same schedule.
(1) After submittal of your initial semiannual compliance report and performance test results for the bioreactor, you may delay submittal of the subsequent semiannual compliance report for the bioreactor until the date the initial or subsequent semiannual compliance report is due for the conventional portion of your landfill.
(2) You may delay submittal of your subsequent semiannual compliance report by no more than 12 months after the due date for submitting the initial semiannual compliance report and performance test results described in 40 CFR 60.757(f) for the bioreactor. The report shall cover the time period since the previous semiannual report for the bioreactor, which would be a period of at least 6 months and no more than 12 months.
(3) After the delayed semiannual report, all subsequent semiannual reports for the bioreactor must be submitted every 6 months on the same date the semiannual report for the conventional portion of the landfill is due.
(g) If you add any liquids other than leachate in a controlled fashion to the waste mass and do not comply with the bioreactor requirements in §§ 63.1947, 63.1955(c) and 63.1980(c) through (f) of this subpart, you must keep a record of calculations showing that the percent moisture by weight expected in the waste mass to which liquid is added is less than 40 percent. The calculation must consider the waste mass, moisture content of the incoming waste, mass of water added to the waste including leachate recirculation and other liquids addition and precipitation, and the mass of water removed through leachate or other water losses. Moisture level sampling or mass balances calculations can be used. You must document the calculations and the basis of any assumptions. Keep the record of the calculations until you cease liquids addition.
(h) If you calculate moisture content to establish the date your bioreactor is required to begin operating the collection and control system under § 63.1947(a)(2) or (c)(2), keep a record of the calculations including the information specified in paragraph (g) of this section for 5 years. Within 90 days after the bioreactor achieves 40 percent moisture content, report the results of the calculation, the date the bioreactor achieved 40 percent moisture content by weight, and the date you plan to begin collection and control system operation.

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Other Requirements and Information

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§ 63.1985 Who enforces this subpart?

(a) This subpart can be implemented and enforced by the U.S. EPA, or a delegated authority such as the applicable State, local, or tribal agency. If the EPA Administrator has delegated authority to a State, local, or tribal agency, then that agency as well as the U.S. EPA has the authority to implement and enforce this subpart. Contact the applicable EPA Regional Office to find out if this subpart is delegated to a State, local, or tribal agency.
(b) In delegating implementation and enforcement authority of this subpart to a State, local, or tribal agency under subpart E of this part, the authorities contained in paragraph (c) of this section are retained by the EPA Administrator and are not transferred to the State, local, or tribal agency.
(c) The authorities that will not be delegated to State, local, or tribal agencies are as follows. Approval of alternatives to the standards in § 63.1955. Where these standards reference another subpart, the cited provisions will be delegated according to the delegation provisions of the referenced subpart.

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§ 63.1990 What definitions apply to this subpart?

Terms used in this subpart are defined in the Clean Air Act, 40 CFR part 60, subparts A, Cc, and WWW; 40 CFR part 62, subpart GGG, and subpart A of this part, and this section that follows:

Bioreactor means a MSW landfill or portion of a MSW landfill where any liquid other than leachate (leachate includes landfill gas condensate) is added in a controlled fashion into the waste mass (often in combination with recirculating leachate) to reach a minimum average moisture content of at least 40 percent by weight to accelerate or enhance the anaerobic (without oxygen) biodegradation of the waste.

Deviation means any instance in which an affected source subject to this subpart, or an owner or operator of such a source:

(1) Fails to meet any requirement or obligation established by this subpart, including, but not limited to, any emissions limitation (including any operating limit) or work practice standard;

(2) Fails to meet any term or condition that is adopted to implement an applicable requirement in this subpart and that is included in the operating permit for any affected source required to obtain such a permit; or

(3) Fails to meet any emission limitation, (including any operating limit), or work practice standard in this subpart during SSM, regardless of whether or not such failure is permitted by this subpart.

Emissions limitation means any emission limit, opacity limit, operating limit, or visible emissions limit.

EPA approved State plan means a State plan that EPA has approved based on the requirements in 40 CFR part 60, subpart B to implement and enforce 40 CFR part 60, subpart Cc. An approved State plan becomes effective on the date specified in the notice published in the FEDERAL REGISTER announcing EPA's approval.

Federal plan means the EPA plan to implement 40 CFR part 60, subpart Cc for existing MSW landfills located in States and Indian country where State plans or tribal plans are not currently in effect. On the effective date of an EPA approved State or tribal plan, the Federal plan no longer applies. The Federal plan is found at 40 CFR part 62, subpart GGG.

Municipal solid waste landfill or MSW landfill means an entire disposal facility in a contiguous geographical space where household waste is placed in or on land. A municipal solid waste landfill may also receive other types of RCRA Subtitle D wastes (see § 257.2 of this chapter) such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste. Portions of a municipal solid waste landfill may be separated by access roads. A municipal solid waste landfill may be publicly or privately owned. A municipal solid waste landfill may be a new municipal solid waste landfill, an existing municipal solid waste landfill, or a lateral expansion.

Tribal plan means a plan submitted by a tribal authority pursuant to 40 CFR parts 9, 35, 49, 50, and 81 to implement and enforce 40 CFR part 60, subpart Cc.

Work practice standard means any design, equipment, work practice, or operational standard, or combination thereof, that is promulgated pursuant to section 112(h) of the Clean Air Act.

As stated in §§ 63.1955 and 63.1980, you must meet each requirement in the following table that applies to you.

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Table 1 to Subpart AAAA of Part 63—Applicability of NESHAP General Provisions to Subpart AAAA

Part 63 Citation	Description	Explanation
63.1(a)	Applicability: general applicability of NESHAP in this part	Affected sources are already subject to the provisions of paragraphs (a)(10)-(12) through the same provisions under 40 CFR, part 60 subpart A.
63.1(b)	Applicability determination for stationary sources	
63.1(e)	Title V permitting	
63.2	Definitions	

Part 63 Citation	Description	Explanation
63.4	Prohibited activities and circumvention	Affected sources are already subject to the provisions of paragraph (b) through the same provisions under 40 CFR, part 60 subpart A.
63.5(b)	Requirements for existing, newly constructed, and reconstructed sources	
63.6(e)	Operation and maintenance requirements, startup, shutdown and malfunction plan provisions	
63.6(f)	Compliance with nonopacity emission standards	Affected sources are already subject to the provisions of paragraphs (f)(1) and (2)(i) through the same provisions under 40 CFR, part 60 subpart A.
63.10(b)(2)(i)-(b)(2)(v)	General recordkeeping requirements	
63.10(d)(5)	If actions taken during a startup, shutdown and malfunction plan are consistent with the procedures in the startup, shutdown and malfunction plan, this information shall be included in a semi-annual startup, shutdown and malfunction plan report. Any time an action taken during a startup, shutdown and malfunction plan is not consistent with the startup, shutdown and malfunction plan, the source shall report actions taken within 2 working days after commencing such actions, followed by a letter 7 days after the event	
63.12(a)	These provisions do not preclude the State from adopting and enforcing any standard, limitation, etc., requiring permits, or requiring emissions reductions in excess of those specified	
63.15	Availability of information and confidentiality	

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Indiana Department of Environmental Management
Office of Air Quality

Attachment D to a Part 70 Operating Permit

Source Background and Description

Source Name:	Sycamore Ridge Landfill
Source Location:	5621 East Cottom Drive, Pimento, Indiana 47866
County:	Vigo County
SIC Code:	4953
Operation Permit No.:	T 167-30079-00116
Operation Permit Issuance Date:	December 19, 2011
Administrative Amendment No.:	167-32729-00116
Permit Reviewer:	David Matousek

40 CFR 63, Subpart CCCCCC

40 CFR 63, Subpart CCCCCC - National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities
SOURCE: 73 FR 1945, Jan. 10, 2008, unless otherwise noted.

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What This Subpart Covers

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§ 63.11110 What is the purpose of this subpart?

This subpart establishes national emission limitations and management practices for hazardous air pollutants (HAP) emitted from the loading of gasoline storage tanks at gasoline dispensing facilities (GDF). This subpart also establishes requirements to demonstrate compliance with the emission limitations and management practices.

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§ 63.11111 Am I subject to the requirements in this subpart?

(a) The affected source to which this subpart applies is each GDF that is located at an area source. The affected source includes each gasoline cargo tank during the delivery of product to a GDF and also includes each storage tank.
(b) If your GDF has a monthly throughput of less than 10,000 gallons of gasoline, you must comply with the requirements in § 63.11116.
(c) If your GDF has a monthly throughput of 10,000 gallons of gasoline or more, you must comply with the requirements in § 63.11117.
(d) If your GDF has a monthly throughput of 100,000 gallons of gasoline or more, you must comply with the requirements in § 63.11118.
(e) An affected source shall, upon request by the Administrator, demonstrate that their monthly throughput is less than the 10,000-gallon or the 100,000-gallon threshold level, as applicable. For new or reconstructed affected sources, as specified in § 63.11112(b) and (c), recordkeeping to document monthly throughput must begin upon startup of the affected source. For existing sources, as specified in § 63.11112(d), recordkeeping to document monthly throughput must begin on January 10, 2008. For existing sources that are subject to this subpart only because they load gasoline into fuel tanks other than those in motor vehicles, as defined in § 63.11132, recordkeeping to document monthly throughput must begin on January 24, 2011. Records required under this paragraph shall be kept for a period of 5 years.
(f) If you are an owner or operator of affected sources, as defined in paragraph (a) of this section, you are not required to obtain a permit under 40 CFR part 70 or 40 CFR part 71 as a result of being subject to this subpart. However, you must still apply for and obtain a permit under 40 CFR part 70 or 40 CFR part 71 if you meet one or more of the applicability criteria found in 40 CFR 70.3(a) and (b) or 40 CFR 71.3(a) and (b).
(g) The loading of aviation gasoline into storage tanks at airports, and the subsequent transfer of aviation

gasoline within the airport, is not subject to this subpart.
(h) Monthly throughput is the total volume of gasoline loaded into, or dispensed from, all the gasoline storage tanks located at a single affected GDF. If an area source has two or more GDF at separate locations within the area source, each GDF is treated as a separate affected source.
(i) If your affected source's throughput ever exceeds an applicable throughput threshold, the affected source will remain subject to the requirements for sources above the threshold, even if the affected source throughput later falls below the applicable throughput threshold.
(j) The dispensing of gasoline from a fixed gasoline storage tank at a GDF into a portable gasoline tank for the on-site delivery and subsequent dispensing of the gasoline into the fuel tank of a motor vehicle or other gasoline-fueled engine or equipment used within the area source is only subject to § 63.11116 of this subpart.
(k) For any affected source subject to the provisions of this subpart and another Federal rule, you may elect to comply only with the more stringent provisions of the applicable subparts. You must consider all provisions of the rules, including monitoring, recordkeeping, and reporting. You must identify the affected source and provisions with which you will comply in your Notification of Compliance Status required under § 63.11124. You also must demonstrate in your Notification of Compliance Status that each provision with which you will comply is at least as stringent as the otherwise applicable requirements in this subpart. You are responsible for making accurate determinations concerning the more stringent provisions, and noncompliance with this rule is not excused if it is later determined that your determination was in error, and, as a result, you are violating this subpart. Compliance with this rule is your responsibility and the Notification of Compliance Status does not alter or affect that responsibility.
[73 FR 1945, Jan. 10, 2008, as amended at 76 FR 4181, Jan. 24, 2011]

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§ 63.11112 What parts of my affected source does this subpart cover?

(a) The emission sources to which this subpart applies are gasoline storage tanks and associated equipment components in vapor or liquid gasoline service at new, reconstructed, or existing GDF that meet the criteria specified in § 63.11111. Pressure/Vacuum vents on gasoline storage tanks and the equipment necessary to unload product from cargo tanks into the storage tanks at GDF are covered emission sources. The equipment used for the refueling of motor vehicles is not covered by this subpart.
(b) An affected source is a new affected source if you commenced construction on the affected source after November 9, 2006, and you meet the applicability criteria in § 63.11111 at the time you commenced operation.
(c) An affected source is reconstructed if you meet the criteria for reconstruction as defined in § 63.2.
(d) An affected source is an existing affected source if it is not new or reconstructed.

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§ 63.11113 When do I have to comply with this subpart?

(a) If you have a new or reconstructed affected source, you must comply with this subpart according to paragraphs (a)(1) and (2) of this section, except as specified in paragraph (d) of this section.
(1) If you start up your affected source before January 10, 2008, you must comply with the standards in this subpart no later than January 10, 2008.
(2) If you start up your affected source after January 10, 2008, you must comply with the standards in this subpart upon startup of your affected source.
(b) If you have an existing affected source, you must comply with the standards in this subpart no later than January 10, 2011.
(c) If you have an existing affected source that becomes subject to the control requirements in this subpart because of an increase in the monthly throughput, as specified in § 63.11111(c) or § 63.11111(d), you must comply with the standards in this subpart no later than 3 years after the affected source becomes subject to the control requirements in this subpart.
(d) If you have a new or reconstructed affected source and you are complying with Table 1 to this subpart, you must comply according to paragraphs (d)(1) and (2) of this section.
(1) If you start up your affected source from November 9, 2006 to September 23, 2008, you must comply no later than September 23, 2008.
(2) If you start up your affected source after September 23, 2008, you must comply upon startup of your affected source.
(e) The initial compliance demonstration test required under § 63.11120(a)(1) and (2) must be conducted

as specified in paragraphs (e)(1) and (2) of this section.
(1) If you have a new or reconstructed affected source, you must conduct the initial compliance test upon installation of the complete vapor balance system.
(2) If you have an existing affected source, you must conduct the initial compliance test as specified in paragraphs (e)(2)(i) or (e)(2)(ii) of this section.
(i) For vapor balance systems installed on or before December 15, 2009, you must test no later than 180 days after the applicable compliance date specified in paragraphs (b) or (c) of this section.
(ii) For vapor balance systems installed after December 15, 2009, you must test upon installation of the complete vapor balance system.
(f) If your GDF is subject to the control requirements in this subpart only because it loads gasoline into fuel tanks other than those in motor vehicles, as defined in § 63.11132, you must comply with the standards in this subpart as specified in paragraphs (f)(1) or (f)(2) of this section.
(1) If your GDF is an existing facility, you must comply by January 24, 2014.
(2) If your GDF is a new or reconstructed facility, you must comply by the dates specified in paragraphs (f)(2)(i) and (ii) of this section.
(i) If you start up your GDF after December 15, 2009, but before January 24, 2011, you must comply no later than January 24, 2011.
(ii) If you start up your GDF after January 24, 2011, you must comply upon startup of your GDF.
[73 FR 1945, Jan. 10, 2008, as amended at 73 FR 35944, June 25, 2008; 76 FR 4181, Jan. 24, 2011]

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Emission Limitations and Management Practices

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§ 63.11115 What are my general duties to minimize emissions?

Each owner or operator of an affected source under this subpart must comply with the requirements of paragraphs (a) and (b) of this section.
(a) You must, at all times, operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.
(b) You must keep applicable records and submit reports as specified in § 63.11125(d) and § 63.11126(b).
[76 FR 4182, Jan. 24, 2011]

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§ 63.11116 Requirements for facilities with monthly throughput of less than 10,000 gallons of gasoline.

(a) You must not allow gasoline to be handled in a manner that would result in vapor releases to the atmosphere for extended periods of time. Measures to be taken include, but are not limited to, the following:
(1) Minimize gasoline spills;
(2) Clean up spills as expeditiously as practicable;
(3) Cover all open gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use;
(4) Minimize gasoline sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices, such as oil/water separators.
(b) You are not required to submit notifications or reports as specified in § 63.11125, § 63.11126, or subpart A of this part, but you must have records available within 24 hours of a request by the Administrator to document your gasoline throughput.
(c) You must comply with the requirements of this subpart by the applicable dates specified in § 63.11113.
(d) Portable gasoline containers that meet the requirements of 40 CFR part 59, subpart F, are considered acceptable for compliance with paragraph (a)(3) of this section.
[73 FR 1945, Jan. 10, 2008, as amended at 76 FR 4182, Jan. 24, 2011]

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§ 63.11117 Requirements for facilities with monthly throughput of 10,000 gallons of gasoline or more.

(a) You must comply with the requirements in section § 63.11116(a).
(b) Except as specified in paragraph (c) of this section, you must only load gasoline into storage tanks at your facility by utilizing submerged filling, as defined in § 63.11132, and as specified in paragraphs (b)(1), (b)(2), or (b)(3) of this section. The applicable distances in paragraphs (b)(1) and (2) shall be measured from the point in the opening of the submerged fill pipe that is the greatest distance from the bottom of the storage tank.
(1) Submerged fill pipes installed on or before November 9, 2006, must be no more than 12 inches from the bottom of the tank.
(2) Submerged fill pipes installed after November 9, 2006, must be no more than 6 inches from the bottom of the tank.
(3) Submerged fill pipes not meeting the specifications of paragraphs (b)(1) or (b)(2) of this section are allowed if the owner or operator can demonstrate that the liquid level in the tank is always above the entire opening of the fill pipe. Documentation providing such demonstration must be made available for inspection by the Administrator's delegated representative during the course of a site visit.
(c) Gasoline storage tanks with a capacity of less than 250 gallons are not required to comply with the submerged fill requirements in paragraph (b) of this section, but must comply only with all of the requirements in § 63.11116.
(d) You must have records available within 24 hours of a request by the Administrator to document your gasoline throughput.
(e) You must submit the applicable notifications as required under § 63.11124(a).
(f) You must comply with the requirements of this subpart by the applicable dates contained in § 63.11113.
[73 FR 1945, Jan. 10, 2008, as amended at 73 FR 12276, Mar. 7, 2008; 76 FR 4182, Jan. 24, 2011]

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§ 63.11118 Requirements for facilities with monthly throughput of 100,000 gallons of gasoline or more.

(a) You must comply with the requirements in §§ 63.11116(a) and 63.11117(b).
(b) Except as provided in paragraph (c) of this section, you must meet the requirements in either paragraph (b)(1) or paragraph (b)(2) of this section.
(1) Each management practice in Table 1 to this subpart that applies to your GDF.
(2) If, prior to January 10, 2008, you satisfy the requirements in both paragraphs (b)(2)(i) and (ii) of this section, you will be deemed in compliance with this subsection.
(i) You operate a vapor balance system at your GDF that meets the requirements of either paragraph (b)(2)(i)(A) or paragraph (b)(2)(i)(B) of this section.
(A) Achieves emissions reduction of at least 90 percent.
(B) Operates using management practices at least as stringent as those in Table 1 to this subpart.
(ii) Your gasoline dispensing facility is in compliance with an enforceable State, local, or tribal rule or permit that contains requirements of either paragraph (b)(2)(i)(A) or paragraph (b)(2)(i)(B) of this section.
(c) The emission sources listed in paragraphs (c)(1) through (3) of this section are not required to comply with the control requirements in paragraph (b) of this section, but must comply with the requirements in § 63.11117.
(1) Gasoline storage tanks with a capacity of less than 250 gallons that are constructed after January 10, 2008.
(2) Gasoline storage tanks with a capacity of less than 2,000 gallons that were constructed before January 10, 2008.
(3) Gasoline storage tanks equipped with floating roofs, or the equivalent.
(d) Cargo tanks unloading at GDF must comply with the management practices in Table 2 to this subpart.
(e) You must comply with the applicable testing requirements contained in § 63.11120.
(f) You must submit the applicable notifications as required under § 63.11124.
(g) You must keep records and submit reports as specified in §§ 63.11125 and 63.11126.
(h) You must comply with the requirements of this subpart by the applicable dates contained in § 63.11113.
[73 FR 1945, Jan. 10, 2008, as amended at 73 FR 12276, Mar. 7, 2008]

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Testing and Monitoring Requirements

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§ 63.11120 What testing and monitoring requirements must I meet?

(a) Each owner or operator, at the time of installation, as specified in § 63.11113(e), of a vapor balance system required under § 63.11118(b)(1), and every 3 years thereafter, must comply with the requirements in paragraphs (a)(1) and (2) of this section.

(1) You must demonstrate compliance with the leak rate and cracking pressure requirements, specified in item 1(g) of Table 1 to this subpart, for pressure-vacuum vent valves installed on your gasoline storage tanks using the test methods identified in paragraph (a)(1)(i) or paragraph (a)(1)(ii) of this section.

(i) California Air Resources Board Vapor Recovery Test Procedure TP-201.1E,—Leak Rate and Cracking Pressure of Pressure/Vacuum Vent Valves, adopted October 8, 2003 (incorporated by reference, see § 63.14).

(ii) Use alternative test methods and procedures in accordance with the alternative test method requirements in § 63.7(f).

(2) You must demonstrate compliance with the static pressure performance requirement specified in item 1(h) of Table 1 to this subpart for your vapor balance system by conducting a static pressure test on your gasoline storage tanks using the test methods identified in paragraphs (a)(2)(i), (a)(2)(ii), or (a)(2)(iii) of this section.

(i) California Air Resources Board Vapor Recovery Test Procedure TP-201.3,—Determination of 2-Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities, adopted April 12, 1996, and amended March 17, 1999 (incorporated by reference, see § 63.14).

(ii) Use alternative test methods and procedures in accordance with the alternative test method requirements in § 63.7(f).

(iii) Bay Area Air Quality Management District Source Test Procedure ST-30—Static Pressure Integrity Test—Underground Storage Tanks, adopted November 30, 1983, and amended December 21, 1994 (incorporated by reference, *see* § 63.14).

(b) Each owner or operator choosing, under the provisions of § 63.6(g), to use a vapor balance system other than that described in Table 1 to this subpart must demonstrate to the Administrator or delegated authority under paragraph § 63.11131(a) of this subpart, the equivalency of their vapor balance system to that described in Table 1 to this subpart using the procedures specified in paragraphs (b)(1) through (3) of this section.

(1) You must demonstrate initial compliance by conducting an initial performance test on the vapor balance system to demonstrate that the vapor balance system achieves 95 percent reduction using the California Air Resources Board Vapor Recovery Test Procedure TP-201.1,—Volumetric Efficiency for Phase I Vapor Recovery Systems, adopted April 12, 1996, and amended February 1, 2001, and October 8, 2003, (incorporated by reference, see § 63.14).

(2) You must, during the initial performance test required under paragraph (b)(1) of this section, determine and document alternative acceptable values for the leak rate and cracking pressure requirements specified in item 1(g) of Table 1 to this subpart and for the static pressure performance requirement in item 1(h) of Table 1 to this subpart.

(3) You must comply with the testing requirements specified in paragraph (a) of this section.

(c) Conduct of performance tests. Performance tests conducted for this subpart shall be conducted under such conditions as the Administrator specifies to the owner or operator based on representative performance (*i.e.,* performance based on normal operating conditions) of the affected source. Upon request, the owner or operator shall make available to the Administrator such records as may be necessary to determine the conditions of performance tests.

(d) Owners and operators of gasoline cargo tanks subject to the provisions of Table 2 to this subpart must conduct annual certification testing according to the vapor tightness testing requirements found in § 63.11092(f).

[73 FR 1945, Jan. 10, 2008, as amended at 76 FR 4182, Jan. 24, 2011]

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Notifications, Records, and Reports

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§ 63.11124 What notifications must I submit and when?

(a) Each owner or operator subject to the control requirements in § 63.11117 must comply with paragraphs (a)(1) through (3) of this section.

(1) You must submit an Initial Notification that you are subject to this subpart by May 9, 2008, or at the time you become subject to the control requirements in § 63.11117, unless you meet the requirements in paragraph (a)(3) of this section. If your affected source is subject to the control requirements in § 63.11117 only because it loads gasoline into fuel tanks other than those in motor vehicles, as defined in § 63.11132, you must submit the Initial Notification by May 24, 2011. The Initial Notification must contain the information specified in paragraphs (a)(1)(i) through (iii) of this section. The notification must be submitted to the applicable EPA Regional Office and delegated State authority as specified in § 63.13.

(i) The name and address of the owner and the operator.

(ii) The address (i.e., physical location) of the GDF.

(iii) A statement that the notification is being submitted in response to this subpart and identifying the requirements in paragraphs (a) through (c) of § 63.11117 that apply to you.

(2) You must submit a Notification of Compliance Status to the applicable EPA Regional Office and the delegated State authority, as specified in § 63.13, within 60 days of the applicable compliance date specified in § 63.11113, unless you meet the requirements in paragraph (a)(3) of this section. The Notification of Compliance Status must be signed by a responsible official who must certify its accuracy, must indicate whether the source has complied with the requirements of this subpart, and must indicate whether the facilities' monthly throughput is calculated based on the volume of gasoline loaded into all storage tanks or on the volume of gasoline dispensed from all storage tanks. If your facility is in compliance with the requirements of this subpart at the time the Initial Notification required under paragraph (a)(1) of this section is due, the Notification of Compliance Status may be submitted in lieu of the Initial Notification provided it contains the information required under paragraph (a)(1) of this section.

(3) If, prior to January 10, 2008, you are operating in compliance with an enforceable State, local, or tribal rule or permit that requires submerged fill as specified in § 63.11117(b), you are not required to submit an Initial Notification or a Notification of Compliance Status under paragraph (a)(1) or paragraph (a)(2) of this section.

(b) Each owner or operator subject to the control requirements in § 63.11118 must comply with paragraphs (b)(1) through (5) of this section.

(1) You must submit an Initial Notification that you are subject to this subpart by May 9, 2008, or at the time you become subject to the control requirements in § 63.11118. If your affected source is subject to the control requirements in § 63.11118 only because it loads gasoline into fuel tanks other than those in motor vehicles, as defined in § 63.11132, you must submit the Initial Notification by May 24, 2011. The Initial Notification must contain the information specified in paragraphs (b)(1)(i) through (iii) of this section. The notification must be submitted to the applicable EPA Regional Office and delegated State authority as specified in § 63.13.

(i) The name and address of the owner and the operator.

(ii) The address (i.e., physical location) of the GDF.

(iii) A statement that the notification is being submitted in response to this subpart and identifying the requirements in paragraphs (a) through (c) of § 63.11118 that apply to you.

(2) You must submit a Notification of Compliance Status to the applicable EPA Regional Office and the delegated State authority, as specified in § 63.13, in accordance with the schedule specified in § 63.9(h). The Notification of Compliance Status must be signed by a responsible official who must certify its accuracy, must indicate whether the source has complied with the requirements of this subpart, and must indicate whether the facility's throughput is determined based on the volume of gasoline loaded into all storage tanks or on the volume of gasoline dispensed from all storage tanks. If your facility is in compliance with the requirements of this subpart at the time the Initial Notification required under paragraph (b)(1) of this section is due, the Notification of Compliance Status may be submitted in lieu of the Initial Notification provided it contains the information required under paragraph (b)(1) of this section.

(3) If, prior to January 10, 2008, you satisfy the requirements in both paragraphs (b)(3)(i) and (ii) of this section, you are not required to submit an Initial Notification or a Notification of Compliance Status under paragraph (b)(1) or paragraph (b)(2) of this subsection.

(i) You operate a vapor balance system at your gasoline dispensing facility that meets the requirements of either paragraphs (b)(3)(i)(A) or (b)(3)(i)(B) of this section.

(A) Achieves emissions reduction of at least 90 percent.
(B) Operates using management practices at least as stringent as those in Table 1 to this subpart.
(ii) Your gasoline dispensing facility is in compliance with an enforceable State, local, or tribal rule or permit that contains requirements of either paragraphs (b)(3)(i)(A) or (b)(3)(i)(B) of this section.
(4) You must submit a Notification of Performance Test, as specified in § 63.9(e), prior to initiating testing required by § 63.11120(a) and (b).
(5) You must submit additional notifications specified in § 63.9, as applicable.
[73 FR 1945, Jan. 10, 2008, as amended at 73 FR 12276, Mar. 7, 2008; 76 FR 4182, Jan. 24, 2011]

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§ 63.11125 What are my recordkeeping requirements?

(a) Each owner or operator subject to the management practices in § 63.11118 must keep records of all tests performed under § 63.11120(a) and (b).
(b) Records required under paragraph (a) of this section shall be kept for a period of 5 years and shall be made available for inspection by the Administrator's delegated representatives during the course of a site visit.
(c) Each owner or operator of a gasoline cargo tank subject to the management practices in Table 2 to this subpart must keep records documenting vapor tightness testing for a period of 5 years. Documentation must include each of the items specified in § 63.11094(b)(2)(i) through (viii). Records of vapor tightness testing must be retained as specified in either paragraph (c)(1) or paragraph (c)(2) of this section.
(1) The owner or operator must keep all vapor tightness testing records with the cargo tank.
(2) As an alternative to keeping all records with the cargo tank, the owner or operator may comply with the requirements of paragraphs (c)(2)(i) and (ii) of this section.
(i) The owner or operator may keep records of only the most recent vapor tightness test with the cargo tank, and keep records for the previous 4 years at their office or another central location.
(ii) Vapor tightness testing records that are kept at a location other than with the cargo tank must be instantly available (*e.g.,* via e-mail or facsimile) to the Administrator's delegated representative during the course of a site visit or within a mutually agreeable time frame. Such records must be an exact duplicate image of the original paper copy record with certifying signatures.
(d) Each owner or operator of an affected source under this subpart shall keep records as specified in paragraphs (d)(1) and (2) of this section.
(1) Records of the occurrence and duration of each malfunction of operation (*i.e.,* process equipment) or the air pollution control and monitoring equipment.
(2) Records of actions taken during periods of malfunction to minimize emissions in accordance with § 63.11115(a), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.
[73 FR 1945, Jan. 10, 2008, as amended at 76 FR 4183, Jan. 24, 2011]

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§ 63.11126 What are my reporting requirements?

(a) Each owner or operator subject to the management practices in § 63.11118 shall report to the Administrator the results of all volumetric efficiency tests required under § 63.11120(b). Reports submitted under this paragraph must be submitted within 180 days of the completion of the performance testing.
(b) Each owner or operator of an affected source under this subpart shall report, by March 15 of each year, the number, duration, and a brief description of each type of malfunction which occurred during the previous calendar year and which caused or may have caused any applicable emission limitation to be exceeded. The report must also include a description of actions taken by an owner or operator during a malfunction of an affected source to minimize emissions in accordance with § 63.11115(a), including actions taken to correct a malfunction. No report is necessary for a calendar year in which no malfunctions occurred.
[76 FR 4183, Jan. 24, 2011]

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Other Requirements and Information

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§ 63.11130 What parts of the General Provisions apply to me?

Table 3 to this subpart shows which parts of the General Provisions apply to you.

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§ 63.11131 Who implements and enforces this subpart?

(a) This subpart can be implemented and enforced by the U.S. EPA or a delegated authority such as the applicable State, local, or tribal agency. If the U.S. EPA Administrator has delegated authority to a State, local, or tribal agency, then that agency, in addition to the U.S. EPA, has the authority to implement and enforce this subpart. Contact the applicable U.S. EPA Regional Office to find out if implementation and enforcement of this subpart is delegated to a State, local, or tribal agency.
(b) In delegating implementation and enforcement authority of this subpart to a State, local, or tribal agency under subpart E of this part, the authorities contained in paragraph (c) of this section are retained by the Administrator of U.S. EPA and cannot be transferred to the State, local, or tribal agency.
(c) The authorities that cannot be delegated to State, local, or tribal agencies are as specified in paragraphs (c)(1) through (3) of this section.
(1) Approval of alternatives to the requirements in §§ 63.11116 through 63.11118 and 63.11120.
(2) Approval of major alternatives to test methods under § 63.7(e)(2)(ii) and (f), as defined in § 63.90, and as required in this subpart.
(3) Approval of major alternatives to recordkeeping and reporting under § 63.10(f), as defined in § 63.90, and as required in this subpart.

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§ 63.11132 What definitions apply to this subpart?

As used in this subpart, all terms not defined herein shall have the meaning given them in the Clean Air Act (CAA), or in subparts A and BBBBBB of this part. For purposes of this subpart, definitions in this section supersede definitions in other parts or subparts.
Dual-point vapor balance system means a type of vapor balance system in which the storage tank is equipped with an entry port for a gasoline fill pipe and a separate exit port for a vapor connection.
Gasoline means any petroleum distillate or petroleum distillate/alcohol blend having a Reid vapor pressure of 27.6 kilopascals or greater, which is used as a fuel for internal combustion engines.
Gasoline cargo tank means a delivery tank truck or railcar which is loading or unloading gasoline, or which has loaded or unloaded gasoline on the immediately previous load.
Gasoline dispensing facility (GDF) means any stationary facility which dispenses gasoline into the fuel tank of a motor vehicle, motor vehicle engine, nonroad vehicle, or nonroad engine, including a nonroad vehicle or nonroad engine used solely for competition. These facilities include, but are not limited to, facilities that dispense gasoline into on- and off-road, street, or highway motor vehicles, lawn equipment, boats, test engines, landscaping equipment, generators, pumps, and other gasoline-fueled engines and equipment.
Monthly throughput means the total volume of gasoline that is loaded into, or dispensed from, all gasoline storage tanks at each GDF during a month. Monthly throughput is calculated by summing the volume of gasoline loaded into, or dispensed from, all gasoline storage tanks at each GDF during the current day, plus the total volume of gasoline loaded into, or dispensed from, all gasoline storage tanks at each GDF during the previous 364 days, and then dividing that sum by 12.
Motor vehicle means any self-propelled vehicle designed for transporting persons or property on a street or highway.
Nonroad engine means an internal combustion engine (including the fuel system) that is not used in a motor vehicle or a vehicle used solely for competition, or that is not subject to standards promulgated under section 7411 of this title or section 7521 of this title.
Nonroad vehicle means a vehicle that is powered by a nonroad engine, and that is not a motor vehicle or a vehicle used solely for competition.
Submerged filling means, for the purposes of this subpart, the filling of a gasoline storage tank through a submerged fill pipe whose discharge is no more than the applicable distance specified in § 63.11117(b) from the bottom of the tank. Bottom filling of gasoline storage tanks is included in this definition.
Vapor balance system means a combination of pipes and hoses that create a closed system between the vapor spaces of an unloading gasoline cargo tank and a receiving storage tank such that vapors displaced from the storage tank are transferred to the gasoline cargo tank being unloaded.
Vapor-tight means equipment that allows no loss of vapors. Compliance with vapor-tight requirements can be determined by checking to ensure that the concentration at a potential leak source is not equal to or greater than 100 percent of the Lower Explosive Limit when measured with a combustible gas

detector, calibrated with propane, at a distance of 1 inch from the source.
Vapor-tight gasoline cargo tank means a gasoline cargo tank which has demonstrated within the 12 preceding months that it meets the annual certification test requirements in § 63.11092(f) of this part.
[73 FR 1945, Jan. 10, 2008, as amended at 76 FR 4183, Jan. 24, 2011]

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Table 1 to Subpart CCCCCC of Part 63—Applicability Criteria and Management Practices for Gasoline Dispensing Facilities With Monthly Throughput of 100,000 Gallons of Gasoline or More[1]

If you own or operate	Then you must
1. A new, reconstructed, or existing GDF subject to § 63.11118	Install and operate a vapor balance system on your gasoline storage tanks that meets the design criteria in paragraphs (a) through (h).
	(a) All vapor connections and lines on the storage tank shall be equipped with closures that seal upon disconnect.
	(b) The vapor line from the gasoline storage tank to the gasoline cargo tank shall be vapor-tight, as defined in § 63.11132.
	(c) The vapor balance system shall be designed such that the pressure in the tank truck does not exceed 18 inches water pressure or 5.9 inches water vacuum during product transfer.
	(d) The vapor recovery and product adaptors, and the method of connection with the delivery elbow, shall be designed so as to prevent the over-tightening or loosening of fittings during normal delivery operations.
	(e) If a gauge well separate from the fill tube is used, it shall be provided with a submerged drop tube that extends the same distance from the bottom of the storage tank as specified in § 63.11117(b).
	(f) Liquid fill connections for all systems shall be equipped with vapor-tight caps.
	(g) Pressure/vacuum (PV) vent valves shall be installed on the storage tank vent pipes. The pressure specifications for PV vent valves shall be: a positive pressure setting of 2.5 to 6.0 inches of water and a negative pressure setting of 6.0 to 10.0 inches of water. The total leak rate of all PV vent valves at an affected facility, including connections, shall not exceed 0.17 cubic foot per hour at a pressure of 2.0 inches of water and 0.63 cubic foot per hour at a vacuum of 4 inches of water.
	(h) The vapor balance system shall be capable of meeting the static pressure performance requirement of the following equation:
	$Pf = 2e^{-500.887/v}$
	Where:
	Pf = Minimum allowable final pressure, inches of water.
	v = Total ullage affected by the test, gallons.
	e = Dimensionless constant equal to approximately 2.718.
	2 = The initial pressure, inches water.

If you own or operate	Then you must
2. A new or reconstructed GDF, or any storage tank(s) constructed after November 9, 2006, at an existing affected facility subject to § 63.11118	Equip your gasoline storage tanks with a dual-point vapor balance system, as defined in § 63.11132, and comply with the requirements of item 1 in this Table.

[1] The management practices specified in this Table are not applicable if you are complying with the requirements in § 63.11118(b)(2), except that if you are complying with the requirements in § 63.11118(b)(2)(i)(B), you must operate using management practices at least as stringent as those listed in this Table.

[73 FR 1945, Jan. 10, 2008, as amended at 73 FR 35944, June 25, 2008; 76 FR 4184, Jan. 24, 2011]

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Table 2 to Subpart CCCCCC of Part 63—Applicability Criteria and Management Practices for Gasoline Cargo Tanks Unloading at Gasoline Dispensing Facilities With Monthly Throughput of 100,000 Gallons of Gasoline or More

If you own or operate	Then you must
A gasoline cargo tank	Not unload gasoline into a storage tank at a GDF subject to the control requirements in this subpart unless the following conditions are met:
	(i) All hoses in the vapor balance system are properly connected,
	(ii) The adapters or couplers that attach to the vapor line on the storage tank have closures that seal upon disconnect,
	(iii) All vapor return hoses, couplers, and adapters used in the gasoline delivery are vapor-tight,
	(iv) All tank truck vapor return equipment is compatible in size and forms a vapor-tight connection with the vapor balance equipment on the GDF storage tank, and
	(v) All hatches on the tank truck are closed and securely fastened.
	(vi) The filling of storage tanks at GDF shall be limited to unloading from vapor-tight gasoline cargo tanks. Documentation that the cargo tank has met the specifications of EPA Method 27 shall be carried with the cargo tank, as specified in § 63.11125(c).

[73 FR 1945, Jan. 10, 2008, as amended at 76 FR 4184, Jan. 24, 2011]

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Table 3 to Subpart CCCCCC of Part 63—Applicability of General Provisions

Citation	Subject	Brief description	Applies to subpart CCCCCC
§ 63.1	Applicability	Initial applicability determination; applicability after standard established; permit requirements; extensions, notifications	Yes, specific requirements given in § 63.11111.
§ 63.1(c)(2)	Title V Permit	Requirements for obtaining a title V permit from the applicable permitting authority	Yes, § 63.11111(f) of subpart CCCCCC

Citation	Subject	Brief description	Applies to subpart CCCCCC
			exempts identified area sources from the obligation to obtain title V operating permits.
§ 63.2	Definitions	Definitions for part 63 standards	Yes, additional definitions in § 63.11132.
§ 63.3	Units and Abbreviations	Units and abbreviations for part 63 standards	Yes.
§ 63.4	Prohibited Activities and Circumvention	Prohibited activities; Circumvention, severability	Yes.
§ 63.5	Construction/Reconstruction	Applicability; applications; approvals	Yes, except that these notifications are not required for facilities subject to § 63.11116
§ 63.6(a)	Compliance with Standards/Operation & Maintenance—Applicability	General Provisions apply unless compliance extension; General Provisions apply to area sources that become major	Yes.
§ 63.6(b)(1)-(4)	Compliance Dates for New and Reconstructed Sources	Standards apply at effective date; 3 years after effective date; upon startup; 10 years after construction or reconstruction commences for CAA section 112(f)	Yes.
§ 63.6(b)(5)	Notification	Must notify if commenced construction or reconstruction after proposal	Yes.
§ 63.6(b)(6)	[Reserved]		
§ 63.6(b)(7)	Compliance Dates for New and Reconstructed Area Sources That Become Major	Area sources that become major must comply with major source standards immediately upon becoming major, regardless of whether required to comply when they were an area source	No.
§ 63.6(c)(1)-(2)	Compliance Dates for Existing Sources	Comply according to date in this subpart, which must be no later than 3 years after effective date; for CAA section 112(f) standards, comply within 90 days of effective date unless compliance extension	No, § 63.11113 specifies the compliance dates.
§ 63.6(c)(3)-(4)	[Reserved]		
§ 63.6(c)(5)	Compliance Dates for Existing Area Sources That Become	Area sources That become major must comply with major source standards by	No.

Citation	Subject	Brief description	Applies to subpart CCCCCC
	Major	date indicated in this subpart or by equivalent time period (e.g., 3 years)	
§ 63.6(d)	[Reserved]		
63.6(e)(1)(i)	General duty to minimize emissions	Operate to minimize emissions at all times; information Administrator will use to determine if operation and maintenance requirements were met.	No.*See* § 63.11115 for general duty requirement.
63.6(e)(1)(ii)	Requirement to correct malfunctions ASAP	Owner or operator must correct malfunctions as soon as possible.	No.
§ 63.6(e)(2)	[Reserved]		
§ 63.6(e)(3)	Startup, Shutdown, and Malfunction (SSM) Plan	Requirement for SSM plan; content of SSM plan; actions during SSM	No.
§ 63.6(f)(1)	Compliance Except During SSM	You must comply with emission standards at all times except during SSM	No.
§ 63.6(f)(2)-(3)	Methods for Determining Compliance	Compliance based on performance test, operation and maintenance plans, records, inspection	Yes.
§ 63.6(g)(1)-(3)	Alternative Standard	Procedures for getting an alternative standard	Yes.
§ 63.6(h)(1)	Compliance with Opacity/Visible Emission (VE) Standards	You must comply with opacity/VE standards at all times except during SSM	No.
§ 63.6(h)(2)(i)	Determining Compliance with Opacity/VE Standards	If standard does not State test method, use EPA Method 9 for opacity in appendix A of part 60 of this chapter and EPA Method 22 for VE in appendix A of part 60 of this chapter	No.
§ 63.6(h)(2)(ii)	[Reserved]		
§ 63.6(h)(2)(iii)	Using Previous Tests To Demonstrate Compliance With Opacity/VE Standards	Criteria for when previous opacity/VE testing can be used to show compliance with this subpart	No.
§ 63.6(h)(3)	[Reserved]		
§ 63.6(h)(4)	Notification of Opacity/VE Observation Date	Must notify Administrator of anticipated date of observation	No.
§ 63.6(h)(5)(i), (iii)-(v)	Conducting Opacity/VE Observations	Dates and schedule for conducting opacity/VE observations	No.
§ 63.6(h)(5)(ii)	Opacity Test Duration and Averaging Times	Must have at least 3 hours of observation with 30 6-minute averages	No.
§ 63.6(h)(6)	Records of Conditions During Opacity/VE Observations	Must keep records available and allow Administrator to inspect	No.

Citation	Subject	Brief description	Applies to subpart CCCCCC
§ 63.6(h)(7)(i)	Report Continuous Opacity Monitoring System (COMS) Monitoring Data From Performance Test	Must submit COMS data with other performance test data	No.
§ 63.6(h)(7)(ii)	Using COMS Instead of EPA Method 9	Can submit COMS data instead of EPA Method 9 results even if rule requires EPA Method 9 in appendix A of part 60 of this chapter, but must notify Administrator before performance test	No.
§ 63.6(h)(7)(iii)	Averaging Time for COMS During Performance Test	To determine compliance, must reduce COMS data to 6-minute averages	No.
§ 63.6(h)(7)(iv)	COMS Requirements	Owner/operator must demonstrate that COMS performance evaluations are conducted according to § 63.8(e); COMS are properly maintained and operated according to § 63.8(c) and data quality as § 63.8(d)	No.
§ 63.6(h)(7)(v)	Determining Compliance with Opacity/VE Standards	COMS is probable but not conclusive evidence of compliance with opacity standard, even if EPA Method 9 observation shows otherwise. Requirements for COMS to be probable evidence-proper maintenance, meeting Performance Specification 1 in appendix B of part 60 of this chapter, and data have not been altered	No.
§ 63.6(h)(8)	Determining Compliance with Opacity/VE Standards	Administrator will use all COMS, EPA Method 9 (in appendix A of part 60 of this chapter), and EPA Method 22 (in appendix A of part 60 of this chapter) results, as well as information about operation and maintenance to determine compliance	No.
§ 63.6(h)(9)	Adjusted Opacity Standard	Procedures for Administrator to adjust an opacity standard	No.
§ 63.6(i)(1)-(14)	Compliance Extension	Procedures and criteria for Administrator to grant compliance extension	Yes.
§ 63.6(j)	Presidential Compliance Exemption	President may exempt any source from requirement to comply with this subpart	Yes.
§ 63.7(a)(2)	Performance Test Dates	Dates for conducting initial performance testing; must conduct 180 days after compliance date	Yes.
§ 63.7(a)(3)	CAA Section 114 Authority	Administrator may require a	Yes.

Citation	Subject	Brief description	Applies to subpart CCCCCC
		performance test under CAA section 114 at any time	
§ 63.7(b)(1)	Notification of Performance Test	Must notify Administrator 60 days before the test	Yes.
§ 63.7(b)(2)	Notification of Re-scheduling	If have to reschedule performance test, must notify Administrator of rescheduled date as soon as practicable and without delay	Yes.
§ 63.7(c)	Quality Assurance (QA)/Test Plan	Requirement to submit site-specific test plan 60 days before the test or on date Administrator agrees with; test plan approval procedures; performance audit requirements; internal and external QA procedures for testing	Yes.
§ 63.7(d)	Testing Facilities	Requirements for testing facilities	Yes.
63.7(e)(1)	Conditions for Conducting Performance Tests	Performance test must be conducted under representative conditions	No, § 63.11120(c) specifies conditions for conducting performance tests.
§ 63.7(e)(2)	Conditions for Conducting Performance Tests	Must conduct according to this subpart and EPA test methods unless Administrator approves alternative	Yes.
§ 63.7(e)(3)	Test Run Duration	Must have three test runs of at least 1 hour each; compliance is based on arithmetic mean of three runs; conditions when data from an additional test run can be used	Yes.
§ 63.7(f)	Alternative Test Method	Procedures by which Administrator can grant approval to use an intermediate or major change, or alternative to a test method	Yes.
§ 63.7(g)	Performance Test Data Analysis	Must include raw data in performance test report; must submit performance test data 60 days after end of test with the Notification of Compliance Status; keep data for 5 years	Yes.
§ 63.7(h)	Waiver of Tests	Procedures for Administrator to waive performance test	Yes.
§ 63.8(a)(1)	Applicability of Monitoring Requirements	Subject to all monitoring requirements in standard	Yes.
§ 63.8(a)(2)	Performance Specifications	Performance Specifications in appendix B of 40 CFR part 60 apply	Yes.

Citation	Subject	Brief description	Applies to subpart CCCCCC
§ 63.8(a)(3)	[Reserved]		
§ 63.8(a)(4)	Monitoring of Flares	Monitoring requirements for flares in § 63.11 apply	Yes.
§ 63.8(b)(1)	Monitoring	Must conduct monitoring according to standard unless Administrator approves alternative	Yes.
§ 63.8(b)(2)-(3)	Multiple Effluents and Multiple Monitoring Systems	Specific requirements for installing monitoring systems; must install on each affected source or after combined with another affected source before it is released to the atmosphere provided the monitoring is sufficient to demonstrate compliance with the standard; if more than one monitoring system on an emission point, must report all monitoring system results, unless one monitoring system is a backup	No.
§ 63.8(c)(1)	Monitoring System Operation and Maintenance	Maintain monitoring system in a manner consistent with good air pollution control practices	No.
§ 63.8(c)(1)(i)-(iii)	Operation and Maintenance of Continuous Monitoring Systems (CMS)	Must maintain and operate each CMS as specified in § 63.6(e)(1); must keep parts for routine repairs readily available; must develop a written SSM plan for CMS, as specified in § 63.6(e)(3)	No.
§ 63.8(c)(2)-(8)	CMS Requirements	Must install to get representative emission or parameter measurements; must verify operational status before or at performance test	No.
§ 63.8(d)	CMS Quality Control	Requirements for CMS quality control, including calibration, etc.; must keep quality control plan on record for 5 years; keep old versions for 5 years after revisions	No.
§ 63.8(e)	CMS Performance Evaluation	Notification, performance evaluation test plan, reports	No.
§ 63.8(f)(1)-(5)	Alternative Monitoring Method	Procedures for Administrator to approve alternative monitoring	No.
§ 63.8(f)(6)	Alternative to Relative Accuracy Test	Procedures for Administrator to approve alternative relative accuracy tests for continuous emissions monitoring system (CEMS)	No.
§ 63.8(g)	Data Reduction	COMS 6-minute averages calculated	No.

Citation	Subject	Brief description	Applies to subpart CCCCCC
		over at least 36 evenly spaced data points; CEMS 1 hour averages computed over at least 4 equally spaced data points; data that cannot be used in average	
§ 63.9(a)	Notification Requirements	Applicability and State delegation	Yes.
§ 63.9(b)(1)-(2), (4)-(5)	Initial Notifications	Submit notification within 120 days after effective date; notification of intent to construct/reconstruct, notification of commencement of construction/reconstruction, notification of startup; contents of each	Yes.
§ 63.9(c)	Request for Compliance Extension	Can request if cannot comply by date or if installed best available control technology or lowest achievable emission rate	Yes.
§ 63.9(d)	Notification of Special Compliance Requirements for New Sources	For sources that commence construction between proposal and promulgation and want to comply 3 years after effective date	Yes.
§ 63.9(e)	Notification of Performance Test	Notify Administrator 60 days prior	Yes.
§ 63.9(f)	Notification of VE/Opacity Test	Notify Administrator 30 days prior	No.
§ 63.9(g)	Additional Notifications when Using CMS	Notification of performance evaluation; notification about use of COMS data; notification that exceeded criterion for relative accuracy alternative	Yes, however, there are no opacity standards.
§ 63.9(h)(1)-(6)	Notification of Compliance Status	Contents due 60 days after end of performance test or other compliance demonstration, except for opacity/VE, which are due 30 days after; when to submit to Federal vs. State authority	Yes, however, there are no opacity standards.
§ 63.9(i)	Adjustment of Submittal Deadlines	Procedures for Administrator to approve change when notifications must be submitted	Yes.
§ 63.9(j)	Change in Previous Information	Must submit within 15 days after the change	Yes.
§ 63.10(a)	Recordkeeping/Reporting	Applies to all, unless compliance extension; when to submit to Federal vs. State authority; procedures for owners of more than one source	Yes.
§ 63.10(b)(1)	Recordkeeping/Reporting	General requirements; keep all records readily available; keep for 5 years	Yes.

Citation	Subject	Brief description	Applies to subpart CCCCCC
§ 63.10(b)(2)(i)	Records related to SSM	Recordkeeping of occurrence and duration of startups and shutdowns	No.
§ 63.10(b)(2)(ii)	Records related to SSM	Recordkeeping of malfunctions	No.*See* § 63.11125(d) for recordkeeping of (1) occurrence and duration and (2) actions taken during malfunction.
§ 63.10(b)(2)(iii)	Maintenance records	Recordkeeping of maintenance on air pollution control and monitoring equipment	Yes.
§ 63.10(b)(2)(iv)	Records Related to SSM	Actions taken to minimize emissions during SSM	No.
§ 63.10(b)(2)(v)	Records Related to SSM	Actions taken to minimize emissions during SSM	No.
§ 63.10(b)(2)(vi)-(xi)	CMS Records	Malfunctions, inoperative, out-of-control periods	No.
§ 63.10(b)(2)(xii)	Records	Records when under waiver	Yes.
§ 63.10(b)(2)(xiii)	Records	Records when using alternative to relative accuracy test	Yes.
§ 63.10(b)(2)(xiv)	Records	All documentation supporting Initial Notification and Notification of Compliance Status	Yes.
§ 63.10(b)(3)	Records	Applicability determinations	Yes.
§ 63.10(c)	Records	Additional records for CMS	No.
§ 63.10(d)(1)	General Reporting Requirements	Requirement to report	Yes.
§ 63.10(d)(2)	Report of Performance Test Results	When to submit to Federal or State authority	Yes.
§ 63.10(d)(3)	Reporting Opacity or VE Observations	What to report and when	No.
§ 63.10(d)(4)	Progress Reports	Must submit progress reports on schedule if under compliance extension	Yes.
§ 63.10(d)(5)	SSM Reports	Contents and submission	No.*See* § 63.11126(b) for malfunction reporting requirements.

Citation	Subject	Brief description	Applies to subpart CCCCCC
§ 63.10(e)(1)-(2)	Additional CMS Reports	Must report results for each CEMS on a unit; written copy of CMS performance evaluation; two-three copies of COMS performance evaluation	No.
§ 63.10(e)(3)(i)-(iii)	Reports	Schedule for reporting excess emissions	No.
§ 63.10(e)(3)(iv)-(v)	Excess Emissions Reports	Requirement to revert to quarterly submission if there is an excess emissions and parameter monitor exceedances (now defined as deviations); provision to request semiannual reporting after compliance for 1 year; submit report by 30th day following end of quarter or calendar half; if there has not been an exceedance or excess emissions (now defined as deviations), report contents in a statement that there have been no deviations; must submit report containing all of the information in §§ 63.8(c)(7)-(8) and 63.10(c)(5)-(13)	No.
§ 63.10(e)(3)(iv)-(v)	Excess Emissions Reports	Requirement to revert to quarterly submission if there is an excess emissions and parameter monitor exceedances (now defined as deviations); provision to request semiannual reporting after compliance for 1 year; submit report by 30th day following end of quarter or calendar half; if there has not been an exceedance or excess emissions (now defined as deviations), report contents in a statement that there have been no deviations; must submit report containing all of the information in §§ 63.8(c)(7)-(8) and 63.10(c)(5)-(13)	No, § 63.11130(K) specifies excess emission events for this subpart.
§ 63.10(e)(3)(vi)-(viii)	Excess Emissions Report and Summary Report	Requirements for reporting excess emissions for CMS; requires all of the information in §§ 63.10(c)(5)-(13) and 63.8(c)(7)-(8)	No.
§ 63.10(e)(4)	Reporting COMS Data	Must submit COMS data with performance test data	No.
§ 63.10(f)	Waiver for Recordkeeping/Reporting	Procedures for Administrator to waive	Yes.
§ 63.11(b)	Flares	Requirements for flares	No.
§ 63.12	Delegation	State authority to enforce standards	Yes.

Citation	Subject	Brief description	Applies to subpart CCCCCC
§ 63.13	Addresses	Addresses where reports, notifications, and requests are sent	Yes.
§ 63.14	Incorporations by Reference	Test methods incorporated by reference	Yes.
§ 63.15	Availability of Information	Public and confidential information	Yes.

[73 FR 1945, Jan. 10, 2008, as amended at 76 FR 4184, Jan. 24, 2011]

Indiana Department of Environmental Management
Office of Air Quality

Addendum to the Technical Support Document (TSD) for a Part 70 Significant Permit Modification

Source Background and Description

Source Name:	**Sycamore Ridge Landfill**
Source Location:	**5621 East Cottom Drive, Pimento, Indiana 47866**
County:	**Vigo County**
SIC Code:	**4953**
Operation Permit No.:	**T 167-32729-00116**
Permit Reviewer:	**David Matousek**

On December 23, 2013, the Office of Air Quality (OAQ) had a notice published in the Tribune Star in Terre Haute, Indiana, stating Sycamore Ridge Landfill applied to modify its Part 70 Operating Permit. The modification included the addition of insignificant activities. One of these insignificant activities is subject to 40 CFR 63, Subpart CCCCCC and the requirements of the NESHAP were added to the Part 70 Operating Permit. Finally the landfill capacity was increased from 14,755,000 megagrams to 17,230,000 megagrams.

The notice also stated that the OAQ proposed to issue a Significant Permit Modification for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

Comments and Responses

IDEM, OAQ did not receive any comments during the public comment period.

Additional Changes

IDEM, OAQ has decided to make additional revisions to the permit as described below, with deleted language as ~~strikeouts~~ and new language **bolded**. The Technical Support Document (TSD) is used by IDEM, OAQ for historical purposes and it will not be updated. However, the permit will have the updated changes incorporated.

IDEM Change No. 1: <u>Updated Greenhouse Gas Global Warming Potentials (GWPs)</u>
U.S. EPA revised the global warming potential of methane proposed on October 30, 2009 from 21 to 25. In addition, U.S. EPA revised the global warming potential of nitrous oxide proposed on October 30, 2009 from 310 to 298. IDEM, OAQ is showing greenhouse gas emissions based on both GWPs. Technical Support Document - Appendix A, TSD Appendix A - page 25 of 25, 2022 Closure, Landfill Greenhouse Gas Emissions - 40 CFR 98, Subpart HH Method was updated to show both GWPs. Revisions are shown below:

****

Potential to Emit (CO_2e)	**2013 CH_4 GWP of 25**	**2009 CH_4 GWP of 21**	
PTE Methane as CO_2e (Non-Biogenic)	**601,150**	504,966	TPY CO_2e
PTE CO_2 as CO_2e (Biogenic)	**65,966**	65,966	TPY CO_2e
Total GHG Emissions (CO_2e)	**667,116**	570,932	TPY CO_2e

Limited and Controlled Potential to Emit (CO_2e)	**2013 CH_4 GWP of 25**	**2009 CH_4 GWP of 21**	
PTE Methane as CO_2e (Non-Biogenic with 98% Combustion)	**12,023**	10,099	TPY CO_2e
PTE CO_2 as CO_2e (Biogenic)	**65,966**	65,966	TPY CO_2e
Total GHG Emissions (CO_2e)	**77,989**	76,065	TPY CO_2e

No revisions to the permit are required because of this change.

IDEM Change No. 2: Updated GWPs and Greenhouse Gas Emission Calculations
Technical Support Document - Appendix A, page 11 of 25 for the Potential to Emit - Waste Oil Combustion Sources - Landfill Closure 2016, and Landfill Closure 2022 have been revised to include both the 2009 and 2013 GWPs. Greenhouse gas emissions were recalculated. Revisions are shown below and are identical for both spreadsheets:

****

CO2				22,000	lb/Kgallon	1,329	AP-42, Chapter 1.11, Table 1.11-3 October 1996
CH4				6.61E-03	lb/MMBtu	0.06	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.01	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e **(2009)**						0	All CO2 is **non-**biogenic
Non-Biogenic GHG as CO2e **(2009)**						1,333	~~CH4 and N2O are nonbiogenic~~
Biogenic GHG as CO2e (2013)						**0**	**All CO2 is non-biogenic**
Non-Biogenic GHG as CO2e (2013)						**1,333**	

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e **2009** (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

****

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e **2009** (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

No revisions to the permit are required because of this change.

IDEM Change No. 3: Updated GWPs and Greenhouse Gas Emission Calculations
Technical Support Document - Appendix A, page 10 of 25 for the Potential to Emit - Kerosene Combustion Sources - Landfill Closure 2016, and Landfill Closure 2022 have been revised to include both the 2009 and 2013 GWPs. Greenhouse gas emissions were recalculated. Revisions are shown below and are identical for both spreadsheets:

****

CO2				165.79	lb/Kgallon	1,452	AP-42, Chapter 1.11, Table 1.11-3 October 1996
CH4				6.61E-03	lb/MMBtu	0.06	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.01	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e **(2009)**						0	All CO2 is **non-**biogenic
Non-Biogenic GHG as CO2e **(2009)**						1,456	~~CH4 and N2O are nonbiogenic~~
Biogenic GHG as CO2e (2013)						**0**	**All CO2 is non-biogenic**
Non-Biogenic GHG as CO2e (2013)						**1,456**	

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
4) CO2e **2009 GWPs** (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 GWPs (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

No revisions to the permit are required because of this change.

IDEM Change No. 4: Updated GWPs and Greenhouse Gas Emission Calculations
Technical Support Document - Appendix A, page 9 of 25 for the Potential to Emit - Propane Combustion Sources - Landfill Closure 2016, and Landfill Closure 2022 have been revised to include both the 2009 and 2013 GWPs. Greenhouse gas emissions were recalculated. Revisions are shown below and are identical for both spreadsheets:

****

CO2				135.49	lb/Kgallon	3,561	AP-42, Chapter 1.11, Table 1.11-3 October 1996
CH4				6.61E-03	lb/MMBtu	0.17	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.03	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e **(2009)**						0	All CO2 is **non-**biogenic
Non-Biogenic GHG as CO2e **(2009)**						3,574	~~CH4 and N2O are nonbiogenic~~
Biogenic GHG as CO2e (2013)						**0**	**All CO2 is non-biogenic**
Non-Biogenic GHG as CO2e (2013)						**3,574**	

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e **2009 GWPs** (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 GWPs (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

No revisions to the permit are required because of this change.

IDEM Change No. 5: Updated GHG Emissions and GWPs - Landfill and Flares 2022
Technical Support Document - Appendix A, pages 6, 7, and 8 of 25, Greenhouse Gas Emissions - Landfill Closure 2022 have been revised to show both 2009 and 2013 GHG GWPs and to recalculate GHG emissions. Revisions are shown below:

****

Landfill Greenhouse Gas Emissions - Uncontrolled Case

					Potential to Emit	
Pollutant	LandGEM Pollutant Flow (SCFM)	Collected GHG Emissions (SCFM)	Collected GHG Emissions (TPY)	Landfill PTE (TPY CO_2e) **(2009/2013 GWPs)**	Biogenic CO_2 (TPY CO2e)	Non-Biogenic GHG (TPY CO2e) **(2009/2013 GWPs)**
CO_2	2,828	2,121	62,616	62,616	62,616	0
CH_4	2,828	2,121	22,821	479,247**/570,525**	0	479,247**/570,525**
N_2O	0	0	0	0	0	0
				Potential to Emit Biogenic CO_2 as TPY CO_2e =	62,616	
				Potential to Emit Non-Biogenic GHG as TPY CO_2e =		479,247**/570,525**

Methodology:
1) Collected GHG Emissions (SCFM) = LandGEM Pollutant Flow (SCFM) x Collection Efficiency
2) Collected GHG Emissions (TPY) = 360 x Collected Emissions (SCFM) x M.W. (lb/lb-mole) x Pressure (1 atm) / Temperature (R)
3) PTE (CO_2e **2009 GWPs**) = TPY CO_2 + [TPY CH_4 x global warming potential (21)] + [TPY N_2O x global warming potential (310)]
4) PTE (CO_2e 2013 GWPs) = TPY CO_2 + [TPY CH_4 x global warming potential (25)] + [TPY N_2O x global warming potential (298)]

****

Landfill Greenhouse Gas Emissions - Controlled Case

	Uncontrolled			Controlled	
Pollutant	Biogenic CO_2 (TPY CO_2e)	Non-Biogenic GHG (TPY CO_2e) **(2009/2013 GWPs)**	Flare Combustion / Destruction Efficiency	Biogenic CO_2 (TPY CO_2e)	Non-Biogenic CO_2e (TPY CO_2e) **(2009/2013 GWPs)**
CO_2	62,616	0	0%	62,616	0
CH_4	0	479,247**/570,525**	98%	0	9,585**/11,411**
N_2O	0	0	0%	0	0

Totals	62,616	9,585**/11,411**

****

Flare GCCS-VES Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:
1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e **2009 GWPs** = Uncombusted Methane (TPY CH_4) x **2009** global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R
5) Uncombusted Methane as TPY CO_2e 2013 GWPs= Uncombusted Methane (TPY CH_4) x 2013 global warming potential (25)

****

Methodology for ~~Methane and Carbon Dioxide~~**N_2O**:
1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBtu/yr) x 1 ton / 2,000 lb
5) **2009** N_2O (TPY as CO_2e) = N_2O (TPY) x **2009** global warming potential (310)
6) 2013 N_2O (TPY as CO_2e) = N_2O (TPY) x 2013 global warming potential (298)

Methane to Flare (SCFM)	558	SCFM CH_4
Methane Usage (MMCF/yr)	293.28	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
~~Landfill~~**Methane** Gas Heating Value	1,000	MMBtu/MMC**F**~~f~~
Methane Combusted (MMBtu/yr)	293,285	
N_2O (TPY)	0.20**4**	
2009 N_2O (TPY as CO_2e)	63	
2013 N_2O (TPY as CO_2e)	**61**	

Flare GCCS-VES Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e) **(2009/2013 GWPs)**
Methane to GCCS-VES / Combusted & Converted to CO_2	16,140	0
N_2O from Landfill Gas Combustion in Flare GCCS-VES	0	63**/61**
Total	16,140	63**/61**

****

Flare GCCS-SRL Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:
1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e **2009 GWPs** = Uncombusted Methane (TPY CH_4) x global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R
5) Uncombusted Methane as TPY CO_2e 2013 GWPs = Uncombusted Methane (TPY CH_4) x global warming potential (25)

~~**********~~

Methodology for ~~Methane and Carbon Dioxide~~**N_2O**:
1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBtu/yr) x 1 ton / 2,000 lb
5) **2009** N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (310)
6) 2013 N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (298)

Methane to Flare (SCFM)	977	SCFM CH_4
Methane Usage (MMCF/yr)	513.25	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
~~Landfill~~**Methane** Gas Heating Value	1,000	MMBtu/MMCF
Methane Combusted (MMBtu/yr)	513,248	
N_2O (TPY)	0.3**5**6	
2009 N_2O (TPY as CO_2e)	110	
2013 N_2O (TPY as CO_2e)	**106**	

Flare GCCS-**SRL**~~VES~~ Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e) **(2009/2013 GWPs)**
Methane to GCCS-**SRL**~~VES~~ / Combusted & Converted to CO_2	28,245	0
N_2O from Landfill Gas Combustion in Flare GCCS-**SRL**~~VES~~	0	110**/106**
Total	16,140	110**/106**

No revisions to the permit are required because of this change.

IDEM Change No. 6: Updated Sourcewide PTE Summary - 2022 Closure

IDEM, OAQ has updated the Potential to Emit after Issuance - After Expansion - Closure 2022, page 1 of 25 to reflect the changes detailed above for the 2022 closure. The greenhouse gas emissions shown use the most current GWPs. Revisions are shown below:

Uncontrolled Potential to Emit (ton/yr)						
Emission Unit	PM	***	Biogenic CO_2 (CO_2e)	Non-Biogenic GHG (CO2e)	***	Total HAPs
Landfill	0.00	***	62,616	~~479,247~~**570,525**	***	29.95
Flare - GCCS-VES 1,200 SCFM	2.49	***	(b)	(b)	***	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	***	(b)	(b)	***	2.16
Insignificant Activities						
Propane Combustion - Unit #13	0.06	***	0	3,574	***	0.00
Kerosene Combustion - Unit #20	0.13	***	0	1,456**.5**	***	0.00
Waste Oil Combustion - Unit #21	2.19	***	0	1,333**.5**	***	0.03
Unit #14 - Diesel Storage Tanks	0.00	***	0	0	***	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	***	0	0	***	negl.
Unit #23 - Gasoline Storage Tank	0.00	***	0	0	***	0.02
Other Insignificant Activities	negl.	***	negl.	negl.	***	negl.
Total PTE of Entire Source	9.23	***	62,616	~~485,610~~**576,889**	***	33.39
Title V Major Source Thresholds	100	***	100,000		***	25

Controlled Potential to Emit (ton/yr)						
Emission Unit	PM	***	Biogenic CO_2 (CO_2e)	Non-Biogenic GHG (CO2e)	***	Total HAPs
Landfill	0.00	***	62,616	~~9,585~~**11,411**	***	0.60
Flare - GCCS-VES 1,200 SCFM	2.49	***	16,140	~~6~~**361**	***	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	***	28,245	~~110~~**106**	***	2.16
Insignificant Activities						
Propane Combustion - Unit #13	0.06	***	0	3,574	***	0.00
Kerosene Combustion - Unit #20	0.13	***	0	1,456**.5**	***	0.00
Waste Oil Combustion - Unit #21	2.19	***	0	1,333**.5**	***	0.03
Unit #14 - Diesel Storage Tanks	0.00	***	0	0	***	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	***	0	0	***	negl.
Unit #23 - Gasoline Storage Tank	0.00	***	0	0	***	0.02
Other Misc. Insignificant	Negl.	***	Negl.	Negl.	***	Negl.
Total PTE of Entire Source	9.23	***	107,001	~~16,122~~**17,942**	***	4.04
PSD Major Source Thresholds	250	***	(a)		***	NA

No revisions to the permit are required because of this change.

IDEM Change No. 7: <u>Updated GHG Emissions and GWPs - Landfill and Flares 2016</u> Technical Support Document - Appendix A, pages 6, 7, and 8 of 25, Greenhouse Gas Emissions - Landfill Closure 2016 have been revised to show both 2009 and 2013 GHG GWPs and to recalculate GHG emissions. Revisions are shown below:

****

Landfill Greenhouse Gas Emissions - Uncontrolled Case

					Potential to Emit	
Pollutant	LandGEM Pollutant Flow (SCFM)	Collected GHG Emissions (SCFM)	Collected GHG Emissions (TPY)	Landfill PTE (TPY CO_2e) **(2009/2013 GWPs)**	Biogenic CO_2 (TPY CO2e)	Non-Biogenic GHG (TPY CO2e) **(2009/2013 GWPs)**
CO_2	2,772	2,079	61,376	61,376	61,376	0
CH_4	2,772	2,079	22,369	469,757**/559,225**	0	469,757**/559,225**
N_2O	0	0	0	0	0	0
				Potential to Emit Biogenic CO_2 as TPY CO_2e =	61,376	
				Potential to Emit Non-Biogenic GHG as TPY CO_2e =		469,757**/559,225**

Methodology:
1) Collected GHG Emissions (SCFM) = LandGEM Pollutant Flow (SCFM) x Collection Efficiency
2) Collected GHG Emissions (TPY) = 360 x Collected Emissions (SCFM) x M.W. (lb/lb-mole) x Pressure (1 atm) / Temperature (R)
3) PTE (CO_2e **2009 GWPs**) = TPY CO_2 + [TPY CH_4 x global warming potential (21)] + [TPY N_2O x global warming potential (310)]
4) PTE (CO_2e 2013 GWPs) = TPY CO_2 + [TPY CH_4 x global warming potential (25)] + [TPY N_2O x global warming potential (298)]

****

Landfill Greenhouse Gas Emissions - Controlled Case

	Uncontrolled			Controlled	
Pollutant	Biogenic CO_2 TPY CO_2e)	Non-Biogenic GHG (TPY CO_2e) **(2009/2013 GWPs)**	Flare Combustion / Destruction Efficiency	Biogenic CO_2 (TPY CO_2e)	Non-Biogenic CO_2e (TPY CO_2e) **(2009/2013 GWPs)**
CO_2	61,376	0	0%	61,376	0
CH_4	0	469,757**/559,225**	98%	0	9,395**/11,185**
N_2O	0	0	0%	0	0
			Totals	61,376	9,585**/11,185**

****

Flare GCCS-VES Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:
1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e **2009 GWPs** = Uncombusted Methane (TPY CH_4) x **2009** global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R
5) Uncombusted Methane as TPY CO_2e 2013 GWPs= Uncombusted Methane (TPY CH_4) x 2013 global warming potential (25)

****

Methodology for ~~Methane and Carbon Dioxide~~**N_2O**:
1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBtu/yr) x 1 ton / 2,000 lb
5) **2009** N_2O (TPY as CO_2e) = N_2O (TPY) x **2009** global warming potential (310)
6) 2013 N_2O (TPY as CO_2e) = N_2O (TPY) x 2013 global warming potential (298)

Methane to Flare (SCFM)	558	SCFM CH_4
Methane Usage (MMCF/yr)	293.28	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
Landfill Gas Heating Value	1,000	MMBtu/MMC**F**~~f~~
Methane Combusted (MMBtu/yr)	293,285	
N_2O (TPY)	0.20**4**	
2009 N_2O (TPY as CO_2e)	63	
2013 N_2O (TPY as CO_2e)	**61**	

Flare GCCS-VES Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e) **(2009/2013 GWPs)**
Methane to GCCS-VES / Combusted & Converted to CO_2	16,140	0
N_2O from Landfill Gas Combustion in Flare GCCS-VES	0	63**/61**
Total	16,140	63**/61**

****

Flare GCCS-SRL Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:
1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e **2009 GWPs** = Uncombusted Methane (TPY CH_4) x global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R
5) Uncombusted Methane as TPY CO_2e 2013 GWPs = Uncombusted Methane (TPY CH_4) x global warming potential (25)

****

Methodology for ~~Methane and Carbon Dioxide~~**N_2O**:
1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBtu/yr) x 1 ton / 2,000 lb
5) **2009** N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (310)
6) 2013 N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (298)

Methane to Flare (SCFM)	977	SCFM CH_4
Methane Usage (MMCF/yr)	513.25	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
Landfill Gas Heating Value	1,000	MMBtu/MMCF
Methane Combusted (MMBtu/yr)	513,248	
N_2O (TPY)	0.3**5**6	
2009 N_2O (TPY as CO_2e)	110	
2013 N_2O (TPY as CO_2e)	**106**	

Flare GCCS-**SRL**~~VES~~ Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e) **(2009/2013 GWPs)**
Methane to GCCS-**SRL**~~VES~~ / Combusted & Converted to CO_2	28,245	0
N_2O from Landfill Gas Combustion in Flare GCCS-**SRL**~~VES~~	0	110**/106**
Total	28,245	110**/106**

No revisions to the permit are required because of this change.

IDEM Change No. 8: Updated GWPs-Sourcewide Summary

Appendix A to the TSD - Sourcewide Summary, Potential to Emit after Issuance - Prior to Expansion - Closure 2016, page 1 of 25 was revised to include the revised greenhouse gas emissions. The figures shown are for the 2013 GWPs. Revisions are shown below:

Uncontrolled Potential to Emit (ton/yr)						
Emission Unit	PM	***	Biogenic CO_2 (CO_2e)	Non-Biogenic GHG (CO2e)	***	Total HAPs
Landfill	0.00	***	61,376	~~469,757~~**559,225**	***	29.95
Flare - GCCS-VES 1,200 SCFM	2.49	***	(b)	(b)	***	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	***	(b)	(b)	***	2.16

Insignificant Activities						
Propane Combustion - Unit #13	0.06	***	0	3,574	***	0.00
Kerosene Combustion - Unit #20	0.13	***	0	1,456**.5**	***	0.00
Waste Oil Combustion - Unit #21	2.19	***	0	1,333**.5**	***	0.03
Unit #14 - Diesel Storage Tanks	0.00	***	0	0	***	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	***	0	0	***	negl.
Unit #23 - Gasoline Storage Tank	0.00	***	0	0	***	0.02
Other Insignificant Activities	negl.	***	negl.	negl.	***	negl.
Total PTE of Entire Source	9.23	***	61,376	~~476,120~~**565,589**	***	33.39
Title V Major Source Thresholds	100	***	100,000		***	25

Controlled Potential to Emit (ton/yr)						
Emission Unit	PM	***	Biogenic CO_2 (CO_2e)	Non-Biogenic GHG (CO2e)	***	Total HAPs
Landfill	0.00	***	61,376	~~9,395~~**11,185**	***	0.60
Flare - GCCS-VES 1,200 SCFM	2.49	***	16,140	~~63~~**61**	***	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	***	28,245	~~110~~**106**	***	2.16

Insignificant Activities						
Propane Combustion - Unit #13	0.06	***	0	3,574	***	0.00
Kerosene Combustion - Unit #20	0.13	***	0	1,456**.5**	***	0.00
Waste Oil Combustion - Unit #21	2.19	***	0	1,333**.5**	***	0.03
Unit #14 - Diesel Storage Tanks	0.00	***	0	0	***	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	***	0	0	***	negl.
Unit #23 - Gasoline Storage Tank	0.00	***	0	0	***	0.02
Other Misc. Insignificant	Negl.	***	Negl.	Negl.	***	Negl.
Total PTE of Entire Source	9.23	***	105,761	~~15,932~~**17,716**	***	4.04
PSD Major Source Thresholds	250	***	(a)		***	NA

No revisions to the draft permit are required because of this change.

IDEM Change No. 9: Updated GWPs-Waste

IDEM, OAQ has updated the 326 IAC 2-7-10.5 Evaluation included in Appendix A to the Technical Support Document, page 25 of 25 for the 2016 closure calculations. Revisions are shown below:

Emissions Increase due to Landfill Capacity Increase (ton/year)				
Emission Unit	PM	Biogenic GHG as CO_2e	Non-CO_2 GHG as CO_2e	Total HAPs
Uncontrolled PTE After Modification	*****	62,616	~~479,241~~**570,525**	*****
Uncontrolled PTE Before Modification	*****	61,376	~~469,749~~**559,225**	*****
Net Change	*****	1,240	~~9,492~~**11,300**	*****

Uncontrolled Potential to Emit of the Project				
Emission Unit	PM	Biogenic GHG as CO_2e	Non-CO_2 GHG as CO_2e	Total HAPs
Landfill Capacity Increase	*****	1,240	~~9,492~~**11,300**	*****
Propane Combustion Unit ID #13	*****	*****	3,574	*****
Kerosene Combustion Unit ID #20	*****	*****	1,456**.5**	*****
Waste Oil Combustion Unit ID #21	*****	*****	1,333**.5**	*****
*****	*****	*****	*****	*****
Total for Project		*****	~~15,855~~**17,664**	*****
326 IAC 2-7-10.5 MSM Thresholds	*****	*****	---	*****

No revisions to the permit are required because of this change.

IDEM Change No. 10: Updated GWPs-Waste

IDEM, OAQ is updating Condition E.1.3 to include alternate operating parameters for wells VEGW04, G102, G108, G111, G120, and G121. Revisions to Condition E.1.3 are shown below:

E.1.3 Operational Standards for Collection and Control Systems [40 CFR 60.753] [326 IAC 12]

In order to comply with 40 CFR 60.752(b)(2)(iii), the Permittee shall:

(a) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55° C and with a nitrogen level less than 20 percent or an oxygen level less than 5 percent, except as indicated below:

(1) **********

(5) Pursuant to Significant Permit Modification No. 167-32729-00116, oxygen levels in the landfill gas well VEGW04 shall not exceed 21%.

(6) Pursuant to Significant Permit Modification No. 167-32729-00116, the landfill gas temperature at landfill gas wells G102, G108, G111, G120, and G121 shall not exceed 60 ºC (140 ºF). **********

IDEM Contact

(a) Questions regarding this Significant Permit Modification can be directed to David Matousek at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 232-8253 or toll free at 1-800-451-6027 extension 2-8253.

(b) A copy of the permit is available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/

(c) For additional information about air permits and how the public and interested parties can participate, refer to the IDEM's Guide for Citizen Participation and Permit Guide on the Internet at: www.idem.in.gov

Addendum to the Technical Support Document (ATSD) - Appendix A - Sourcewide Summary
Potential to Emit after Issuance - Prior to Expansion - Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Uncontrolled Potential to Emit (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic CO_2 as CO2e**	**Non-Biogenic GHG as CO2e**	**Toluene**	**Total HAPs**
Landfill	0.00	0.00	0.00	0.00	56.62	11.02	0.00	61,376	559,225	10.02	29.34
Flare - GCCS-VES 1,200 SCFM	2.49	2.49	2.49	2.40	0.32	64.18	11.79	(b)	(b)	0.00	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	4.36	4.36	4.21	0.56	111.82	20.55	(b)	(b)	0.00	2.16
Insignificant Activities											
Propane Combustion - Unit #13	0.06	0.20	0.20	0.01	0.29	2.15	3.73	0	3,574	0.00	0.00
Kerosene Combustion - Unit #20	0.13	0.21	0.21	0.46	0.02	0.32	1.30	0	1,456.5	0.00	0.00
Waste Oil Combustion - Unit #21	2.19	1.90	1.90	3.23	0.06	0.13	0.97	0	1,333.5	0.00	0.03
Unit #14 - Diesel Storage Tanks	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0	0	negl.	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0	0	negl.	negl.
Unit #23 - Gasoline Storage Tank	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	0.01	0.02
Other Insignificant Activities	negl.	negl.	negl.	negl.	5.48	negl.	negl.	negl.	negl.	0.00	negl.
Total PTE of Entire Source	**9.23**	**9.16**	**9.16**	**10.31**	**64.05**	**189.62**	**38.34**	**61,376**	**565,589**	**10.03**	**32.78**
Title V Major Source Thresholds	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100,000**		**10**	**25**

Controlled Potential to Emit (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic CO_2 as CO2e**	**Non-Biogenic GHG as CO2e**	**HCL**	**Total HAPs**
Landfill	0.00	0.00	0.00	0.00	1.13	0.22	0.00	61,376	11,185	0.00	0.59
Flare - GCCS-VES 1,200 SCFM	2.49	2.49	2.49	2.40	0.32	64.18	11.79	16,140	61	1.23	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	4.36	4.36	4.21	0.56	111.82	20.55	28,245	106	2.16	2.16
Insignificant Activities											
Propane Combustion - Unit #13	0.06	0.20	0.20	0.01	0.29	2.15	3.73	0	3,574	0.00	0.00
Kerosene Combustion - Unit #20	0.13	0.21	0.21	0.46	0.02	0.32	1.30	0	1,456.5	0.00	0.00
Waste Oil Combustion - Unit #21	2.19	1.90	1.90	3.23	0.06	0.13	0.97	0	1,333.5	0.00	0.03
Unit #14 - Diesel Storage Tanks	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0	0	negl.	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0	0	negl.	negl.
Unit #23 - Gasoline Storage Tank	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	0.00	0.02
Other Misc. Insignificant	Negl.	Negl.	Negl.	Negl.	5.48	Negl.	Negl.	Negl.	Negl.	0.00	Negl.
Total PTE of Entire Source	**9.23**	**9.16**	**9.16**	**10.31**	**8.56**	**178.82**	**38.34**	**105,761**	**17,716**	**3.39**	**4.03**
PSD Major Source Thresholds	**250**	**250**	**250**	**250**	**250**	**250**	**250**	**(a)**		**NA**	**NA**

Notes:

(a) Under Step 2 of the Greenhouse Gas (GHG) Tailoring Rule that went into effect on July 1, 2011, PSD applies to new sources that emit or have the potential to emit at least 100,000 TPY CO_2e or existing sources that emit at that level and that undertake a modification that increases emissions by at least 75,000 TPY CO_2e, and also emit at least 100/250 TPY of GHGs on a mass basis. On June 29, 2012, the U.S. EPA issued a final rule that did not revise the GHG permitting thresholds that were established in Step 1 or Step 2 of the GHG Tailoring Rule.

(b) The flare can be treated as an emission unit and a control device. In terms of PM, PM_{10}, $PM_{2.5}$, SO_2, VOC, CO, NO_x and HAPs, IDEM is treating the flare as an emission unit. Controlled emissions are based on the maximum heat input capacity to the flare. In terms of greenhouse gas (GHG) emissions, IDEM is treating the flare as a control device. For GHGs, the Uncontrolled Potential to Emit is based on the worst case scenario where the landfill gas is not controlled. The flare will not have significant GHG emissions in the uncontrolled case, because the only emissions would be those associated with natural gas combustion by the pilot in the flare. In the controlled case, the flare will have GHG emissions from the conversion of methane to carbon dioxide during combustion of the landfill gas. These emissions are detailed on Sheets 6, 7 and 8 of 25.

Addendum to the Technical Support Document (ATSD) - Appendix A - VOC Emissions from Landfill
Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Potential to Emit

NMOC Emissions
IDEM completed a computer simulation of the potential emissions from the landfill using US EPA LandGEM. This model indicated the highest emission rate of landfill gas will be reached in the year 2016. The potential to emit NMOC in 2016 is estimated at:

193.6 TPY

VOC Emissions
VOC emissions can be estimated from the NMOC emission rate using information provided in AP-42, Chapter 2.4, November 1998. IDEM estimates VOC emissions as shown below:

NMOC in Landfill Gas	595	ppmv	(AP-42, Chapter 2.4, Table 2.4-2, November 1998)
NMOC Emission Rate	193.60	TPY	
% VOC	39.00%		(AP-42, Chapter 2.4, Table 2.4-2, Note c, November 1998)
VOC Emission Rate	75.5	TPY	

Limited Potential to Emit

VOC Emissions
AP-42, Chapter 2.4, paragraph 2.4.4.2 - Controlled Emissions, October 2008 indicates approximately 75% of the VOC is captured, 25% is fugitive.

Landfill Collection Efficiency 75.00%

Landfill PTE from LandGEM 75.5 TPY

Fugitive VOC Emissions	= Landfill PTE from LandGEM x (1 - collection eff.)	18.88 TPY
VOC Emissions to Control Devices	= Landfill PTE from LandGEM - Fugitive VOC	56.62 TPY
Destruction Efficiency (NSPS Requirement)		98%
VOC Emissions after Control	= VOC to Control Device x (1 - Dest. Efficiency)	1.13 TPY

Addendum to the Technical Support Document(ATSD) - Appendix A - Emission Calculation Sheet
Potential to Emit - Landfill HAP and CO - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Temperature	536.67	°R
Atmospheric Pressure	1.00	atm
Maximum LandGEM LFG	5,544	SCFM
Capture Efficiency	75%	
Maximum Captured LFG	4,158	SCFM

PTE of CO						
Pollutant	**Molecular Weight**	**Concentration (ppmv)**	**Average Pollutant Flow (SCFM)**	**Landfill Emission (TPY)**	**Control Efficiency**	**Controlled PTE (TPY)**
CO at 4158 SCFM	28.01	141.00	0.5863	11.02	98%	0.22

PTE of Hazardous Air Pollutants - LandGEM - AP-42, Chapter 2.4, November 1998						
Pollutant	**Concentration (ppmv)**	**Molecular Weight**	**Avg. Pollutant Flow (SCFM)**	**Landfill PTE (TPY)**	**Control Efficiency**	**Controlled PTE (TPY)**
1,1,1-Trichloroethane	0.48	133.41	0.00200	0.17898	98%	3.58E-03
1,2,2,2-Tetrachloroethane	1.10	167.85	4.57E-03	5.15E-01	98%	1.03E-02
1,1-Dichloroethane	2.40	98.97	0.01000	0.66389	98%	1.33E-02
1,1-Dichloroethene	0.20	96.94	0.00080	0.05202	98%	1.04E-03
1,2-Dichloroethane	0.41	98.96	0.00170	0.11285	98%	2.26E-03
1,2-Dichloropropane	0.18	112.99	0.00075	0.05673	98%	1.13E-03
Acrylonitrile	6.30	53.06	0.02620	0.93237	98%	0.019
Benzene (1.9 or 11)	1.90	78.11	0.00790	0.41393	98%	8.28E-03
Carbon Disulfide	0.58	76.13	0.00240	0.12256	98%	2.45E-03
Carbon Tetrachloride	0.004	153.84	0.00000	0.00000	98%	0
Carbonyl Sulfide	0.49	60.07	0.00204	0.08210	98%	1.64E-03
Chlorobenzene	0.25	112.56	0.00100	0.07551	98%	1.51E-03
Chloroethane	1.30	64.52	0.00540	0.23371	98%	4.67E-03
Chloroform	0.03	119.39	0.00010	0.00801	98%	1.60E-04
Dichlorobenzene	0.21	147.00	0.00090	0.08875	98%	1.78E-03
Dichloromethane	14.00	84.94	0.05820	3.31612	98%	0.066
Ethylbenzene	4.60	106.16	0.01910	1.36016	98%	0.027
Ethylene Dibromide	0.001	187.88	0.00000	0.00000	98%	0
Hexane	6.60	86.18	0.02740	1.58399	98%	0.032
Mercury	2.90E-04	200.61	0.00000	0.00000	0%	0
Methyl Ethyl Ketone	7.10	72.11	0.02952	1.42802	98%	0.029
Methyl Isobutyl Ketone	1.90	100.16	0.00790	0.53078	98%	1.06E-02
Perchloroethylene	3.70	165.83	0.01540	1.71309	98%	0.034
Toluene (39 or 170)	**39.00**	**92.13**	**0.16220**	**10.02414**	**98%**	**0.200**
Trichloroethylene	2.80	131.40	0.01160	1.02247	98%	0.020
Vinyl Chloride	7.30	62.50	0.03040	1.27453	98%	0.025
Xylene	12.00	106.17	0.04990	3.55384	98%	0.071
				10.02	Highest	**0.20**
				29.34	Total	**0.59**

Methodology:

1) Average Flow (SCFM) = [Maximum Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]

2) PTE (tons/yr) = $\frac{360 \times \text{Average Flow (SCFM)} \times \text{MW (lb/lb mole)} \times \text{P (atm)}}{\text{T(°R)}}$

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - Flare GCCS-VES - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Flare Heat Input Capacity	39.60	MMBtu/hr	Molecular Weight (S)	32.07	lb/lb mole
Heating Value of Landfill Gas	550.00	Btu/CF	Molecular Weight (SO2)	64.06	lb/lb mole
Calculated Landfill Gas	1,200	SCFM	Molecular Weight (HCL)	36.458	lb/lb mole
Inlet Gas Temperature	536.67	R	Weight % Water in LFG	7.0%	
Inlet Gas Pressure	1	atm			
Maximum LGF Rate	1,200	SCFM			

Landfill Gas Flow Rate (Wet Basis)		Landfill Gas Flow Rate (Dry Basis)		% Methane	Methane Flow Rate (Dry Basis)		
1,200	SCFM	1,116	DSCFM	50.00%	558.00 SCFM	or	293.29 MMSCF/yr

Potential to Emit Calculations - Flare

Pollutant	Concentration (ppmv)	Pollutant Flow (SCFM)	Throughput (SCFM or MMBtu/hr)	Emission Factor		PTE (TPY)	Notes
PM			558	17.0	lb/MMCF CH4, dry basis	2.49	AP-42, Chapter 2.4, Table 2.4-5, 11/1998
PM10			558	17.0	lb/MMCF CH4, dry basis	2.49	Assumed the same as PM
PM2.5			558	17.0	lb/MMCF CH4, dry basis	2.49	Assumed the same as PM
S	46.9	0.056				1.20	AP-42, Chapter 2.4, page 2.4-8, 11/1998
SO2						2.40	PTE (SO2) = PTE (S) x MW (SO2) / MW (S)
CO			39.60	0.370	lb/MMBtu	64.18	Manufacturer Specification
NOx			39.60	0.068	lb/MMBtu	11.79	Manufacturer Specification
HCL	42	0.050				1.23	AP-42, Chapter 2.4, page 2.4-9, 11/1998
VOC						0.32	Applicant Estimate

Methodology:
1) Methane Flow Rate = Flare Gas Flow Rate x (% Methane)
2) AP-42 does not include emission factors for PM10 or PM2.5. They are assumed identical to PM.
3) DSCFM = SCFM (1 - % Water)
4) Pollutant Flow (SCFM) = [Total Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]
5) PTE (TPY) = Flow (CFM) x Emission Factor (lb/MMCF) x [MMCF/1,000,000 CF] x [60 min/hr] x [8,760 hr/yr] x [ton/2,000 lb]
6) PTE (TPY) = Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu) x [8,760 hr/yr] x [ton/2,000 lb]
7) CO2e = [TPY CO2] + 21 x [TPY CH4] + 310 x [TPY N2O]
8) PTE (tons/yr) = $\frac{360 \times Q_{pollutant} (CFM) \times MW (lb/lb\ mole) \times P (atm)}{T(°R)}$ (AP-42, Chapter 2.4, Eq. 4 - converted to US units)

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - Flare GCCS-SRL - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Flare Heat Input Capacity	69.00	MMBtu/hr	Molecular Weight (S)	32.07	lb/lb mole
Heating Value of Landfill Gas	550.00	Btu/CF	Molecular Weight (SO2)	64.06	lb/lb mole
Calculated Landfill Gas	2,091	SCFM	Molecular Weight (HCL)	36.458	lb/lb mole
Inlet Gas Temperature	536.67	R	Weight % Water in LFG	7.0%	
Inlet Gas Pressure	1	atm			
Maximum LGF Rate	2,100	SCFM			

Landfill Gas Flow Rate (Wet Basis)		Landfill Gas Flow Rate (Dry Basis)		% Methane	Methane Flow Rate (Dry Basis)		
2,100	SCFM	1,953	DSCFM	50.00%	976.50 SCFM	or	513.25 MMSCF/yr

Potential to Emit Calculations - Flare

Pollutant	Concentration (ppmv)	Pollutant Flow (SCFM)	Throughput (SCFM or MMBtu/hr)	Emission Factor		PTE (TPY)	Notes
PM			977	17.0	lb/MMCF CH4, dry basis	4.36	AP-42, Chapter 2.4, Table 2.4-5, 11/1998
PM10			977	17.0	lb/MMCF CH4, dry basis	4.36	Assumed the same as PM
PM2.5			977	17.0	lb/MMCF CH4, dry basis	4.36	Assumed the same as PM
S	46.9	0.098				2.11	AP-42, Chapter 2.4, page 2.4-8, 11/1998
SO2						4.21	PTE (SO2) = PTE (S) x MW (SO2) / MW (S)
CO			69.00	0.370	lb/MMBtu	111.82	Manufacturer Specification
NOx			69.00	0.068	lb/MMBtu	20.55	Manufacturer Specification
HCL	42	0.088				2.16	AP-42, Chapter 2.4, page 2.4-9, 11/1998
VOC						0.56	Applicant Estimate

Methodology:
1) Methane Flow Rate = Flare Gas Flow Rate x (% Methane)
2) AP-42 does not include emission factors for PM10 or PM2.5. They are assumed identical to PM.
3) DSCFM = SCFM (1 - % Water)
4) Pollutant Flow (SCFM) = [Total Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]
5) PTE (TPY) = Flow (CFM) x Emission Factor (lb/MMCF) x [MMCF/1,000,000 CF] x [60 min/hr] x [8,760 hr/yr] x [ton/2,000 lb]
6) PTE (TPY) = Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu) x [8,760 hr/yr] x [ton/2,000 lb]
7) CO2e = [TPY CO2] + 21 x [TPY CH4] + 310 x [TPY N2O]
8) PTE (tons/yr) = $\frac{360 \times Q_{pollutant} (CFM) \times MW (lb/lb\ mole) \times P (atm)}{T(°R)}$ (AP-42, Chapter 2.4, Eq. 4 - converted to US units)

Addendum to the Technical Support Document (ATSD) - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David Matousek
Date: October 7, 2013

Landfill Greenhouse Gas Emissions

Landfill Collection Efficiency	**75%**
Landfill Gas Temperature	**536.67 Rankine**
Molecular Weight of Methane	**16.04**
Molecular Weight of Carbon Dioxide	**44.01**

Landfill Greenhouse Gas Emissions - Uncontrolled Case

					Potential to Emit	
Pollutant	**LandGEM Pollutant Flow (SCFM)**	**Collected GHG Emissions (SCFM)**	**Collected GHG Emissions (TPY)**	**Landfill PTE (TPY CO_2e) (2009/2013 GWPs)**	**Biogenic CO_2 (TPY CO2e)**	**Non-Biogenic GHG (TPY CO2e) (2009/2013)**
CO_2	2,772	2,079	61,376	61,376	61,376	0
CH_4	2,772	2,079	22,369	469,757/559,225	0	469,757/559,225
N_2O	0	0	0	0	0	0
			Potential to Emit Biogenic CO_2 as TPY CO_2e =		**61,376**	
			Potential to Emit Non-Biogenic GHG as TPY CO_2e =			**469,757/559,225**

Methodology:
1) Collected GHG Emissions (SCFM) = LandGEM Pollutant Flow (SCFM) x Collection Efficiency
2) Collected GHG Emissions (TPY) = 360 x Collected Emissions (SCFM) x M.W. (lb/lb-mole) x Pressure (1 atm) / Temperature (R)
3) PTE (CO_2e 2009 GWPs) = TPY CO_2 + [TPY CH_4 x global warming potential (21)] + [TPY N_2O x global warming potential (310)]
4) PTE (CO_2e 2013 GWPs) = TPY CO_2 + [TPY CH_4 x global warming potential (25)] + [TPY N_2O x global warming potential (298)]

Landfill Greenhouse Gas Emissions - Controlled Case

	Uncontrolled			Controlled	
Pollutant	**Biogenic CO_2 (TPY CO_2e)**	**Non-Biogenic GHG (TPY CO_2e) (2009/2013 GWPs)**	**Flare Combustion / Destruction Efficiency**	**Biogenic CO_2 (TPY CO_2e)**	**Non-Biogenic CO_2e (TPY CO_2e) (2009/2013 GWPs)**
CO_2	61,376	0	0%	61,376	0
CH_4	0	469,757/559,225	98%	0	9,395/11,185
N_2O	0	0	0%	0	0
			Totals	**61,376**	**9,585/11,185**

(Continued Next Sheet)

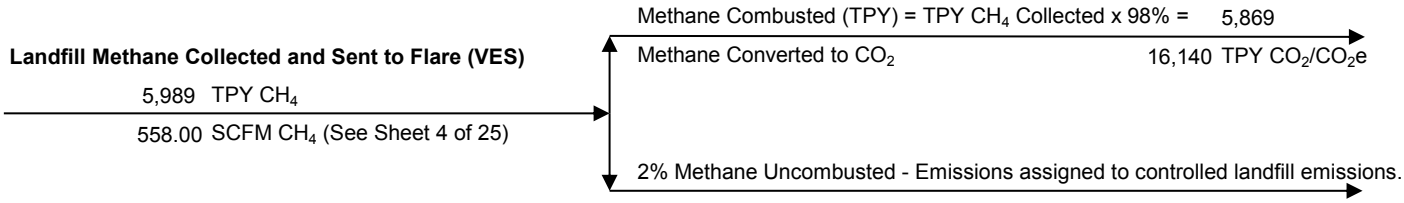
Addendum to the Technical Support Document (ATSD) - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2022

Flare GCCS-VES Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:

1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e 2009 GWPs = Uncombusted Methane (TPY CH_4) x 2009 global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R
5) Uncombusted Methane as TPY CO_2e 2013 GWPs= Uncombusted Methane (TPY CH_4) x 2013 global warming potential (25)



Methodology for N_2O:

1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBty/yr) x 1 ton / 2,000 lb
5) 2009 N_2O (TPY as CO_2e) = N_2O (TPY) x 2009 global warming potential (310)
6) 2013 N_2O (TPY as CO_2e) = N_2O (TPY) x 2013 global warming potential (298)

Methane to Flare (SCFM)	558	SCFM CH_4
Methane Usage (MMCF/yr)	293.28	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
Landfill Gas Heating Value	1,000	MMBtu/MMCF
Methane Combusted (MMBtu/yr)	293,285	
N_2O (TPY)	0.204	
2009 N_2O (TPY as CO_2e)	63	
2013 N_2O (TPY as CO_2e)	61	

Flare GCCS-VES Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e) (2009/2013 GWPs)
Methane to GCCS-VES / Combusted & Converted to CO_2	16,140	0
N2O from Landfill Gas Combustion in Flare GCCS-VES	0	63/61
Total	16,140	63/61

(Continued Next Sheet)

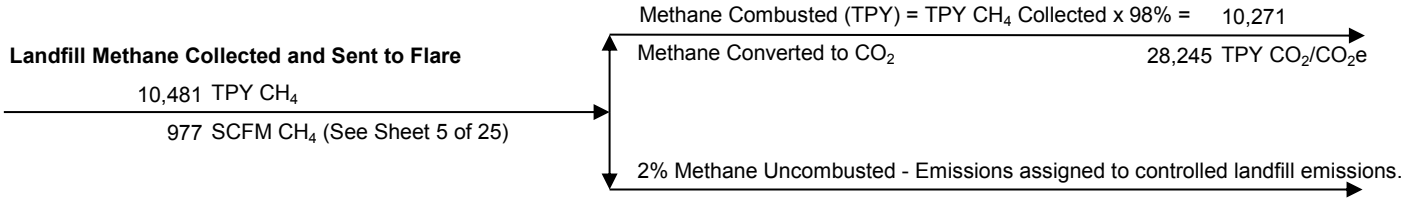
Addendum to the Technical Support Document (ATSD) - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2022

Flare GCCS-SRL Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:

1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e 2009 GWPs = Uncombusted Methane (TPY CH_4) x global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R
5) Uncombusted Methane as TPY CO_2e 2013 GWPs = Uncombusted Methane (TPY CH_4) x global warming potential (25)



Methodology for N_2O:

1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBty/yr) x 1 ton / 2,000 lb
5) 2009 N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (310)
6) 2013 N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (298)

Methane to Flare (SCFM)	977	SCFM CH_4
Methane Usage (MMCF/yr)	513.25	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
Landfill Gas Heating Value	1,000	MMBtu/MMCF
Methane Combusted (MMBtu/yr)	513,248	
N_2O (TPY)	0.356	
2009 N_2O (TPY as CO_2e)	110	
2013 N_2O (TPY as CO_2e)	106	

Flare GCCS-SRL Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e) (2009/2013 GWPs)
Methane to GCCS-SRL / Combusted & Converted to CO_2	28,245	0
N2O from Landfill Gas Combustion in Flare GCCS-SRL	0	110/106
Total	28,245	110/106

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Propane Combustion Sources - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	6.00	MMBtu/hr			
Heat Content of Propane	91,500	Btu/gallon			
Maximum Propane Usage	574.43	Kgallons/yr			
Sulfur Content	0.18	gr/100 FT^3	or	0.018	lb/Kgallon

Potential to Emit Calculations - Propane Combustion

Pollutant	Emission Factor		PTE (TPY)	Notes			
PM	0.2	lb/Kgallon	0.06	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
PM10	0.7	lb/Kgallon	0.20	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
PM2.5	0.7	lb/Kgallon	0.20	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
SO2	0.018	lb/Kgallon	0.01	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
VOC	1	lb/Kgallon	0.29	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
CO	7.5	lb/Kgallon	2.15	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
NOx	13	lb/Kgallon	3.73	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
CO2				135.49	lb/MMBtu	3,561	40 CFR 98, Subpart C, Table C-1 (61.46 kg/MMBtu)
CH4				6.61E-03	lb/MMBtu	0.17	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.03	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e (2009)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2009)						3,574	
Biogenic GHG as CO2e (2013)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2013)						3,574	

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e 2009 GWPs (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 GWPs (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Kerosene Combustion Sources - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	2.00	MMBtu/hr
Heat Content of Kerosene	135,000	Btu/gallon
Maximum Kerosene Usage	129.78	Kgallons/yr
Sulfur Content	0.05%	

Potential to Emit Calculations - Propane Combustion

Pollutant	Emission Factor		PTE (TPY)	Notes			
PM	2	lb/Kgallon	0.13	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
PM10	3.3	lb/Kgallon	0.21	AP-42, Chapter 1.3, Table 1.3-2, May 2010			
PM2.5	3.3	lb/Kgallon	0.21	AP-42, Chapter 1.3, Table 1.3-2, May 2010			
SO2	7.1	lb/Kgallon	0.46	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
VOC	0.252	lb/Kgallon	0.02	AP-42, Chapter 1.3, Table 1.3-3, May 2010			
CO	5	lb/Kgallon	0.32	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
NOx	20	lb/Kgallon	1.30	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
CO2				165.79	lb/MMBtu	1,452	40 CFR 98, Subpart C, Table C-1 (75.20 kg/MMBtu)
CH4				6.61E-03	lb/MMBtu	0.06	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.01	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e (2009)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2009)						1,456	
Biogenic GHG as CO2e (2013)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2013)						1,456	

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e 2009 GWPs (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 GWPs (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Waste Oil Combustion Sources - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	2.00	MMBtu/hr
Heat Content of Waste Oil	145,000	Btu/gallon
Maximum Waste Oil Usage	120.83	Kgallons/yr
Sulfur Content	0.50%	Typical for Fuel Oil
Ash Content	0.55%	Ash Content of Motor Oil

Potential to Emit Calculations

Pollutant	Emission Factor		PTE (TPY)	Notes
PM	36.3	lb/Kgallon	2.19	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM = 66A
PM10	31.4	lb/Kgallon	1.90	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM10 = 57A
PM2.5	31.4	lb/Kgallon	1.90	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM2.5 = 57A
SO2	53.5	lb/Kgallon	3.23	AP-42, Chapter 1.11, Table 1.11-3, October 1996: SO2 = 107S
VOC	1.0	lb/Kgallon	0.06	AP-42, Chapter 1.3, Table 1.3-3, May 2010
CO	2.1	lb/Kgallon	0.13	AP-42, Chapter 1.11, Table 1.11-3, October 1996
NOx	16	lb/Kgallon	0.97	AP-42, Chapter 1.11, Table 1.11-3, October 1996

CO2				22,000	lb/Kgallon	1,329	AP-42, Chapter 1.11, Table 1.11-3 October 1996
CH4				6.61E-03	lb/MMBtu	0.06	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.01	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e (2009)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2009)						1,333	
Biogenic GHG as CO2e (2013)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2013)						1,333	

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e 2009 (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Waste Oil Combustion Sources - Continued

HAP Calculations

Pollutant	Emission Factor		PTE (TPY)	Notes
Antimony	4.50E-03	lb/Kgallon	2.72E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Arsenic	6.00E-02	lb/Kgallon	3.62E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Beryllium	1.80E-03	lb/Kgallon	1.09E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Cadmium	1.20E-02	lb/Kgallon	7.25E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Chromium	0.18	lb/Kgallon	1.09E-02	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Cobalt	0.0052	lb/Kgallon	3.14E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Manganese	0.05	lb/Kgallon	3.02E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Nickel	0.15	lb/Kgallon	9.06E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Phenol	2.80E-05	lb/Kgallon	1.69E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Naphthalene	9.20E-05	lb/Kgallon	5.56E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Anthracene	1.00E-04	lb/Kgallon	6.04E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Dibutylphthalate	3.40E-05	lb/Kgallon	2.05E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Pyrene	8.30E-06	lb/Kgallon	5.01E-07	AP-42, Chapter 1.11, Table 1.11-5, October 1996

Worst Case HAP - Chromium **0.01** **TPY**

Total HAP **0.03** **TPY**

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e 2009 (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline Above Ground Storage Tank (AST)

Company: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana, 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 16, 2013

1.) Temperature Data

Temperature Attenuation Factor = 0.17 (0.80 insulated tank, 0.17 non-insulated tank)

Key to Table 1 - Temperature Data for Indianapolis, Indiana

T_{ax} = Daily maximum ambient temperature, AP-42, Table 7.1-3, 11/2006
T_{an} = Daily minimum ambient temperature, AP-42, Table 7.1-3, 11/2006
T_{ln} = Daily minimum liquid surface temperature, see Eq. 1 in methodology.
T_{lx} = Daily maximum liquid surface temperature, see Eq. 1 in methodology.
T_{la} = Daily average liquid surface temperature, see Eq. 2 in methodology.
ΔT_v = Daily vapor temperature range, see Eq. 3 in methodology.

Table 1 - Temperature Data for Indianapolis, Indiana

Month	T_{ax} (°F)	T_{an} (°F)	Temperature Average (°F)	Temperature Range (°F or °R)	T_{ln} (°R)	T_{lx} (°R)	T_{la} (°R)	ΔT_V (°R)
January	34.2	18.8	26.50	15.40	480.11	492.89	486.50	12.78
February	38.5	21.1	29.80	17.40	482.58	497.02	489.80	14.44
March	49.3	30.7	40.00	18.60	492.28	507.72	500.00	15.44
April	63.1	41.7	52.40	21.40	503.52	521.28	512.40	17.76
May	73.4	51.5	62.45	21.90	513.36	531.54	522.45	18.18
June	82.3	60.9	71.60	21.40	522.72	540.48	531.60	17.76
July	85.2	64.9	75.05	20.30	526.63	543.47	535.05	16.85
August	83.7	62.7	73.20	21.00	524.49	541.92	533.20	17.43
September	77.9	55.3	66.60	22.60	517.22	535.98	526.60	18.76
October	66.1	43.4	54.75	22.70	505.33	524.17	514.75	18.84
November	50.8	32.8	41.80	18.00	494.33	509.27	501.80	14.94
December	39.2	23.7	31.45	15.50	485.02	497.88	491.45	12.87

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

2) Pressure Data

S = ASTM-D86 distillation slope at 10 volume percent evaporation, AP-42, Table 7.1-4, 11/06	3.00	(°F/vol%)
P_{BP} = Breather vent pressure setting, psi	0.0722	psi
P_{BV} = Breather vent vacuum setting, psi	-0.1444	psi
$\Delta P_B = P_{BP} - P_{BV}$, psi	0.2166	psi

Key to Table 2 - Pressure Data for Indianapolis, Indiana

1) A = Vapor pressure equation constant, dimensionless, see Eq. 9 in methodology
2) B = Vapor pressure equation constant, °R, see Eq. 9 in methodology
3) T_{ln} = Daily minimum liquid surface temperature, Calulated in Table 1
4) T_{lx} = Daily maximum liquid surface temperature, Calculated in Table 1
5) T_{la} = Daily average liquid surface temperature, Calculated in Table 1
6) P_{vx} = Vapor pressure at daily maximum liquid surface temperature, psi, see Eq. 11 in methodology
7) P_{vn} = Vapor pressure at dauly minimum liquid surfact temperature, psi, see Eq. 12 in methodology
8) ΔP_v = Daily vapor pressure range, see Eq. 10 in methodology
9) P_{va} = True vapor pressure, see Eq. 7 in methodology

Table 2 - Pressure Data for Indianapolis, Indiana

Month	Reid Vapor Pressure (psi)	A (no units)	B (°R)	T_{ln} (°R)	T_{lx} (°R)	T_{la} (°R)	P_{vx} (psi)	P_{vn} (psi)	ΔP_v (psi)	P_{va} (psi)
January	9.0	11.76	5,315.06	480.11	492.89	486.50	2.65	1.99	0.66	2.30
February	9.0	11.76	5,315.06	482.58	497.02	489.80	2.90	2.11	0.79	2.48
March	9.0	11.76	5,315.06	492.28	507.72	500.00	3.64	2.62	1.02	3.09
April	9.0	11.76	5,315.06	503.52	521.28	512.40	4.77	3.33	1.44	4.00
May	9.0	11.76	5,315.06	513.36	531.54	522.45	5.81	4.08	1.73	4.88
June	7.8	11.80	5,420.70	522.72	540.48	531.60	5.89	4.19	1.70	4.98
July	7.8	11.80	5,420.70	526.63	543.47	535.05	6.23	4.52	1.70	5.32
August	7.8	11.80	5,420.70	524.49	541.92	533.20	6.05	4.34	1.71	5.14
September	7.8	11.80	5,420.70	517.22	535.98	526.60	5.42	3.75	1.66	4.52
October	9.0	11.76	5,315.06	505.33	524.17	514.75	5.05	3.46	1.59	4.19
November	9.0	11.76	5,315.06	494.33	509.27	501.80	3.75	2.74	1.02	3.21
December	9.0	11.76	5,315.06	485.02	497.88	491.45	2.96	2.23	0.73	2.57

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

3) Standing Loss Calculation

Storage tank volume	1000	gallons	
V_v = Tank vapor space volume (1/2 total volume)	500	gallons	66.836 ft^3

Key to Table 3 - Storage Tanks Standing Losses

1) ΔT_v = Daily vapor temperature range, calculated in Table 1
2) T_{la} = Daily average liquid surface temperature, calculated in Table 1
3) ΔP_v = Daily vapor pressure range, calculated in Table 2
4) K_s = Assumed to equal one. No roof outage.
5) K_E = Vapor space expansion factor, see Eq. 8 in methodology
6) W_v = Vapor density, see Eq. 6 in methodology
7) L_s = Standing storage losses, see Eq. 4 in methodology, lb/month

Table 3 - Gasoline Storage Tank Standing Losses (L_s)

Month	Days in Month	Vapor Molecular Weight (lb/mole)	ΔT_v (°R)	T_{la} (°R)	ΔP_v (psi)	ΔP_B (psi)	P_{va} (psi)	K_s (unitless)	K_E (unitless)	W_v (lb/ft^3)	L_s (lb/month)
January	31	67	12.78	486.50	0.66	0.217	2.30	1.0	0.062	0.030	3.81
February	28	67	14.44	489.80	0.79	0.217	2.48	1.0	0.077	0.032	4.54
March	31	67	15.44	500.00	1.02	0.217	3.09	1.0	0.100	0.039	7.99
April	30	67	17.76	512.40	1.44	0.217	4.00	1.0	0.149	0.049	14.58
May	31	67	18.18	522.45	1.73	0.217	4.88	1.0	0.189	0.058	22.89
June	30	68	17.76	531.60	1.70	0.217	4.98	1.0	0.186	0.059	22.17
July	31	68	16.85	535.05	1.70	0.217	5.32	1.0	0.190	0.063	24.78
August	31	68	17.43	533.20	1.71	0.217	5.14	1.0	0.189	0.061	23.90
September	30	68	18.76	526.60	1.66	0.217	4.52	1.0	0.178	0.054	19.39
October	31	67	18.84	514.75	1.59	0.217	4.19	1.0	0.167	0.051	17.64
November	30	67	14.94	501.80	1.02	0.217	3.21	1.0	0.099	0.040	7.96
December	31	67	12.87	491.45	0.73	0.217	2.57	1.0	0.068	0.033	4.63

Total Annual Standing Losses (lb VOC /year) **174.29**

Total Annual Standing Losses (ton VOC/year) **0.09**

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

3) Working Losses

Storage tank volume =	1,000 gallons	133.68 ft^3
Maximum annual gasoline usage =	10,000 gallons	1,336.81 ft^3

L_w (storage tank deliveries and vehicle dispenses) = Volume delivered (ft^3/month) x vapor density (lb/ft^3)

L_w (spillage) = 0.7 lb/kgallon

L_w total = L_w storage tank + L_w vehicle tank + L_w spillage

Table 4 - Working Losses

Month	Gasoline Delivered (ft^3 per month)	W_v (lb/ft^3)	L_w Storage Tank (lb/month)	L_w Vehicle Tank (lb/month)
January	833.33	0.030	24.63	24.63
February	833.34	0.032	26.33	26.33
March	833.33	0.039	32.19	32.19
April	833.34	0.049	40.62	40.62
May	833.33	0.058	48.64	48.64
June	833.34	0.059	49.49	49.49
July	833.33	0.063	52.52	52.52
August	833.34	0.061	50.88	50.88
September	833.33	0.054	45.35	45.35
October	833.33	0.051	42.40	42.40
November	833.33	0.040	33.32	33.32
December	833.33	0.033	27.22	27.22
	Total L_w storage tank (lb/yr)=		473.58	
	Total L_w vehicle tank (lb/yr)=			473.58

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Total gasoline throughput =	10,000.00	gallons/yr	
Spillage Emission Factor =	0.70	lb/Kgallon	AP-42, Table 5.2-7, 6/08
L_w spillage (lb/yr) = 0.7 x 10,000/1000 =	7.00	lb/yr	

Total Working Losses

Lw storage tank	473.58	lb/yr			
Lw vehicle	473.58	lb/yr			
Lw spillage	7.00	lb/yr			
Total Working Losses	954.16	lb/yr	or	0.48	TPY

Total VOC Emissions

PTE of VOC (TPY) = Total $L_{standing}$ + Total $L_{working}$

Total $L_{standing}$	0.09	TPY
Total $L_{working}$	0.48	TPY
PTE (VOC) =	0.56	TPY

Potential to Emit HAP

HAP Emissions	Total VOC (TPY)	Wt% VOC	PTE (TPY)		Source
Hexane (Worst Case HAP)	0.56	1.4%	0.0079	TPY	Gasoline Distribution Industry (Stage 1) - Background Information for Proposed Standards, January 2004, Table 3-2
Benzene	0.56	0.4%	0.0023	TPY	
Toluene	0.56	1.1%	0.0062	TPY	
2,2,2-Trimethylpentane	0.56	0.7%	0.0039	TPY	
Xylene	0.56	0.4%	0.0023	TPY	
Ethyl Benzene	0.56	0.1%	0.0006	TPY	
Total HAP			0.02	TPY	

PTE HAP (TPY) = Total VOC Emissions (TPY) * Weight Percent HAP in Gasoline

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Emission Calculation Methodology

Equation 1 - Gasoline Liquid Surface Temperatures

T_{ln} **= (avg. ambient air temp + 460) - ((1 - attenuation factor) x (ambient air temp range / 2))**

T_{lx} **= (avg ambient air temp + 460) + ((1 - attenuation factor) x (ambient air temp range / 2))**

Where: T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

avg ambient air temp = Daily ambient average temperature, °F

attenuation factor = Correction factor to estimate liquid surface temp from air temperatures

ambient air temp range = Daily ambient temperature range, °F or °R

Equation 2 - Daily Average Liquid Surface Temperature

$$T_{la} = (T_{ln} + T_{lx}) / 2$$

Where: T_{la} = Daily average liquid surface temperature, °R

T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

Equation 3 - Daily Vapor Temperature Range

$$\Delta T_v = T_{lx} - T_{ln}$$

Where: ΔT_V = Daily vapor temperature range, °R or °F

T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

Equation 4 - Storage Tank Standing Losses

$$Ls = n\ Vv\ Wv\ Ke\ Ks$$

Where: L_s = Standing storage loss, lb/month

n = Number of days in the month

V_v = Vapor space volume of the ullage, ft^3

W_v = Vapor density, lb/ft^3

K_e = Vapor space expansion factor, dimensionless

K_s = Vented vapor saturation factor, dimensionless

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Equation 5 - Tank Vapor Space

$$\mathbf{V_v = 1/2 \text{ tank capacity } (ft^3)}$$

Where: V_v = Tank vapor space volume, ft^3

Equation 6 - Molecular Weight of the Vapor

$$\mathbf{Wv = M_v P_{va} / Rt_{la}}$$

Where: W_v = Vapor density, lb/ft^3

M_v = Vapor molecular weight, lb/lb-mole [AP-42, Table 3-2]

R = Ideal gas constant, 10.731 $psia.ft^3/lb\text{-}mole.°R$

P_{va} = Vapor pressure at daily average liquid surface temperature, psia

T_{la} = Daily average liquid surface temperature, °R

Equation 7 - Gasoline True Vapor Pressure

$$\mathbf{P_{va} = \exp [A - (B / T_{la})]}$$

Where: P_{va} = True vapor pressure, psia

exp = exponential function, 2.71828

A = Dimensionless constant [AP-42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

T_{la} = Daily average liquid surface temperature, °R

Equation 8 - Vapor Space Expansion Factor

$$\mathbf{K_E = (\Delta T_v / T_{la}) + ((\Delta P_v - \Delta P_B) / (14.7 - P_{va}))}$$

Where: K_E = Vapor space expansion factor, dimensionless factor

ΔT_V = Daily vapor temperature range, °R

ΔP_V = Daily vapor pressure range, °R

ΔP_B = Breather vent pressure setting, psi.

14.7 = Atmospheric pressure, psi

P_{va} = Vapor pressure at average liquid temperature, psi, from Eq. 7

T_{la} = Daily average liquid surface temperature, °R

Addendum to the Technical Support Document (TSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Equation 9 - Vapor Pressure Equation Constants

$$\mathbf{A = 15.64 - 1.854\ S^{0.5} - (0.8742 - 0.3280\ S^{0.5})\ ln\ (Ried\ Vapor\ Pressure)}$$

$$\mathbf{B = 8{,}742 - 1{,}042\ S^{0.5} - (1{,}049 - 179.4\ S^{0.5})\ ln\ (Ried\ Vapor\ Pressure)}$$

Where: S = Stock ASTM-D86 distillation slope at 10 volume percent evaporation (°F/vol%), 3.0 for gasoline

A = Vapor pressure equation constant, dimensionless

B = Constant in vapor pressure equation, °R or °C

Equation 10 - Daily Vapor Pressure Range

$$\mathbf{\Delta P_v = P_{vx} - P_{vn}}$$

Where: ΔP_V = Daily vapor pressure range, °R

P_{vx} = Vapor pressure P_{va} at daily maximum liquid surface temperature, psi

P_{vn} = Vapor pressure P_{va} at daily minimum liquid surface temperature, psi

Equation 11 - Vapor Pressure at Maximum Liquid Temperature

$$\mathbf{P_{vx} = exp\ (\ A - (\ B / T_{lx}\ )\ )}$$

Where: P_{vx} = Vapor pressure P_{va} at daily maximum liquid surface temperature, psi

T_{lx} = Daily maximum liquid surface temperature, °R

A = Dimensionless constant [AP-42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

Equation 12 - Vapor Pressure at Minimum Liquid Temperature

$$\mathbf{P_{vn} = exp\ (\ A - (\ B / T_{ln}\ )\ )}$$

Where: P_{vn} = Vapor pressure P_{va} at daily minimum liquid surface temperature, psi

T_{ln} = Daily minimum liquid surface temperature, °R

A = Dimensionless constant [AP42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

Equation 13 - Vented Vapor Saturation Factor

$$\mathbf{K_s = 1 / (\ 1 + (\ 0.053 \times P_{va} \times H_{vo}\ )\ ) = 1}$$

Where: K_s = Vented vapor saturation factor, dimensionless

P_{va} = Vapor pressure at daily average fuel surface temperature, psi

H_{vo} = Vapor space outage, assumed to be 0 feet

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Leachate Storage and Misc. Insignificant - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana
Permit Number: 47866
Reviewer: T 167-32729-00116
Date: David J. Matousek

Diesel and Leachate Storage Tanks						
Emission Unit	**Description**	**Throughput (gallons/yr)**	**Volume of Vapor Displaced (ft^3/yr)**	**US EPA Tanks Vapor Density (lb/ft^3)**	**VOC Emissions (TPY)**	**Data Source**
Unit #14	Two (2) 35,000 gallon diesel storage tanks	500,000	66,836	0.0002	0.01	Applicant provided Tanks output
Units #15 and #26	One 26,000 gal and One 108,000 gal leachate storage tanks	2,000,000	267,344	0.0010	0.13	Applicant provided Tanks output

VOC (TPY) = Vapor Displaced (cubic feet/year) x Vapor Density (lb/cubic foot) x 1 ton/2,000lb
Volume of Vapor Displaced (cubic feet/yr) = Throughput (gallons/yr) x 1 cubic foot /7.481 gallons

Other Miscellaneous Insignificant Activities - Potential to Emit						
Emission Unit	**Description**	**PM / PM_{10} / $PM_{2.5}$ (TPY)**	**VOC (TPY)**	**Single HAP (TPY)**	**Total HAP (TPY)**	**Data Source**
Unit #2	Refrigerant Station	0	negl.	0	0	Applicant Estimate
Unit #3	Six portable welders	negl.	negl.	0	0	Applicant Estimate
Unit #4	Painting Operation	negl.	< 2.74	0	0	Applicant Estimate
Unit #5	One 55 gallon drum transmission fluid	0	negl.	0	0	Applicant Estimate
Unit #6	One 55 gallon drum grease	0	negl.	0	0	Applicant Estimate
Unit #7	One 300 gallon antifreeze AST	0	negl.	0	0	Applicant Estimate
Unit #8	One 400 gallon hydraulic oil AST	0	negl.	0	0	Applicant Estimate
Unit #9	One 250 gallon motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #10	One 250 gallon used motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #12	One 500 gallon propane AST	0	negl.	0	0	Applicant Estimate
Unit #16	Two 55 gallon drum castrol gear lube	0	negl.	0	0	Applicant Estimate
Unit #17	Two 250 gallon hydraulic fluid AST	0	negl.	0	0	Applicant Estimate
Unit #18	One 250 gallon gear oil AST	0	negl.	0	0	Applicant Estimate
Unit #19	One 375 gallon transmission fluid AST	0	negl.	0	0	Applicant Estimate
Unit #25	One 1,000 gallon on-road diesel AST	0	negl.	0	0	Applicant Estimate
Unit #27	One 3,500 gallons used oil AST	0	negl.	0	0	Applicant Estimate
Unit #29	One 375 gallon motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #30	One 250 gallon transmission fluid AST	0	negl.	0	0	Applicant Estimate
Unit #31	One portable 3,500 gallon fuel truck	0	< 2.74	0	0	Applicant Estimate
Unit #32	One 300 gallon kerosene AST	0	negl.	0	0	Applicant Estimate
Unit #33	Two 200 pound propane tanks	0	negl.	0	0	Applicant Estimate
Unit #34	One 55 gallon drum of tranmission oil	0	negl.	0	0	Applicant Estimate
Unit #35	One 500 gallon used oil AST	0	negl.	0	0	Applicant Estimate
Total PTE (TPY)		**negl.**	**5.48**	**0**	**0**	

Addendum to the Technical Support Document - Appendix A - Emission Calculation Sheet
Municipal Landfill - Emissions from Paved Roads

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 19, 2013

Average Vehicle Weight Calculation

Vehicle Type	Trucks/Day	Average Weight (tons)	Total Trips per Year	Miles per Trip	Vehicle Miles Traveled (miles per year)	Traffic Component (%)	Component Weight (tons)
Transfer Trailer	120	15	43,800	1.02	44,676	23.121%	3.47
Front Loader	48	15	17,520	1.02	17,870	9.249%	1.39
Rear Loader	40	15	14,600	1.02	14,892	7.707%	1.16
Roll-Off	75	15	27,375	1.02	27,923	14.451%	2.17
Dump Trucks	30	15	10,950	1.02	11,169	5.780%	0.87
Other	206	2.5	75,190	1.02	76,694	39.692%	0.99
				Total VMT	193,224		
					Average Vehicle Weight (tons) - W		10.05

Site Specific Constants

Value Name	Symbol	Value	Units	Source
Emission Factor	E	---	lb/VMT	Calculated
Particle Size Multiplier	k for PM	0.011	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Particle Size Multiplier	k for PM10	0.0022	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Particle Size Multiplier	k for PM2.5	0.00054	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Silt Loading	sL (Winter)	29.6	g/cubic meter	AP-42, Table 13.2.1-2, January 2011, ADT <500
Silt Loading	sL (Non-Winter)	7.4	g/cubic meter	Previous Determination
Winter Days	Winter Days	90	days	Estimated by IDEM
Non-Winter Days	Non-Winter Days	275	days	Estimated by IDEM
Days >0.01" of rain	P	120	days	AP-42, Figure 13.2.1-2, January 2011
Total Days in Period	N	365	days	Days in the period
Mean Vehicle Weight	W	10.05	tons	Calculated above

Winter Emission Factor Calculations

E = [k * (sL for winter)^0.91 * (W)^1.02] * [1 - P/(4 * N)] — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 2.32 lb/VMT
E for PM10 (lb/VMT) = 0.46 lb/VMT
E for PM2.5 (lb/VMT) = 0.11 lb/VMT

Non-Winter Emission Factor Calculations

E = [k * (sL for non-winter)^0.91 * (W)^1.02] * [1 - P/(4 * N)] — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 0.66 lb/VMT
E for PM10 (lb/VMT) = 0.13 lb/VMT
E for PM2.5 (lb/VMT) = 0.03 lb/VMT

Annual Average Emission Factors

Annual Average Emission Factor = [Winter Days * Winter Factor + Non-Winter Days * Non-Winter Factor] / 365

E for PM (lb/VMT) = 1.07 lb/VMT
E for PM10 (lb/VMT) = 0.21 lb/VMT
E for PM2.5 (lb/VMT) = 0.05 lb/VMT

Potential to Emit

PM Emissions (TPY) = [Annual Average E for PM (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 103.37 TPY
PM10 Emissions (TPY) = [Annual Average E for PM10 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 20.29 TPY
PM2.5 Emissions (TPY) = [Annual Average E for PM2.5 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 4.83 TPY

Limited Potential to Emit

Control Efficiency 80.00% per fugitive dust plan

Limited PM Emissions (TPY) = Potential to Emit PM * (1 - Control Efficiency) — 20.67 TPY
Limited PM10 Emissions (TPY) = Potential to Emit PM10 * (1 - Control Efficiency) — 4.06 TPY
Limited PM2.5 Emissions (TPY) = Potential to Emit PM2.5 * (1 - Control Efficiency) — 0.97 TPY

Addendum to the Technical Support Document - Appendix A - Emission Calculation Sheet
Municipal Landfill - Emissions from Unpaved Roads

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 19, 2013

Average Vehicle Weight Calculation

Vehicle Type	Trucks/Day	Average Weight (tons)	Total Trips per Year	Miles per Trip	Vehicle Miles Traveled (miles per year)	Traffic Component (%)	Component Weight (tons)
Transfer Trailer	120	15	43,800	1.7	74,460	23.121%	3.47
Front Loader	48	15	17,520	1.7	29,784	9.249%	1.39
Rear Loader	40	15	14,600	1.7	24,820	7.707%	1.16
Roll-Off	75	15	27,375	1.7	46,538	14.451%	2.17
Dump Trucks	30	15	10,950	1.7	18,615	5.780%	0.87
Other	206	2.5	75,190	1.7	127,823	39.692%	0.99
				Total VMT	322,040		
					Average Vehicle Weight (tons) - W		10.05

Site Specific Constants

Value Name	Symbol	Value	Units	Source
Emission Factor	E	---	lb/VMT	Calculated
Particle Size Multiplier	k for PM	4.90	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Particle Size Multiplier	k for PM10	1.50	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Particle Size Multiplier	k for PM2.5	0.15	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Silt Content	s	6.40	%	Previous Determination
Days >0.01" of rain	P	120.00	days	AP-42, Figure 13.2.2-1, November 2006
Emperical Constant	a for PM	0.70	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	a for PM10	0.90	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	a for PM2.5	0.90	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM10	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM2.5	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Mean Vehicle Weight	W	10.05	tons	Calculated above

Emission Factor Calculations

$E = [k * (s/12)^a * (W/3)^b] * [(365 - P) / 365]$ — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 3.65 lb/VMT
E for PM10 (lb/VMT) = 0.99 lb/VMT
E for PM2.5 (lb/VMT) = 0.10 lb/VMT

Potential to Emit

PM Emissions (TPY) = [E for PM (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 587.72 TPY
PM10 Emissions (TPY) = [E for PM10 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 159.41 TPY
PM2.5 Emissions (TPY) = [E for PM2.5 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 16.10 TPY

Limited Potential to Emit

Control Efficiency 80.00% per fugitive dust plan

Limited PM Emissions (TPY) = Potential to Emit PM * (1 - Control Efficiency) 117.54 TPY
Limited PM10 Emissions (TPY) = Potential to Emit PM10 * (1 - Control Efficiency) 31.88 TPY
Limited PM2.5 Emissions (TPY) = Potential to Emit PM2.5 * (1 - Control Efficiency) 3.22 TPY

Addendum to the Technical Support Document - Appendix A
326 IAC 6.5 Applicability Determination

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Uncontrolled Potential to Emit (ton/yr)	
Emission Unit	**PM**
Landfill	0.00
Flare - GCCS-VES, 1,200 SCFM	2.49
Flare - GCCS-SRL , 2,100 SCFM	4.36
Paved Roads-Fugitive	103.37
Unpaved Roads -Fugitive	587.72
Insignificant Activities	
Propane Combustion - Unit #13	0.06
Kerosene Combustion - Unit #20	0.13
Waste Oil Combustion - Unit #21	2.19
Unit #14 - Diesel Storage Tanks	0.00
Units #15 and #26 - Leachate Storage Tanks	0.00
Unit #23 - Gasoline Storage Tank	0.00
Other Insignificant Activities	negl.
Total PTE of Entire Source	**700.32**
Title V Major Source Thresholds	**100**
The potential to emit particulate matter is in excess of 10 TPY; therefore, 326 IAC 6.5 applies to the landfill.	

Addendum to the Technical Support Document - Appendix A - Sourcewide Summary
326 IAC 2-7-10.5 Evaluation

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Emissions Increase due to Landfill Capacity Increase (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic GHG as CO2e**	**Non-CO2 GHG as CO2e**	**Toluene**	**Total HAPs**
Uncontrolled PTE After Modification	0.00	0.00	0.00	0.00	57.77	11.24	0.00	62,616	570,525	10.23	29.95
Uncontrolled PTE Before Modification	0.00	0.00	0.00	0.00	56.62	11.02	0.00	61,376	559,225	10.02	29.34
Net Change	0.00	0.00	0.00	0.00	1.15	0.22	0.00	1,240	11,300	0.21	0.61

Uncontrolled Potential to Emit of the Project (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic GHG as CO2e**	**Non-CO2 GHG as CO2e**	**Toluene**	**Total HAPs**
Landfill Capacity Increase	0.00	0.00	0.00	0.00	1.15	0.22	0.00	1,240	11,300	0.21	0.61
Propane Combustion Unit ID #13	0.06	0.20	0.20	0.01	0.29	2.15	3.73	0	3,574	0.00	0.00
Kerosene Combustion Unit ID #20	0.13	0.21	0.21	0.46	0.02	0.32	1.30	0	1,456.5	0.00	0.00
Waste Oil Combustion Unit ID#21	2.19	1.90	1.90	3.23	0.06	0.13	0.97	0	1,333.5	0.00	0.03
Unit #14 - Diesel Storage Tanks	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0	0	0.00	0.00
Unit #15 and #26 - Leachate Storage	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0	0	0.00	0.00
Unit #23 - Gasoline Storage	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	0.01	0.02
Other Misc. Insignificant Activities	negl.	negl.	negl.	negl.	5.48	negl.	negl.	negl.	negl.	negl.	negl.
Total for Project	2.38	2.31	2.31	3.70	7.70	2.82	6.00	1,240	17,664	0.22	0.66
326 IAC 2-7-10.5 MSM Thresholds	**5**	**5**	**---**	**10**	**10**	**25**	**10**	**---**	**---**	**10**	**25**

negl. = negligible

Addendum to the Technical Support Document - Appendix A - Sourcewide Summary
Potential to Emit after Issuance - After Expansion - Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Uncontrolled Potential to Emit (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic CO_2 (CO_2e)**	**Non-Biogenic GHG (CO2e)**	**Toluene**	**Total HAPs**
Landfill	0.00	0.00	0.00	0.00	57.77	11.24	0.00	62,616	570,525	10.23	29.95
Flare - GCCS-VES 1,200 SCFM	2.49	2.49	2.49	2.40	0.32	64.18	11.79	(b)	(b)	0.00	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	4.36	4.36	4.21	0.56	111.82	20.55	(b)	(b)	0.00	2.16
Insignificant Activities											
Propane Combustion - Unit #13	0.06	0.20	0.20	0.01	0.29	2.15	3.73	0	3,574	0.00	0.00
Kerosene Combustion - Unit #20	0.13	0.21	0.21	0.46	0.02	0.32	1.30	0	1,456.5	0.00	0.00
Waste Oil Combustion - Unit #21	2.19	1.90	1.90	3.23	0.06	0.13	0.97	0	1,333.5	0.00	0.03
Unit #14 - Diesel Storage Tanks	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0	0	negl.	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0	0	negl.	negl.
Unit #23 - Gasoline Storage Tank	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	0.01	0.02
Other Insignificant Activities	negl.	negl.	negl.	negl.	5.48	negl.	negl.	negl.	negl.	0.00	negl.
Total PTE of Entire Source	**9.23**	**9.16**	**9.16**	**10.31**	**65.20**	**189.84**	**38.34**	**62,616**	**576,889**	**10.23**	**33.39**
Title V Major Source Thresholds	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100,000**		**10**	**25**

Controlled Potential to Emit (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic CO_2 (CO_2e)**	**Non-Biogenic GHG (CO2e)**	**HCL**	**Total HAPs**
Landfill	0.00	0.00	0.00	0.00	1.16	0.22	0.00	62,616	11,411	0.00	0.60
Flare - GCCS-VES 1,200 SCFM	2.49	2.49	2.49	2.40	0.32	64.18	11.79	16,140	61	1.23	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	4.36	4.36	4.21	0.56	111.82	20.55	28,245	106	2.16	2.16
Insignificant Activities											
Propane Combustion - Unit #13	0.06	0.20	0.20	0.01	0.29	2.15	3.73	0	3,574	0.00	0.00
Kerosene Combustion - Unit #20	0.13	0.21	0.21	0.46	0.02	0.32	1.30	0	1,456.5	0.00	0.00
Waste Oil Combustion - Unit #21	2.19	1.90	1.90	3.23	0.06	0.13	0.97	0	1,333.5	0.00	0.03
Unit #14 - Diesel Storage Tanks	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0	0	negl.	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0	0	negl.	negl.
Unit #23 - Gasoline Storage Tank	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	0.00	0.02
Other Misc. Insignificant	Negl.	Negl.	Negl.	Negl.	5.48	Negl.	Negl.	Negl.	Negl.	0.00	Negl.
Total PTE of Entire Source	**9.23**	**9.16**	**9.16**	**10.31**	**8.59**	**178.82**	**38.34**	**107,001**	**17,942**	**3.39**	**4.04**
PSD Major Source Thresholds	**250**	**250**	**250**	**250**	**250**	**250**	**250**	**(a)**		**NA**	**NA**

Notes:

(a) Under Step 2 of the Greenhouse Gas (GHG) Tailoring Rule that went into effect on July 1, 2011, PSD applies to new sources that emit or have the potential to emit at least 100,000 TPY CO_2e or existing sources that emit at that level and that undertake a modification that increases emissions by at least 75,000 TPY CO_2e, and also emit at least 100/250 TPY of GHGs on a mass basis. On June 29, 2012, the U.S. EPA issued a final rule that did not revise the GHG permitting thresholds that were established in Step 1 or Step 2 of the GHG Tailoring Rule.

(b) The flare can be treated as an emission unit and a control device. In terms of PM, PM_{10}, $PM_{2.5}$, SO_2, VOC, CO, NO_x and HAPs, IDEM is treating the flare as an emission unit. Controlled emissions are based on the maximum heat input capacity to the flare. In terms of greenhouse gas (GHG) emissions, IDEM is treating the flare as a control device. For GHGs, the Uncontrolled Potential to Emit is based on the worst case scenario where the landfill gas is not controlled. The flare will not have significant GHG emissions in the uncontrolled case, because the only emissions would be those associated with natural gas combustion by the pilot in the flare. In the controlled case, the flare will have GHG emissions from the conversion of methane to carbon dioxide during combustion of the landfill gas. These emissions are detailed on Sheets 6, 7 and 8 of 23.

Addendum to the Technical Support Document - Appendix A - VOC Emissions from Landfill
Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Potential to Emit

NMOC Emissions
IDEM completed a computer simulation of the potential emissions from the landfill using US EPA LandGEM. This model indicated the highest emission rate of landfill gas will be reached in the year 2022. The potential to emit NMOC in 2022 is estimated at:

197.5 TPY

VOC Emissions
VOC emissions can be estimated from the NMOC emission rate using information provided in AP-42, Chapter 2.4, November 1998. IDEM estimates VOC emissions as shown below:

NMOC in Landfill Gas	595	ppmv	(AP-42, Chapter 2.4, Table 2.4-2, November 1998)
NMOC Emission Rate	197.50	TPY	
% VOC	39.00%		(AP-42, Chapter 2.4, Table 2.4-2, Note c, November 1998)
VOC Emission Rate	77.03	TPY	

Limited Potential to Emit

VOC Emissions
AP-42, Chapter 2.4, paragraph 2.4.4.2 - Controlled Emissions, October 2008 indicates approximately 75% of the VOC is captured, 25% is fugitive.

Landfill Collection Efficiency 75.00%

Landfill PTE from LandGEM 77.03 TPY

Fugitive VOC Emissions	= Landfill PTE from LandGEM x (1 - collection eff.)	19.26 TPY
VOC Emissions to Control Devices	= Landfill PTE from LandGEM - Fugitive VOC	57.77 TPY
Destruction Efficiency (NSPS Requirement)		98%
VOC Emissions after Control	= VOC to Control Device x (1 - Dest. Efficiency)	1.16 TPY

Addendum to the Technical Support Document - Appendix A - Emission Calculation Sheet
Potential to Emit - Landfill HAP and CO - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Temperature	536.67	°R
Atmospheric Pressure	1.00	atm
Maximum LandGEM LFG	5,657	SCFM
Capture Efficiency	75%	
Maximum Captured LFG	4,243	SCFM

PTE of CO						
Pollutant	**Molecular Weight**	**Concentration (ppmv)**	**Average Pollutant Flow (SCFM)**	**Landfill PTE (TPY)**	**Control Efficiency**	**Controlled PTE (TPY)**
CO at 4243 SCFM	28.01	141.00	0.5983	11.24	98%	0.22

PTE of Hazardous Air Pollutants - LandGEM - AP-42, Chapter 2.4, November 1998						
Pollutant	**Concentration (ppmv)**	**Molecular Weight**	**Avg. Pollutant Flow (SCFM)**	**Landfill PTE (TPY)**	**Control Efficiency**	**Controlled PTE (TPY)**
1,1,1-Trichloroethane	0.48	133.41	0.00200	0.17898	98%	3.58E-03
1,2,2,2-Tetrachloroethane	1.10	167.85	4.67E-03	5.26E-01	98%	1.05E-02
1,1-Dichloroethane	2.40	98.97	0.01020	0.67717	98%	1.35E-02
1,1-Dichloroethene	0.20	96.94	0.00080	0.05202	98%	1.04E-03
1,2-Dichloroethane	0.41	98.96	0.00170	0.11285	98%	2.26E-03
1,2-Dichloropropane	0.18	112.99	0.00076	0.05789	98%	1.16E-03
Acrylonitrile	6.30	53.06	0.02673	0.95143	98%	0.019
Benzene (1.9 or 11)	1.90	78.11	0.00810	0.42441	98%	8.49E-03
Carbon Disulfide	0.58	76.13	0.00250	0.12767	98%	2.55E-03
Carbon Tetrachloride	0.004	153.84	0.00000	0.00000	98%	0
Carbonyl Sulfide	0.49	60.07	0.00208	0.08378	98%	1.68E-03
Chlorobenzene	0.25	112.56	0.00110	0.08306	98%	1.66E-03
Chloroethane	1.30	64.52	0.00550	0.23804	98%	4.76E-03
Chloroform	0.03	119.39	0.00010	0.00801	98%	1.60E-04
Dichlorobenzene	0.21	147.00	0.00090	0.08875	98%	1.78E-03
Dichloromethane	14.00	84.94	0.05940	3.38450	98%	0.068
Ethylbenzene	4.60	106.16	0.01950	1.38864	98%	0.028
Ethylene Dibromide	0.001	187.88	0.00000	0.00000	98%	0
Hexane	6.60	86.18	0.02800	1.61868	98%	0.032
Mercury	2.90E-04	200.61	0.00000	0.00000	0%	0
Methyl Ethyl Ketone	7.10	72.11	0.03013	1.45721	98%	0.029
Methyl Isobutyl Ketone	1.90	100.16	0.00810	0.54422	98%	1.09E-02
Perchloroethylene	3.70	165.83	0.01570	1.74646	98%	0.035
Toluene (39 or 170)	**39.00**	**92.13**	**0.16550**	**10.22808**	**98%**	**0.205**
Trichloroethylene	2.80	131.40	0.01190	1.04891	98%	0.021
Vinyl Chloride	7.30	62.50	0.03100	1.29968	98%	0.026
Xylene	12.00	106.17	0.05090	3.62506	98%	0.073
				10.23	Highest	**0.20**
				29.95	Total	**0.60**

Methodology:

1) Average Flow (SCFM) = [Maximum Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]

2) PTE (tons/yr) = $\frac{360 \times \text{Average Flow (SCFM)} \times \text{MW (lb/lb mole)} \times \text{P (atm)}}{\text{T(°R)}}$

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Flare GCCS-VES - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Flare Heat Input Capacity	39.60	MMBtu/hr	Molecular Weight (S)	32.07	lb/lb mole
Heating Value of Landfill Gas	550.00	Btu/CF	Molecular Weight (SO2)	64.06	lb/lb mole
Calculated Landfill Gas	1,200	SCFM	Molecular Weight (HCL)	36.458	lb/lb mole
Inlet Gas Temperature	536.67	R	Weight % Water in LFG	7.0%	
Inlet Gas Pressure	1	atm			
Maximum LGF Rate	1,200	SCFM			

Landfill Gas Flow Rate (Wet Basis)		Landfill Gas Flow Rate (Dry Basis)		% Methane	Methane Flow Rate (Dry Basis)		
1,200	SCFM	1,116	DSCFM	50.00%	558.00 SCFM	or	293.29 MMSCF/yr

Potential to Emit Calculations - Flare

Pollutant	Concentration (ppmv)	Pollutant Flow (SCFM)	Throughput (SCFM or MMBtu/hr)	Emission Factor		PTE (TPY)	Notes
PM			558	17.0	lb/MMCF CH4, dry basis	2.49	AP-42, Chapter 2.4, Table 2.4-5, 11/1998
PM10			558	17.0	lb/MMCF CH4, dry basis	2.49	Assumed the same as PM
PM2.5			558	17.0	lb/MMCF CH4, dry basis	2.49	Assumed the same as PM
S	46.9	0.056				1.20	AP-42, Chapter 2.4, page 2.4-8, 11/1998
SO2						2.40	PTE (SO2) = PTE (S) x MW (SO2) / MW (S)
CO			39.60	0.370	lb/MMBtu	64.18	Manufacturer Specification
NOx			39.60	0.068	lb/MMBtu	11.79	Manufacturer Specification
HCL	42	0.050				1.23	AP-42, Chapter 2.4, page 2.4-9, 11/1998
VOC						0.32	Applicant Estimate

Methodology:

1) Methane Flow Rate = Flare Gas Flow Rate x (% Methane)
2) AP-42 does not include emission factors for PM10 or PM2.5. They are assumed identical to PM.
3) DSCFM = SCFM (1 - % Water)
4) Pollutant Flow (SCFM) = [Total Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]
5) PTE (TPY) = Flow (CFM) x Emission Factor (lb/MMCF) x [MMCF/1,000,000 CF] x [60 min/hr] x [8,760 hr/yr] x [ton/2,000 lb]
6) PTE (TPY) = Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu) x [8,760 hr/yr] x [ton/2,000 lb]
7) CO2e = [TPY CO2] + 21 x [TPY CH4] + 310 x [TPY N2O]
8) PTE (tons/yr) = $\frac{360 \times Q_{pollutant} (CFM) \times MW (lb/lb\ mole) \times P (atm)}{T(°R)}$ (AP-42, Chapter 2.4, Eq. 4 - converted to US units)

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Flare GCCS-SRL - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Flare Heat Input Capacity	69.00	MMBtu/hr	Molecular Weight (S)	32.07	lb/lb mole
Heating Value of Landfill Gas	550.00	Btu/CF	Molecular Weight (SO2)	64.06	lb/lb mole
Calculated Landfill Gas	2,091	SCFM	Molecular Weight (HCL)	36.458	lb/lb mole
Inlet Gas Temperature	536.67	R	Weight % Water in LFG	7.0%	
Inlet Gas Pressure	1	atm			
Maximum LGF Rate	2,100	SCFM			

Landfill Gas Flow Rate (Wet Basis)		Landfill Gas Flow Rate (Dry Basis)		% Methane	Methane Flow Rate (Dry Basis)		
2,100	SCFM	1,953	DSCFM	50.00%	976.50 SCFM	or	513.25 MMSCF/yr

Potential to Emit Calculations - Flare

Pollutant	Concentration (ppmv)	Pollutant Flow (SCFM)	Throughput (SCFM or MMBtu/hr)	Emission Factor		PTE (TPY)	Notes
PM			977	17.0	lb/MMCF CH4, dry basis	4.36	AP-42, Chapter 2.4, Table 2.4-5, 11/1998
PM10			977	17.0	lb/MMCF CH4, dry basis	4.36	Assumed the same as PM
PM2.5			977	17.0	lb/MMCF CH4, dry basis	4.36	Assumed the same as PM
S	46.9	0.098				2.11	AP-42, Chapter 2.4, page 2.4-8, 11/1998
SO_2						4.21	PTE (SO2) = PTE (S) x MW (SO2) / MW (S)
CO			69.00	0.370	lb/MMBtu	111.82	Manufacturer Specification
NOx			69.00	0.068	lb/MMBtu	20.55	Manufacturer Specification
HCL	42	0.088				2.16	AP-42, Chapter 2.4, page 2.4-9, 11/1998
VOC						0.56	Applicant Estimate

Methodology:
1) Methane Flow Rate = Flare Gas Flow Rate x (% Methane)
2) AP-42 does not include emission factors for PM10 or PM2.5. They are assumed identical to PM.
3) DSCFM = SCFM (1 - % Water)
4) Pollutant Flow (SCFM) = [Total Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]
5) PTE (TPY) = Flow (CFM) x Emission Factor (lb/MMCF) x [MMCF/1,000,000 CF] x [60 min/hr] x [8,760 hr/yr] x [ton/2,000 lb]
6) PTE (TPY) = Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu) x [8,760 hr/yr] x [ton/2,000 lb]
7) CO2e = [TPY CO2] + 21 x [TPY CH4] + 310 x [TPY N2O]
8) PTE (tons/yr) = $\frac{360 \times Q_{pollutant} (CFM) \times MW (lb/lb\ mole) \times P (atm)}{T(°R)}$ (AP-42, Chapter 2.4, Eq. 4 - converted to US units)

Addendum to the Technical Support Document - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David Matousek
Date: October 7, 2013

Landfill Greenhouse Gas Emissions

Landfill Collection Efficiency	**75%**
Landfill Gas Temperature	**536.67 Rankine**
Molecular Weight of Methane	**16.04**
Molecular Weight of Carbon Dioxide	**44.01**

Landfill Greenhouse Gas Emissions - Uncontrolled Case

					Potential to Emit	
Pollutant	**LandGEM Pollutant Flow (SCFM)**	**Collected GHG Emissions (SCFM)**	**Collected GHG Emissions (TPY)**	**Landfill PTE (TPY CO_2e) (2009/2013 GWPs)**	**Biogenic CO_2 (TPY CO2e)**	**Non-Biogenic GHG (TPY CO2e) (2009/2013 GWPs)**
CO_2	2,828	2,121	62,616	62,616	62,616	0
CH_4	2,828	2,121	22,821	479,247/570,525	0	479,247/570,525
N_2O	0	0	0	0	0	0
			Potential to Emit Biogenic CO_2 as TPY CO_2e =		**62,616**	
			Potential to Emit Non-Biogenic GHG as TPY CO_2e =			**479,247/570,525**

Methodology:
1) Collected GHG Emissions (SCFM) = LandGEM Pollutant Flow (SCFM) x Collection Efficiency
2) Collected GHG Emissions (TPY) = 360 x Collected Emissions (SCFM) x M.W. (lb/lb-mole) x Pressure (1 atm) / Temperature (R)
3) PTE (CO_2e 2009 GWPs) = TPY CO_2 + [TPY CH_4 x global warming potential (21)] + [TPY N_2O x global warming potential (310)]
4) PTE (CO_2e 2013 GWPs) = TPY CO_2 + [TPY CH_4 x global warming potential (25)] + [TPY N_2O x global warming potential (298)]

Landfill Greenhouse Gas Emissions - Controlled Case

	Uncontrolled			Controlled	
Pollutant	**Biogenic CO_2 (TPY CO_2e)**	**Non-Biogenic GHG (TPY CO_2e) (2009/2013 GWPs)**	**Flare Combustion / Destruction Efficiency**	**Biogenic CO_2 (TPY CO_2e)**	**Non-Biogenic CO_2e (TPY CO_2e) (2009/2013 GWPs)**
CO_2	62,616	0	0%	62,616	0
CH_4	0	479,247/570,525	98%	0	9,585/11,411
N_2O	0	0	0%	0	0
			Totals	**62,616**	**9,585/11,411**

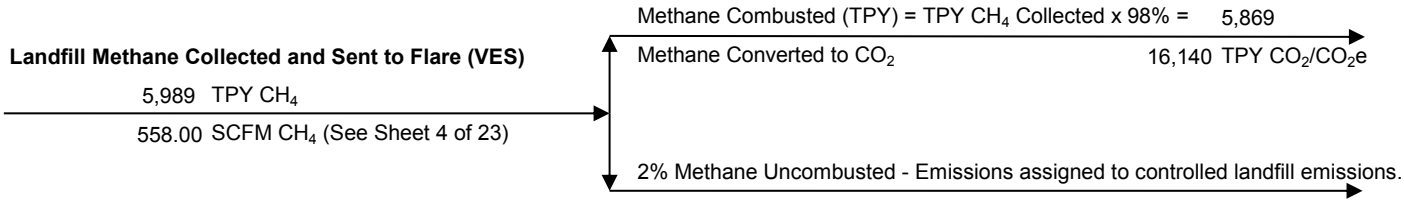
(Continued Next Sheet)

Addendum to the Technical Support Document - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2022

Flare GCCS-VES Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:
1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e 2009 GWPs = Uncombusted Methane (TPY CH_4) x 2009 global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R
5) Uncombusted Methane as TPY CO_2e 2013 GWPs= Uncombusted Methane (TPY CH_4) x 2013 global warming potential (25)



Methodology for N_2O:
1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBty/yr) x 1 ton / 2,000 lb
5) 2009 N_2O (TPY as CO_2e) = N_2O (TPY) x 2009 global warming potential (310)
6) 2013 N_2O (TPY as CO_2e) = N_2O (TPY) x 2013 global warming potential (298)

Methane to Flare (SCFM)	558	SCFM CH_4
Methane Usage (MMCF/yr)	293.28	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
Methane Gas Heating Value	1,000	MMBtu/MMCF
Methane Combusted (MMBtu/yr)	293,285	
N_2O (TPY)	0.204	
2009 N_2O (TPY as CO_2e)	63	
2013 N_2O (TPY as CO_2e)	61	

Flare GCCS-VES Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e) (2009/2013 GWPs)
Methane to GCCS-VES / Combusted & Converted to CO_2	16,140	0
N_2O from Landfill Gas Combustion in Flare GCCS-VES	0	63/61
Total	**16,140**	**63/61**

(Continued Next Sheet)

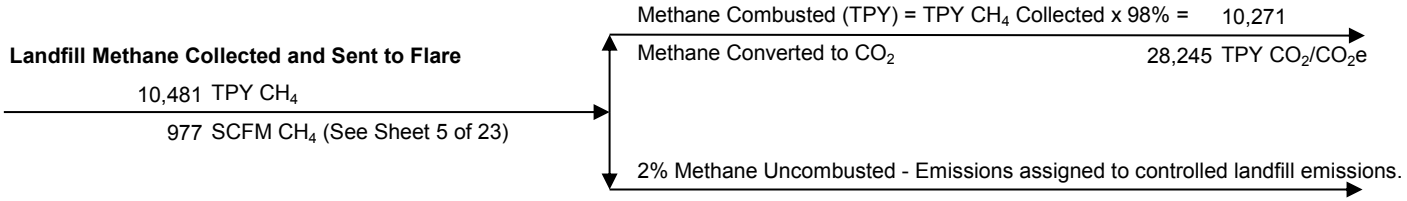
Addendum to the Technical Support Document - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2022

Flare GCCS-SRL Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:

1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e 2009 GWPs = Uncombusted Methane (TPY CH_4) x global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R
5) Uncombusted Methane as TPY CO_2e 2013 GWPs = Uncombusted Methane (TPY CH_4) x global warming potential (25)



Methodology for N_2O:

1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBty/yr) x 1 ton / 2,000 lb
5) 2009 N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (310)
6) 2013 N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (298)

Methane to Flare (SCFM)	977	SCFM CH_4
Methane Usage (MMCF/yr)	513.25	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
Methane Gas Heating Value	1,000	MMBtu/MMCF
Methane Combusted (MMBtu/yr)	513,248	
N_2O (TPY)	0.356	
2009 N_2O (TPY as CO_2e)	110	
2013 N_2O (TPY as CO_2e)	106	

Flare GCCS-SRL Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e) (2009/2013 GWPs)
Methane to GCCS-SRL / Combusted & Converted to CO_2	28,245	0
N_2O from Landfill Gas Combustion in Flare GCCS-SRL	0	110/106
Total	**28,245**	**110/106**

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Propane Combustion Sources - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	6.00	MMBtu/hr			
Heat Content of Propane	91,500	Btu/gallon			
Maximum Propane Usage	574.43	Kgallons/yr			
Sulfur Content	0.18	gr/100 FT^3	or	0.018	lb/Kgallon

Potential to Emit Calculations - Propane Combustion

Pollutant	Emission Factor		PTE (TPY)	Notes
PM	0.2	lb/Kgallon	0.06	AP-42, Chapter 1.5, Table 1.5-1, July 2008
PM10	0.7	lb/Kgallon	0.20	AP-42, Chapter 1.5, Table 1.5-1, July 2008
PM2.5	0.7	lb/Kgallon	0.20	AP-42, Chapter 1.5, Table 1.5-1, July 2008
SO2	0.018	lb/Kgallon	0.01	AP-42, Chapter 1.5, Table 1.5-1, July 2008
VOC	1	lb/Kgallon	0.29	AP-42, Chapter 1.5, Table 1.5-1, July 2008
CO	7.5	lb/Kgallon	2.15	AP-42, Chapter 1.5, Table 1.5-1, July 2008
NOx	13	lb/Kgallon	3.73	AP-42, Chapter 1.5, Table 1.5-1, July 2008

CO2				135.49	lb/MMBtu	3,561	40 CFR 98, Subpart C, Table C-1 (61.46 kg/MMBtu)
CH4				6.61E-03	lb/MMBtu	0.17	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.03	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e (2009)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2009)						3,574	
Biogenic GHG as CO2e (2013)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2013)						3,574	

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e 2009 GWPs (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 GWPs (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Kerosene Combustion Sources - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	2.00	MMBtu/hr
Heat Content of Kerosene	135,000	Btu/gallon
Maximum Kerosene Usage	129.78	Kgallons/yr
Sulfur Content	0.05%	

Potential to Emit Calculations - Propane Combustion

Pollutant	Emission Factor		PTE (TPY)	Notes
PM	2	lb/Kgallon	0.13	AP-42, Chapter 1.3, Table 1.3-1, May 2010
PM10	3.3	lb/Kgallon	0.21	AP-42, Chapter 1.3, Table 1.3-2, May 2010
PM2.5	3.3	lb/Kgallon	0.21	AP-42, Chapter 1.3, Table 1.3-2, May 2010
SO2	7.1	lb/Kgallon	0.46	AP-42, Chapter 1.3, Table 1.3-1, May 2010
VOC	0.252	lb/Kgallon	0.02	AP-42, Chapter 1.3, Table 1.3-3, May 2010
CO	5	lb/Kgallon	0.32	AP-42, Chapter 1.3, Table 1.3-1, May 2010
NOx	20	lb/Kgallon	1.30	AP-42, Chapter 1.3, Table 1.3-1, May 2010

CO2				165.79	lb/MMBtu	1,452	40 CFR 98, Subpart C, Table C-1 (75.20 kg/MMBtu)
CH4				6.61E-03	lb/MMBtu	0.06	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.01	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e (2009)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2009)						1,456	
Biogenic GHG as CO2e (2013)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2013)						1,456	

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e 2009 GWPs (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 GWPs (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Waste Oil Combustion Sources - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	2.00	MMBtu/hr
Heat Content of Waste Oil	145,000	Btu/gallon
Maximum Waste Oil Usage	120.83	Kgallons/yr
Sulfur Content	0.50%	Typical for Fuel Oil
Ash Content	0.55%	Ash Content of Motor Oil

Potential to Emit Calculations

Pollutant	Emission Factor		PTE (TPY)	Notes
PM	36.3	lb/Kgallon	2.19	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM = 66A
PM10	31.4	lb/Kgallon	1.90	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM10 = 57A
PM2.5	31.4	lb/Kgallon	1.90	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM2.5 = 57A
SO2	53.5	lb/Kgallon	3.23	AP-42, Chapter 1.11, Table 1.11-3, October 1996: SO2 = 107S
VOC	1.0	lb/Kgallon	0.06	AP-42, Chapter 1.3, Table 1.3-3, May 2010
CO	2.1	lb/Kgallon	0.13	AP-42, Chapter 1.11, Table 1.11-3, October 1996
NOx	16	lb/Kgallon	0.97	AP-42, Chapter 1.11, Table 1.11-3, October 1996

CO2				22,000	lb/Kgallon	1,329	AP-42, Chapter 1.11, Table 1.11-3 October 1996
CH4				6.61E-03	lb/MMBtu	0.06	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.01	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e (2009)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2009)						1,333	
Biogenic GHG as CO2e (2013)						0	All CO2 is non-biogenic
Non-Biogenic GHG as CO2e (2013)						1,333	

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e 2009 (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Waste Oil Combustion Sources - Continued

HAP Calculations

Pollutant	Emission Factor		PTE (TPY)	Notes
Antimony	4.50E-03	lb/Kgallon	2.72E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Arsenic	6.00E-02	lb/Kgallon	3.62E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Beryllium	1.80E-03	lb/Kgallon	1.09E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Cadmium	1.20E-02	lb/Kgallon	7.25E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Chromium	0.18	lb/Kgallon	1.09E-02	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Cobalt	0.0052	lb/Kgallon	3.14E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Manganese	0.05	lb/Kgallon	3.02E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Nickel	0.15	lb/Kgallon	9.06E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Phenol	2.80E-05	lb/Kgallon	1.69E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Naphthalene	9.20E-05	lb/Kgallon	5.56E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Anthracene	1.00E-04	lb/Kgallon	6.04E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Dibutylphthalate	3.40E-05	lb/Kgallon	2.05E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Pyrene	8.30E-06	lb/Kgallon	5.01E-07	AP-42, Chapter 1.11, Table 1.11-5, October 1996

Worst Case HAP - Chromium	**0.01**	**TPY**
Total HAP	**0.03**	**TPY**

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e 2009 (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310
5) CO2e 2013 (TPY) = CO2 emissions x 1 + CH4 emissions x 25 + N2O emissions x 298

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline Above Ground Storage Tank (AST)

Company: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana, 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 16, 2013

1.) Temperature Data

Temperature Attenuation Factor = 0.17 (0.80 insulated tank, 0.17 non-insulated tank)

Key to Table 1 - Temperature Data for Indianapolis, Indiana

T_{ax} = Daily maximum ambient temperature, AP-42, Table 7.1-3, 11/2006
T_{an} = Daily minimum ambient temperature, AP-42, Table 7.1-3, 11/2006
T_{ln} = Daily minimum liquid surface temperature, see Eq. 1 in methodology.
T_{lx} = Daily maximum liquid surface temperature, see Eq. 1 in methodology.
T_{la} = Daily average liquid surface temperature, see Eq. 2 in methodology.
ΔT_v = Daily vapor temperature range, see Eq. 3 in methodology.

Table 1 - Temperature Data for Indianapolis, Indiana

Month	T_{ax} (°F)	T_{an} (°F)	Temperature Average (°F)	Temperature Range (°F or °R)	T_{ln} (°R)	T_{lx} (°R)	T_{la} (°R)	ΔT_V (°R)
January	34.2	18.8	26.50	15.40	480.11	492.89	486.50	12.78
February	38.5	21.1	29.80	17.40	482.58	497.02	489.80	14.44
March	49.3	30.7	40.00	18.60	492.28	507.72	500.00	15.44
April	63.1	41.7	52.40	21.40	503.52	521.28	512.40	17.76
May	73.4	51.5	62.45	21.90	513.36	531.54	522.45	18.18
June	82.3	60.9	71.60	21.40	522.72	540.48	531.60	17.76
July	85.2	64.9	75.05	20.30	526.63	543.47	535.05	16.85
August	83.7	62.7	73.20	21.00	524.49	541.92	533.20	17.43
September	77.9	55.3	66.60	22.60	517.22	535.98	526.60	18.76
October	66.1	43.4	54.75	22.70	505.33	524.17	514.75	18.84
November	50.8	32.8	41.80	18.00	494.33	509.27	501.80	14.94
December	39.2	23.7	31.45	15.50	485.02	497.88	491.45	12.87

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

2) Pressure Data

S = ASTM-D86 distillation slope at 10 volume percent evaporation, AP-42, Table 7.1-4, 11/06	3.00	(°F/vol%)
P_{BP} = Breather vent pressure setting, psi	0.0722	psi
P_{BV} = Breather vent vacuum setting, psi	-0.1444	psi
$\Delta P_B = P_{BP} - P_{BV}$, psi	0.2166	psi

Key to Table 2 - Pressure Data for Indianapolis, Indiana

1) A = Vapor pressure equation constant, dimensionless, see Eq. 9 in methodology
2) B = Vapor pressure equation constant, °R, see Eq. 9 in methodology
3) T_{ln} = Daily minimum liquid surface temperature, Calulated in Table 1
4) T_{lx} = Daily maximum liquid surface temperature, Calculated in Table 1
5) T_{la} = Daily average liquid surface temperature, Calculated in Table 1
6) P_{vx} = Vapor pressure at daily maximum liquid surface temperature, psi, see Eq. 11 in methodology
7) P_{vn} = Vapor pressure at dauly minimum liquid surfact temperature, psi, see Eq. 12 in methodology
8) ΔP_v = Daily vapor pressure range, see Eq. 10 in methodology
9) P_{va} = True vapor pressure, see Eq. 7 in methodology

Table 2 - Pressure Data for Indianapolis, Indiana

Month	Reid Vapor Pressure (psi)	A (no units)	B (°R)	T_{ln} (°R)	T_{lx} (°R)	T_{la} (°R)	P_{vx} (psi)	P_{vn} (psi)	ΔP_v (psi)	P_{va} (psi)
January	9.0	11.76	5,315.06	480.11	492.89	486.50	2.65	1.99	0.66	2.30
February	9.0	11.76	5,315.06	482.58	497.02	489.80	2.90	2.11	0.79	2.48
March	9.0	11.76	5,315.06	492.28	507.72	500.00	3.64	2.62	1.02	3.09
April	9.0	11.76	5,315.06	503.52	521.28	512.40	4.77	3.33	1.44	4.00
May	9.0	11.76	5,315.06	513.36	531.54	522.45	5.81	4.08	1.73	4.88
June	7.8	11.80	5,420.70	522.72	540.48	531.60	5.89	4.19	1.70	4.98
July	7.8	11.80	5,420.70	526.63	543.47	535.05	6.23	4.52	1.70	5.32
August	7.8	11.80	5,420.70	524.49	541.92	533.20	6.05	4.34	1.71	5.14
September	7.8	11.80	5,420.70	517.22	535.98	526.60	5.42	3.75	1.66	4.52
October	9.0	11.76	5,315.06	505.33	524.17	514.75	5.05	3.46	1.59	4.19
November	9.0	11.76	5,315.06	494.33	509.27	501.80	3.75	2.74	1.02	3.21
December	9.0	11.76	5,315.06	485.02	497.88	491.45	2.96	2.23	0.73	2.57

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

3) Standing Loss Calculation

Storage tank volume	1000	gallons	
V_v = Tank vapor space volume (1/2 total volume)	500	gallons	66.836 ft^3

Key to Table 3 - Storage Tanks Standing Losses

1) ΔT_v = Daily vapor temperature range, calculated in Table 1
2) T_{la} = Daily average liquid surface temperature, calculated in Table 1
3) ΔP_v = Daily vapor pressure range, calculated in Table 2
4) K_s = Assumed to equal one. No roof outage.
5) K_E = Vapor space expansion factor, see Eq. 8 in methodology
6) W_v = Vapor density, see Eq. 6 in methodology
7) L_s = Standing storage losses, see Eq. 4 in methodology, lb/month

Table 3 - Gasoline Storage Tank Standing Losses (L_s)

Month	Days in Month	Vapor Molecular Weight (lb/mole)	ΔT_v (°R)	T_{la} (°R)	ΔP_v (psi)	ΔP_B (psi)	P_{va} (psi)	K_s (unitless)	K_E (unitless)	W_v (lb/ft^3)	L_s (lb/month)
January	31	67	12.78	486.50	0.66	0.217	2.30	1.0	0.062	0.030	3.81
February	28	67	14.44	489.80	0.79	0.217	2.48	1.0	0.077	0.032	4.54
March	31	67	15.44	500.00	1.02	0.217	3.09	1.0	0.100	0.039	7.99
April	30	67	17.76	512.40	1.44	0.217	4.00	1.0	0.149	0.049	14.58
May	31	67	18.18	522.45	1.73	0.217	4.88	1.0	0.189	0.058	22.89
June	30	68	17.76	531.60	1.70	0.217	4.98	1.0	0.186	0.059	22.17
July	31	68	16.85	535.05	1.70	0.217	5.32	1.0	0.190	0.063	24.78
August	31	68	17.43	533.20	1.71	0.217	5.14	1.0	0.189	0.061	23.90
September	30	68	18.76	526.60	1.66	0.217	4.52	1.0	0.178	0.054	19.39
October	31	67	18.84	514.75	1.59	0.217	4.19	1.0	0.167	0.051	17.64
November	30	67	14.94	501.80	1.02	0.217	3.21	1.0	0.099	0.040	7.96
December	31	67	12.87	491.45	0.73	0.217	2.57	1.0	0.068	0.033	4.63

Total Annual Standing Losses (lb VOC /year) **174.29**

Total Annual Standing Losses (ton VOC/year) **0.09**

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

3) Working Losses

Storage tank volume =	1,000 gallons	133.68 ft^3
Maximum annual gasoline usage =	10,000 gallons	1,336.81 ft^3

L_w (storage tank deliveries and vehicle dispenses) = Volume delivered (ft^3/month) x vapor density (lb/ft^3)

L_w (spillage) = 0.7 lb/kgallon

L_w total = L_w storage tank + L_w vehicle tank + L_w spillage

Table 4 - Working Losses

Month	Gasoline Delivered (ft^3 per month)	W_v (lb/ft^3)	L_w Storage Tank (lb/month)	L_w Vehicle Tank (lb/month)
January	833.33	0.030	24.63	24.63
February	833.34	0.032	26.33	26.33
March	833.33	0.039	32.19	32.19
April	833.34	0.049	40.62	40.62
May	833.33	0.058	48.64	48.64
June	833.34	0.059	49.49	49.49
July	833.33	0.063	52.52	52.52
August	833.34	0.061	50.88	50.88
September	833.33	0.054	45.35	45.35
October	833.33	0.051	42.40	42.40
November	833.33	0.040	33.32	33.32
December	833.33	0.033	27.22	27.22
	Total L_w storage tank (lb/yr)=		473.58	
	Total L_w vehicle tank (lb/yr)=			473.58

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Total gasoline throughput =	10,000.00	gallons/yr	
Spillage Emission Factor =	0.70	lb/Kgallon	AP-42, Table 5.2-7, 6/08
L_w spillage (lb/yr) = 0.7 x 10,000/1000 =	7.00	lb/yr	

Total Working Losses

Lw storage tank	473.58	lb/yr			
Lw vehicle	473.58	lb/yr			
Lw spillage	7.00	lb/yr			
Total Working Losses	954.16	lb/yr	or	0.48	TPY

Total VOC Emissions

PTE of VOC (TPY) = Total $L_{standing}$ + Total $L_{working}$

Total $L_{standing}$	0.09	TPY
Total $L_{working}$	0.48	TPY
PTE (VOC) =	0.56	TPY

Potential to Emit HAP

HAP Emissions	Total VOC (TPY)	Wt% VOC	PTE (TPY)		Source
Hexane (Worst Case HAP)	0.56	1.4%	0.0079	TPY	Gasoline Distribution Industry (Stage 1) - Background Information for Proposed Standards, January 2004, Table 3-2
Benzene	0.56	0.4%	0.0023	TPY	
Toluene	0.56	1.1%	0.0062	TPY	
2,2,2-Trimethylpentane	0.56	0.7%	0.0039	TPY	
Xylene	0.56	0.4%	0.0023	TPY	
Ethyl Benzene	0.56	0.1%	0.0006	TPY	
Total HAP			0.02	TPY	

PTE HAP (TPY) = Total VOC Emissions (TPY) * Weight Percent HAP in Gasoline

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Emission Calculation Methodology

Equation 1 - Gasoline Liquid Surface Temperatures

T_{ln} **= (avg. ambient air temp + 460) - ((1 - attenuation factor) x (ambient air temp range / 2))**

T_{lx} **= (avg ambient air temp + 460) + ((1 - attenuation factor) x (ambient air temp range / 2))**

Where: T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

avg ambient air temp = Daily ambient average temperature, °F

attenuation factor = Correction factor to estimate liquid surface temp from air temperatures

ambient air temp range = Daily ambient temperature range, °F or °R

Equation 2 - Daily Average Liquid Surface Temperature

$$T_{la} = (T_{ln} + T_{lx}) / 2$$

Where: T_{la} = Daily average liquid surface temperature, °R

T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

Equation 3 - Daily Vapor Temperature Range

$$\Delta T_v = T_{lx} - T_{ln}$$

Where: ΔT_V = Daily vapor temperature range, °R or °F

T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

Equation 4 - Storage Tank Standing Losses

$$Ls = n\ Vv\ Wv\ Ke\ Ks$$

Where: L_s = Standing storage loss, lb/month

n = Number of days in the month

V_v = Vapor space volume of the ullage, ft^3

W_v = Vapor density, lb/ft^3

K_e = Vapor space expansion factor, dimensionless

K_s = Vented vapor saturation factor, dimensionless

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Equation 5 - Tank Vapor Space

$$\mathbf{V_v = 1/2 \text{ tank capacity } (ft^3)}$$

Where: V_v = Tank vapor space volume, ft^3

Equation 6 - Molecular Weight of the Vapor

$$\mathbf{Wv = M_v P_{va} / Rt_{la}}$$

Where: W_v = Vapor density, lb/ft^3

M_v = Vapor molecular weight, lb/lb-mole [AP-42, Table 3-2]

R = Ideal gas constant, 10.731 $psia.ft^3/lb\text{-}mole.°R$

P_{va} = Vapor pressure at daily average liquid surface temperature, psia

T_{la} = Daily average liquid surface temperature, °R

Equation 7 - Gasoline True Vapor Pressure

$$\mathbf{P_{va} = \exp [A - (B / T_{la})]}$$

Where: P_{va} = True vapor pressure, psia

exp = exponential function, 2.71828

A = Dimensionless constant [AP-42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

T_{la} = Daily average liquid surface temperature, °R

Equation 8 - Vapor Space Expansion Factor

$$\mathbf{K_E = (\Delta T_v / T_{la}) + ((\Delta P_v - \Delta P_B) / (14.7 - P_{va}))}$$

Where: K_E = Vapor space expansion factor, dimensionless factor

ΔT_V = Daily vapor temperature range, °R

ΔP_V = Daily vapor pressure range, °R

ΔP_B = Breather vent pressure setting, psi.

14.7 = Atmospheric pressure, psi

P_{va} = Vapor pressure at average liquid temperature, psi, from Eq. 7

T_{la} = Daily average liquid surface temperature, °R

Addendum to the Technical Support Document (ATSD) - Appendix A
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Equation 9 - Vapor Pressure Equation Constants

$$\mathbf{A = 15.64 - 1.854\ S^{0.5} - (0.8742 - 0.3280\ S^{0.5})\ ln\ (Ried\ Vapor\ Pressure)}$$

$$\mathbf{B = 8{,}742 - 1{,}042\ S^{0.5} - (1{,}049 - 179.4\ S^{0.5})\ ln\ (Ried\ Vapor\ Pressure)}$$

Where: S = Stock ASTM-D86 distillation slope at 10 volume percent evaporation (°F/vol%), 3.0 for gasoline

A = Vapor pressure equation constant, dimensionless

B = Constant in vapor pressure equation, °R or °C

Equation 10 - Daily Vapor Pressure Range

$$\mathbf{\Delta P_v = P_{vx} - P_{vn}}$$

Where: ΔP_V = Daily vapor pressure range, °R

P_{vx} = Vapor pressure P_{va} at daily maximum liquid surface temperature, psi

P_{vn} = Vapor pressure P_{va} at daily minimum liquid surface temperature, psi

Equation 11 - Vapor Pressure at Maximum Liquid Temperature

$$\mathbf{P_{vx} = exp\ (\ A - (\ B / T_{lx}\ )\ )}$$

Where: P_{vx} = Vapor pressure P_{va} at daily maximum liquid surface temperature, psi

T_{lx} = Daily maximum liquid surface temperature, °R

A = Dimensionless constant [AP-42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

Equation 12 - Vapor Pressure at Minimum Liquid Temperature

$$\mathbf{P_{vn} = exp\ (\ A - (\ B / T_{ln}\ )\ )}$$

Where: P_{vn} = Vapor pressure P_{va} at daily minimum liquid surface temperature, psi

T_{ln} = Daily minimum liquid surface temperature, °R

A = Dimensionless constant [AP42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

Equation 13 - Vented Vapor Saturation Factor

$$\mathbf{K_s = 1 / (\ 1 + (\ 0.053 \times P_{va} \times H_{vo}\ )\ ) = 1}$$

Where: K_s = Vented vapor saturation factor, dimensionless

P_{va} = Vapor pressure at daily average fuel surface temperature, psi

H_{vo} = Vapor space outage, assumed to be 0 feet

Addendum to the Technical Support Document - Appendix A
Potential to Emit - Leachate Storage and Misc. Insignificant - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana
Permit Number: 47866
Reviewer: T 167-32729-00116
Date: David J. Matousek

Diesel and Leachate Storage Tanks						
Emission Unit	**Description**	**Throughput (gallons/yr)**	**Volume of Vapor Displaced (ft^3/yr)**	**US EPA Tanks Vapor Density (lb/ft^3)**	**VOC Emissions (TPY)**	**Data Source**
Unit #14	Two (2) 35,000 gallon diesel storage tanks	500,000	66,836	0.0002	0.01	Applicant provided Tanks output
Units #15 and #26	One 26,000 gal and One 108,000 gal leachate storage tanks	2,000,000	267,344	0.0010	0.13	Applicant provided Tanks output

VOC (TPY) = Vapor Displaced (cubic feet/year) x Vapor Density (lb/cubic foot) x 1 ton/2,000lb
Volume of Vapor Displaced (cubic feet/yr) = Throughput (gallons/yr) x 1 cubic foot /7.481 gallons

Other Miscellaneous Insignificant Activities - Potential to Emit						
Emission Unit	**Description**	**PM / PM_{10} / $PM_{2.5}$ (TPY)**	**VOC (TPY)**	**Single HAP (TPY)**	**Total HAP (TPY)**	**Data Source**
Unit #2	Refrigerant Station	0	negl.	0	0	Applicant Estimate
Unit #3	Six portable welders	negl.	negl.	0	0	Applicant Estimate
Unit #4	Painting Operation	negl.	< 2.74	0	0	Applicant Estimate
Unit #5	One 55 gallon drum transmission fluid	0	negl.	0	0	Applicant Estimate
Unit #6	One 55 gallon drum grease	0	negl.	0	0	Applicant Estimate
Unit #7	One 300 gallon antifreeze AST	0	negl.	0	0	Applicant Estimate
Unit #8	One 400 gallon hydraulic oil AST	0	negl.	0	0	Applicant Estimate
Unit #9	One 250 gallon motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #10	One 250 gallon used motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #12	One 500 gallon propane AST	0	negl.	0	0	Applicant Estimate
Unit #16	Two 55 gallon drum castrol gear lube	0	negl.	0	0	Applicant Estimate
Unit #17	Two 250 gallon hydraulic fluid AST	0	negl.	0	0	Applicant Estimate
Unit #18	One 250 gallon gear oil AST	0	negl.	0	0	Applicant Estimate
Unit #19	One 375 gallon transmission fluid AST	0	negl.	0	0	Applicant Estimate
Unit #25	One 1,000 gallon on-road diesel AST	0	negl.	0	0	Applicant Estimate
Unit #27	One 3,500 gallons used oil AST	0	negl.	0	0	Applicant Estimate
Unit #29	One 375 gallon motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #30	One 250 gallon transmission fluid AST	0	negl.	0	0	Applicant Estimate
Unit #31	One portable 3,500 gallon fuel truck	0	< 2.74	0	0	Applicant Estimate
Unit #32	One 300 gallon kerosene AST	0	negl.	0	0	Applicant Estimate
Unit #33	Two 200 pound propane tanks	0	negl.	0	0	Applicant Estimate
Unit #34	One 55 gallon drum of tranmission oil	0	negl.	0	0	Applicant Estimate
Unit #35	One 500 gallon used oil AST	0	negl.	0	0	Applicant Estimate
Total PTE (TPY)		**negl.**	**5.48**	**0**	**0**	

Addendum to the Technical Support Document - Appendix A - Emission Calculation Sheet
Municipal Landfill - Emissions from Paved Roads

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 19, 2013

Average Vehicle Weight Calculation

Vehicle Type	Trucks/Day	Average Weight (tons)	Total Trips per Year	Miles per Trip	Vehicle Miles Traveled (miles per year)	Traffic Component (%)	Component Weight (tons)
Transfer Trailer	120	15	43,800	1.02	44,676	23.121%	3.47
Front Loader	48	15	17,520	1.02	17,870	9.249%	1.39
Rear Loader	40	15	14,600	1.02	14,892	7.707%	1.16
Roll-Off	75	15	27,375	1.02	27,923	14.451%	2.17
Dump Trucks	30	15	10,950	1.02	11,169	5.780%	0.87
Other	206	2.5	75,190	1.02	76,694	39.692%	0.99
				Total VMT	193,224		
					Average Vehicle Weight (tons) - W		10.05

Site Specific Constants

Value Name	Symbol	Value	Units	Source
Emission Factor	E	---	lb/VMT	Calculated
Particle Size Multiplier	k for PM	0.011	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Particle Size Multiplier	k for PM10	0.0022	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Particle Size Multiplier	k for PM2.5	0.00054	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Silt Loading	sL (Winter)	29.6	g/cubic meter	AP-42, Table 13.2.1-2, January 2011, ADT <500
Silt Loading	sL (Non-Winter)	7.4	g/cubic meter	Previous Determination
Winter Days	Winter Days	90	days	Estimated by IDEM
Non-Winter Days	Non-Winter Days	275	days	Estimated by IDEM
Days >0.01" of rain	P	120	days	AP-42, Figure 13.2.1-2, January 2011
Total Days in Period	N	365	days	Days in the period
Mean Vehicle Weight	W	10.05	tons	Calculated above

Winter Emission Factor Calculations

E = [k * (sL for winter)^0.91 * (W)^1.02] * [1 - P/(4 * N)] — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 2.32 lb/VMT
E for PM10 (lb/VMT) = 0.46 lb/VMT
E for PM2.5 (lb/VMT) = 0.11 lb/VMT

Non-Winter Emission Factor Calculations

E = [k * (sL for non-winter)^0.91 * (W)^1.02] * [1 - P/(4 * N)] — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 0.66 lb/VMT
E for PM10 (lb/VMT) = 0.13 lb/VMT
E for PM2.5 (lb/VMT) = 0.03 lb/VMT

Annual Average Emission Factors

Annual Average Emission Factor = [Winter Days * Winter Factor + Non-Winter Days * Non-Winter Factor] / 365

E for PM (lb/VMT) = 1.07 lb/VMT
E for PM10 (lb/VMT) = 0.21 lb/VMT
E for PM2.5 (lb/VMT) = 0.05 lb/VMT

Potential to Emit

PM Emissions (TPY) = [Annual Average E for PM (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 103.37 TPY
PM10 Emissions (TPY) = [Annual Average E for PM10 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 20.29 TPY
PM2.5 Emissions (TPY) = [Annual Average E for PM2.5 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 4.83 TPY

Limited Potential to Emit

Control Efficiency 80.00% per fugitive dust plan

Limited PM Emissions (TPY) = Potential to Emit PM * (1 - Control Efficiency) — 20.67 TPY
Limited PM10 Emissions (TPY) = Potential to Emit PM10 * (1 - Control Efficiency) — 4.06 TPY
Limited PM2.5 Emissions (TPY) = Potential to Emit PM2.5 * (1 - Control Efficiency) — 0.97 TPY

Addendum to the Technical Support Document - Appendix A - Emission Calculation Sheet
Municipal Landfill - Emissions from Unpaved Roads

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 19, 2013

Average Vehicle Weight Calculation

Vehicle Type	Trucks/Day	Average Weight (tons)	Total Trips per Year	Miles per Trip	Vehicle Miles Traveled (miles per year)	Traffic Component (%)	Component Weight (tons)
Transfer Trailer	120	15	43,800	1.7	74,460	23.121%	3.47
Front Loader	48	15	17,520	1.7	29,784	9.249%	1.39
Rear Loader	40	15	14,600	1.7	24,820	7.707%	1.16
Roll-Off	75	15	27,375	1.7	46,538	14.451%	2.17
Dump Trucks	30	15	10,950	1.7	18,615	5.780%	0.87
Other	206	2.5	75,190	1.7	127,823	39.692%	0.99
				Total VMT	322,040		
					Average Vehicle Weight (tons) - W		10.05

Site Specific Constants

Value Name	Symbol	Value	Units	Source
Emission Factor	E	---	lb/VMT	Calculated
Particle Size Multiplier	k for PM	4.90	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Particle Size Multiplier	k for PM10	1.50	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Particle Size Multiplier	k for PM2.5	0.15	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Silt Content	s	6.40	%	Previous Determination
Days >0.01" of rain	P	120.00	days	AP-42, Figure 13.2.2-1, November 2006
Emperical Constant	a for PM	0.70	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	a for PM10	0.90	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	a for PM2.5	0.90	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM10	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM2.5	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Mean Vehicle Weight	W	10.05	tons	Calculated above

Emission Factor Calculations

$E = [k * (s/12)^a * (W/3)^b] * [(365 - P) / 365]$ — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 3.65 lb/VMT
E for PM10 (lb/VMT) = 0.99 lb/VMT
E for PM2.5 (lb/VMT) = 0.10 lb/VMT

Potential to Emit

PM Emissions (TPY) = [E for PM (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 587.72 TPY
PM10 Emissions (TPY) = [E for PM10 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 159.41 TPY
PM2.5 Emissions (TPY) = [E for PM2.5 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 16.10 TPY

Limited Potential to Emit

Control Efficiency 80.00% per fugitive dust plan

Limited PM Emissions (TPY) = Potential to Emit PM * (1 - Control Efficiency) 117.54 TPY
Limited PM10 Emissions (TPY) = Potential to Emit PM10 * (1 - Control Efficiency) 31.88 TPY
Limited PM2.5 Emissions (TPY) = Potential to Emit PM2.5 * (1 - Control Efficiency) 3.22 TPY

Addendum to the Technical Support Document - Appendix A
Landfill Greenhouse Gas Emissions - 40 CFR 98, Subpart HH Method

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Permit Reviewer: David Matousek
Date: October 29, 2013

40 CFR 98, Subpart HH - Equation HH-1

$$G_{CH_4} = \sum_{X=S}^{T-1} \left[W_x * MCF * DOC_f * F * \frac{16}{12} * \left(e^{-k(T-x-1)} - e^{-k(T-x)} \right) \right]$$

Where:

Mass of Methane Generated (G_{CH4}) in megagrams	
Year Landfill Opened (S)	1972
Reporting Year (T) at Closure	2023
Waste Accepted (W_x) in Mg	
Methane Correction Factor (MCF)	1
Degradable Organic Carbon (DOC)	0.2
Fraction of DOC dissimilated (DOC_f)	0.5
Volume Fraction of Methane in Landfill Gas	0.5
Rate Constant (k)	0.057
Mathematical constant (e)	2.718281828
Year Waste Disposed (x)	
Equation HH-5 Constants = MCF*DOC*DOC_f*F*(16/12)	0.067
Temperature in Degree Rankine	520

Eq. HH-5: MG = G_{CH4} * (1 - OX); Where: MG = Methane Generation Adjusted for Oxidation (Mg), OX = Oxidation Fraction
Methane Oxidation Reduction Factor (OX) 0.1

Conversion Factor: TPY = Mg/yr * 1.1023
Equation 1: Average Flow (ACFM) = [PTE (TPY) * T (Rankine)] / [360 * MW * P (atm)]
Equation 2: PTE (TPY) = 360 * Volume Flow (SCFM) * MW * P (atm) / T (Rankine)

		40 CFR 98.343, Eq. HH-1				Eq. HH-5	Conversion Factor	Equation 1
Year Waste Disposed (x)	Waste Accepted Wx (Mg/yr)	$e^{-k*(T-x-1)}$ (Unitless)	$e^{-k*(T-x)}$ (Unitless)	Summation Result for Year X	G_{CH4} (Mg/yr)	G_{CH4} Emissions Adjusted for Oxidation (Mg/yr)	G_{CH4} Emissions Adjusted for Oxidation (TPY)	G_{CH4} Emissions Adjusted for Oxidation ACFM
1972	66,636	0.05784	0.05464	14.31	14.31	12.88	14.20	1.28
1973	66,636	0.06124	0.05784	15.15	29.46	26.51	29.22	2.63
1974	67,000	0.06483	0.06124	16.12	45.58	41.02	45.22	4.07
1975	66,364	0.06863	0.06483	16.91	62.49	56.24	61.99	5.58
1976	66,364	0.07266	0.06863	17.90	80.39	72.35	79.75	7.18
1977	66,364	0.07692	0.07266	18.95	99.34	89.41	98.56	8.87
1978	67,273	0.08143	0.07692	20.34	119.68	107.71	118.73	10.69
1979	66,364	0.08621	0.08143	21.24	140.92	126.83	139.80	12.59
1980	66,364	0.09126	0.08621	22.48	163.40	147.06	162.10	14.59
1981	66,364	0.09662	0.09126	23.80	187.20	168.48	185.72	16.72
1982	67,273	0.10228	0.09662	25.54	212.74	191.47	211.06	19.00
1983	66,364	0.10828	0.10228	26.68	239.42	215.48	237.52	21.39
1984	66,364	0.11464	0.10828	28.24	267.66	240.89	265.53	23.91
1985	66,364	0.12136	0.11464	29.90	297.56	267.80	295.20	26.58
1986	70,909	0.12848	0.12136	33.82	331.38	298.24	328.75	29.60
1987	63,636	0.13601	0.12848	32.13	363.51	327.16	360.63	32.47
1988	63,636	0.14399	0.13601	34.02	397.53	357.78	394.38	35.51
1989	72,727	0.15244	0.14399	41.15	438.68	394.81	435.20	39.18

Year Waste Disposed (x)	Waste Accepted Wx (Mg/yr)	$e^{-k * (T-x-1)}$ (Unitless)	$e^{-k * (T-x)}$ (Unitless)	Summation Result for Year X	G_{CH4} (Mg/yr)	G_{CH4} Emissions Adjusted for Oxidation (Mg/yr)	G_{CH4} Emissions Adjusted for Oxidation (TPY)	G_{CH4} Emissions Adjusted for Oxidation ACFM
1990	63,636	0.16138	0.15244	38.12	476.80	429.12	473.02	42.59
1991	63,636	0.17084	0.16138	40.36	517.16	465.44	513.05	46.19
1992	54,545	0.18087	0.17084	36.62	553.78	498.40	549.39	49.46
1993	100,000	0.19147	0.18087	71.08	624.86	562.37	619.90	55.81
1994	118,182	0.20271	0.19147	88.93	713.79	642.41	708.13	63.76
1995	118,182	0.21460	0.20271	94.15	807.94	727.15	801.54	72.17
1996	109,091	0.22718	0.21460	92.00	899.94	809.95	892.81	80.38
1997	100,000	0.24051	0.22718	89.28	989.22	890.30	981.38	88.36
1998	100,000	0.25462	0.24051	94.52	1,083.74	975.37	1,075.15	96.80
1999	218,182	0.26955	0.25462	218.32	1,302.06	1,171.85	1,291.73	116.30
2000	263,636	0.28536	0.26955	279.27	1,581.33	1,423.20	1,568.79	141.25
2001	290,909	0.30210	0.28536	326.24	1,907.57	1,716.81	1,892.44	170.39
2002	354,545	0.31982	0.30210	420.93	2,328.50	2,095.65	2,310.03	207.99
2003	761,262	0.33858	0.31982	956.81	3,285.31	2,956.78	3,259.26	293.45
2004	936,318	0.35844	0.33858	1,245.86	4,531.17	4,078.05	4,495.23	404.73
2005	1,035,973	0.37946	0.35844	1,459.31	5,990.48	5,391.43	5,942.97	535.08
2006	995,433	0.40172	0.37946	1,484.45	7,474.93	6,727.44	7,415.66	667.67
2007	983,135	0.42528	0.40172	1,552.11	9,027.04	8,124.34	8,955.46	806.31
2008	941,644	0.45023	0.42528	1,573.80	10,600.84	9,540.76	10,516.78	946.89
2009	779,123	0.47664	0.45023	1,378.56	11,979.40	10,781.46	11,884.40	1,070.02
2010	555,169	0.50459	0.47664	1,039.92	13,019.32	11,717.39	12,916.08	1,162.91
2011	521,642	0.53419	0.50459	1,034.43	14,053.75	12,648.38	13,942.31	1,255.31
2012	500,305	0.56553	0.53419	1,050.31	15,104.06	13,593.65	14,984.28	1,349.12
2013	659,576	0.59870	0.56553	1,465.89	16,569.95	14,912.96	16,438.56	1,480.06
2014	659,576	0.63381	0.59870	1,551.88	18,121.83	16,309.65	17,978.13	1,618.68
2015	659,576	0.67099	0.63381	1,642.90	19,764.73	17,788.26	19,608.00	1,765.42
2016	659,576	0.71035	0.67099	1,739.27	21,504.00	19,353.60	21,333.47	1,920.78
2017	659,576	0.75201	0.71035	1,841.29	23,345.29	21,010.76	23,160.16	2,085.24
2018	659,576	0.79612	0.75201	1,949.29	25,294.58	22,765.12	25,093.99	2,259.36
2019	659,576	0.84282	0.79612	2,063.63	27,358.21	24,622.39	27,141.26	2,443.69
2020	659,576	0.89226	0.84282	2,184.67	29,542.88	26,588.59	29,308.60	2,638.82
2021	659,576	0.94459	0.89226	2,312.82	31,855.70	28,670.13	31,603.08	2,845.41
2022	126,266	1.00000	0.94459	468.72	32,324.42	29,091.98	32,068.09	2,887.28
2023	0	1.05866	1.00000	0.00	32,324.42	29,091.98	32,068.09	2,887.28
Total Waste	17,230,000 Mg							

Peak Methane Generation Rate	2,887 SCFM (Eq. 1)	19,608 TPY (Eq. 2)
LFG = Peak Methane Generation Rate / % Methane	5,775 SCFM	
Peak CO_2 Generation Rate = LFG (1- % Methane)	2,887 SCFM	87,964 TPY (Eq. 2)

Landfill Generation Potential	
Peak Methane Generation Rate as CO_2e	411,768 TPY CO_2e
Peak CO_2 Generation Rate as CO_2e	87,964 TPY CO_2e
Peak Total Generation Rate as CO_2e	499,732 TPY CO_2e

Potential to Emit (75% Capture / 25% Fugitive)		
Collected Methane	2,165 SCFM	24,046 TPY (Eq. 2)
Collected CO_2	2,165 SCFM	65,966 TPY (Eq. 2)

Potential to Emit (CO_2e)	2013 CH_4 GWP of 25	2009 CH_4 GWP of 21
PTE Methane as CO_2e (Non-Biogenic)	601,150	504,966 TPY CO_2e
PTE CO_2 as CO_2e (Biogenic)	65,966	65,966 TPY CO_2e
Total GHG Emissions (CO_2e)	667,116	570,932 TPY CO_2e

Limited and Controlled Potential to Emit (CO_2e)	2013 CH_4 GWP of 25	2009 CH_4 GWP of 21
PTE Methane as CO_2e (Non-Biogenic with 98% Combustion)	12,023	10,099 TPY CO_2e
PTE CO_2 as CO_2e (Biogenic)	65,966	65,966 TPY CO_2e
Total GHG Emissions (CO_2e)	77,989	76,065 TPY CO_2e

Indiana Department of Environmental Management
Office of Air Quality

Technical Support Document (TSD) for a Part 70 Significant Permit Modification

Source Description and Location

Source Name:	Sycamore Ridge Landfill
Source Location:	5621 East Cottom Drive, Pimento, Indiana 47866
County:	Vigo County
SIC Code:	4953
Operation Permit No.:	T 167-30079-00116
Operation Permit Issuance Date:	December 19, 2011
Significant Permit Modification No.:	167-32729-00116
Permit Reviewer:	David Matousek

Source Definition

This municipal solid waste landfill consists of two (2) plants:

(a) Landfill 1, Sycamore Ridge Landfill, 167-00116, is located at 5621 East Cottom Drive, Pimento, Indiana; and

(b) Landfill 2, Victory Environmental Services, Inc., 167-00116, is located at 12247 South Mill Street, Terre Haute, Indiana.

Since the two (2) Landfills are located on contiguous or adjacent properties, belong to the same industrial grouping, and are under common control of the same entity, they will be considered one (1) source, effective from the date of issuance of this Part 70 permit.

Sycamore Ridge Landfill (source ID 167-00116), located at 5621 E. Cotton Dr., Pimento, IN 47866, sells landfill gas to Boral Bricks (source ID 167-00139), located at 5601 Price Rd, Terre Haute, IN 47802, via a dedicated pipeline. The two properties are approximately 0.7 miles apart. IDEM, OAQ has examined whether the brick works and the landfill will be part of the same major source.

The term “major source” is defined at 326 IAC 2-7-1(22). In order for these two sources to be considered one major source, they must meet all three of the following criteria:

(1) the sources must be under common ownership or common control;
(2) the sources must have the same two-digit Standard Industrial Classification (SIC) Code or one must serve as a support facility for the other; and
(3) the sources must be located on contiguous or adjacent properties.

IDEM, OAQ will first look at whether the two plants are under common ownership or common control. The plants are owned by separate corporations that have no common parent company. Therefore no common ownership exists.

In 1996, IDEM adopted a nonrule policy document, Air-005-NPD, titled Guidance on Definition of “Source” for Collocated Activities. The guidance endorses the but/for test for determining whether common control exists when there is no common ownership. The test considers the relationship between the two sources. Common control exists if the test is satisfied.

The but/for test examines whether an auxiliary plant would exist absent the existence of the primary plant. This is an examination of whether the auxiliary plant is so dependent on the primary plant that if the primary plant were to cease operations, then the auxiliary would also have to shut down. Boral Bricks purchases landfill gas from Sycamore Ridge to fuel its Tunnel Kiln. The kiln can use natural gas as a backup fuel. If the landfill were to cease providing landfill gas, Boral Bricks would continue to operate. If Boral Bricks were to cease operation, the landfill could find another customer for its gas or burn off the gas in a flare. Since neither plant is dependent on the other no common control exists. The two plants do not meet the first element of the definition of a major source.

The second element of the major source definition is whether the sources have the same two-digit Standard Industrial Classification (SIC) Code, or if one serves as a support facility for the other. The SIC Codes can be found on the United States Department of Labor, Occupational Safety and Health Administration website. The proper two-digit code for Boral Bricks, whose main product is bricks, is Major Group 32: Stone, Clay, Glass, and Concrete Products. The landfill's two-digit code is Major Group 49: Electric, Gas, and Sanitary Services. The two sources do not have the same two-digit SIC Code.

A plant is considered a support facility if at least 50% of its output is dedicated to another plant. None of the bricks from Boral Bricks go to the landfill. The landfill's output includes the work it does in accepting and processing sanitary waste as well as the production of landfill gas. The landfill gas sold to Boral Bricks will be less than 50% of the total output of the landfill. Therefore, neither plant provides 50% or more of its output to the other. Since the brick works and the landfill do not have the same two-digit SIC Code and the support relationship is less than 50%, the two plants do not meet the second element of the definition of a major source.

The plants are located on adjacent properties connected by a dedicated pipeline. Therefore, the third element of the definition is met. However, since the plants are not under common control, do not have the same two-digit SIC Code and neither is a support facility, IDEM, OAQ has determined that the plants do not meet all the elements of the definition and are not part of the same major source.

Existing Approvals

The source was issued Part 70 Operating Permit Renewal No. T 167-30079-00116 on December 19, 2011. The source has since received the following approvals:

(a) First Administrative Amendment No. 167-31434-00116, issued on February 22, 2012; and

(b) Second Administrative Amendment No. 167-32050-00116, issued on June 29, 2012.

County Attainment Status

The source is located in Vigo County.

Pollutant	Designation
SO_2	Non-attainment effective October 4, 2013, for the Fayette and Harrison Twp. The remainder of Vigo County is unclassifiable or attainment effective.
CO	Unclassifiable or attainment effective November 15, 1990.
O_3	Attainment effective February 6, 2006, for the Terre Haute area, including Vigo County, for the 8-hour ozone standard.[1]
PM_{10}	Unclassifiable effective November 15, 1990.
NO_2	Cannot be classified or better than national standards.
Pb	Not designated.

[1]Unclassifiable or attainment effective October 18, 2000, for the 1-hour ozone standard which was revoked effective June 15, 2005.
Unclassifiable or attainment effective April 5, 2005, for $PM_{2.5}$.

(a) Ozone Standards
Volatile organic compounds (VOC) and Nitrogen Oxides (NOx) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for ozone. Therefore, VOC and NOx emissions are considered when evaluating the rule applicability relating to ozone. Vigo County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

(b) $PM_{2.5}$
Vigo County has been classified as attainment for $PM_{2.5}$. On May 8, 2008, U.S. EPA promulgated the requirements for Prevention of Significant Deterioration (PSD) for $PM_{2.5}$ emissions. These rules became effective on July 15, 2008. On May 4, 2011, the air pollution control board issued an emergency rule establishing the direct $PM_{2.5}$ significant level at ten (10) tons per year. This rule became effective, June 28, 2011. Therefore, direct $PM_{2.5}$, SO_2 and NO_x emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2. See the State Rule Applicability – Entire Source section.

(c) Other Criteria Pollutants
Vigo County, outside of Fayette and Harrison Townships, has been classified as attainment or unclassifiable in Indiana for PM_{10}, NO_x, SO_2, CO and lead. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

Fugitive Emissions

Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2, 326 IAC 2-3, or 326 IAC 2-7, and there is no applicable New Source Performance Standard that was in effect on August 7, 1980, fugitive emissions are not counted toward the determination of PSD, Emission Offset, and Part 70 Permit applicability.

Note: The landfill is subject to 40 CFR 61, Subpart M; however, landfills were not subject to this NSPS until after August 7, 1980.

Unrestricted Potential Emissions

This table reflects the unrestricted potential emissions of the source.

Unrestricted Potential Emissions (tons/year)	
PM	9.23
PM_{10}	9.16
$PM_{2.5}$	9.16
SO_2	10.31
VOC	65.20
CO	189.84
NO_x	38.34
Biogenic CO_2 as CO_2e	62,616
Non-Biogenic GHGs as CO_2e	485,610
Single HAP	10.23
Total HAP	33.39

HAPs	tons/year
Toluene	10.23
Xylene	3.63
HCL	3.39
Dichloromethane	3.38
Perchloroethylene	1.75
Hexane	1.63
Methyl Ethyl Ketone	1.46
Ethylbenzene	1.39
Vinyl Chloride	1.30
Trichloroethylene	1.05
Multiple Minor HAPs	4.18
Total	**33.39**

(a) The potential to emit (as defined in 326 IAC 2-7-1(29)) of CO is equal to or greater than 100 tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-7.

(b) The potential to emit (as defined in 326 IAC 2-7-1(29)) of GHGs is equal to or greater than one hundred thousand (100,000) tons of CO_2 equivalent emissions (CO_2e) per year. Therefore, the source is subject to the provisions of 326 IAC 2-7.

(c) This source has an unrestricted potential to emit 485,610 tons of non-biogenic GHGs per year and 62,616 tons of biogenic CO_2 per year. If the biogenic CO_2 emissions are included in the source-wide potential to emit (PTE), the total PTE of GHGs would be 548,226 tons of CO_2e per year, which is greater than the subject to regulation threshold of one hundred thousand (100,000) tons of CO_2e per year for PSD applicability and Title V.

(d) The potential to emit (as defined in 326 IAC 2-7-1(29)) of any single HAP is equal to or greater than ten (10) tons per year and/or the potential to emit (as defined in 326 IAC 2-7-1(29)) of a combination of HAPs is equal to or greater than twenty-five (25) tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-7.

Potential to Emit After Issuance

The table below summarizes the potential to emit, reflecting all limits, of the emission units. Any new control equipment is considered federally enforceable only after issuance of this Part 70 permit renewal, and only to the extent that the effect of the control equipment is made practically enforceable in the permit.

Process Emission Unit	Potential To Emit of the Entire Source After Issuance (tons/year)										
	PM	PM_{10}*	$PM_{2.5}$**	SO_2	NO_x	VOC	CO	Biogenic CO_2 (CO_2e)	Non-Biogenic GHG (CO_2e)	Total HAPs	Worst Single HAP (HCL)
Landfill	0.00	0.00	0.00	0.00	0.00	1.16	0.22	62,616	9,585	0.60	0.00
Flare GCCS-VES, 1,200 SCFM	2.49	2.49	2.49	2.40	11.79	0.32	64.18	16,140	63	1.23	1.23
Flare GCCS-SRL, 2,100 SCFM	4.36	4.36	4.36	4.21	20.55	0.56	111.82	28,245	110	2.16	2.16
Insignificant Activities											
Propane Combustion – Unit #13	0.06	0.20	0.20	0.01	3.73	0.29	2.15	0.00	3,574	0.00	0.00
Kerosene Combustion – Unit #20	0.13	0.21	0.21	0.46	1.30	0.02	0.32	0.00	1,456	0.00	0.00
Waste Oil Combustion – Unit #21	2.19	1.90	1.90	3.23	0.97	0.06	0.13	0.00	1,333	0.03	0.00
Diesel Storage Tanks – Unit #14	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	Negl.	Negl.
Leachate Storage Tanks – Unit #16 and Unit #26	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	Negl.	Negl.
Gasoline Storage Tank – Unit #23	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.02	0.00
Other Misc. Insignificant Activities	Negl.	Negl.	Negl.	Negl.	Negl.	5.48	Negl.	Negl.	Negl.	Negl.	Negl.
Total PTE of Entire Source	**9.23**	**9.16**	**9.16**	**10.31**	**38.34**	**8.59**	**178.82**	**107,001**	**16,122**	**4.04**	**3.39**
Title V Major Source Thresholds	**NA**	**100**	**100**	**100**	**100**	**100**	**100**	**100,000 CO_2e**		**25**	**10**
PSD Major Source Thresholds	**250**	**250**	**250**	**250**	**250**	**250**	**250**	**(a)**		**NA**	**NA**

negl. = negligible
*Under the Part 70 Permit program (40 CFR 70), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM10), not particulate matter (PM), is considered as a "regulated air pollutant".
**$PM_{2.5}$ listed is direct $PM_{2.5}$.
(a) PSD applies to new sources that emit or have the potential to emit at least 100,000 TPY CO_2e or existing sources that emit at that level and that undertake a modification that increases emissions by at least 75,000 TPY CO_2e, and also emit at least 100/250 on GHGs on a mass basis.

(a) This existing stationary source is not major for PSD because the emissions of each regulated pollutant, excluding GHGs, are less than two hundred fifty (<250) tons per year, emissions of non-biogenic GHGs are less than one hundred thousand (<100,000) tons of CO_2e per year, and it is not in one of the twenty-eight (28) listed source categories. Biogenic CO_2 is not considered when evaluating PSD applicability, at this time.

If biogenic CO_2 were considered, the source-wide potential to emit GHGs is greater than 100,000 TPY of CO_2e. However, this is an existing source and the source is not making modifications that would result in an increase of GHG emissions exceeding the major modification threshold of 75,000 TPY CO_2e. Therefore, if biogenic CO_2 were included in the source wide potential to emit, the GHG emissions at the existing source would not be subject to regulation under PSD.

(b) PSD applies to new sources that emit or have the potential to emit at least 100,000 TPY CO_2e or existing sources that emit at that level and that undertake a modification that increases emissions by at least 75,000 TPY CO_2e, and also emit at least 100/250 TPY of GHGs on a mass basis. This source has biogenic CO_2 emissions in excess of 100,000 TPY as CO_2e. When biogenic emissions are counted and this source undertakes a modification that increases GHG emissions by 75,000 TPY or more as CO_2e, the GHGs from the modification will be subject to regulation under PSD.

Description of Proposed Modification

The Office of Air Quality (OAQ) has reviewed a modification application, submitted by Sycamore Ridge Landfill on January 10, 2013, relating to a revision of the insignificant activities listed in the current Part 70 Operating Permit Renewal issued on December 19, 2011. The following insignificant activities have been removed from the Part 70 Operating Permit:

(a) One (1) Parts Washer, identified as Unit ID #1
(b) One (1) 10,000 gallons AST diesel fueling tank, identified as Unit ID #11
(c) One (1) 330 gallons antifreeze tank, identified as Unit ID #22
(d) One (1) 12,000 gallon AST on-road diesel, identified as Unit ID #24
(e) One (1) portable 275 gallons hydraulic fluid tank, identified as Unit ID #28

The following insignificant activities have been added to the Part 70 Operating Permit Renewal:

(a) One (1) 300 gallon kerosene tank, identified as Unit ID #32
(b) Two (2) 200 gallon propane tanks, identified as Unit ID #33
(c) One (1) 55 gallon transmission oil tank, identified as Unit ID #34
(d) One (1) 500 gallon AST used oil tank for furnace, identified as Unit ID #35

The following insignificant activities have been modified since the Part 70 Operating Permit Renewal was issued:

(a) Six (6) portable welders, identified as Unit ID #3 [326 IAC 6.5]
(b) One (1) 55 gallon drum of transmission fluid, identified as Unit ID #5
(c) One (1) 300 gallon AST for antifreeze, identified as Unit ID #7
(d) One (1) 400 gallon AST hydraulic oil tank, identified as Unit ID #8
(e) One (1) 250 gallon used motor oil tank, identified as Unit ID #10
(f) One (1) 500 gallon AST propane tank, identified as Unit ID #12
(g) Four (4) propane-fired space heaters, identified as Unit ID #13 [326 IAC 6.5]
(h) Two (2) 35,000 gallon AST diesel storage tanks, identified as Unit ID #14
(i) One (1) 26,000 gallon UST leachate storage tank, identified as Unit ID #15
(j) Two (2) 55 gallon drums Castrol gear lube, identified as Unit ID #16
(k) Two (2) 250 gallon AST for hydraulic fluid, identified as Unit ID #17
(l) One (1) 250 gallon AST for gear oil, identified as Unit ID #18
(m) One (1) 375 gallon transmission fluid tank, identified as Unit ID #19
(n) Two (2) portable kerosene heaters, identified as Unit ID #20 [326 IAC 6.5]
(o) Two (2) 500 gallon used oil tanks with burner, identified as Unit ID #21 [326 IAC 6.5]

(p) One (1) 1,000 gallon gasoline AST with vent, identified as Unit ID #23, with a monthly gasoline throughput of less than ten thousand (10,000) gallons. [40 CFR 63, Subpart CCCCCC]
(q) One (1) 1,000 gallon AST on-road diesel tank, identified as Unit ID #25
(r) One (1) portable 375 gallon motor oil tank, identified as Unit ID #29
(s) One (1) 250 gallon transmission fluid tank, identified as Unit ID #30

The source also requested an increase in the capacity of the landfill from 14,755,000 megagrams to 17,230,000 megagrams.

The insignificant activity description below is being added to the Section A.4 of permit. This is not a new emission unit, since it was previously included in the technical support document and potential to emit calculations for Part 70 Operating Permit Renewal 167-30079-00116.

(x) Paved and unpaved roads. [326 IAC 6.5]

Enforcement Issues

There are no pending enforcement actions.

Emission Calculations

See Appendix A of this Technical Support Document for detailed emission calculations.

Permit Level Determination – Part 70

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as "the maximum capacity of a stationary source or emission unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, IDEM, or the appropriate local air pollution control agency."

The following table is used to determine the appropriate permit level under 326 IAC 2-7-10.5. This table reflects the PTE before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

Increase in PTE Before Controls of the Modification	
Pollutant	**Potential To Emit** (ton/yr)
PM	2.38
PM_{10}	2.31
$PM_{2.5}$	2.31
SO_2	3.70
VOC	7.70
CO	2.82
NO_X	6.00
Single HAPs	0.22
Total HAPs	0.66

This modification is not subject to the source modification requirements under 326 IAC 2-7-10.5. The changes will be incorporated into the permit as a significant permit modification under 326 IAC 2-7-12(d), because the modification includes significant changes to Part 70 terms and conditions.

Federal Rule Applicability Determination

The following federal rules are applicable to the source due to this modification:

NSPS:

(a) There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) applicable to this proposed modification.

NESHAP:

(b) The 1,000 gallon gasoline AST with a vent, identified as Unit ID #23 is subject to the National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities (40 CFR 63.11111, Subpart CCCCCC), which is incorporated by reference as 326 IAC 20. The units subject to this rule include the following:

One (1) 1,000 gallon gasoline AST with vent, identified as Unit ID #23, with a monthly gasoline throughput of less than ten thousand (10,000) gallons. [40 CFR 63, Subpart CCCCCC]

Nonapplicable portions of the NESHAP will not be included in the permit. This source is subject to the following portions of Subpart CCCCCC:

(1) 40 CFR 63.11111(a), (b), (i) and (j);
(2) 40 CFR 63.11112;
(3) 40 CFR 63.11113(a), (b), and (c);
(4) 40 CFR 63.11115(a);
(5) 40 CFR 63.11116;
(6) 40 CFR 63.11130;
(7) 40 CFR 63.11131;
(8) 40 CFR 63.11132; and
(9) Table 3

The provisions of 40 CFR 63 Subpart A – General Provisions, which are incorporated as 326 IAC 20-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR 63 Subpart CCCCCC.

(c) There are no other National Emission Standards for Hazardous Air Pollutants (NESHAPs) (326 IAC 14, 326 IAC 20 and 40 CFR Part 63) applicable to this proposed modification.

(d) Pursuant to 40 CFR 64.2, Compliance Assurance Monitoring (CAM) is applicable to new or modified emission units that involve a pollutant-specific emission unit and meet the following criteria:

(1) has a potential to emit before controls equal to or greater than the Part 70 major source threshold for the pollutant involved;

(2) is subject to an emission limitation or standard for that pollutant; and

(3) uses a control device, as defined in 40 CFR 64.1, to comply with that emission limitation or standard.

This modification consists of the incorporation of insignificant activities; therefore, the requirements of 40 CFR Part 64, CAM are not applicable.

State Rule Applicability Determination

The following state rules are applicable to the source due to the modification:

326 IAC 2-2 (PSD)
PSD applicability is discussed under the Potential to Emit After Issuance section.

326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants (HAP))
This modification consists of the incorporation of insignificant activities, each with a potential to emit of less than ten (10) tons per year for a single HAP and less than twenty-five (25) tons per year for a combination of HAPs. Therefore, 326 IAC 2-4.1 does not apply.

326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)
The source is subject to the requirements of 326 IAC 6-5, because this source has potential fugitive particulate emissions equal to or greater than 25 tons per year, when fugitive emissions are included.

326 IAC 6.5 (Particulate Matter Limitations Except Lake County)
This rule applies to sources or facilities located in Clark, Dearborn, Dubois, Howard, Marion, St. Joseph, Vanderburgh, Vigo or Wayne counties that are specifically listed in 326 IAC 6.5-2 through 326 IAC 6.5-10, or have the potential to emit one hundred tons, or actual emissions of ten tons of particulate matter per year. This source is not specifically listed in 326 IAC 6.5-2 through 326 IAC 6.5-10, but it has a potential to emit 100 TPY of particulate matter when fugitive emissions are included in the potential to emit. Therefore, this rule applies to this source.

Pursuant to 326 IAC 6.5-1-2(a), particulate matter emissions from the following operations shall not exceed 0.03 grain per dry standard cubic foot (dscf):

(a) The flare for the gas collection and control system identified as GCCS-VES;

(b) The flare for the gas collection and control system identified as GCCS-SRL;

(c) The six welders identified as Unit #3;

(d) The four propane-fired space heaters identified as Unit #13;

(e) The two portable kerosene heaters identified as Unit #20; and

(f) The two 500 gallon used oil burners associated with Unit #21.

(g) Paved and unpaved roads.

326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations)
This rule applies to any emission unit with a potential to emit twenty-five (25) tons per year or ten (10) pounds per hour of sulfur dioxide. All of the emission units located at this source have a potential to emit below these levels; therefore, 326 IAC 7-1.1 does not apply.

Storage Tanks and Fuel Dispensing Facilities

326 IAC 8-1-6 (VOC Rules: General Reduction Requirements for New Facilities)
The storage tanks and the fuel dispensing facilities are each not subject to the requirements of 326 IAC 8-1-6, since the unlimited VOC potential emissions from each unit is less than twenty-five (25) tons per year.

326 IAC 8-4-3 (Petroleum Sources: Petroleum Liquid Storage Facilities)
Pursuant to 326 IAC 8-4-1(c) and 326 IAC 8-4-3(a), each of the storage vessels at this source is not subject to the requirements of 326 IAC 8-3-4, since:

(1) the gasoline storage tank (1,000 gallon capacity), has a storage capacity less than thirty-nine thousand (39,000) gallons; and

(2) each of the other storage tanks has a storage capacity less than thirty-nine thousand (39,000) gallons and stores organic liquid which has a true vapor pressure less than 1.52 psi at the storage temperature.

326 8-4-4 (Petroleum Sources: Bulk Gasoline Terminals)
This source is not subject to the requirements of 326 IAC 8-4-4, because this source is not a bulk gasoline terminal.

326 IAC 8-4-6 (Petroleum Sources: Gasoline Dispensing Facilities)
The fuel dispensing facilities at this source are not subject to the requirements of 326 IAC 8-4-6, since:

(1) the gasoline dispensing facility at this source does not have a monthly gasoline throughput of ten thousand (10,000) gallons per month or greater; and

(2) the diesel fuel dispensing facilities are not considered gasoline dispensing facilities as defined by 326 IAC 8-4-6(a)(8).

326 IAC 8-6 (VOC Rules: Organic Solvent Emission Limitations)
Pursuant to 326 IAC 8-6-1, this rule applies to sources commencing operation after October 7, 1974 and prior to January 1, 1980, located anywhere in the state, with potential VOC emissions of 100 tons per year or more, and not regulated by any other provisions of Article 8. Pursuant to 326 IAC 8-6-1, this source is not subject to the requirements of 326 IAC 8-6, because this source, which is located in Vigo County, did not commence operation after October 7, 1974 and prior to January 1, 1980.

326 IAC 8-7 (VOC Rules: Specific VOC Reduction Requirements for Lake, Porter, Clark, and Floyd Counties)
Pursuant to 326 IAC 8-7-2(a), this source is not subject to the requirements of 326 IAC 8-7, since it is not located in Lake, Porter, Clark, or Floyd County.

326 IAC 8-9 (VOC Rules: Volatile Organic Liquid Storage Vessels)
Pursuant to 326 IAC 8-9-1(a), this source is not subject to the requirements of 326 IAC 8-9, since it is not located in Lake, Porter, Clark, or Floyd County.

There are no other 326 IAC 8 Rules that are applicable to the storage tanks and fuel dispensing facilities at this source.

Compliance Determination and Monitoring Requirements

Permits issued under 326 IAC 2-7 are required to ensure that sources can demonstrate compliance with all applicable state and federal rules on a continuous basis. All state and federal rules contain compliance provisions; however, these provisions do not always fulfill the requirement for a continuous demonstration. When this occurs, IDEM, OAQ, in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-7-5. As a result, Compliance Determination Requirements are included in the permit. The Compliance Determination Requirements in Section D of the permit are those conditions that are found directly within state and federal rules and the violation of which serves as grounds for enforcement action.

If the Compliance Determination Requirements are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also in Section D of the permit. Unlike Compliance Determination Requirements, failure to meet Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the appropriate corrective actions within a specific time period.

There are no Compliance Determination Requirements applicable to this modification.

There are no Compliance Monitoring requirements applicable to this modification.

Proposed Changes

The changes listed below have been made to Part 70 Operating Permit Renewal No. T 167-30079-00116. Deleted language appears as ~~strikethroughs~~ and new language appears in **bold**:

Modification No. 1:

Part 70 Source Definition

IDEM, OAQ has decided to remove a portion of the Part 70 Source Definition in the A Section of the permit, since this source is one source with the landfill located at Victory Environmental Services, Inc., (Plant ID 167-00116), but not with Boral Bricks (Plant ID 167-00139). The entire original text is included in the technical support document (TSD). Revisions to the condition are shown below:

A.2 Part 70 Source Definition [326 IAC 2-7-1(22)]

This municipal solid waste landfill consists of two (2) plants:

(a) Landfill 1, Sycamore Ridge Landfill, 167-00116, is located at 5621 East Cottom Drive, Pimento, Indiana; and

(b) Landfill 2, Victory Environmental Services, Inc., 167-00116, is located at 12247 South Mill Street, Terre Haute, Indiana.

Since the two (2) Landfills are located on contiguous or adjacent properties, belong to the same industrial grouping, and are under common control of the same entity, they will be considered one (1) source, effective from the date of issuance of this Part 70 permit.

~~Sycamore Ridge Landfill (source ID 167-00116), located at 5621 E. Cotton Dr., Pimento, IN 47866, sells landfill gas to Boral Bricks (source ID 167-00139), located at 5601 Price Rd, Terre Haute, IN 47802, via a dedicated pipeline. The two properties are approximately 0.7 miles apart. IDEM, OAQ has examined whether the brick works and the landfill will be part of the same major source.~~

~~The term "major source" is defined at 326 IAC 2-7-1(22). In order for these two sources to be considered one major source, they must meet all three of the following criteria:~~

~~(1) the sources must be under common ownership or common control;~~
~~(2) the sources must have the same two-digit Standard Industrial Classification (SIC) Code or one must serve as a support facility for the other; and~~
~~(3) the sources must be located on contiguous or adjacent properties.~~

~~IDEM, OAQ will first look at whether the two plants are under common ownership or common control. The plants are owned by separate corporations that have no common parent company. Therefore no common ownership exists.~~

~~In 1996, IDEM adopted a nonrule policy document, Air-005-NPD, titled Guidance on Definition of "Source" for Collocated Activities. The guidance endorses the but/for test for determining whether common control exists when there is no common ownership. The test considers the relationship between the two sources. Common control exists if the test is satisfied.~~

~~The but/for test examines whether an auxiliary plant would exist absent the existence of the primary plant. This is an examination of whether the auxiliary plant is so dependent on the primary plant that if the primary plant were to cease operations, then the auxiliary would also have to shut down. Boral Bricks purchases landfill gas from Sycamore Ridge to fuel its Tunnel Kiln. The kiln can use natural gas as a backup fuel. If the landfill were to cease providing landfill gas, Boral Bricks would continue to operate. If Boral Bricks were to cease operation, the landfill could find another customer for its gas or burn off the gas in a flare. Since neither plant is dependent on the other no common control exists. The two plants do not meet the first element of the definition of a major source.~~

~~The second element of the major source definition is whether the sources have the same two-digit Standard Industrial Classification (SIC) Code, or if one serves as a support facility for the other. The SIC Codes can be found at http://www.osha.gov/pls/imis/sicsearch.html on the United States Department of Labor, Occupational Safety and Health Administration website. The proper two-digit code for Boral Bricks, whose main product is bricks, is Major Group 32: Stone, Clay, Glass, and Concrete Products. The landfill's two-digit code is Major Group 49: Electric, Gas, and Sanitary Services. The two sources do not have the same two-digit SIC Code.~~

~~A plant is considered a support facility if at least 50% of its output is dedicated to another plant. None of the bricks from Boral Bricks go to the landfill. The landfill's output includes the work it does in accepting and processing sanitary waste as well as the production of landfill gas. The landfill gas sold to Boral Bricks will be less than 50% of the total output of the landfill. Therefore, neither plant provides 50% or more of its output to the other. Since the brick works and the landfill do not have the same two-digit SIC Code and the support relationship is less than 50%, the two plants do not meet the second element of the definition of a major source.~~

~~The plants are located on adjacent properties connected by a dedicated pipeline. Therefore, the third element of the definition is met. However, since the plants are not under common control, do not have the same two-digit SIC Code and neither is a support facility, IDEM, OAQ has determined that the plants do not meet all the elements of the definition and are not part of the same major source.~~

Modification No. 2:

Emission Units and Pollution Control Equipment Descriptions

IDEM, OAQ is adding the design heat input capacity to the emission unit descriptions for flares GCCS-VES and GCCS-SRL. In addition, IDEM, OAQ is correcting the design capacity for flare GCCS-VES. No modifications have been made to the flare. The description is simply incorrect. The capacity of the landfill has been increased from 14,755,000 megagrams to 17,230,000 megagrams. Revisions are shown below:

A.3 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(14)]

This stationary source consists of the following emission units and pollution control devices:

(a) One (1) municipal solid waste landfill with a total combined design capacity of ~~14.755~~**17.230** million megagrams (Mg) (~~21.203~~**24.76** million cubic meters, or ~~27.7~~**32.34** million cubic yards). The original landfill (Victory Environmental Services, Inc.) was constructed in 1972. The expanded landfill (Sycamore Ridge Landfill) was constructed in 2003. **[40 CFR 61, Subpart M][40 CFR 60, Subpart WWW] [40 CFR 63, Subpart AAAA]**

(b) One (1) Active Gas Collection and Control System, identified as GCCS-VES, for Victory Environmental Services, Inc., including an open flare with a design capacity of ~~3,000~~**1,200** standard cubic feet per minute **with a maximum heat input capacity of 39.6 MMBtu/hr**. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-VES was constructed in 2004. **[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]**

(c) One (1) Active Gas Collection and Control System, identified as GCCS-SRL, for Landfill 1 (Sycamore Ridge Landfill), including one (1) LFG Specialties Candlestick Flare, with a maximum capacity of 2,100 scfm of landfill gas **with a maximum heat input capacity of 69.0 MMBtu/hr**. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-SRL was approved for construction in 2008 and will be expanded based on site conditions. **[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]**

Modification No. 3:

Specifically Regulated Insignificant Activities

IDEM, OAQ is updating the list of specifically regulated insignificant activities. The gasoline storage tank added as a result of this modification is subject to 40 CFR 63, Subpart CCCCCC. Revisions are shown below:

A.4 ~~Specifically Regulated~~ Insignificant Activities [326 IAC 2-7-1(21)] [326 IAC 2-7-4(c)] [326 IAC 2-7-5(1~~4~~5)]

~~This stationary source does not currently have any insignificant activities which are specifically regulated, as defined in 326 IAC 2-7-1(21).~~**This stationary source also includes the following insignificant activities, as defined in 326 IAC 2-7-1(21):**

(a) Six (6) portable welders, Unit #3 [326 IAC 6.5]
(b) One (1) 55 gallon drum of transmission fluid, Unit #5
(c) One (1) 300 gallon above ground storage tank (AST) for antifreeze, Unit #7
(d) One (1) 400 gallon AST for hydraulic oil, Unit #8
(e) One (1) 250 gallon AST for used motor oil tank, Unit #10
(f) One (1) 500 gallon AST for propane, Unit #12
(g) Four (4) propane-fired space heaters, Unit #13 [326 IAC 6.5]
(h) Two (2) 35,000 gallon AST for diesel storage, Unit #14
(i) One (1) 26,000 gallon underground storage tank (UST) for leachate, Unit #15
(j) Two (2) 55 gallon drums of Castrol gear oil, Unit #16
(k) Two (2) 250 gallon AST for hydraulic fluid, Unit #17
(l) One (1) 250 gallon AST for gear oil, Unit #18
(m) One (1) 375 gallon AST for transmission fluid, Unit #19
(n) Two (2) portable kerosene heaters, less than 2 MMBtu/hr each, Unit #20 [326 IAC 6.5]
(o) Two (2) 500 gallon used oil tanks and burner, Unit #21 [326 IAC 6.5]
(p) One (1) 1,000 gallon gasoline AST with vent, identified as Unit ID #23, with a monthly gasoline throughput of less than ten thousand (10,000) gallons. [40 CFR 63, Subpart CCCCCC]
(q) One (1) 1,000 gallon AST for on-road diesel, Unit #25
(r) One (1) portable 375 gallon tank for motor oil, Unit #29
(s) One (1) 250 gallon storage tank for transmission fluid, Unit #30
(t) One (1) 300 gallon storage tank for kerosene, Unit #32
(u) Two (2) 200 gallon propane tanks, Unit #33
(v) One (1) 55 gallon drum of transmission oil, Unit #34
(w) One (1) 500 gallon AST for used oil storage for the boiler, Unit #35
(x) Paved and unpaved roads. [326 IAC 6.5]

Modification No. 4:

Particulate Emission Limitations – 326 IAC 6-3-2

A new Condition C.1 has been added to the permit. All follow on Section C conditions have been renumbered to incorporate the addition. The new condition provides an emission limitation for manufacturing processes with a process weight rate below 100 pounds per hour. The condition added is shown below:

C.1 Particulate Emission Limitations For Processes with Process Weight Rates Less Than One Hundred (100) Pounds per Hour [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2(e)(2), particulate emissions from any process not exempt under 326 IAC 6-3-1(b) or (c) which has a maximum process weight rate less than 100 pounds per hour and the methods in 326 IAC 6-3-2(b) through (d) do not apply shall not exceed 0.551 pounds per hour.

Modification No. 5:

Permit Term Clarification

Original Condition B.2(a) has been clarified. The condition is intended to indicate T 167-30079-00116 was issued for a period of five years and not five years from the issuance of a permit amendment or permit modification. Revisions are shown below:

B.2 Permit Term [326 IAC 2-7-5(2)] [326 IAC 2-1.1-9.5] [326 IAC 2-7-4(a)(1)(D)] [IC 13-15-3-6(a)]

(a) ~~The Part 70 Operating Permit Renewal~~**This permit**, T167-30079-00116, is issued for a fixed term of five (5) years from the issuance date of this permit, as determined in accordance with IC 4-21.5-3-5(f) and IC 13-15-5-3. Subsequent revisions, modifications, or amendments of this permit do not affect the expiration date of this permit. **********

Modification No. 6:

Instrument Specifications

Original Condition C.10 has been clarified to indicate the analog instrument used must be capable of reading outside the normal range. The condition was renumbered. Revisions are shown below:

C.~~9~~**11** Instrument Specifications [326 IAC 2-1.1-11] [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

(a) When required by any condition of this permit, an analog instrument used to measure a parameter related to the operation of an air pollution control device shall have a scale such that the expected maximum reading for the normal range shall be no less than twenty percent (20%) of full scale. **The analog instrument shall be capable of measuring values outside of the normal range.** **********

Modification No. 7:

Responsible Official Rule Citation

On October 27, 2010, the Indiana Air Pollution Control Board issued revisions to 326 IAC 2. These revisions resulted in changes to the rule sites listed in the permit. These changes are not changes to the underlying provisions. The change is only to the rule cites. The rule citation for the responsible official was updated. Section C conditions have been renumbered. The compliance monitoring condition was clarified. Revisions are shown below:

B.8 Certification [326 IAC 2-7-4(f)][326 IAC 2-7-6(1)][326 IAC 2-7-5(3)(C)]

(a) A certification required by this permit meets the requirements of 326 IAC 2-7-6(1) if:

(1) it contains a certification by a "responsible official" as defined by 326 IAC 2-7-1(~~34~~**35**), and **********

(c) A "responsible official" is defined at 326 IAC 2-7-1(~~34~~**35**).

B.9 Annual Compliance Certification [326 IAC 2-7-6(5)]

(a) **********

(c) **********

(5) Such other facts, as specified in Sections D of this permit, as IDEM, OAQ may require to determine the compliance status of the source.

The submittal by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~3~~**435**).

B.10 Preventive Maintenance Plan [326 IAC 2-7-5(12)][326 IAC 1-6-3]

(a) A Preventive Maintenance Plan meets the requirements of 326 IAC 1-6-3 if it includes, at a minimum: **********

(b) **********

The PMP extension notification does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~3~~**435**).

The Permittee shall implement the PMPs.

(c) A copy of the PMPs shall be submitted to IDEM, OAQ upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ may require the Permittee to revise its PMPs whenever lack of proper maintenance causes or is the primary contributor to an exceedance of any limitation on emissions. The PMPs and their submittal do not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~3~~**435**).

****

B.11 Emergency Provisions [326 IAC 2-7-16]

(a) **********

(b) **********

(5) **********

The notification which shall be submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~3~~**435**).

B.15 Permit Modification, Reopening, Revocation and Reissuance, or Termination [326 IAC 2-7-5(6)(C)] [326 IAC 2-7-8(a)] [326 IAC 2-7-9]

(a) This permit may be modified, reopened, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a Part 70 Operating Permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any condition of this permit. [326 IAC 2-7-5(6)(C)] The notification by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~3~~**435**). **********

B.16 Permit Renewal [326 IAC 2-7-3] [326 IAC 2-7-4] [326 IAC 2-7-8(e)]

(a) The application for renewal shall be submitted using the application form or forms prescribed by IDEM, OAQ and shall include the information specified in 326 IAC 2-7-4. Such information shall be included in the application for each emission unit at this source, except those emission units included on the trivial or insignificant activities list contained in 326 IAC 2-7-1(21) and 326 IAC 2-7-1(40). The renewal application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~34~~**35**). **********

B.17 Permit Amendment or Modification [326 IAC 2-7-11] [326 IAC 2-7-12]

(a) **********

(b) **********

Any such application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~34~~**35**). **********

B.19 Operational Flexibility [326 IAC 2-7-20] [326 IAC 2-7-10.5]

(a) **********

(b) **********

The notification which shall be submitted is not considered an application form, report or compliance certification. Therefore, the notification by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~34~~**35**).

B.22 Transfer of Ownership or Operational Control [326 IAC 2-7-11]

(a) **********

(b) **********

Any such application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~34~~**35**).

C.~~5~~**7** Asbestos Abatement Projects [326 IAC 14-10] [326 IAC 18] [40 CFR 61, Subpart M]

(a) **********

(d) **********

The notice shall include a signed certification from the owner or operator that the information provided in this notification is correct and that only Indiana licensed workers and project supervisors will be used to implement the asbestos removal project. The notifications do not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~34~~**35**).

C.~~6~~**8** Performance Testing [326 IAC 3-6]

(a) **********

no later than thirty-five (35) days prior to the intended test date. The protocol submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~34~~**35**).

(b) The Permittee shall notify IDEM, OAQ of the actual test date at least fourteen (14) days prior to the actual test date. The notification submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~34~~**35**). **********

C.~~8~~**10** Compliance Monitoring [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

~~Unless otherwise specified in this permit, for all monitoring requirements not already legally required, the Permittee shall be allowed up to ninety (90) days from the date of permit issuance or of initial start-up, whichever is later, to begin such monitoring. If due to circumstances beyond the Permittee's control, any monitoring equipment required by this permit cannot be installed and operated no later than ninety (90) days after permit issuance or the date of initial startup, whichever is later, the Permittee may extend the compliance schedule related to the equipment for an additional ninety (90) days provided the Permittee notifies:~~

~~Indiana Department of Environmental Management~~
~~Compliance and Enforcement Branch, Office of Air Quality~~
~~100 North Senate Avenue~~
~~MC 61-53 IGCN 1003~~
~~Indianapolis, Indiana 46204-2251~~

~~in writing, prior to the end of the initial ninety (90) day compliance schedule, with full justification of the reasons for the inability to meet this date.~~

~~The notification which shall be submitted by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(34).~~

~~Unless otherwise specified in the approval for the new emission unit(s), compliance monitoring for new emission units or emission units added through a source modification shall be implemented when operation begins.~~

(a) For new units:

Unless otherwise specified in the approval for the new emission units(s), compliance monitoring for new emission units shall be implemented on and after the date of initial start-up.

(b) For existing units:

Unless otherwise specified in this permit, for all monitoring requirements not already legally required, the Permittee shall be allowed up to ninety (90) days from the date of permit issuance to begin such monitoring. If due to circumstances beyond the Permittee's control, any monitoring equipment required by this permit cannot be installed and operated no later than ninety (90) days after permit issuance, the Permittee may extend the compliance schedule related to the equipment for an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

in writing, prior to the end of the initial ninety (90) day compliance schedule, with full justification of the reasons for the inability to meet this date.

The notification which shall be submitted by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

C.1~~0~~**2** Emergency Reduction Plans [326 IAC 1-5-2] [326 IAC 1-5-3]
****

C.1~~1~~**3** Risk Management Plan [326 IAC 2-7-5(12)] [40 CFR 68]
****

C.1~~2~~**4** Response to Excursions or Exceedances [326 IAC 2-7-5] [326 IAC 2-7-6]
****

C.1~~3~~**5** Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2-7-5] [326 IAC 2-7-6]
****

The response action documents submitted pursuant to this condition do require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~3~~**35**).

C.1~~4~~**6** Emission Statement [326 IAC 2-7-5(3)(C)(iii)] [326 IAC 2-7-5(7)] [326 IAC 2-7-19(c)] [326 IAC 2-6]
****

The emission statement does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~3~~**35**). **********

C.1~~6~~**8** General Reporting Requirements [326 IAC 2-7-5(3)(C)] [326 IAC 2-1.1-11]

(a) The Permittee shall submit the attached Quarterly Deviation and Compliance Monitoring Report or its equivalent. **Proper notice submittal under Section B – Emergency Provisions satisfies the reporting requirements of this paragraph.** Any deviation from permit requirements, the date(s) of each deviation, the cause of the deviation, and the response steps taken must be reported except that a deviation required to be reported pursuant to an applicable requirement that exists independent of this permit, shall be reported according to the schedule stated in the applicable requirement and does not need to be included in this report. This report shall be submitted not later than thirty (30) days after the end of the reporting period. The Quarterly Deviation and Compliance Monitoring Report shall include a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(~~3~~**35**). A deviation is an exceedance of a permit limitation or a failure to comply with a requirement of the permit. **********

C.1~~7~~**9** Compliance with 40 CFR 82 and 326 IAC 22-1
****

Modification No. 8:

Fugitive Dust Emissions [326 IAC 6-5]

Details of the fugitive dust control plan have been added as Condition C.6. The condition is shown below:

C.6 Fugitive Particulate Matter Emission Limitations [326 IAC 6-5]

Pursuant to 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive particulate matter emissions shall be controlled according to the fugitive dust control plan submitted on February 16, 1999. The provisions of 326 IAC 6-5 are not federally enforceable. The plan consists of:

(a) Roads - Dust will be controlled by sweeping on-site paved road areas and by the application of water to paved and unpaved roads as needed to minimize the fugitive dust emissions leading to and from the working face of the landfill and other areas of activity on the landfill.

(b) Cover Stockpiles - Soil cover stockpiles will be wetted with water as needed if they present fugitive dust concerns. In the event soil stockpiles present a continuing fugitive dust concern, a temporary stand of vegetation will be established.

(c) Completed Fill Areas - Areas of the facility that are at intermediate grade with intermediate cover will be vegetated as needed to minimize fugitive dust concerns. Those areas of the facility at final grade will be closed in accordance with 329 IAC 10 and vegetation established as required to minimize fugitive dust.

Modification No. 9:

General Record Keeping Requirements – Where Applicable

IDEM, OAQ added "where applicable" to the lists in Section C – General Record Keeping to more closely match the underlying rule. Revisions are shown below:

C.1~~5~~**7** General Record Keeping Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-6]

(a) Records of all required monitoring data, reports and support information required by this permit shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. Support information includes the following**, where applicable**:

(AA) All calibration and maintenance records.

(BB) All original strip chart recordings for continuous monitoring instrumentation.

(CC) Copies of all reports required by the Part 70 permit.

Records of required monitoring information include the following**, where applicable**: **********

Modification No. 10:

General Reporting Requirements and Emergency Provisions

IDEM, OAQ has clarified the Permittee's responsibility with regards to reporting. The first sentence of Condition C.16(d) was deleted because it only applies to initial Part 70 Operating Permits and T 167-30079-00116 is a renewal. The condition was renumbered. Revisions are shown below:

C.1~~6~~**8** General Reporting Requirements [326 IAC 2-7-5(3)(C)] [326 IAC 2-1.1-11]

(a) **********

(d) ~~The first report shall cover the period commencing on the date of issuance of this permit or the date of initial start-up, whichever is later, and ending on the last day of the reporting period.~~ Reporting periods are based on calendar years, unless otherwise specified in this permit. For the purpose of this permit, "calendar year" means the twelve (12) month period from January 1 to December 31 inclusive. **********

QUARTERLY DEVIATION AND COMPLIANCE MONITORING REPORT
****

Months: _____ to _____ Year: _____

Page 1 of 2

This report shall be submitted quarterly based on a calendar year or its equivalent. **Proper notice submittal under Section B – Emergency Provisions satisfies the reporting requirements of this paragraph.** Any deviation from the requirements of this permit, **********

Modification No. 11:

326 IAC 6.5 Requirements

The testing requirements in original Condition D.1.3 have been deleted. Sycamore Ridge Landfill uses two (2) open flares to comply with the requirements of 40 CFR 60.752(b)(2)(iii) (Standards of Performance for Municipal Solid Waste Landfills [40 CFR Part 60, Subpart WWW]). Pursuant to 40 CFR 60.752(b)(2)(iii)(A), open flares are required to be designed and operated in accordance with 40 CFR 60.18 (General control device and work practice requirements) and must conduct an initial performance test as specified in 40 CFR 60.18 (see 40 CFR 60.758(b)(4)). Sycamore Ridge Landfill conducted an initial performance test for each of the open flares on December 4, 2010. The initial performance tests demonstrated that the open flares were in compliance with the requirements of 40 CFR 60.18. IDEM OAQ has determined that repeat testing is not required. Also, the flare has a particulate matter emission limitation under 326 IAC 6.5; however, field testing of flare emissions is not practical. The emission unit descriptions have been revised to match Section A. All units subject to 326 IAC 6.5 have been listed. Revisions to Section D.1 are shown below:

SECTION D.1 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description:

(a) One (1) municipal solid waste landfill with a total combined design capacity of ~~14.755~~**17.230** million megagrams (Mg) (~~21.203~~**24.76** million cubic meters, or ~~27.7~~**32.34** million cubic yards). The original landfill (Victory Environmental Services, Inc.) was constructed in 1972. The expanded landfill (Sycamore Ridge Landfill) was constructed in 2003. **[40 CFR 61, Subpart M][40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]**

(b) One (1) Active Gas Collection and Control System, identified as GCCS-VES, for Victory Environmental Services, Inc., including an open flare with a design capacity of ~~3,000~~**1,200** standard cubic feet per minute **with a maximum heat input capacity of 39.6 MMBtu/hr**. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-VES was constructed in 2004. **[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]**

(c) One (1) Active Gas Collection and Control System, identified as GCCS-SRL, for Landfill 1 (Sycamore Ridge Landfill), including one (1) LFG Specialties Candlestick Flare, with a maximum capacity of 2,100 scfm of landfill gas **with a maximum heat input capacity of 69.0 MMBtu/hr**. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-SRL was approved for construction in 2008 and will be expanded based on site conditions. **[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]**

Insignificant Activities
(a) Six (6) portable welders, Unit #3 [326 IAC 6.5]

(g) Four (4) propane-fired space heaters, Unit #13 [326 IAC 6.5]

(n) Two (2) portable kerosene heaters, less than 2 MMBtu/hr each, Unit #20 [326 IAC 6.5]

(o) Two (2) 500 gallon used oil tanks and burner, Unit #21[326 IAC 6.5]

(x) Paved and unpaved roads. [326 IAC 6.5]

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

~~Compliance Determination Requirements [326 IAC 2-7-5(1)] [326 IAC 2-7-6(1)] [40 CFR 64]~~

~~D.1.3 Testing Requirements [326 IAC 2-1.1-11]~~

~~All testing required by Conditions E.1.2, E.2.2, and E.3.2, shall be repeated at least once every five (5) years from the date of the most recent valid compliance demonstration.~~

~~All testing shall be conducted utilizing methods as approved by the Commissioner. Section C – Performance Testing contains the Permittee's obligations with regard to the testing required by this condition.~~

Modification No. 12:

326 IAC 6.5 Applicability

Original Conditions D.1.1 and D.1.2 have been updated due to the addition of units subject to 326 IAC 6.5. Revisions are shown below:

D.1.1 Particulate Matter Limitations except Lake County [326 IAC 6.5]

Pursuant to 326 IAC 6.5-1-2(a), particulate matter emissions from the ~~flare~~ **following** operations shall not exceed 0.03 grain per dry standard cubic foot (dscf)~~.~~**:**

(a) The flare for the gas collection and control system identified as GCCS-VES;

(b) The flare for the gas collection and control system identified as GCCS-SRL;

(c) The six welders identified as Unit #3;

(d) The four propane-fired space heaters identified as Unit #13;

(e) The two portable kerosene heaters identified as Unit #20; and

(f) The two 500 gallon used oil burners associated with Unit #21.

(g) Paved and unpaved roads.

D.1.2 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan (PMP) is required for ~~the flares~~**the facilities listed in this section**. Section B – Preventive Maintenance Plan contains the Permittee's obligations with regard ~~the flares~~ to the preventive maintenance plan required by this condition.

Modification No. 13:

40 CFR 63, Subpart CCCCCC

Section E.4 has been added to the permit to incorporate the requirements of 40 CFR 63, Subpart CCCCCC. The section added to the permit is shown below:

SECTION E.4 National Emissions Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities [40 CFR 63, Subpart CCCCCC]

Emissions Unit Description:

Insignificant Activities

(p) One (1) 1,000 gallon gasoline AST with vent, identified as Unit ID #23, with a monthly gasoline throughput of less than ten thousand (10,000) gallons. [40 CFR 63, Subpart CCCCCC]

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

National Emission Standards for Hazardous Air Pollutants Requirements (NESHAP) [40 CFR 63]

E.4.1 General Provisions Relating to NESHAP [326 IAC 20-1] [40 CFR Part 63, Subpart A]

The provisions of 40 CFR Part 61, Subpart A – General Provisions, which are incorporated by reference as 326 IAC 20-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR Part 63, Subpart CCCCCC.

E.4.2 National Emissions Standards for Hazardous Air Pollutants for Source Categories: Gasoline Dispensing Facilities [40 CFR 63, Subpart CCCCCC]

Pursuant to 40 CFR Part 63, Subpart CCCCCC, the Permittee shall comply with the following provisions of 40 CFR Part 63, Subpart CCCCCC (included as Attachment D), for the gasoline above ground storage tank, identified as Unit ID #23:

(1) 40 CFR 63.11111(a), (b), (i) and (j);
(2) 40 CFR 63.11112;
(3) 40 CFR 63.11113(a), (b), and (c);
(4) 40 CFR 63.11115(a);
(5) 40 CFR 63.11116;
(6) 40 CFR 63.11130;
(7) 40 CFR 63.11131;
(8) 40 CFR 63.11132; and
(9) Table 3

Modification No. 14:

Section E Emissions Unit Descriptions

The emission unit descriptions in Section E.1, E.2 and E.3 have been updated to match the Section A descriptions. Only emission units subject to Subpart M are included in the facility description box in Section E.2. Revisions are shown below:

SECTION E.1 Standards of Performance for Municipal Solid Waste Landfills [40 CFR 60, Subpart WWW]

Emissions Unit Description:

(a) One (1) municipal solid waste landfill with a total combined design capacity of ~~14.755~~**17.230** million megagrams (Mg) (~~21.203~~**24.76** million cubic meters, or ~~27.7~~**32.34** million cubic yards). The original landfill (Victory Environmental Services, Inc.) was constructed in 1972. The expanded landfill (Sycamore Ridge Landfill) was constructed in 2003.
[40 CFR 61, Subpart M][40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(b) One (1) Active Gas Collection and Control System, identified as GCCS-VES, for Victory Environmental Services, Inc., including an open flare with a design capacity of ~~3,000~~**1,200** standard cubic feet per minute **with a maximum heat input capacity of 39.6 MMBtu/hr**. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-VES was constructed in 2004. **[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]**

(c) One (1) Active Gas Collection and Control System, identified as GCCS-SRL, for Landfill 1 (Sycamore Ridge Landfill), including one (1) LFG Specialties Candlestick Flare, with a maximum capacity of 2,100 scfm of landfill gas **with a maximum heat input capacity of 69.0 MMBtu/hr**. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-SRL was approved for construction in 2008 and will be expanded based on site conditions. **[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]**

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

SECTION E.2 National Emissions Standards for Hazardous Air Pollutants for Asbestos Requirements [40 CFR 61, Subpart M]

Emissions Unit Description:

(a) One (1) municipal solid waste landfill with a total combined design capacity of ~~14.755~~**17.230** million megagrams (Mg) (~~21.203~~**24.76** million cubic meters, or ~~27.7~~**32.34** million cubic yards). The original landfill (Victory Environmental Services, Inc.) was constructed in 1972. The expanded landfill (Sycamore Ridge Landfill) was constructed in 2003.
[40 CFR 61, Subpart M][40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

~~(b) One (1) Active Gas Collection and Control System, identified as GCCS-VES, for Victory Environmental Services, Inc., including an open flare with a design capacity of 3,000 standard cubic feet per minute. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-VES was constructed in 2004.~~

~~(c) One (1) Active Gas Collection and Control System, identified as GCCS-SRL, for Landfill 1 (Sycamore Ridge Landfill), including one (1) LFG Specialties Candlestick Flare, with a maximum capacity of 2,100 scfm of landfill gas. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-SRL was approved for construction in 2008 and will be expanded based on site conditions.~~

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

SECTION E.3 National Emissions Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills Requirements [40 CFR 63, Subpart AAAA]

Emissions Unit Description:

(a) One (1) municipal solid waste landfill with a total combined design capacity of ~~14.755~~**17.230** million megagrams (Mg) (~~21.203~~**24.76** million cubic meters, or ~~27.7~~**32.34** million cubic yards). The original landfill (Victory Environmental Services, Inc.) was constructed in 1972. The expanded landfill (Sycamore Ridge Landfill) was constructed in 2003.
[40 CFR 61, Subpart M][40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(b) One (1) Active Gas Collection and Control System, identified as GCCS-VES, for Victory Environmental Services, Inc., including an open flare with a design capacity of ~~3,000~~**1,200** standard cubic feet per minute **with a maximum heat input capacity of 39.6 MMBtu/hr**. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-VES was constructed in 2004.
[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(c) One (1) Active Gas Collection and Control System, identified as GCCS-SRL, for Landfill 1 (Sycamore Ridge Landfill), including one (1) LFG Specialties Candlestick Flare, with a maximum capacity of 2,100 scfm of landfill gas **with a maximum heat input capacity of 69.0 MMBtu/hr**. The Gas Collection and Control System consists of vertical gas extraction wells connected by a network of header piping that will be used to transport the collected landfill gas to a central point of service. Landfill gas will be collected from the landfill by inducing a vacuum on the well field using an in-line blower system. The GCCS-SRL was approved for construction in 2008 and will be expanded based on site conditions.
[40 CFR 60, Subpart WWW][40 CFR 63, Subpart AAAA]

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

Modification No. 15:

Table of Contents and Permit Cover Sheet

The table of contents and permit cover sheet has been updated to reflect the changes detailed in this technical support document. Bold and strikeout is not shown.

Conclusion and Recommendation

The construction of this proposed modification shall be subject to the conditions of the attached proposed Part 70 Significant Permit Modification. The staff recommends to the Commissioner that this Part 70 Significant Permit Modification be approved.

IDEM Contact

(a) Questions regarding this proposed permit can be directed to David Matousek at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 232-8253 or toll free at 1-800-451-6027 extension 2-8253.

(b) A copy of the findings is available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/

(c) For additional information about air permits and how the public and interested parties can participate, refer to the IDEM's Guide for Citizen Participation and Permit Guide on the Internet at: www.idem.in.gov

Technical Support Document - Appendix A - Sourcewide Summary
Potential to Emit after Issuance - Prior to Expansion - Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Uncontrolled Potential to Emit (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic CO_2 as CO2e**	**Non-Biogenic GHG as CO2e**	**Toluene**	**Total HAPs**
Landfill	0.00	0.00	0.00	0.00	56.62	11.02	0.00	61,376	469,757	10.02	29.34
Flare - GCCS-VES 1,200 SCFM	2.49	2.49	2.49	2.40	0.32	64.18	11.79	(b)	(b)	0.00	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	4.36	4.36	4.21	0.56	111.82	20.55	(b)	(b)	0.00	2.16
Insignificant Activities											
Propane Combustion - Unit #13	0.06	0.20	0.20	0.01	0.29	2.15	3.73	0	3,574	0.00	0.00
Kerosene Combustion - Unit #20	0.13	0.21	0.21	0.46	0.02	0.32	1.30	0	1,456	0.00	0.00
Waste Oil Combustion - Unit #21	2.19	1.90	1.90	3.23	0.06	0.13	0.97	0	1,333	0.00	0.03
Unit #14 - Diesel Storage Tanks	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0	0	negl.	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0	0	negl.	negl.
Unit #23 - Gasoline Storage Tank	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	0.01	0.02
Other Insignificant Activities	negl.	negl.	negl.	negl.	5.48	negl.	negl.	negl.	negl.	0.00	negl.
Total PTE of Entire Source	**9.23**	**9.16**	**9.16**	**10.31**	**64.05**	**189.62**	**38.34**	**61,376**	**476,120**	**10.03**	**32.78**
Title V Major Source Thresholds	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100,000**		**10**	**25**

Controlled Potential to Emit (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic CO_2 as CO2e**	**Non-Biogenic GHG as CO2e**	**HCL**	**Total HAPs**
Landfill	0.00	0.00	0.00	0.00	1.13	0.22	0.00	61,376	9,395	0.00	0.59
Flare - GCCS-VES 1,200 SCFM	2.49	2.49	2.49	2.40	0.32	64.18	11.79	16,140	63	1.23	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	4.36	4.36	4.21	0.56	111.82	20.55	28,245	110	2.16	2.16
Insignificant Activities											
Propane Combustion - Unit #13	0.06	0.20	0.20	0.01	0.29	2.15	3.73	0	3,574	0.00	0.00
Kerosene Combustion - Unit #20	0.13	0.21	0.21	0.46	0.02	0.32	1.30	0	1,456	0.00	0.00
Waste Oil Combustion - Unit #21	2.19	1.90	1.90	3.23	0.06	0.13	0.97	0	1,333	0.00	0.03
Unit #14 - Diesel Storage Tanks	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0	0	negl.	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0	0	negl.	negl.
Unit #23 - Gasoline Storage Tank	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	0.00	0.02
Other Misc. Insignificant	Negl.	Negl.	Negl.	Negl.	5.48	Negl.	Negl.	Negl.	Negl.	0.00	Negl.
Total PTE of Entire Source	**9.23**	**9.16**	**9.16**	**10.31**	**8.56**	**178.82**	**38.34**	**105,761**	**15,932**	**3.39**	**4.03**
PSD Major Source Thresholds	**250**	**250**	**250**	**250**	**250**	**250**	**250**	**(a)**		**NA**	**NA**

Notes:

(a) Under Step 2 of the Greenhouse Gas (GHG) Tailoring Rule that went into effect on July 1, 2011, PSD applies to new sources that emit or have the potential to emit at least 100,000 TPY CO_2e or existing sources that emit at that level and that undertake a modification that increases emissions by at least 75,000 TPY CO_2e, and also emit at least 100/250 TPY of GHGs on a mass basis. On June 29, 2012, the U.S. EPA issued a final rule that did not revise the GHG permitting thresholds that were established in Step 1 or Step 2 of the GHG Tailoring Rule.

(b) The flare can be treated as an emission unit and a control device. In terms of PM, PM_{10}, $PM_{2.5}$, SO_2, VOC, CO, NO_x and HAPs, IDEM is treating the flare as an emission unit. Controlled emissions are based on the maximum heat input capacity to the flare. In terms of greenhouse gas (GHG) emissions, IDEM is treating the flare as a control device. For GHGs, the Uncontrolled Potential to Emit is based on the worst case scenario where the landfill gas is not controlled. The flare will not have significant GHG emissions in the uncontrolled case, because the only emissions would be those associated with natural gas combustion by the pilot in the flare. In the controlled case, the flare will have GHG emissions from the conversion of methane to carbon dioxide during combustion of the landfill gas. These emissions are detailed on Sheets 6, 7 and 8 of 25.

Technical Support Document - Appendix A - VOC Emissions from Landfill
Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Potential to Emit

NMOC Emissions

IDEM completed a computer simulation of the potential emissions from the landfill using US EPA LandGEM. This model indicated the highest emission rate of landfill gas will be reached in the year 2016. The potential to emit NMOC in 2016 is estimated at:

193.6 TPY

VOC Emissions

VOC emissions can be estimated from the NMOC emission rate using information provided in AP-42, Chapter 2.4, November 1998. IDEM estimates VOC emissions as shown below:

NMOC in Landfill Gas	595	ppmv	(AP-42, Chapter 2.4, Table 2.4-2, November 1998)
NMOC Emission Rate	193.60	TPY	
% VOC	39.00%		(AP-42, Chapter 2.4, Table 2.4-2, Note c, November 1998)
VOC Emission Rate	75.5	TPY	

Limited Potential to Emit

VOC Emissions

AP-42, Chapter 2.4, paragraph 2.4.4.2 - Controlled Emissions, October 2008 indicates approximately 75% of the VOC is captured, 25% is fugitive.

Landfill Collection Efficiency 75.00%

Landfill PTE from LandGEM 75.5 TPY

Fugitive VOC Emissions	= Landfill PTE from LandGEM x (1 - collection eff.)	18.88 TPY
VOC Emissions to Control Devices	= Landfill PTE from LandGEM - Fugitive VOC	56.62 TPY
Destruction Efficiency (NSPS Requirement)		98%
VOC Emissions after Control	= VOC to Control Device x (1 - Dest. Efficiency)	1.13 TPY

Technical Support Document - Appendix A - Emission Calculation Sheet
Potential to Emit - Landfill HAP and CO - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Temperature	536.67	°R
Atmospheric Pressure	1.00	atm
Maximum LandGEM LFG	5,544	SCFM
Capture Efficiency	75%	
Maximum Captured LFG	4,158	SCFM

PTE of CO						
Pollutant	**Molecular Weight**	**Concentration (ppmv)**	**Average Pollutant Flow (SCFM)**	**Landfill Emission (TPY)**	**Control Efficiency**	**Controlled PTE (TPY)**
CO at 4158 SCFM	28.01	141.00	0.5863	11.02	98%	0.22

PTE of Hazardous Air Pollutants - LandGEM - AP-42, Chapter 2.4, November 1998						
Pollutant	**Concentration (ppmv)**	**Molecular Weight**	**Avg. Pollutant Flow (SCFM)**	**Landfill PTE (TPY)**	**Control Efficiency**	**Controlled PTE (TPY)**
1,1,1-Trichloroethane	0.48	133.41	0.00200	0.17898	98%	3.58E-03
1,2,2,2-Tetrachloroethane	1.10	167.85	4.57E-03	5.15E-01	98%	1.03E-02
1,1-Dichloroethane	2.40	98.97	0.01000	0.66389	98%	1.33E-02
1,1-Dichloroethene	0.20	96.94	0.00080	0.05202	98%	1.04E-03
1,2-Dichloroethane	0.41	98.96	0.00170	0.11285	98%	2.26E-03
1,2-Dichloropropane	0.18	112.99	0.00075	0.05673	98%	1.13E-03
Acrylonitrile	6.30	53.06	0.02620	0.93237	98%	0.019
Benzene (1.9 or 11)	1.90	78.11	0.00790	0.41393	98%	8.28E-03
Carbon Disulfide	0.58	76.13	0.00240	0.12256	98%	2.45E-03
Carbon Tetrachloride	0.004	153.84	0.00000	0.00000	98%	0
Carbonyl Sulfide	0.49	60.07	0.00204	0.08210	98%	1.64E-03
Chlorobenzene	0.25	112.56	0.00100	0.07551	98%	1.51E-03
Chloroethane	1.30	64.52	0.00540	0.23371	98%	4.67E-03
Chloroform	0.03	119.39	0.00010	0.00801	98%	1.60E-04
Dichlorobenzene	0.21	147.00	0.00090	0.08875	98%	1.78E-03
Dichloromethane	14.00	84.94	0.05820	3.31612	98%	0.066
Ethylbenzene	4.60	106.16	0.01910	1.36016	98%	0.027
Ethylene Dibromide	0.001	187.88	0.00000	0.00000	98%	0
Hexane	6.60	86.18	0.02740	1.58399	98%	0.032
Mercury	2.90E-04	200.61	0.00000	0.00000	0%	0
Methyl Ethyl Ketone	7.10	72.11	0.02952	1.42802	98%	0.029
Methyl Isobutyl Ketone	1.90	100.16	0.00790	0.53078	98%	1.06E-02
Perchloroethylene	3.70	165.83	0.01540	1.71309	98%	0.034
Toluene (39 or 170)	**39.00**	**92.13**	**0.16220**	**10.02414**	**98%**	**0.200**
Trichloroethylene	2.80	131.40	0.01160	1.02247	98%	0.020
Vinyl Chloride	7.30	62.50	0.03040	1.27453	98%	0.025
Xylene	12.00	106.17	0.04990	3.55384	98%	0.071
				10.02	Highest	**0.20**
				29.34	Total	**0.59**

Methodology:

1) Average Flow (SCFM) = [Maximum Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]

2) PTE (tons/yr) = $\frac{360 \times \text{Average Flow (SCFM)} \times \text{MW (lb/lb mole)} \times \text{P (atm)}}{\text{T(°R)}}$

Technical Support Document - Appendix A
Potential to Emit - Flare GCCS-VES - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Flare Heat Input Capacity	39.60	MMBtu/hr	Molecular Weight (S)	32.07	lb/lb mole
Heating Value of Landfill Gas	550.00	Btu/CF	Molecular Weight (SO2)	64.06	lb/lb mole
Calculated Landfill Gas	1,200	SCFM	Molecular Weight (HCL)	36.458	lb/lb mole
Inlet Gas Temperature	536.67	R	Weight % Water in LFG	7.0%	
Inlet Gas Pressure	1	atm			
Maximum LGF Rate	1,200	SCFM			

Landfill Gas Flow Rate (Wet Basis)		Landfill Gas Flow Rate (Dry Basis)		% Methane	Methane Flow Rate (Dry Basis)		
1,200	SCFM	1,116	DSCFM	50.00%	558.00 SCFM	or	293.29 MMSCF/yr

Potential to Emit Calculations - Flare

Pollutant	Concentration (ppmv)	Pollutant Flow (SCFM)	Throughput (SCFM or MMBtu/hr)	Emission Factor		PTE (TPY)	Notes
PM			558	17.0	lb/MMCF CH4, dry basis	2.49	AP-42, Chapter 2.4, Table 2.4-5, 11/1998
PM10			558	17.0	lb/MMCF CH4, dry basis	2.49	Assumed the same as PM
PM2.5			558	17.0	lb/MMCF CH4, dry basis	2.49	Assumed the same as PM
S	46.9	0.056				1.20	AP-42, Chapter 2.4, page 2.4-8, 11/1998
SO2						2.40	PTE (SO2) = PTE (S) x MW (SO2) / MW (S)
CO			39.60	0.370	lb/MMBtu	64.18	Manufacturer Specification
NOx			39.60	0.068	lb/MMBtu	11.79	Manufacturer Specification
HCL	42	0.050				1.23	AP-42, Chapter 2.4, page 2.4-9, 11/1998
VOC						0.32	Applicant Estimate

Methodology:
1) Methane Flow Rate = Flare Gas Flow Rate x (% Methane)
2) AP-42 does not include emission factors for PM10 or PM2.5. They are assumed identical to PM.
3) DSCFM = SCFM (1 - % Water)
4) Pollutant Flow (SCFM) = [Total Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]
5) PTE (TPY) = Flow (CFM) x Emission Factor (lb/MMCF) x [MMCF/1,000,000 CF] x [60 min/hr] x [8,760 hr/yr] x [ton/2,000 lb]
6) PTE (TPY) = Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu) x [8,760 hr/yr] x [ton/2,000 lb]
7) CO2e = [TPY CO2] + 21 x [TPY CH4] + 310 x [TPY N2O]
8) PTE (tons/yr) = $\frac{360 \times Q_{pollutant} (CFM) \times MW (lb/lb\ mole) \times P (atm)}{T(°R)}$ (AP-42, Chapter 2.4, Eq. 4 - converted to US units)

Technical Support Document - Appendix A
Potential to Emit - Flare GCCS-SRL - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Flare Heat Input Capacity	69.00	MMBtu/hr	Molecular Weight (S)	32.07	lb/lb mole
Heating Value of Landfill Gas	550.00	Btu/CF	Molecular Weight (SO2)	64.06	lb/lb mole
Calculated Landfill Gas	2,091	SCFM	Molecular Weight (HCL)	36.458	lb/lb mole
Inlet Gas Temperature	536.67	R	Weight % Water in LFG	7.0%	
Inlet Gas Pressure	1	atm			
Maximum LGF Rate	2,100	SCFM			

Landfill Gas Flow Rate (Wet Basis)		Landfill Gas Flow Rate (Dry Basis)		% Methane	Methane Flow Rate (Dry Basis)		
2,100	SCFM	1,953	DSCFM	50.00%	976.50 SCFM	or	513.25 MMSCF/yr

Potential to Emit Calculations - Flare

Pollutant	Concentration (ppmv)	Pollutant Flow (SCFM)	Throughput (SCFM or MMBtu/hr)	Emission Factor		PTE (TPY)	Notes
PM			977	17.0	lb/MMCF CH4, dry basis	4.36	AP-42, Chapter 2.4, Table 2.4-5, 11/1998
PM10			977	17.0	lb/MMCF CH4, dry basis	4.36	Assumed the same as PM
PM2.5			977	17.0	lb/MMCF CH4, dry basis	4.36	Assumed the same as PM
S	46.9	0.098				2.11	AP-42, Chapter 2.4, page 2.4-8, 11/1998
SO2						4.21	PTE (SO2) = PTE (S) x MW (SO2) / MW (S)
CO			69.00	0.370	lb/MMBtu	111.82	Manufacturer Specification
NOx			69.00	0.068	lb/MMBtu	20.55	Manufacturer Specification
HCL	42	0.088				2.16	AP-42, Chapter 2.4, page 2.4-9, 11/1998
VOC						0.56	Applicant Estimate

Methodology:
1) Methane Flow Rate = Flare Gas Flow Rate x (% Methane)
2) AP-42 does not include emission factors for PM10 or PM2.5. They are assumed identical to PM.
3) DSCFM = SCFM (1 - % Water)
4) Pollutant Flow (SCFM) = [Total Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]
5) PTE (TPY) = Flow (CFM) x Emission Factor (lb/MMCF) x [MMCF/1,000,000 CF] x [60 min/hr] x [8,760 hr/yr] x [ton/2,000 lb]
6) PTE (TPY) = Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu) x [8,760 hr/yr] x [ton/2,000 lb]
7) CO2e = [TPY CO2] + 21 x [TPY CH4] + 310 x [TPY N2O]
8) PTE (tons/yr) = $\frac{360 \times Q_{pollutant} (CFM) \times MW (lb/lb\ mole) \times P (atm)}{T(°R)}$ (AP-42, Chapter 2.4, Eq. 4 - converted to US units)

Technical Support Document - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David Matousek
Date: October 7, 2013

Landfill Greenhouse Gas Emissions

Landfill Collection Efficiency	**75%**
Landfill Gas Temperature	**536.67 Rankine**
Molecular Weight of Methane	**16.04**
Molecular Weight of Carbon Dioxide	**44.01**

Landfill Greenhouse Gas Emissions - Uncontrolled Case

					Potential to Emit	
Pollutant	**LandGEM Pollutant Flow (SCFM)**	**Collected GHG Emissions (SCFM)**	**Collected GHG Emissions (TPY)**	**Landfill PTE (TPY CO_2e)**	**Biogenic CO_2 (TPY CO2e)**	**Non-Biogenic GHG (TPY CO2e)**
CO_2	2,772	2,079	61,376	61,376	61,376	0
CH_4	2,772	2,079	22,369	469,757	0	469,757
N_2O	0	0	0	0	0	0
			Potential to Emit Biogenic CO_2 as TPY CO_2e =		**61,376**	
			Potential to Emit Non-Biogenic GHG as TPY CO_2e =			**469,757**

Methodology:
1) Collected GHG Emissions (SCFM) = LandGEM Pollutant Flow (SCFM) x Collection Efficiency
2) Collected GHG Emissions (TPY) = 360 x Collected Emissions (SCFM) x M.W. (lb/lb-mole) x Pressure (1 atm) / Temperature (R)
3) PTE (CO_2e) = TPY CO_2 + [TPY CH_4 x global warming potential (21)] + [TPY N_2O x global warming potential (310)]

Landfill Greenhouse Gas Emissions - Controlled Case

	Uncontrolled			Controlled	
Pollutant	**Biogenic CO_2 (TPY CO_2e)**	**Non-Biogenic GHG (TPY CO_2e)**	**Flare Combustion / Destruction Efficiency**	**Biogenic CO_2 (TPY CO_2e)**	**Non-Biogenic GHG (TPY CO_2e)**
CO_2	61,376	0	0%	61,376	0
CH_4	0	469,757	98%	0	9,395
N_2O	0	0	0%	0	0
			Totals	**61,376**	**9,395**

(Continued Next Sheet)

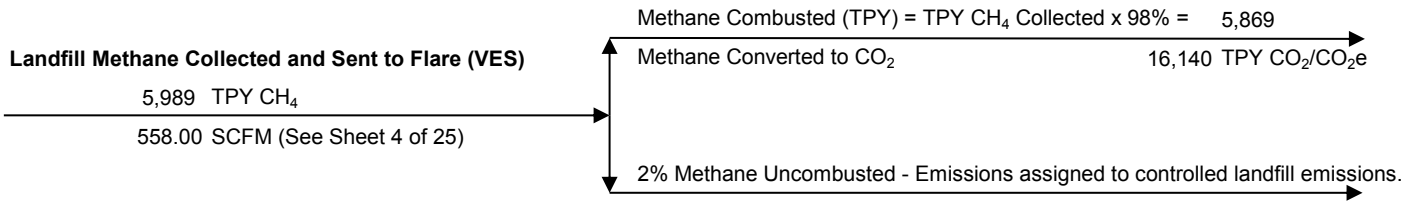
Technical Support Document - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2022

Flare GCCS-VES Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:

1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e = Uncombusted Methane (TPY CH_4) x global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R



Methodology for Methane and Carbon Dioxide:

1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBty/yr) x 1 ton / 2,000 lb
5) N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (310)

Methane to Flare (SCFM)	558	
Methane Usage (MMCF/yr)	293.28	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
Methane Gas Heating Value	1,000	MMBtu/MMCf
Methane Combusted (MMBtu/yr)	293,285	
N_2O (TPY)	0.20	
N_2O (TPY as CO_2e)	63	

Flare GCCS-VES Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e)
Methane to GCCS-VES / Combusted & Converted to CO_2	16,140	0
N2O from Landfill Gas Combustion in Flare GCCS-VES	0	63
Total	16,140	63

(Continued Next Sheet)

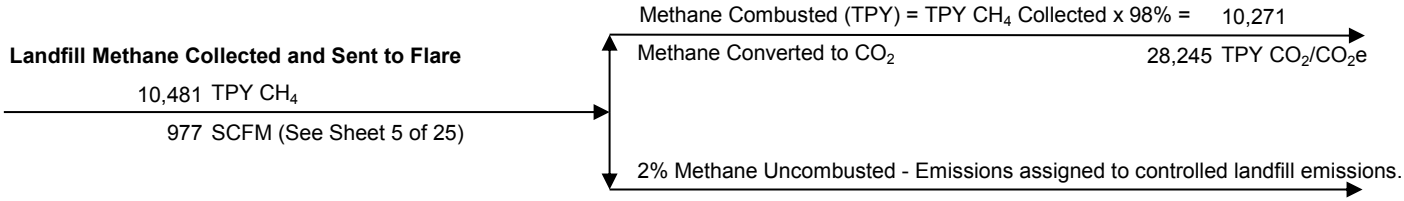
Technical Support Document - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2022

Flare GCCS-SRL Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:

1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e = Uncombusted Methane (TPY CH_4) x global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R



Methodology for Methane and Carbon Dioxide:

1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBty/yr) x 1 ton / 2,000 lb
5) N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (310)

Methane to Flare (SCFM)	977	
Methane Usage (MMCF/yr)	513.25	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
Methane Gas Heating Value	1,000	MMBtu/MMCf
Methane Combusted (MMBtu/yr)	513,248	
N_2O (TPY)	0.36	
N_2O (TPY as CO_2e)	110	

Flare GCCS-VES Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e)
Methane to GCCS-VES / Combusted & Converted to CO_2	28,245	0
N2O from Landfill Gas Combustion in Flare GCCS-VES	0	110
Total	28,245	110

Technical Support Document - Appendix A
Potential to Emit - Propane Combustion Sources - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	6.00	MMBtu/hr			
Heat Content of Propane	91,500	Btu/gallon			
Maximum Propane Usage	574.43	Kgallons/yr			
Sulfur Content	0.18	gr/100 FT^3	or	0.018	lb/Kgallon

Potential to Emit Calculations - Propane Combustion

Pollutant	Emission Factor		PTE (TPY)	Notes			
PM	0.2	lb/Kgallon	0.06	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
PM10	0.7	lb/Kgallon	0.20	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
PM2.5	0.7	lb/Kgallon	0.20	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
SO2	0.018	lb/Kgallon	0.01	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
VOC	1	lb/Kgallon	0.29	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
CO	7.5	lb/Kgallon	2.15	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
NOx	13	lb/Kgallon	3.73	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
CO2				135.49	lb/MMBtu	3,561	40 CFR 98, Subpart C, Table C-1 (61.46 kg/MMBtu)
CH4				6.61E-03	lb/MMBtu	0.17	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.03	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e						0	All CO2 is biogenic
Non-Biogenic GHG as CO2e						3,574	CH4 and N2O are nonbiogenic

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310

Technical Support Document - Appendix A
Potential to Emit - Kerosene Combustion Sources - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	2.00	MMBtu/hr
Heat Content of Kerosene	135,000	Btu/gallon
Maximum Kerosene Usage	129.78	Kgallons/yr
Sulfur Content	0.05%	

Potential to Emit Calculations - Propane Combustion

Pollutant	Emission Factor		PTE (TPY)	Notes			
PM	2	lb/Kgallon	0.13	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
PM10	3.3	lb/Kgallon	0.21	AP-42, Chapter 1.3, Table 1.3-2, May 2010			
PM2.5	3.3	lb/Kgallon	0.21	AP-42, Chapter 1.3, Table 1.3-2, May 2010			
SO2	7.1	lb/Kgallon	0.46	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
VOC	0.252	lb/Kgallon	0.02	AP-42, Chapter 1.3, Table 1.3-3, May 2010			
CO	5	lb/Kgallon	0.32	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
NOx	20	lb/Kgallon	1.30	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
CO2				165.79	lb/MMBtu	1,452	40 CFR 98, Subpart C, Table C-1 (75.20 kg/MMBtu)
CH4				6.61E-03	lb/MMBtu	0.06	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.01	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e						0	All CO2 is biogenic
Non-Biogenic GHG as CO2e						1,456	CH4 and N2O are nonbiogenic

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310

Technical Support Document - Appendix A
Potential to Emit - Waste Oil Combustion Sources - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	2.00	MMBtu/hr
Heat Content of Waste Oil	145,000	Btu/gallon
Maximum Waste Oil Usage	120.83	Kgallons/yr
Sulfur Content	0.50%	Typical for Fuel Oil
Ash Content	0.55%	Ash Content of Motor Oil

Potential to Emit Calculations

Pollutant	Emission Factor		PTE (TPY)	Notes
PM	36.3	lb/Kgallon	2.19	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM = 66A
PM10	31.4	lb/Kgallon	1.90	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM10 = 57A
PM2.5	31.4	lb/Kgallon	1.90	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM2.5 = 57A
SO2	53.5	lb/Kgallon	3.23	AP-42, Chapter 1.11, Table 1.11-3, October 1996: SO2 = 107S
VOC	1.0	lb/Kgallon	0.06	AP-42, Chapter 1.3, Table 1.3-3, May 2010
CO	2.1	lb/Kgallon	0.13	AP-42, Chapter 1.11, Table 1.11-3, October 1996
NOx	16	lb/Kgallon	0.97	AP-42, Chapter 1.11, Table 1.11-3, October 1996

CO2				22,000	lb/Kgallon	1,329	AP-42, Chapter 1.11, Table 1.11-3 October 1996
CH4				6.61E-03	lb/MMBtu	0.06	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.01	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e						0	All CO2 is biogenic
Non-Biogenic GHG as CO2e						1,333	CH4 and N2O are nonbiogenic

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310

Technical Support Document - Appendix A
Potential to Emit - Waste Oil Combustion Sources - Continued

HAP Calculations

Pollutant	Emission Factor		PTE (TPY)	Notes
Antimony	4.50E-03	lb/Kgallon	2.72E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Arsenic	6.00E-02	lb/Kgallon	3.62E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Beryllium	1.80E-03	lb/Kgallon	1.09E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Cadmium	1.20E-02	lb/Kgallon	7.25E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Chromium	0.18	lb/Kgallon	1.09E-02	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Cobalt	0.0052	lb/Kgallon	3.14E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Manganese	0.05	lb/Kgallon	3.02E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Nickel	0.15	lb/Kgallon	9.06E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Phenol	2.80E-05	lb/Kgallon	1.69E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Naphthalene	9.20E-05	lb/Kgallon	5.56E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Anthracene	1.00E-04	lb/Kgallon	6.04E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Dibutylphthalate	3.40E-05	lb/Kgallon	2.05E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Pyrene	8.30E-06	lb/Kgallon	5.01E-07	AP-42, Chapter 1.11, Table 1.11-5, October 1996

Worst Case HAP - Chromium **0.01** **TPY**

Total HAP **0.03** **TPY**

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310

Appendix A to the Technical Support Document (TSD)

Potential to Emit - 1,000 Gallon Gasoline Above Ground Storage Tank (AST)

Company: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana, 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 16, 2013

1.) Temperature Data

Temperature Attenuation Factor = 0.17 (0.80 insulated tank, 0.17 non-insulated tank)

Key to Table 1 - Temperature Data for Indianapolis, Indiana

T_{ax} = Daily maximum ambient temperature, AP-42, Table 7.1-3, 11/2006
T_{an} = Daily minimum ambient temperature, AP-42, Table 7.1-3, 11/2006
T_{ln} = Daily minimum liquid surface temperature, see Eq. 1 in methodology.
T_{lx} = Daily maximum liquid surface temperature, see Eq. 1 in methodology.
T_{la} = Daily average liquid surface temperature, see Eq. 2 in methodology.
ΔT_v = Daily vapor temperature range, see Eq. 3 in methodology.

Table 1 - Temperature Data for Indianapolis, Indiana

Month	T_{ax} (°F)	T_{an} (°F)	Temperature Average (°F)	Temperature Range (°F or °R)	T_{ln} (°R)	T_{lx} (°R)	T_{la} (°R)	ΔT_V (°R)
January	34.2	18.8	26.50	15.40	480.11	492.89	486.50	12.78
February	38.5	21.1	29.80	17.40	482.58	497.02	489.80	14.44
March	49.3	30.7	40.00	18.60	492.28	507.72	500.00	15.44
April	63.1	41.7	52.40	21.40	503.52	521.28	512.40	17.76
May	73.4	51.5	62.45	21.90	513.36	531.54	522.45	18.18
June	82.3	60.9	71.60	21.40	522.72	540.48	531.60	17.76
July	85.2	64.9	75.05	20.30	526.63	543.47	535.05	16.85
August	83.7	62.7	73.20	21.00	524.49	541.92	533.20	17.43
September	77.9	55.3	66.60	22.60	517.22	535.98	526.60	18.76
October	66.1	43.4	54.75	22.70	505.33	524.17	514.75	18.84
November	50.8	32.8	41.80	18.00	494.33	509.27	501.80	14.94
December	39.2	23.7	31.45	15.50	485.02	497.88	491.45	12.87

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

2) Pressure Data

S = ASTM-D86 distillation slope at 10 volume percent evaporation, AP-42, Table 7.1-4, 11/06	3.00	(°F/vol%)
P_{BP} = Breather vent pressure setting, psi	0.0722	psi
P_{BV} = Breather vent vacuum setting, psi	-0.1444	psi
$\Delta P_B = P_{BP} - P_{BV}$, psi	0.2166	psi

Key to Table 2 - Pressure Data for Indianapolis, Indiana

1) A = Vapor pressure equation constant, dimensionless, see Eq. 9 in methodology
2) B = Vapor pressure equation constant, °R, see Eq. 9 in methodology
3) T_{ln} = Daily minimum liquid surface temperature, Calulated in Table 1
4) T_{lx} = Daily maximum liquid surface temperature, Calculated in Table 1
5) T_{la} = Daily average liquid surface temperature, Calculated in Table 1
6) P_{vx} = Vapor pressure at daily maximum liquid surface temperature, psi, see Eq. 11 in methodology
7) P_{vn} = Vapor pressure at dauly minimum liquid surfact temperature, psi, see Eq. 12 in methodology
8) ΔP_v = Daily vapor pressure range, see Eq. 10 in methodology
9) P_{va} = True vapor pressure, see Eq. 7 in methodology

Table 2 - Pressure Data for Indianapolis, Indiana

Month	Reid Vapor Pressure (psi)	A (no units)	B (°R)	T_{ln} (°R)	T_{lx} (°R)	T_{la} (°R)	P_{vx} (psi)	P_{vn} (psi)	ΔP_v (psi)	P_{va} (psi)
January	9.0	11.76	5,315.06	480.11	492.89	486.50	2.65	1.99	0.66	2.30
February	9.0	11.76	5,315.06	482.58	497.02	489.80	2.90	2.11	0.79	2.48
March	9.0	11.76	5,315.06	492.28	507.72	500.00	3.64	2.62	1.02	3.09
April	9.0	11.76	5,315.06	503.52	521.28	512.40	4.77	3.33	1.44	4.00
May	9.0	11.76	5,315.06	513.36	531.54	522.45	5.81	4.08	1.73	4.88
June	7.8	11.80	5,420.70	522.72	540.48	531.60	5.89	4.19	1.70	4.98
July	7.8	11.80	5,420.70	526.63	543.47	535.05	6.23	4.52	1.70	5.32
August	7.8	11.80	5,420.70	524.49	541.92	533.20	6.05	4.34	1.71	5.14
September	7.8	11.80	5,420.70	517.22	535.98	526.60	5.42	3.75	1.66	4.52
October	9.0	11.76	5,315.06	505.33	524.17	514.75	5.05	3.46	1.59	4.19
November	9.0	11.76	5,315.06	494.33	509.27	501.80	3.75	2.74	1.02	3.21
December	9.0	11.76	5,315.06	485.02	497.88	491.45	2.96	2.23	0.73	2.57

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

3) Standing Loss Calculation

Storage tank volume	1000	gallons	
V_v = Tank vapor space volume (1/2 total volume)	500	gallons	66.836 ft^3

Key to Table 3 - Storage Tanks Standing Losses

1) ΔT_v = Daily vapor temperature range, calculated in Table 1
2) T_{la} = Daily average liquid surface temperature, calculated in Table 1
3) ΔP_v = Daily vapor pressure range, calculated in Table 2
4) K_s = Assumed to equal one. No roof outage.
5) K_E = Vapor space expansion factor, see Eq. 8 in methodology
6) W_v = Vapor density, see Eq. 6 in methodology
7) L_s = Standing storage losses, see Eq. 4 in methodology, lb/month

Table 3 - Gasoline Storage Tank Standing Losses (L_s)

Month	Days in Month	Vapor Molecular Weight (lb/mole)	ΔT_v (°R)	T_{la} (°R)	ΔP_v (psi)	ΔP_B (psi)	P_{va} (psi)	K_s (unitless)	K_E (unitless)	W_v (lb/ft^3)	L_s (lb/month)
January	31	67	12.78	486.50	0.66	0.217	2.30	1.0	0.062	0.030	3.81
February	28	67	14.44	489.80	0.79	0.217	2.48	1.0	0.077	0.032	4.54
March	31	67	15.44	500.00	1.02	0.217	3.09	1.0	0.100	0.039	7.99
April	30	67	17.76	512.40	1.44	0.217	4.00	1.0	0.149	0.049	14.58
May	31	67	18.18	522.45	1.73	0.217	4.88	1.0	0.189	0.058	22.89
June	30	68	17.76	531.60	1.70	0.217	4.98	1.0	0.186	0.059	22.17
July	31	68	16.85	535.05	1.70	0.217	5.32	1.0	0.190	0.063	24.78
August	31	68	17.43	533.20	1.71	0.217	5.14	1.0	0.189	0.061	23.90
September	30	68	18.76	526.60	1.66	0.217	4.52	1.0	0.178	0.054	19.39
October	31	67	18.84	514.75	1.59	0.217	4.19	1.0	0.167	0.051	17.64
November	30	67	14.94	501.80	1.02	0.217	3.21	1.0	0.099	0.040	7.96
December	31	67	12.87	491.45	0.73	0.217	2.57	1.0	0.068	0.033	4.63

Total Annual Standing Losses (lb VOC /year) **174.29**

Total Annual Standing Losses (ton VOC/year) **0.09**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

3) Working Losses

Storage tank volume =	1,000 gallons	133.68 ft^3
Maximum annual gasoline usage =	10,000 gallons	1,336.81 ft^3

L_w (storage tank deliveries and vehicle dispenses) = Volume delivered (ft^3/month) x vapor density (lb/ft^3)

L_w (spillage) = 0.7 lb/kgallon

L_w total = L_w storage tank + L_w vehicle tank + L_w spillage

Table 4 - Working Losses

Month	Gasoline Delivered (ft^3 per month)	W_v (lb/ft^3)	L_w Storage Tank (lb/month)	L_w Vehicle Tank (lb/month)
January	833.33	0.030	24.63	24.63
February	833.34	0.032	26.33	26.33
March	833.33	0.039	32.19	32.19
April	833.34	0.049	40.62	40.62
May	833.33	0.058	48.64	48.64
June	833.34	0.059	49.49	49.49
July	833.33	0.063	52.52	52.52
August	833.34	0.061	50.88	50.88
September	833.33	0.054	45.35	45.35
October	833.33	0.051	42.40	42.40
November	833.33	0.040	33.32	33.32
December	833.33	0.033	27.22	27.22
	Total L_w storage tank (lb/yr)=		473.58	
	Total L_w vehicle tank (lb/yr)=			473.58

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Total gasoline throughput =	10,000.00	gallons/yr	
Spillage Emission Factor =	0.70	lb/Kgallon	AP-42, Table 5.2-7, 6/08
L_w spillage (lb/yr) = 0.7 x 10,000/1000 =	7.00	lb/yr	

Total Working Losses

Lw storage tank	473.58	lb/yr			
Lw vehicle	473.58	lb/yr			
Lw spillage	7.00	lb/yr			
Total Working Losses	954.16	lb/yr	or	0.48	TPY

Total VOC Emissions

PTE of VOC (TPY) = Total $L_{standing}$ + Total $L_{working}$

Total $L_{standing}$	0.09	TPY
Total $L_{working}$	0.48	TPY
PTE (VOC) =	0.56	TPY

Potential to Emit HAP

HAP Emissions	Total VOC (TPY)	Wt% VOC	PTE (TPY)		Source
Hexane (Worst Case HAP)	0.56	1.4%	0.0079	TPY	Gasoline Distribution Industry (Stage 1) - Background Information for Proposed Standards, January 2004, Table 3-2
Benzene	0.56	0.4%	0.0023	TPY	
Toluene	0.56	1.1%	0.0062	TPY	
2,2,2-Trimethylpentane	0.56	0.7%	0.0039	TPY	
Xylene	0.56	0.4%	0.0023	TPY	
Ethyl Benzene	0.56	0.1%	0.0006	TPY	
Total HAP			0.02	TPY	

PTE HAP (TPY) = Total VOC Emissions (TPY) * Weight Percent HAP in Gasoline

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Emission Calculation Methodology

Equation 1 - Gasoline Liquid Surface Temperatures

T_{ln} = (avg. ambient air temp + 460) - ((1 - attenuation factor) x (ambient air temp range / 2))

T_{lx} = (avg ambient air temp + 460) + ((1 - attenuation factor) x (ambient air temp range / 2))

Where: T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

avg ambient air temp = Daily ambient average temperature, °F

attenuation factor = Correction factor to estimate liquid surface temp from air temperatures

ambient air temp range = Daily ambient temperature range, °F or °R

Equation 2 - Daily Average Liquid Surface Temperature

$$T_{la} = (T_{ln} + T_{lx}) / 2$$

Where: T_{la} = Daily average liquid surface temperature, °R

T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

Equation 3 - Daily Vapor Temperature Range

$$\Delta T_v = T_{lx} - T_{ln}$$

Where: ΔT_V = Daily vapor temperature range, °R or °F

T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

Equation 4 - Storage Tank Standing Losses

$$Ls = n\ Vv\ Wv\ Ke\ Ks$$

Where: L_s = Standing storage loss, lb/month

n = Number of days in the month

V_v = Vapor space volume of the ullage, ft^3

W_v = Vapor density, lb/ft^3

K_e = Vapor space expansion factor, dimensionless

K_s = Vented vapor saturation factor, dimensionless

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Equation 5 - Tank Vapor Space

$$\mathbf{V_v = 1/2 \text{ tank capacity } (ft^3)}$$

Where: V_v = Tank vapor space volume, ft^3

Equation 6 - Molecular Weight of the Vapor

$$\mathbf{Wv = M_v P_{va} / Rt_{la}}$$

Where: W_v = Vapor density, lb/ft^3

M_v = Vapor molecular weight, lb/lb-mole [AP-42, Table 3-2]

R = Ideal gas constant, 10.731 $psia.ft^3/lb\text{-}mole.°R$

P_{va} = Vapor pressure at daily average liquid surface temperature, psia

T_{la} = Daily average liquid surface temperature, °R

Equation 7 - Gasoline True Vapor Pressure

$$\mathbf{P_{va} = \exp [A - (B / T_{la})]}$$

Where: P_{va} = True vapor pressure, psia

exp = exponential function, 2.71828

A = Dimensionless constant [AP-42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

T_{la} = Daily average liquid surface temperature, °R

Equation 8 - Vapor Space Expansion Factor

$$\mathbf{K_E = (\Delta T_v / T_{la}) + ((\Delta P_v - \Delta P_B) / (14.7 - P_{va}))}$$

Where: K_E = Vapor space expansion factor, dimensionless factor

ΔT_V = Daily vapor temperature range, °R

ΔP_V = Daily vapor pressure range, °R

ΔP_B = Breather vent pressure setting, psi.

14.7 = Atmospheric pressure, psi

P_{va} = Vapor pressure at average liquid temperature, psi, from Eq. 7

T_{la} = Daily average liquid surface temperature, °R

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Equation 9 - Vapor Pressure Equation Constants

$$A = 15.64 - 1.854\ S^{0.5} - (0.8742 - 0.3280\ S^{0.5})\ \ln(\text{Ried Vapor Pressure})$$

$$B = 8{,}742 - 1{,}042\ S^{0.5} - (1{,}049 - 179.4\ S^{0.5})\ \ln(\text{Ried Vapor Pressure})$$

Where: S = Stock ASTM-D86 distillation slope at 10 volume percent evaporation (°F/vol%), 3.0 for gasoline

A = Vapor pressure equation constant, dimensionless

B = Constant in vapor pressure equation, °R or °C

Equation 10 - Daily Vapor Pressure Range

$$\Delta P_v = P_{vx} - P_{vn}$$

Where: ΔP_V = Daily vapor pressure range, °R

P_{vx} = Vapor pressure P_{va} at daily maximum liquid surface temperature, psi

P_{vn} = Vapor pressure P_{va} at daily minimum liquid surface temperature, psi

Equation 11 - Vapor Pressure at Maximum Liquid Temperature

$$P_{vx} = \exp\left(A - \left(B / T_{lx}\right)\right)$$

Where: P_{vx} = Vapor pressure P_{va} at daily maximum liquid surface temperature, psi

T_{lx} = Daily maximum liquid surface temperature, °R

A = Dimensionless constant [AP-42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

Equation 12 - Vapor Pressure at Minimum Liquid Temperature

$$P_{vn} = \exp\left(A - \left(B / T_{ln}\right)\right)$$

Where: P_{vn} = Vapor pressure P_{va} at daily minimum liquid surface temperature, psi

T_{ln} = Daily minimum liquid surface temperature, °R

A = Dimensionless constant [AP42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

Equation 13 - Vented Vapor Saturation Factor

$$K_s = 1 / \left(1 + \left(0.053 \times P_{va} \times H_{vo}\right)\right) = 1$$

Where: K_s = Vented vapor saturation factor, dimensionless

P_{va} = Vapor pressure at daily average fuel surface temperature, psi

H_{vo} = Vapor space outage, assumed to be 0 feet

Technical Support Document - Appendix A
Potential to Emit - Leachate Storage and Misc. Insignificant - Landfill Closure 2016

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana
Permit Number: 47866
Reviewer: T 167-32729-00116
Date: David J. Matousek

Diesel and Leachate Storage Tanks						
Emission Unit	**Description**	**Throughput (gallons/yr)**	**Volume of Vapor Displaced (ft^3/yr)**	**US EPA Tanks Vapor Density (lb/ft^3)**	**VOC Emissions (TPY)**	**Data Source**
Unit #14	Two (2) 35,000 gallon diesel storage tanks	500,000	66,836	0.0002	0.01	Applicant provided Tanks output
Units #15 and #26	One 26,000 gal and One 108,000 gal leachate storage tanks	2,000,000	267,344	0.0010	0.13	Applicant provided Tanks output

VOC (TPY) = Vapor Displaced (cubic feet/year) x Vapor Density (lb/cubic foot) x 1 ton/2,000lb

Volume of Vapor Displaced (cubic feet/yr) = Throughput (gallons/yr) x 1 cubic foot /7.481 gallons

Other Miscellaneous Insignificant Activities - Potential to Emit						
Emission Unit	**Description**	**PM / PM_{10} / $PM_{2.5}$ (TPY)**	**VOC (TPY)**	**Single HAP (TPY)**	**Total HAP (TPY)**	**Data Source**
Unit #2	Refrigerant Station	0	negl.	0	0	Applicant Estimate
Unit #3	Six portable welders	negl.	negl.	0	0	Applicant Estimate
Unit #4	Painting Operation	negl.	< 2.74	0	0	Applicant Estimate
Unit #5	One 55 gallon drum transmission fluid	0	negl.	0	0	Applicant Estimate
Unit #6	One 55 gallon drum grease	0	negl.	0	0	Applicant Estimate
Unit #7	One 300 gallon antifreeze AST	0	negl.	0	0	Applicant Estimate
Unit #8	One 400 gallon hydraulic oil AST	0	negl.	0	0	Applicant Estimate
Unit #9	One 250 gallon motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #10	One 250 gallon used motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #12	One 500 gallon propane AST	0	negl.	0	0	Applicant Estimate
Unit #16	Two 55 gallon drum castrol gear lube	0	negl.	0	0	Applicant Estimate
Unit #17	Two 250 gallon hydraulic fluid AST	0	negl.	0	0	Applicant Estimate
Unit #18	One 250 gallon gear oil AST	0	negl.	0	0	Applicant Estimate
Unit #19	One 375 gallon transmission fluid AST	0	negl.	0	0	Applicant Estimate
Unit #25	One 1,000 gallon on-road diesel AST	0	negl.	0	0	Applicant Estimate
Unit #27	One 3,500 gallons used oil AST	0	negl.	0	0	Applicant Estimate
Unit #29	One 375 gallon motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #30	One 250 gallon transmission fluid AST	0	negl.	0	0	Applicant Estimate
Unit #31	One portable 3,500 gallon fuel truck	0	< 2.74	0	0	Applicant Estimate
Unit #32	One 300 gallon kerosene AST	0	negl.	0	0	Applicant Estimate
Unit #33	Two 200 pound propane tanks	0	negl.	0	0	Applicant Estimate
Unit #34	One 55 gallon drum of tranmission oil	0	negl.	0	0	Applicant Estimate
Unit #35	One 500 gallon used oil AST	0	negl.	0	0	Applicant Estimate
Total PTE (TPY)		**negl.**	**5.48**	**0**	**0**	

Technical Support Document - Appendix A - Emission Calculation Sheet
Municipal Landfill - Emissions from Paved Roads

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 19, 2013

Average Vehicle Weight Calculation

Vehicle Type	Trucks/Day	Average Weight (tons)	Total Trips per Year	Miles per Trip	Vehicle Miles Traveled (miles per year)	Traffic Component (%)	Component Weight (tons)
Transfer Trailer	120	15	43,800	1.02	44,676	23.121%	3.47
Front Loader	48	15	17,520	1.02	17,870	9.249%	1.39
Rear Loader	40	15	14,600	1.02	14,892	7.707%	1.16
Roll-Off	75	15	27,375	1.02	27,923	14.451%	2.17
Dump Trucks	30	15	10,950	1.02	11,169	5.780%	0.87
Other	206	2.5	75,190	1.02	76,694	39.692%	0.99
				Total VMT	193,224		
					Average Vehicle Weight (tons) - W		10.05

Site Specific Constants

Value Name	Symbol	Value	Units	Source
Emission Factor	E	---	lb/VMT	Calculated
Particle Size Multiplier	k for PM	0.011	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Particle Size Multiplier	k for PM10	0.0022	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Particle Size Multiplier	k for PM2.5	0.00054	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Silt Loading	sL (Winter)	29.6	g/cubic meter	AP-42, Table 13.2.1-2, January 2011, ADT <500
Silt Loading	sL (Non-Winter)	7.4	g/cubic meter	Previous Determination
Winter Days	Winter Days	90	days	Estimated by IDEM
Non-Winter Days	Non-Winter Days	275	days	Estimated by IDEM
Days >0.01" of rain	P	120	days	AP-42, Figure 13.2.1-2, January 2011
Total Days in Period	N	365	days	Days in the period
Mean Vehicle Weight	W	10.05	tons	Calculated above

Winter Emission Factor Calculations

E = [k * (sL for winter)^0.91 * (W)^1.02] * [1 - P/(4 * N)] — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 2.32 lb/VMT
E for PM10 (lb/VMT) = 0.46 lb/VMT
E for PM2.5 (lb/VMT) = 0.11 lb/VMT

Non-Winter Emission Factor Calculations

E = [k * (sL for non-winter)^0.91 * (W)^1.02] * [1 - P/(4 * N)] — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 0.66 lb/VMT
E for PM10 (lb/VMT) = 0.13 lb/VMT
E for PM2.5 (lb/VMT) = 0.03 lb/VMT

Annual Average Emission Factors

Annual Average Emission Factor = [Winter Days * Winter Factor + Non-Winter Days * Non-Winter Factor] / 365

E for PM (lb/VMT) = 1.07 lb/VMT
E for PM10 (lb/VMT) = 0.21 lb/VMT
E for PM2.5 (lb/VMT) = 0.05 lb/VMT

Potential to Emit

PM Emissions (TPY) = [Annual Average E for PM (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 103.37 TPY
PM10 Emissions (TPY) = [Annual Average E for PM10 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 20.29 TPY
PM2.5 Emissions (TPY) = [Annual Average E for PM2.5 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 4.83 TPY

Limited Potential to Emit

Control Efficiency 80.00% per fugitive dust plan

Limited PM Emissions (TPY) = Potential to Emit PM * (1 - Control Efficiency) — 20.67 TPY
Limited PM10 Emissions (TPY) = Potential to Emit PM10 * (1 - Control Efficiency) — 4.06 TPY
Limited PM2.5 Emissions (TPY) = Potential to Emit PM2.5 * (1 - Control Efficiency) — 0.97 TPY

Technical Support Document - Appendix A - Emission Calculation Sheet
Municipal Landfill - Emissions from Unpaved Roads

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 19, 2013

Average Vehicle Weight Calculation

Vehicle Type	Trucks/Day	Average Weight (tons)	Total Trips per Year	Miles per Trip	Vehicle Miles Traveled (miles per year)	Traffic Component (%)	Component Weight (tons)
Transfer Trailer	120	15	43,800	1.7	74,460	23.121%	3.47
Front Loader	48	15	17,520	1.7	29,784	9.249%	1.39
Rear Loader	40	15	14,600	1.7	24,820	7.707%	1.16
Roll-Off	75	15	27,375	1.7	46,538	14.451%	2.17
Dump Trucks	30	15	10,950	1.7	18,615	5.780%	0.87
Other	206	2.5	75,190	1.7	127,823	39.692%	0.99
				Total VMT	322,040		
					Average Vehicle Weight (tons) - W		10.05

Site Specific Constants

Value Name	Symbol	Value	Units	Source
Emission Factor	E	---	lb/VMT	Calculated
Particle Size Multiplier	k for PM	4.90	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Particle Size Multiplier	k for PM10	1.50	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Particle Size Multiplier	k for PM2.5	0.15	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Silt Content	s	6.40	%	Previous Determination
Days >0.01" of rain	P	120.00	days	AP-42, Figure 13.2.2-1, November 2006
Emperical Constant	a for PM	0.70	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	a for PM10	0.90	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	a for PM2.5	0.90	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM10	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM2.5	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Mean Vehicle Weight	W	10.05	tons	Calculated above

Emission Factor Calculations

$E = [k * (s/12)^a * (W/3)^b] * [(365 - P) / 365]$ — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 3.65 lb/VMT
E for PM10 (lb/VMT) = 0.99 lb/VMT
E for PM2.5 (lb/VMT) = 0.10 lb/VMT

Potential to Emit

PM Emissions (TPY) = [E for PM (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 587.72 TPY
PM10 Emissions (TPY) = [E for PM10 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 159.41 TPY
PM2.5 Emissions (TPY) = [E for PM2.5 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 16.10 TPY

Limited Potential to Emit

Control Efficiency 80.00% per fugitive dust plan

Limited PM Emissions (TPY) = Potential to Emit PM * (1 - Control Efficiency) 117.54 TPY
Limited PM10 Emissions (TPY) = Potential to Emit PM10 * (1 - Control Efficiency) 31.88 TPY
Limited PM2.5 Emissions (TPY) = Potential to Emit PM2.5 * (1 - Control Efficiency) 3.22 TPY

Technical Support Document - Appendix A
326 IAC 6.5 Applicability Determination

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Uncontrolled Potential to Emit (ton/yr)	
Emission Unit	**PM**
Landfill	0.00
Flare - GCCS-VES, 1,200 SCFM	2.49
Flare - GCCS-SRL , 2,100 SCFM	4.36
Paved Roads-Fugitive	103.37
Unpaved Roads -Fugitive	587.72
Insignificant Activities	
Propane Combustion - Unit #13	0.06
Kerosene Combustion - Unit #20	0.13
Waste Oil Combustion - Unit #21	2.19
Unit #14 - Diesel Storage Tanks	0.00
Units #15 and #26 - Leachate Storage Tanks	0.00
Unit #23 - Gasoline Storage Tank	0.00
Other Insignificant Activities	negl.
Total PTE of Entire Source	**700.32**
Title V Major Source Thresholds	**100**
The potential to emit particulate matter is in excess of 10 TPY; therefore, 326 IAC 6.5 applies to the landfill.	

Technical Support Document - Appendix A - Sourcewide Summary
326 IAC 2-7-10.5 Evaluation

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Emissions Increase due to Landfill Capacity Increase (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic GHG as CO2e**	**Non-CO2 GHG as CO2e**	**Toluene**	**Total HAPs**
Uncontrolled PTE After Modification	0.00	0.00	0.00	0.00	57.77	11.24	0.00	62,616	479,241	10.23	29.95
Uncontrolled PTE Before Modification	0.00	0.00	0.00	0.00	56.62	11.02	0.00	61,376	469,749	10.02	29.34
Net Change	0.00	0.00	0.00	0.00	1.15	0.22	0.00	1,240	9,492	0.21	0.61

Uncontrolled Potential to Emit of the Project (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic GHG as CO2e**	**Non-CO2 GHG as CO2e**	**Toluene**	**Total HAPs**
Landfill Capacity Increase	0.00	0.00	0.00	0.00	1.15	0.22	0.00	1,240	9,492	0.21	0.61
Propane Combustion Unit ID #13	0.06	0.20	0.20	0.01	0.29	2.15	3.73	0	3,574	0.00	0.00
Kerosene Combustion Unit ID #20	0.13	0.21	0.21	0.46	0.02	0.32	1.30	0	1,456	0.00	0.00
Waste Oil Combustion Unit ID#21	2.19	1.90	1.90	3.23	0.06	0.13	0.97	0	1,333	0.00	0.03
Unit #14 - Diesel Storage Tanks	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0	0	0.00	0.00
Unit #15 and #26 - Leachate Storage	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0	0	0.00	0.00
Unit #23 - Gasoline Storage	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	0.01	0.02
Other Misc. Insignificant Activities	negl.	negl.	negl.	negl.	5.48	negl.	negl.	negl.	negl.	negl.	negl.
Total for Project	2.38	2.31	2.31	3.70	7.70	2.82	6.00	1,240	15,855	0.22	0.66
326 IAC 2-7-10.5 MSM Thresholds	**5**	**5**	**---**	**10**	**10**	**25**	**10**	**---**	**---**	**10**	**25**

negl. = negligible

Technical Support Document - Appendix A - Sourcewide Summary
Potential to Emit after Issuance - After Expansion - Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Uncontrolled Potential to Emit (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic CO_2 (CO_2e)**	**Non-Biogenic GHG (CO2e)**	**Toluene**	**Total HAPs**
Landfill	0.00	0.00	0.00	0.00	57.77	11.24	0.00	62,616	479,247	10.23	29.95
Flare - GCCS-VES 1,200 SCFM	2.49	2.49	2.49	2.40	0.32	64.18	11.79	(b)	(b)	0.00	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	4.36	4.36	4.21	0.56	111.82	20.55	(b)	(b)	0.00	2.16
Insignificant Activities											
Propane Combustion - Unit #13	0.06	0.20	0.20	0.01	0.29	2.15	3.73	0	3,574	0.00	0.00
Kerosene Combustion - Unit #20	0.13	0.21	0.21	0.46	0.02	0.32	1.30	0	1,456	0.00	0.00
Waste Oil Combustion - Unit #21	2.19	1.90	1.90	3.23	0.06	0.13	0.97	0	1,333	0.00	0.03
Unit #14 - Diesel Storage Tanks	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0	0	negl.	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0	0	negl.	negl.
Unit #23 - Gasoline Storage Tank	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	0.01	0.02
Other Insignificant Activities	negl.	negl.	negl.	negl.	5.48	negl.	negl.	negl.	negl.	0.00	negl.
Total PTE of Entire Source	**9.23**	**9.16**	**9.16**	**10.31**	**65.20**	**189.84**	**38.34**	**62,616**	**485,610**	**10.23**	**33.39**
Title V Major Source Thresholds	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100,000**		**10**	**25**

Controlled Potential to Emit (ton/yr)											
Emission Unit	**PM**	**PM10**	**PM2.5**	**SO_2**	**VOC**	**CO**	**NOx**	**Biogenic CO_2 (CO_2e)**	**Non-Biogenic GHG (CO2e)**	**HCL**	**Total HAPs**
Landfill	0.00	0.00	0.00	0.00	1.16	0.22	0.00	62,616	9,585	0.00	0.60
Flare - GCCS-VES 1,200 SCFM	2.49	2.49	2.49	2.40	0.32	64.18	11.79	16,140	63	1.23	1.23
Flare - GCCS-SRL 2,100 SCFM	4.36	4.36	4.36	4.21	0.56	111.82	20.55	28,245	110	2.16	2.16
Insignificant Activities											
Propane Combustion - Unit #13	0.06	0.20	0.20	0.01	0.29	2.15	3.73	0	3,574	0.00	0.00
Kerosene Combustion - Unit #20	0.13	0.21	0.21	0.46	0.02	0.32	1.30	0	1,456	0.00	0.00
Waste Oil Combustion - Unit #21	2.19	1.90	1.90	3.23	0.06	0.13	0.97	0	1,333	0.00	0.03
Unit #14 - Diesel Storage Tanks	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0	0	negl.	negl.
Units #15 and #26 - Leachate Storage Tanks	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0	0	negl.	negl.
Unit #23 - Gasoline Storage Tank	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0	0	0.00	0.02
Other Misc. Insignificant	Negl.	Negl.	Negl.	Negl.	5.48	Negl.	Negl.	Negl.	Negl.	0.00	Negl.
Total PTE of Entire Source	**9.23**	**9.16**	**9.16**	**10.31**	**8.59**	**178.82**	**38.34**	**107,001**	**16,122**	**3.39**	**4.04**
PSD Major Source Thresholds	**250**	**250**	**250**	**250**	**250**	**250**	**250**	**(a)**		**NA**	**NA**

Notes:

(a) Under Step 2 of the Greenhouse Gas (GHG) Tailoring Rule that went into effect on July 1, 2011, PSD applies to new sources that emit or have the potential to emit at least 100,000 TPY CO_2e or existing sources that emit at that level and that undertake a modification that increases emissions by at least 75,000 TPY CO_2e, and also emit at least 100/250 TPY of GHGs on a mass basis. On June 29, 2012, the U.S. EPA issued a final rule that did not revise the GHG permitting thresholds that were established in Step 1 or Step 2 of the GHG Tailoring Rule.

(b) The flare can be treated as an emission unit and a control device. In terms of PM, PM_{10}, $PM_{2.5}$, SO_2, VOC, CO, NO_x and HAPs, IDEM is treating the flare as an emission unit. Controlled emissions are based on the maximum heat input capacity to the flare. In terms of greenhouse gas (GHG) emissions, IDEM is treating the flare as a control device. For GHGs, the Uncontrolled Potential to Emit is based on the worst case scenario where the landfill gas is not controlled. The flare will not have significant GHG emissions in the uncontrolled case, because the only emissions would be those associated with natural gas combustion by the pilot in the flare. In the controlled case, the flare will have GHG emissions from the conversion of methane to carbon dioxide during combustion of the landfill gas. These emissions are detailed on Sheets 6, 7 and 8 of 23.

Technical Support Document - Appendix A - VOC Emissions from Landfill
Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Potential to Emit

NMOC Emissions

IDEM completed a computer simulation of the potential emissions from the landfill using US EPA LandGEM. This model indicated the highest emission rate of landfill gas will be reached in the year 2016. The potential to emit NMOC in 2016 is estimated at:

197.5 TPY

VOC Emissions

VOC emissions can be estimated from the NMOC emission rate using information provided in AP-42, Chapter 2.4, November 1998. IDEM estimates VOC emissions as shown below:

NMOC in Landfill Gas	595	ppmv	(AP-42, Chapter 2.4, Table 2.4-2, November 1998)
NMOC Emission Rate	197.50	TPY	
% VOC	39.00%		(AP-42, Chapter 2.4, Table 2.4-2, Note c, November 1998)
VOC Emission Rate	77.03	TPY	

Limited Potential to Emit

VOC Emissions

AP-42, Chapter 2.4, paragraph 2.4.4.2 - Controlled Emissions, October 2008 indicates approximately 75% of the VOC is captured, 25% is fugitive.

Landfill Collection Efficiency 75.00%

Landfill PTE from LandGEM 77.03 TPY

Fugitive VOC Emissions	= Landfill PTE from LandGEM x (1 - collection eff.)	19.26 TPY
VOC Emissions to Control Devices	= Landfill PTE from LandGEM - Fugitive VOC	57.77 TPY
Destruction Efficiency (NSPS Requirement)		98%
VOC Emissions after Control	= VOC to Control Device x (1 - Dest. Efficiency)	1.16 TPY

Technical Support Document - Appendix A - Emission Calculation Sheet
Potential to Emit - Landfill HAP and CO - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Temperature	536.67	°R
Atmospheric Pressure	1.00	atm
Maximum LandGEM LFG	5,657	SCFM
Capture Efficiency	75%	
Maximum Captured LFG	4,243	SCFM

PTE of CO						
Pollutant	**Molecular Weight**	**Concentration (ppmv)**	**Average Pollutant Flow (SCFM)**	**Landfill Emission (TPY)**	**Control Efficiency**	**Controlled PTE (TPY)**
CO at 4243 SCFM	28.01	141.00	0.5983	11.24	98%	0.22

PTE of Hazardous Air Pollutants - LandGEM - AP-42, Chapter 2.4, November 1998						
Pollutant	**Concentration (ppmv)**	**Molecular Weight**	**Avg. Pollutant Flow (SCFM)**	**Landfill PTE (TPY)**	**Control Efficiency**	**Controlled PTE (TPY)**
1,1,1-Trichloroethane	0.48	133.41	0.00200	0.17898	98%	3.58E-03
1,2,2,2-Tetrachloroethane	1.10	167.85	4.67E-03	5.26E-01	98%	1.05E-02
1,1-Dichloroethane	2.40	98.97	0.01020	0.67717	98%	1.35E-02
1,1-Dichloroethene	0.20	96.94	0.00080	0.05202	98%	1.04E-03
1,2-Dichloroethane	0.41	98.96	0.00170	0.11285	98%	2.26E-03
1,2-Dichloropropane	0.18	112.99	0.00076	0.05789	98%	1.16E-03
Acrylonitrile	6.30	53.06	0.02673	0.95143	98%	0.019
Benzene (1.9 or 11)	1.90	78.11	0.00810	0.42441	98%	8.49E-03
Carbon Disulfide	0.58	76.13	0.00250	0.12767	98%	2.55E-03
Carbon Tetrachloride	0.004	153.84	0.00000	0.00000	98%	0
Carbonyl Sulfide	0.49	60.07	0.00208	0.08378	98%	1.68E-03
Chlorobenzene	0.25	112.56	0.00110	0.08306	98%	1.66E-03
Chloroethane	1.30	64.52	0.00550	0.23804	98%	4.76E-03
Chloroform	0.03	119.39	0.00010	0.00801	98%	1.60E-04
Dichlorobenzene	0.21	147.00	0.00090	0.08875	98%	1.78E-03
Dichloromethane	14.00	84.94	0.05940	3.38450	98%	0.068
Ethylbenzene	4.60	106.16	0.01950	1.38864	98%	0.028
Ethylene Dibromide	0.001	187.88	0.00000	0.00000	98%	0
Hexane	6.60	86.18	0.02800	1.61868	98%	0.032
Mercury	2.90E-04	200.61	0.00000	0.00000	0%	0
Methyl Ethyl Ketone	7.10	72.11	0.03013	1.45721	98%	0.029
Methyl Isobutyl Ketone	1.90	100.16	0.00810	0.54422	98%	1.09E-02
Perchloroethylene	3.70	165.83	0.01570	1.74646	98%	0.035
Toluene (39 or 170)	**39.00**	**92.13**	**0.16550**	**10.22808**	**98%**	**0.205**
Trichloroethylene	2.80	131.40	0.01190	1.04891	98%	0.021
Vinyl Chloride	7.30	62.50	0.03100	1.29968	98%	0.026
Xylene	12.00	106.17	0.05090	3.62506	98%	0.073
				10.23	Highest	**0.20**
				29.95	Total	**0.60**

Methodology:

1) Average Flow (SCFM) = [Maximum Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]

2) PTE (tons/yr) = $\frac{360 \times \text{Average Flow (SCFM)} \times \text{MW (lb/lb mole)} \times \text{P (atm)}}{\text{T(°R)}}$

Technical Support Document - Appendix A
Potential to Emit - Flare GCCS-VES - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Flare Heat Input Capacity	39.60	MMBtu/hr	Molecular Weight (S)	32.07	lb/lb mole
Heating Value of Landfill Gas	550.00	Btu/CF	Molecular Weight (SO2)	64.06	lb/lb mole
Calculated Landfill Gas	1,200	SCFM	Molecular Weight (HCL)	36.458	lb/lb mole
Inlet Gas Temperature	536.67	R	Weight % Water in LFG	7.0%	
Inlet Gas Pressure	1	atm			
Maximum LGF Rate	1,200	SCFM			

Landfill Gas Flow Rate (Wet Basis)		Landfill Gas Flow Rate (Dry Basis)		% Methane	Methane Flow Rate (Dry Basis)		
1,200	SCFM	1,116	DSCFM	50.00%	558.00 SCFM	or	293.29 MMSCF/yr

Potential to Emit Calculations - Flare

Pollutant	Concentration (ppmv)	Pollutant Flow (SCFM)	Throughput (SCFM or MMBtu/hr)	Emission Factor		PTE (TPY)	Notes
PM			558	17.0	lb/MMCF CH4, dry basis	2.49	AP-42, Chapter 2.4, Table 2.4-5, 11/1998
PM10			558	17.0	lb/MMCF CH4, dry basis	2.49	Assumed the same as PM
PM2.5			558	17.0	lb/MMCF CH4, dry basis	2.49	Assumed the same as PM
S	46.9	0.056				1.20	AP-42, Chapter 2.4, page 2.4-8, 11/1998
SO2						2.40	PTE (SO2) = PTE (S) x MW (SO2) / MW (S)
CO			39.60	0.370	lb/MMBtu	64.18	Manufacturer Specification
NOx			39.60	0.068	lb/MMBtu	11.79	Manufacturer Specification
HCL	42	0.050				1.23	AP-42, Chapter 2.4, page 2.4-9, 11/1998
VOC						0.32	Applicant Estimate

Methodology:
1) Methane Flow Rate = Flare Gas Flow Rate x (% Methane)
2) AP-42 does not include emission factors for PM10 or PM2.5. They are assumed identical to PM.
3) DSCFM = SCFM (1 - % Water)
4) Pollutant Flow (SCFM) = [Total Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]
5) PTE (TPY) = Flow (CFM) x Emission Factor (lb/MMCF) x [MMCF/1,000,000 CF] x [60 min/hr] x [8,760 hr/yr] x [ton/2,000 lb]
6) PTE (TPY) = Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu) x [8,760 hr/yr] x [ton/2,000 lb]
7) CO2e = [TPY CO2] + 21 x [TPY CH4] + 310 x [TPY N2O]
8) PTE (tons/yr) = $\frac{360 \times Q_{pollutant} (CFM) \times MW (lb/lb\ mole) \times P (atm)}{T(°R)}$ (AP-42, Chapter 2.4, Eq. 4 - converted to US units)

Technical Support Document - Appendix A
Potential to Emit - Flare GCCS-SRL - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Flare Heat Input Capacity	69.00	MMBtu/hr	Molecular Weight (S)	32.07	lb/lb mole
Heating Value of Landfill Gas	550.00	Btu/CF	Molecular Weight (SO2)	64.06	lb/lb mole
Calculated Landfill Gas	2,091	SCFM	Molecular Weight (HCL)	36.458	lb/lb mole
Inlet Gas Temperature	536.67	R	Weight % Water in LFG	7.0%	
Inlet Gas Pressure	1	atm			
Maximum LGF Rate	2,100	SCFM			

Landfill Gas Flow Rate (Wet Basis)		Landfill Gas Flow Rate (Dry Basis)		% Methane	Methane Flow Rate (Dry Basis)		
2,100	SCFM	1,953	DSCFM	50.00%	976.50 SCFM	or	513.25 MMSCF/yr

Potential to Emit Calculations - Flare

Pollutant	Concentration (ppmv)	Pollutant Flow (SCFM)	Throughput (SCFM or MMBtu/hr)	Emission Factor		PTE (TPY)	Notes
PM			977	17.0	lb/MMCF CH4, dry basis	4.36	AP-42, Chapter 2.4, Table 2.4-5, 11/1998
PM10			977	17.0	lb/MMCF CH4, dry basis	4.36	Assumed the same as PM
PM2.5			977	17.0	lb/MMCF CH4, dry basis	4.36	Assumed the same as PM
S	46.9	0.098				2.11	AP-42, Chapter 2.4, page 2.4-8, 11/1998
SO2						4.21	PTE (SO2) = PTE (S) x MW (SO2) / MW (S)
CO			69.00	0.370	lb/MMBtu	111.82	Manufacturer Specification
NOx			69.00	0.068	lb/MMBtu	20.55	Manufacturer Specification
HCL	42	0.088				2.16	AP-42, Chapter 2.4, page 2.4-9, 11/1998
VOC						0.56	Applicant Estimate

Methodology:
1) Methane Flow Rate = Flare Gas Flow Rate x (% Methane)
2) AP-42 does not include emission factors for PM10 or PM2.5. They are assumed identical to PM.
3) DSCFM = SCFM (1 - % Water)
4) Pollutant Flow (SCFM) = [Total Landfill Flow (SCFM)] x [ppmv pollutant / 1,000,000]
5) PTE (TPY) = Flow (CFM) x Emission Factor (lb/MMCF) x [MMCF/1,000,000 CF] x [60 min/hr] x [8,760 hr/yr] x [ton/2,000 lb]
6) PTE (TPY) = Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu) x [8,760 hr/yr] x [ton/2,000 lb]
7) CO2e = [TPY CO2] + 21 x [TPY CH4] + 310 x [TPY N2O]
8) PTE (tons/yr) = $\frac{360 \times Q_{pollutant} (CFM) \times MW (lb/lb\ mole) \times P (atm)}{T(°R)}$ (AP-42, Chapter 2.4, Eq. 4 - converted to US units)

Technical Support Document - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David Matousek
Date: October 7, 2013

Landfill Greenhouse Gas Emissions

Landfill Collection Efficiency	**75%**	
Landfill Gas Temperature	**536.67**	**Rankine**
Molecular Weight of Methane	**16.04**	
Molecular Weight of Carbon Dioxide	**44.01**	

Landfill Greenhouse Gas Emissions - Uncontrolled Case

					Potential to Emit	
Pollutant	**LandGEM Pollutant Flow (SCFM)**	**Collected GHG Emissions (SCFM)**	**Collected GHG Emissions (TPY)**	**Landfill PTE (TPY CO_2e)**	**Biogenic CO_2 (TPY CO2e)**	**Non-Biogenic GHG (TPY CO2e)**
CO_2	2,828	2,121	62,616	62,616	62,616	0
CH_4	2,828	2,121	22,821	479,247	0	479,247
N_2O	0	0	0	0	0	0
			Potential to Emit Biogenic CO_2 as TPY CO_2e =		**62,616**	
			Potential to Emit Non-Biogenic GHG as TPY CO_2e =			**479,247**

Methodology:
1) Collected GHG Emissions (SCFM) = LandGEM Pollutant Flow (SCFM) x Collection Efficiency
2) Collected GHG Emissions (TPY) = 360 x Collected Emissions (SCFM) x M.W. (lb/lb-mole) x Pressure (1 atm) / Temperature (R)
3) PTE (CO_2e) = TPY CO_2 + [TPY CH_4 x global warming potential (21)] + [TPY N_2O x global warming potential (310)]

Landfill Greenhouse Gas Emissions - Controlled Case

	Uncontrolled			Controlled	
Pollutant	**Biogenic CO_2 (TPY CO_2e)**	**Non-Biogenic GHG (TPY CO_2e)**	**Flare Combustion / Destruction Efficiency**	**Biogenic CO_2 (TPY CO_2e)**	**Non-Biogenic GHG (TPY CO_2e)**
CO_2	62,616	0	0%	62,616	0
CH_4	0	479,247	98%	0	9,585
N_2O	0	0	0%	0	0
			Totals	**62,616**	**9,585**

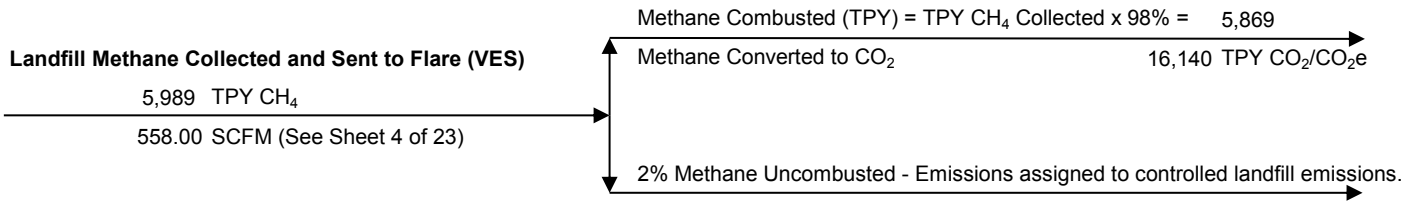
(Continued Next Sheet)

Technical Support Document - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2022

Flare GCCS-VES Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:
1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e = Uncombusted Methane (TPY CH_4) x global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R



Methodology for Methane and Carbon Dioxide:
1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBty/yr) x 1 ton / 2,000 lb
5) N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (310)

Methane to Flare (SCFM)	558	
Methane Usage (MMCF/yr)	293.28	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
Landfill Gas Heating Value	1,000	MMBtu/MMCf
Methane Combusted (MMBtu/yr)	293,285	
N_2O (TPY)	0.20	
N_2O (TPY as CO_2e)	63	

Flare GCCS-VES Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e)
Methane to GCCS-VES / Combusted & Converted to CO_2	16,140	0
N_2O from Landfill Gas Combustion in Flare GCCS-VES	0	63
Total	16,140	63

(Continued Next Sheet)

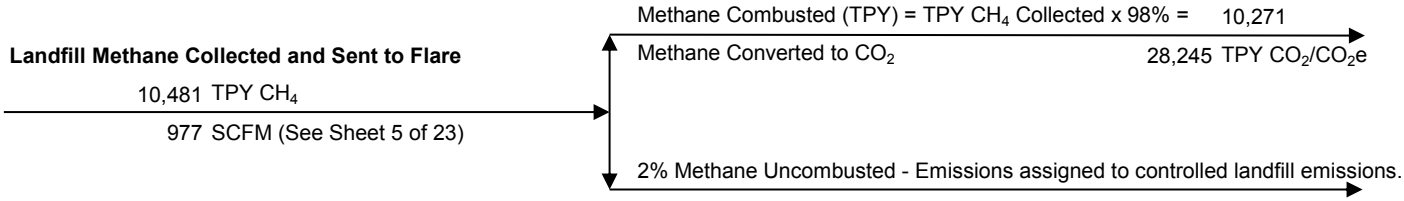
Technical Support Document - Appendix A

Greenhouse Gas Emissions - Landfill Closure 2022

Flare GCCS-SRL Greenhouse Gas Emissions - Controlled Case

Methodology for Methane and Carbon Dioxide:

1) Combusted TPY CO_2/CO_2e = Combusted Methane (TPY CH_4) x Molecular Weight Ration CO_2/CH_4 (44/16)
2) Uncombusted Methane as TPY CO_2e = Uncombusted Methane (TPY CH_4) x global warming potential (21)
3) Methane Combusted (TPY CH_4) = Landfill Methane Collected and Sent to Flare (TPY) x Combustion Efficiency
4) Methane to Flare (TPY) = 360 x Methane Flow (SCFM) x 16 lb-lb.mole x 1 atm / 536.67 R



Methodology for Methane and Carbon Dioxide:

1) Methane (MMCF/yr) = Methane Flow (SCFM) x 60 min/hr x 8,760 hr/yr x 1 MMCF / 1,000,000 CF
2) Emission Factor (lb/MMBtu) = 2.2046 lb/kg x Emission Factor (kb/MMBtu)
3) Methane (MMBtu/yr) = Landfill Gas Heating Value (MMBtu/MMCF) x Methane Usage (MMCF/yr)
4) N_2O (TPY) = Emissions Factor (lb/MMBtu) x Methane Usage (MMBty/yr) x 1 ton / 2,000 lb
5) N_2O (TPY as CO_2e) = N_2O (TPY) x global warming potential (310)

Methane to Flare (SCFM)	977	
Methane Usage (MMCF/yr)	513.25	
N_2O Emission Factor (kg/MMBtu)	6.30E-04	
N_2O Emission Factor (lb/MMBtu)	1.39E-03	
Landfill Gas Heating Value	1,000	MMBtu/MMCf
Methane Combusted (MMBtu/yr)	513,248	
N_2O (TPY)	0.36	
N_2O (TPY as CO_2e)	110	

Flare GCCS-VES Controlled Emissions Summary

Source of Emissions	Biogenic CO_2 (TPY as CO_2e)	Non-Biogenic GHG (TPY as CO_2e)
Methane to GCCS-VES / Combusted & Converted to CO_2	28,245	0
N_2O from Landfill Gas Combustion in Flare GCCS-VES	0	110
Total	28,245	110

Technical Support Document - Appendix A
Potential to Emit - Propane Combustion Sources - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	6.00	MMBtu/hr			
Heat Content of Propane	91,500	Btu/gallon			
Maximum Propane Usage	574.43	Kgallons/yr			
Sulfur Content	0.18	gr/100 FT^3	or	0.018	lb/Kgallon

Potential to Emit Calculations - Propane Combustion

Pollutant	Emission Factor		PTE (TPY)	Notes			
PM	0.2	lb/Kgallon	0.06	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
PM10	0.7	lb/Kgallon	0.20	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
PM2.5	0.7	lb/Kgallon	0.20	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
SO2	0.018	lb/Kgallon	0.01	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
VOC	1	lb/Kgallon	0.29	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
CO	7.5	lb/Kgallon	2.15	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
NOx	13	lb/Kgallon	3.73	AP-42, Chapter 1.5, Table 1.5-1, July 2008			
CO2				135.49	lb/MMBtu	3,561	40 CFR 98, Subpart C, Table C-1 (61.46 kg/MMBtu)
CH4				6.61E-03	lb/MMBtu	0.17	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.03	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e						0	All CO2 is biogenic
Non-Biogenic GHG as CO2e						3,574	CH4 and N2O are nonbiogenic

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310

Technical Support Document - Appendix A
Potential to Emit - Kerosene Combustion Sources - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	2.00	MMBtu/hr
Heat Content of Kerosene	135,000	Btu/gallon
Maximum Kerosene Usage	129.78	Kgallons/yr
Sulfur Content	0.05%	

Potential to Emit Calculations - Propane Combustion

Pollutant	Emission Factor		PTE (TPY)	Notes			
PM	2	lb/Kgallon	0.13	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
PM10	3.3	lb/Kgallon	0.21	AP-42, Chapter 1.3, Table 1.3-2, May 2010			
PM2.5	3.3	lb/Kgallon	0.21	AP-42, Chapter 1.3, Table 1.3-2, May 2010			
SO2	7.1	lb/Kgallon	0.46	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
VOC	0.252	lb/Kgallon	0.02	AP-42, Chapter 1.3, Table 1.3-3, May 2010			
CO	5	lb/Kgallon	0.32	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
NOx	20	lb/Kgallon	1.30	AP-42, Chapter 1.3, Table 1.3-1, May 2010			
CO2				165.79	lb/MMBtu	1,452	40 CFR 98, Subpart C, Table C-1 (75.20 kg/MMBtu)
CH4				6.61E-03	lb/MMBtu	0.06	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.01	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e						0	All CO2 is biogenic
Non-Biogenic GHG as CO2e						1,456	CH4 and N2O are nonbiogenic

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310

Technical Support Document - Appendix A
Potential to Emit - Waste Oil Combustion Sources - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Reviewer: David J. Matousek
Date: January 24, 2013

Input Data

Maximum Heat Input Capacity	2.00	MMBtu/hr
Heat Content of Waste Oil	145,000	Btu/gallon
Maximum Waste Oil Usage	120.83	Kgallons/yr
Sulfur Content	0.50%	Typical for Fuel Oil
Ash Content	0.55%	Ash Content of Motor Oil

Potential to Emit Calculations

Pollutant	Emission Factor		PTE (TPY)	Notes
PM	36.3	lb/Kgallon	2.19	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM = 66A
PM10	31.4	lb/Kgallon	1.90	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM10 = 57A
PM2.5	31.4	lb/Kgallon	1.90	AP-42, Chapter 1.11, Table 1.11-1, October 1996: PM2.5 = 57A
SO2	53.5	lb/Kgallon	3.23	AP-42, Chapter 1.11, Table 1.11-3, October 1996: SO2 = 107S
VOC	1.0	lb/Kgallon	0.06	AP-42, Chapter 1.3, Table 1.3-3, May 2010
CO	2.1	lb/Kgallon	0.13	AP-42, Chapter 1.11, Table 1.11-3, October 1996
NOx	16	lb/Kgallon	0.97	AP-42, Chapter 1.11, Table 1.11-3, October 1996

CO2				22,000	lb/Kgallon	1,329	AP-42, Chapter 1.11, Table 1.11-3 October 1996
CH4				6.61E-03	lb/MMBtu	0.06	40 CFR 98, Subpart C, Table C-2 (3.0 E-03 kg/MMBtu)
N2O				1.32E-03	lb/MMBtu	0.01	40 CFR 98, Subpart C, Table C-2 (6.0E-04 kg/MMBtu)
Biogenic GHG as CO2e						0	All CO2 is biogenic
Non-Biogenic GHG as CO2e						1,333	CH4 and N2O are nonbiogenic

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310

Technical Support Document - Appendix A
Potential to Emit - Waste Oil Combustion Sources - Continued

HAP Calculations

Pollutant	Emission Factor		PTE (TPY)	Notes
Antimony	4.50E-03	lb/Kgallon	2.72E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Arsenic	6.00E-02	lb/Kgallon	3.62E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Beryllium	1.80E-03	lb/Kgallon	1.09E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Cadmium	1.20E-02	lb/Kgallon	7.25E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Chromium	0.18	lb/Kgallon	1.09E-02	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Cobalt	0.0052	lb/Kgallon	3.14E-04	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Manganese	0.05	lb/Kgallon	3.02E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Nickel	0.15	lb/Kgallon	9.06E-03	AP-42, Chapter 1.11, Table 1.11-4, October 1996
Phenol	2.80E-05	lb/Kgallon	1.69E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Naphthalene	9.20E-05	lb/Kgallon	5.56E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Anthracene	1.00E-04	lb/Kgallon	6.04E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Dibutylphthalate	3.40E-05	lb/Kgallon	2.05E-06	AP-42, Chapter 1.11, Table 1.11-5, October 1996
Pyrene	8.30E-06	lb/Kgallon	5.01E-07	AP-42, Chapter 1.11, Table 1.11-5, October 1996

Worst Case HAP - Chromium **0.01** **TPY**

Total HAP **0.03** **TPY**

Methodology:
1) Usage (kgal/yr) = Heat Input (MMBtu/hr) x (1.0E+06 BTU/MMBtu) x (8,760 hr/yr) / Heat Content (Btu/gallon) x (1,000 Kgal/gallon)
2) Emissions (TPY) = Fuel Usage (Kgal/yr) x Emission Factor (lb/Kgal) / 2,000 lb/ton
3) Emissions (TPY) = Heat Input Rate (MMBtu/hr) x Emission Factor (lb/MMBtu) x 4.38 ton-hr/lb-yr
4) CO2e (TPY) = CO2 emissions x 1 + CH4 emissions x 21 + N2O emissions x 310

Appendix A to the Technical Support Document (TSD)

Potential to Emit - 1,000 Gallon Gasoline Above Ground Storage Tank (AST)

Company: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana, 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 16, 2013

1.) Temperature Data

Temperature Attenuation Factor = 0.17 (0.80 insulated tank, 0.17 non-insulated tank)

Key to Table 1 - Temperature Data for Indianapolis, Indiana

T_{ax} = Daily maximum ambient temperature, AP-42, Table 7.1-3, 11/2006
T_{an} = Daily minimum ambient temperature, AP-42, Table 7.1-3, 11/2006
T_{ln} = Daily minimum liquid surface temperature, see Eq. 1 in methodology.
T_{lx} = Daily maximum liquid surface temperature, see Eq. 1 in methodology.
T_{la} = Daily average liquid surface temperature, see Eq. 2 in methodology.
ΔT_v = Daily vapor temperature range, see Eq. 3 in methodology.

Table 1 - Temperature Data for Indianapolis, Indiana

Month	T_{ax} (°F)	T_{an} (°F)	Temperature Average (°F)	Temperature Range (°F or °R)	T_{ln} (°R)	T_{lx} (°R)	T_{la} (°R)	ΔT_V (°R)
January	34.2	18.8	26.50	15.40	480.11	492.89	486.50	12.78
February	38.5	21.1	29.80	17.40	482.58	497.02	489.80	14.44
March	49.3	30.7	40.00	18.60	492.28	507.72	500.00	15.44
April	63.1	41.7	52.40	21.40	503.52	521.28	512.40	17.76
May	73.4	51.5	62.45	21.90	513.36	531.54	522.45	18.18
June	82.3	60.9	71.60	21.40	522.72	540.48	531.60	17.76
July	85.2	64.9	75.05	20.30	526.63	543.47	535.05	16.85
August	83.7	62.7	73.20	21.00	524.49	541.92	533.20	17.43
September	77.9	55.3	66.60	22.60	517.22	535.98	526.60	18.76
October	66.1	43.4	54.75	22.70	505.33	524.17	514.75	18.84
November	50.8	32.8	41.80	18.00	494.33	509.27	501.80	14.94
December	39.2	23.7	31.45	15.50	485.02	497.88	491.45	12.87

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

2) Pressure Data

S = ASTM-D86 distillation slope at 10 volume percent evaporation, AP-42, Table 7.1-4, 11/06	3.00	(°F/vol%)
P_{BP} = Breather vent pressure setting, psi	0.0722	psi
P_{BV} = Breather vent vacuum setting, psi	-0.1444	psi
$\Delta P_B = P_{BP} - P_{BV}$, psi	0.2166	psi

Key to Table 2 - Pressure Data for Indianapolis, Indiana

1) A = Vapor pressure equation constant, dimensionless, see Eq. 9 in methodology
2) B = Vapor pressure equation constant, °R, see Eq. 9 in methodology
3) T_{ln} = Daily minimum liquid surface temperature, Calulated in Table 1
4) T_{lx} = Daily maximum liquid surface temperature, Calculated in Table 1
5) T_{la} = Daily average liquid surface temperature, Calculated in Table 1
6) P_{vx} = Vapor pressure at daily maximum liquid surface temperature, psi, see Eq. 11 in methodology
7) P_{vn} = Vapor pressure at dauly minimum liquid surfact temperature, psi, see Eq. 12 in methodology
8) ΔP_v = Daily vapor pressure range, see Eq. 10 in methodology
9) P_{va} = True vapor pressure, see Eq. 7 in methodology

Table 2 - Pressure Data for Indianapolis, Indiana

Month	Reid Vapor Pressure (psi)	A (no units)	B (°R)	T_{ln} (°R)	T_{lx} (°R)	T_{la} (°R)	P_{vx} (psi)	P_{vn} (psi)	ΔP_v (psi)	P_{va} (psi)
January	9.0	11.76	5,315.06	480.11	492.89	486.50	2.65	1.99	0.66	2.30
February	9.0	11.76	5,315.06	482.58	497.02	489.80	2.90	2.11	0.79	2.48
March	9.0	11.76	5,315.06	492.28	507.72	500.00	3.64	2.62	1.02	3.09
April	9.0	11.76	5,315.06	503.52	521.28	512.40	4.77	3.33	1.44	4.00
May	9.0	11.76	5,315.06	513.36	531.54	522.45	5.81	4.08	1.73	4.88
June	7.8	11.80	5,420.70	522.72	540.48	531.60	5.89	4.19	1.70	4.98
July	7.8	11.80	5,420.70	526.63	543.47	535.05	6.23	4.52	1.70	5.32
August	7.8	11.80	5,420.70	524.49	541.92	533.20	6.05	4.34	1.71	5.14
September	7.8	11.80	5,420.70	517.22	535.98	526.60	5.42	3.75	1.66	4.52
October	9.0	11.76	5,315.06	505.33	524.17	514.75	5.05	3.46	1.59	4.19
November	9.0	11.76	5,315.06	494.33	509.27	501.80	3.75	2.74	1.02	3.21
December	9.0	11.76	5,315.06	485.02	497.88	491.45	2.96	2.23	0.73	2.57

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

3) Standing Loss Calculation

Storage tank volume	1000	gallons	
V_v = Tank vapor space volume (1/2 total volume)	500	gallons	66.836 ft^3

Key to Table 3 - Storage Tanks Standing Losses

1) ΔT_v = Daily vapor temperature range, calculated in Table 1
2) T_{la} = Daily average liquid surface temperature, calculated in Table 1
3) ΔP_v = Daily vapor pressure range, calculated in Table 2
4) K_s = Assumed to equal one. No roof outage.
5) K_E = Vapor space expansion factor, see Eq. 8 in methodology
6) W_v = Vapor density, see Eq. 6 in methodology
7) L_s = Standing storage losses, see Eq. 4 in methodology, lb/month

Table 3 - Gasoline Storage Tank Standing Losses (L_s)

Month	Days in Month	Vapor Molecular Weight (lb/mole)	ΔT_v (°R)	T_{la} (°R)	ΔP_v (psi)	ΔP_B (psi)	P_{va} (psi)	K_s (unitless)	K_E (unitless)	W_v (lb/ft^3)	L_s (lb/month)
January	31	67	12.78	486.50	0.66	0.217	2.30	1.0	0.062	0.030	3.81
February	28	67	14.44	489.80	0.79	0.217	2.48	1.0	0.077	0.032	4.54
March	31	67	15.44	500.00	1.02	0.217	3.09	1.0	0.100	0.039	7.99
April	30	67	17.76	512.40	1.44	0.217	4.00	1.0	0.149	0.049	14.58
May	31	67	18.18	522.45	1.73	0.217	4.88	1.0	0.189	0.058	22.89
June	30	68	17.76	531.60	1.70	0.217	4.98	1.0	0.186	0.059	22.17
July	31	68	16.85	535.05	1.70	0.217	5.32	1.0	0.190	0.063	24.78
August	31	68	17.43	533.20	1.71	0.217	5.14	1.0	0.189	0.061	23.90
September	30	68	18.76	526.60	1.66	0.217	4.52	1.0	0.178	0.054	19.39
October	31	67	18.84	514.75	1.59	0.217	4.19	1.0	0.167	0.051	17.64
November	30	67	14.94	501.80	1.02	0.217	3.21	1.0	0.099	0.040	7.96
December	31	67	12.87	491.45	0.73	0.217	2.57	1.0	0.068	0.033	4.63

Total Annual Standing Losses (lb VOC /year) **174.29**

Total Annual Standing Losses (ton VOC/year) **0.09**

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

3) Working Losses

Storage tank volume =	1,000 gallons	133.68 ft^3
Maximum annual gasoline usage =	10,000 gallons	1,336.81 ft^3

L_w (storage tank deliveries and vehicle dispenses) = Volume delivered (ft^3/month) x vapor density (lb/ft^3)

L_w (spillage) = 0.7 lb/kgallon

L_w total = L_w storage tank + L_w vehicle tank + L_w spillage

Table 4 - Working Losses

Month	Gasoline Delivered (ft^3 per month)	W_v (lb/ft^3)	L_w Storage Tank (lb/month)	L_w Vehicle Tank (lb/month)
January	833.33	0.030	24.63	24.63
February	833.34	0.032	26.33	26.33
March	833.33	0.039	32.19	32.19
April	833.34	0.049	40.62	40.62
May	833.33	0.058	48.64	48.64
June	833.34	0.059	49.49	49.49
July	833.33	0.063	52.52	52.52
August	833.34	0.061	50.88	50.88
September	833.33	0.054	45.35	45.35
October	833.33	0.051	42.40	42.40
November	833.33	0.040	33.32	33.32
December	833.33	0.033	27.22	27.22
	Total L_w storage tank (lb/yr)=		473.58	
	Total L_w vehicle tank (lb/yr)=			473.58

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Total gasoline throughput =	10,000.00	gallons/yr	
Spillage Emission Factor =	0.70	lb/Kgallon	AP-42, Table 5.2-7, 6/08
L_w spillage (lb/yr) = 0.7 x 10,000/1000 =	7.00	lb/yr	

Total Working Losses

Lw storage tank	473.58	lb/yr			
Lw vehicle	473.58	lb/yr			
Lw spillage	7.00	lb/yr			
Total Working Losses	954.16	lb/yr	or	0.48	TPY

Total VOC Emissions

PTE of VOC (TPY) = Total $L_{standing}$ + Total $L_{working}$

Total $L_{standing}$	0.09	TPY
Total $L_{working}$	0.48	TPY
PTE (VOC) =	0.56	TPY

Potential to Emit HAP

HAP Emissions	Total VOC (TPY)	Wt% VOC	PTE (TPY)		Source
Hexane (Worst Case HAP)	0.56	1.4%	0.0079	TPY	Gasoline Distribution Industry (Stage 1) - Background Information for Proposed Standards, January 2004, Table 3-2
Benzene	0.56	0.4%	0.0023	TPY	
Toluene	0.56	1.1%	0.0062	TPY	
2,2,2-Trimethylpentane	0.56	0.7%	0.0039	TPY	
Xylene	0.56	0.4%	0.0023	TPY	
Ethyl Benzene	0.56	0.1%	0.0006	TPY	
Total HAP			0.02	TPY	

PTE HAP (TPY) = Total VOC Emissions (TPY) * Weight Percent HAP in Gasoline

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Emission Calculation Methodology

Equation 1 - Gasoline Liquid Surface Temperatures

T_{ln} = (avg. ambient air temp + 460) - ((1 - attenuation factor) x (ambient air temp range / 2))

T_{lx} = (avg ambient air temp + 460) + ((1 - attenuation factor) x (ambient air temp range / 2))

Where: T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

avg ambient air temp = Daily ambient average temperature, °F

attenuation factor = Correction factor to estimate liquid surface temp from air temperatures

ambient air temp range = Daily ambient temperature range, °F or °R

Equation 2 - Daily Average Liquid Surface Temperature

$$T_{la} = (T_{ln} + T_{lx}) / 2$$

Where: T_{la} = Daily average liquid surface temperature, °R

T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

Equation 3 - Daily Vapor Temperature Range

$$\Delta T_v = T_{lx} - T_{ln}$$

Where: ΔT_V = Daily vapor temperature range, °R or °F

T_{ln} = Daily minimum liquid surface temperature, °R

T_{lx} = Daily maximum liquid surface temperature, °R

Equation 4 - Storage Tank Standing Losses

$$Ls = n\ Vv\ Wv\ Ke\ Ks$$

Where: L_s = Standing storage loss, lb/month

n = Number of days in the month

V_v = Vapor space volume of the ullage, ft^3

W_v = Vapor density, lb/ft^3

K_e = Vapor space expansion factor, dimensionless

K_s = Vented vapor saturation factor, dimensionless

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Equation 5 - Tank Vapor Space

$$\mathbf{V_v = 1/2 \text{ tank capacity } (ft^3)}$$

Where: V_v = Tank vapor space volume, ft^3

Equation 6 - Molecular Weight of the Vapor

$$\mathbf{Wv = M_v P_{va} / Rt_{la}}$$

Where: W_v = Vapor density, lb/ft^3

M_v = Vapor molecular weight, lb/lb-mole [AP-42, Table 3-2]

R = Ideal gas constant, 10.731 $psia.ft^3/lb\text{-}mole.°R$

P_{va} = Vapor pressure at daily average liquid surface temperature, psia

T_{la} = Daily average liquid surface temperature, °R

Equation 7 - Gasoline True Vapor Pressure

$$\mathbf{P_{va} = \exp [A - (B / T_{la})]}$$

Where: P_{va} = True vapor pressure, psia

exp = exponential function, 2.71828

A = Dimensionless constant [AP-42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

T_{la} = Daily average liquid surface temperature, °R

Equation 8 - Vapor Space Expansion Factor

$$\mathbf{K_E = (\Delta T_v / T_{la}) + ((\Delta P_v - \Delta P_B) / (14.7 - P_{va}))}$$

Where: K_E = Vapor space expansion factor, dimensionless factor

ΔT_V = Daily vapor temperature range, °R

ΔP_V = Daily vapor pressure range, °R

ΔP_B = Breather vent pressure setting, psi.

14.7 = Atmospheric pressure, psi

P_{va} = Vapor pressure at average liquid temperature, psi, from Eq. 7

T_{la} = Daily average liquid surface temperature, °R

Appendix A to the Technical Support Document (TSD)
Potential to Emit - 1,000 Gallon Gasoline AST (continued)

Equation 9 - Vapor Pressure Equation Constants

$$A = 15.64 - 1.854\ S^{0.5} - (0.8742 - 0.3280\ S^{0.5})\ \ln(\text{Ried Vapor Pressure})$$

$$B = 8{,}742 - 1{,}042\ S^{0.5} - (1{,}049 - 179.4\ S^{0.5})\ \ln(\text{Ried Vapor Pressure})$$

Where: S = Stock ASTM-D86 distillation slope at 10 volume percent evaporation (°F/vol%), 3.0 for gasoline

A = Vapor pressure equation constant, dimensionless

B = Constant in vapor pressure equation, °R or °C

Equation 10 - Daily Vapor Pressure Range

$$\Delta P_v = P_{vx} - P_{vn}$$

Where: ΔP_V = Daily vapor pressure range, °R

P_{vx} = Vapor pressure P_{va} at daily maximum liquid surface temperature, psi

P_{vn} = Vapor pressure P_{va} at daily minimum liquid surface temperature, psi

Equation 11 - Vapor Pressure at Maximum Liquid Temperature

$$P_{vx} = \exp\left(A - \left(B / T_{lx}\right)\right)$$

Where: P_{vx} = Vapor pressure P_{va} at daily maximum liquid surface temperature, psi

T_{lx} = Daily maximum liquid surface temperature, °R

A = Dimensionless constant [AP-42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

Equation 12 - Vapor Pressure at Minimum Liquid Temperature

$$P_{vn} = \exp\left(A - \left(B / T_{ln}\right)\right)$$

Where: P_{vn} = Vapor pressure P_{va} at daily minimum liquid surface temperature, psi

T_{ln} = Daily minimum liquid surface temperature, °R

A = Dimensionless constant [AP42, Figure 3-5]

B = Constant, °R [AP-42, Figure 3-5]

Equation 13 - Vented Vapor Saturation Factor

$$K_s = 1 / \left(1 + \left(0.053 \times P_{va} \times H_{vo}\right)\right) = 1$$

Where: K_s = Vented vapor saturation factor, dimensionless

P_{va} = Vapor pressure at daily average fuel surface temperature, psi

H_{vo} = Vapor space outage, assumed to be 0 feet

Technical Support Document - Appendix A
Potential to Emit - Leachate Storage and Misc. Insignificant - Landfill Closure 2022

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana
Permit Number: 47866
Reviewer: T 167-32729-00116
Date: David J. Matousek

Diesel and Leachate Storage Tanks						
Emission Unit	**Description**	**Throughput (gallons/yr)**	**Volume of Vapor Displaced (ft^3/yr)**	**US EPA Tanks Vapor Density (lb/ft^3)**	**VOC Emissions (TPY)**	**Data Source**
Unit #14	Two (2) 35,000 gallon diesel storage tanks	500,000	66,836	0.0002	0.01	Applicant provided Tanks output
Units #15 and #26	One 26,000 gal and One 108,000 gal leachate storage tanks	2,000,000	267,344	0.0010	0.13	Applicant provided Tanks output

VOC (TPY) = Vapor Displaced (cubic feet/year) x Vapor Density (lb/cubic foot) x 1 ton/2,000lb

Volume of Vapor Displaced (cubic feet/yr) = Throughput (gallons/yr) x 1 cubic foot /7.481 gallons

Other Miscellaneous Insignificant Activities - Potential to Emit						
Emission Unit	**Description**	**PM / PM_{10} / $PM_{2.5}$ (TPY)**	**VOC (TPY)**	**Single HAP (TPY)**	**Total HAP (TPY)**	**Data Source**
Unit #2	Refrigerant Station	0	negl.	0	0	Applicant Estimate
Unit #3	Six portable welders	negl.	negl.	0	0	Applicant Estimate
Unit #4	Painting Operation	negl.	< 2.74	0	0	Applicant Estimate
Unit #5	One 55 gallon drum transmission fluid	0	negl.	0	0	Applicant Estimate
Unit #6	One 55 gallon drum grease	0	negl.	0	0	Applicant Estimate
Unit #7	One 300 gallon antifreeze AST	0	negl.	0	0	Applicant Estimate
Unit #8	One 400 gallon hydraulic oil AST	0	negl.	0	0	Applicant Estimate
Unit #9	One 250 gallon motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #10	One 250 gallon used motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #12	One 500 gallon propane AST	0	negl.	0	0	Applicant Estimate
Unit #16	Two 55 gallon drum castrol gear lube	0	negl.	0	0	Applicant Estimate
Unit #17	Two 250 gallon hydraulic fluid AST	0	negl.	0	0	Applicant Estimate
Unit #18	One 250 gallon gear oil AST	0	negl.	0	0	Applicant Estimate
Unit #19	One 375 gallon transmission fluid AST	0	negl.	0	0	Applicant Estimate
Unit #25	One 1,000 gallon on-road diesel AST	0	negl.	0	0	Applicant Estimate
Unit #27	One 3,500 gallons used oil AST	0	negl.	0	0	Applicant Estimate
Unit #29	One 375 gallon motor oil AST	0	negl.	0	0	Applicant Estimate
Unit #30	One 250 gallon transmission fluid AST	0	negl.	0	0	Applicant Estimate
Unit #31	One portable 3,500 gallon fuel truck	0	< 2.74	0	0	Applicant Estimate
Unit #32	One 300 gallon kerosene AST	0	negl.	0	0	Applicant Estimate
Unit #33	Two 200 pound propane tanks	0	negl.	0	0	Applicant Estimate
Unit #34	One 55 gallon drum of tranmission oil	0	negl.	0	0	Applicant Estimate
Unit #35	One 500 gallon used oil AST	0	negl.	0	0	Applicant Estimate
Total PTE (TPY)		**negl.**	**5.48**	**0**	**0**	

Technical Support Document - Appendix A - Emission Calculation Sheet
Municipal Landfill - Emissions from Paved Roads

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 19, 2013

Average Vehicle Weight Calculation

Vehicle Type	Trucks/Day	Average Weight (tons)	Total Trips per Year	Miles per Trip	Vehicle Miles Traveled (miles per year)	Traffic Component (%)	Component Weight (tons)
Transfer Trailer	120	15	43,800	1.02	44,676	23.121%	3.47
Front Loader	48	15	17,520	1.02	17,870	9.249%	1.39
Rear Loader	40	15	14,600	1.02	14,892	7.707%	1.16
Roll-Off	75	15	27,375	1.02	27,923	14.451%	2.17
Dump Trucks	30	15	10,950	1.02	11,169	5.780%	0.87
Other	206	2.5	75,190	1.02	76,694	39.692%	0.99
				Total VMT	193,224		
					Average Vehicle Weight (tons) - W		10.05

Site Specific Constants

Value Name	Symbol	Value	Units	Source
Emission Factor	E	---	lb/VMT	Calculated
Particle Size Multiplier	k for PM	0.011	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Particle Size Multiplier	k for PM10	0.0022	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Particle Size Multiplier	k for PM2.5	0.00054	lb/VMT	AP-42 Table 13.2.1-1, January 2011
Silt Loading	sL (Winter)	29.6	g/cubic meter	AP-42, Table 13.2.1-2, January 2011, ADT <500
Silt Loading	sL (Non-Winter)	7.4	g/cubic meter	Previous Determination
Winter Days	Winter Days	90	days	Estimated by IDEM
Non-Winter Days	Non-Winter Days	275	days	Estimated by IDEM
Days >0.01" of rain	P	120	days	AP-42, Figure 13.2.1-2, January 2011
Total Days in Period	N	365	days	Days in the period
Mean Vehicle Weight	W	10.05	tons	Calculated above

Winter Emission Factor Calculations

E = [k * (sL for winter)^0.91 * (W)^1.02] * [1 - P/(4 * N)] — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 2.32 lb/VMT
E for PM10 (lb/VMT) = 0.46 lb/VMT
E for PM2.5 (lb/VMT) = 0.11 lb/VMT

Non-Winter Emission Factor Calculations

E = [k * (sL for non-winter)^0.91 * (W)^1.02] * [1 - P/(4 * N)] — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 0.66 lb/VMT
E for PM10 (lb/VMT) = 0.13 lb/VMT
E for PM2.5 (lb/VMT) = 0.03 lb/VMT

Annual Average Emission Factors

Annual Average Emission Factor = [Winter Days * Winter Factor + Non-Winter Days * Non-Winter Factor] / 365

E for PM (lb/VMT) = 1.07 lb/VMT
E for PM10 (lb/VMT) = 0.21 lb/VMT
E for PM2.5 (lb/VMT) = 0.05 lb/VMT

Potential to Emit

PM Emissions (TPY) = [Annual Average E for PM (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 103.37 TPY
PM10 Emissions (TPY) = [Annual Average E for PM10 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 20.29 TPY
PM2.5 Emissions (TPY) = [Annual Average E for PM2.5 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] — 4.83 TPY

Limited Potential to Emit

Control Efficiency 80.00% per fugitive dust plan

Limited PM Emissions (TPY) = Potential to Emit PM * (1 - Control Efficiency) — 20.67 TPY
Limited PM10 Emissions (TPY) = Potential to Emit PM10 * (1 - Control Efficiency) — 4.06 TPY
Limited PM2.5 Emissions (TPY) = Potential to Emit PM2.5 * (1 - Control Efficiency) — 0.97 TPY

Technical Support Document - Appendix A - Emission Calculation Sheet
Municipal Landfill - Emissions from Unpaved Roads

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: 167-32729-00116
Reviewer: David Matousek
Date: August 19, 2013

Average Vehicle Weight Calculation

Vehicle Type	Trucks/Day	Average Weight (tons)	Total Trips per Year	Miles per Trip	Vehicle Miles Traveled (miles per year)	Traffic Component (%)	Component Weight (tons)
Transfer Trailer	120	15	43,800	1.7	74,460	23.121%	3.47
Front Loader	48	15	17,520	1.7	29,784	9.249%	1.39
Rear Loader	40	15	14,600	1.7	24,820	7.707%	1.16
Roll-Off	75	15	27,375	1.7	46,538	14.451%	2.17
Dump Trucks	30	15	10,950	1.7	18,615	5.780%	0.87
Other	206	2.5	75,190	1.7	127,823	39.692%	0.99
				Total VMT	322,040		
					Average Vehicle Weight (tons) - W		10.05

Site Specific Constants

Value Name	Symbol	Value	Units	Source
Emission Factor	E	---	lb/VMT	Calculated
Particle Size Multiplier	k for PM	4.90	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Particle Size Multiplier	k for PM10	1.50	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Particle Size Multiplier	k for PM2.5	0.15	lb/VMT	AP-42, Table 13.2.2-2, November 2006
Silt Content	s	6.40	%	Previous Determination
Days >0.01" of rain	P	120.00	days	AP-42, Figure 13.2.2-1, November 2006
Emperical Constant	a for PM	0.70	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	a for PM10	0.90	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	a for PM2.5	0.90	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM10	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Emperical Constant	b for PM2.5	0.45	Unitless	AP-42, Table 13.2.2-2, November 2006
Mean Vehicle Weight	W	10.05	tons	Calculated above

Emission Factor Calculations

$E = [k * (s/12)^a * (W/3)^b] * [(365 - P) / 365]$ — AP-42, Chapter 13.2.1-5, January 2011, Eq. 2

E for PM (lb/VMT) = 3.65 lb/VMT
E for PM10 (lb/VMT) = 0.99 lb/VMT
E for PM2.5 (lb/VMT) = 0.10 lb/VMT

Potential to Emit

PM Emissions (TPY) = [E for PM (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 587.72 TPY
PM10 Emissions (TPY) = [E for PM10 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 159.41 TPY
PM2.5 Emissions (TPY) = [E for PM2.5 (lb/VMT) * Total VMT/yr * 1 ton / 2,000 lb] 16.10 TPY

Limited Potential to Emit

Control Efficiency 80.00% per fugitive dust plan

Limited PM Emissions (TPY) = Potential to Emit PM * (1 - Control Efficiency) 117.54 TPY
Limited PM10 Emissions (TPY) = Potential to Emit PM10 * (1 - Control Efficiency) 31.88 TPY
Limited PM2.5 Emissions (TPY) = Potential to Emit PM2.5 * (1 - Control Efficiency) 3.22 TPY

Technical Support Document - Appendix A
Landfill Greenhouse Gas Emissions - 40 CFR 98, Subpart HH Method

Company Name: Sycamore Ridge Landfill
Address: 5621 East Cottom Drive, Pimento, Indiana 47866
Permit Number: T 167-32729-00116
Permit Reviewer: David Matousek
Date: October 29, 2013

40 CFR 98, Subpart HH - Equation HH-1

$$G_{CH_4} = \sum_{X=S}^{T-1} \left[W_x * MCF * DOC_f * F * \frac{16}{12} * \left(e^{-k(T-x-1)} - e^{-k(T-x)} \right) \right]$$

Where:

Mass of Methane Generated (G_{CH4}) in megagrams	
Year Landfill Opened (S)	1972
Reporting Year (T) at Closure	2023
Waste Accepted (W_x) in Mg	
Methane Correction Factor (MCF)	1
Degradable Organic Carbon (DOC)	0.2
Fraction of DOC dissimilated (DOC_f)	0.5
Volume Fraction of Methane in Landfill Gas	0.5
Rate Constant (k)	0.057
Mathematical constant (e)	2.718281828
Year Waste Disposed (x)	
Equation HH-5 Constants = MCF*DOC*DOC_f*F*(16/12)	0.067
Temperature in Degree Rankine	520

Eq. HH-5: MG = G_{CH4} * (1 - OX); Where: MG = Methane Generation Adjusted for Oxidation (Mg), OX = Oxidation Fraction

Methane Oxidation Reduction Factor (OX)	0.1

Conversion Factor: TPY = Mg/yr * 1.1023
Equation 1: Average Flow (ACFM) = [PTE (TPY) * T (Rankine)] / [360 * MW * P (atm)]
Equation 2: PTE (TPY) = 360 * Volume Flow (SCFM) * MW * P (atm) / T (Rankine)

		40 CFR 98.343, Eq. HH-1				Eq. HH-5	Conversion Factor	Equation 1
Year Waste Disposed (x)	Waste Accepted Wx (Mg/yr)	$e^{-k*(T-x-1)}$ (Unitless)	$e^{-k*(T-x)}$ (Unitless)	Summation Result for Year X	G_{CH4} (Mg/yr)	G_{CH4} Emissions Adjusted for Oxidation (Mg/yr)	G_{CH4} Emissions Adjusted for Oxidation (TPY)	G_{CH4} Emissions Adjusted for Oxidation ACFM
1972	66,636	0.05784	0.05464	14.31	14.31	12.88	14.20	1.28
1973	66,636	0.06124	0.05784	15.15	29.46	26.51	29.22	2.63
1974	67,000	0.06483	0.06124	16.12	45.58	41.02	45.22	4.07
1975	66,364	0.06863	0.06483	16.91	62.49	56.24	61.99	5.58
1976	66,364	0.07266	0.06863	17.90	80.39	72.35	79.75	7.18
1977	66,364	0.07692	0.07266	18.95	99.34	89.41	98.56	8.87
1978	67,273	0.08143	0.07692	20.34	119.68	107.71	118.73	10.69
1979	66,364	0.08621	0.08143	21.24	140.92	126.83	139.80	12.59
1980	66,364	0.09126	0.08621	22.48	163.40	147.06	162.10	14.59
1981	66,364	0.09662	0.09126	23.80	187.20	168.48	185.72	16.72
1982	67,273	0.10228	0.09662	25.54	212.74	191.47	211.06	19.00
1983	66,364	0.10828	0.10228	26.68	239.42	215.48	237.52	21.39
1984	66,364	0.11464	0.10828	28.24	267.66	240.89	265.53	23.91
1985	66,364	0.12136	0.11464	29.90	297.56	267.80	295.20	26.58
1986	70,909	0.12848	0.12136	33.82	331.38	298.24	328.75	29.60
1987	63,636	0.13601	0.12848	32.13	363.51	327.16	360.63	32.47
1988	63,636	0.14399	0.13601	34.02	397.53	357.78	394.38	35.51
1989	72,727	0.15244	0.14399	41.15	438.68	394.81	435.20	39.18

Year Waste Disposed (x)	Waste Accepted Wx (Mg/yr)	$e^{-k * (T-x-1)}$ (Unitless)	$e^{-k * (T-x)}$ (Unitless)	Summation Result for Year X	G_{CH4} (Mg/yr)	G_{CH4} Emissions Adjusted for Oxidation (Mg/yr)	G_{CH4} Emissions Adjusted for Oxidation (TPY)	G_{CH4} Emissions Adjusted for Oxidation ACFM
1990	63,636	0.16138	0.15244	38.12	476.80	429.12	473.02	42.59
1991	63,636	0.17084	0.16138	40.36	517.16	465.44	513.05	46.19
1992	54,545	0.18087	0.17084	36.62	553.78	498.40	549.39	49.46
1993	100,000	0.19147	0.18087	71.08	624.86	562.37	619.90	55.81
1994	118,182	0.20271	0.19147	88.93	713.79	642.41	708.13	63.76
1995	118,182	0.21460	0.20271	94.15	807.94	727.15	801.54	72.17
1996	109,091	0.22718	0.21460	92.00	899.94	809.95	892.81	80.38
1997	100,000	0.24051	0.22718	89.28	989.22	890.30	981.38	88.36
1998	100,000	0.25462	0.24051	94.52	1,083.74	975.37	1,075.15	96.80
1999	218,182	0.26955	0.25462	218.32	1,302.06	1,171.85	1,291.73	116.30
2000	263,636	0.28536	0.26955	279.27	1,581.33	1,423.20	1,568.79	141.25
2001	290,909	0.30210	0.28536	326.24	1,907.57	1,716.81	1,892.44	170.39
2002	354,545	0.31982	0.30210	420.93	2,328.50	2,095.65	2,310.03	207.99
2003	761,262	0.33858	0.31982	956.81	3,285.31	2,956.78	3,259.26	293.45
2004	936,318	0.35844	0.33858	1,245.86	4,531.17	4,078.05	4,495.23	404.73
2005	1,035,973	0.37946	0.35844	1,459.31	5,990.48	5,391.43	5,942.97	535.08
2006	995,433	0.40172	0.37946	1,484.45	7,474.93	6,727.44	7,415.66	667.67
2007	983,135	0.42528	0.40172	1,552.11	9,027.04	8,124.34	8,955.46	806.31
2008	941,644	0.45023	0.42528	1,573.80	10,600.84	9,540.76	10,516.78	946.89
2009	779,123	0.47664	0.45023	1,378.56	11,979.40	10,781.46	11,884.40	1,070.02
2010	555,169	0.50459	0.47664	1,039.92	13,019.32	11,717.39	12,916.08	1,162.91
2011	521,642	0.53419	0.50459	1,034.43	14,053.75	12,648.38	13,942.31	1,255.31
2012	500,305	0.56553	0.53419	1,050.31	15,104.06	13,593.65	14,984.28	1,349.12
2013	659,576	0.59870	0.56553	1,465.89	16,569.95	14,912.96	16,438.56	1,480.06
2014	659,576	0.63381	0.59870	1,551.88	18,121.83	16,309.65	17,978.13	1,618.68
2015	659,576	0.67099	0.63381	1,642.90	19,764.73	17,788.26	19,608.00	1,765.42
2016	659,576	0.71035	0.67099	1,739.27	21,504.00	19,353.60	21,333.47	1,920.78
2017	659,576	0.75201	0.71035	1,841.29	23,345.29	21,010.76	23,160.16	2,085.24
2018	659,576	0.79612	0.75201	1,949.29	25,294.58	22,765.12	25,093.99	2,259.36
2019	659,576	0.84282	0.79612	2,063.63	27,358.21	24,622.39	27,141.26	2,443.69
2020	659,576	0.89226	0.84282	2,184.67	29,542.88	26,588.59	29,308.60	2,638.82
2021	659,576	0.94459	0.89226	2,312.82	31,855.70	28,670.13	31,603.08	2,845.41
2022	126,266	1.00000	0.94459	468.72	32,324.42	29,091.98	32,068.09	2,887.28
2023	0	1.05866	1.00000	0.00	32,324.42	29,091.98	32,068.09	2,887.28
Total Waste	17,230,000 Mg							

Peak Methane Generation Rate	2,887	SCFM (Eq. 1)	19,608 TPY (Eq. 2)
LFG = Peak Methane Generation Rate / % Methane	5,775	SCFM	
Peak CO_2 Generation Rate = LFG (1- % Methane)	2,887	SCFM	87,964 TPY (Eq. 2)

Landfill Generation Potential	
Peak Methane Generation Rate as CO_2e	411,768 TPY CO_2e
Peak CO_2 Generation Rate as CO_2e	87,964 TPY CO_2e
Peak Total Generation Rate as CO_2e	499,732 TPY CO_2e

Potential to Emit (75% Capture / 25% Fugitive)			
Collected Methane	2,165	SCFM	24,046 TPY (Eq. 2)
Collected CO_2	2,165	SCFM	65,966 TPY (Eq. 2)

Potential to Emit (CO_2e)	
PTE Methane as CO_2e (Non-Biogenic)	504,966 TPY CO_2e
PTE CO_2 as CO_2e (Biogenic)	65,966 TPY CO_2e
Total GHG Emissions (CO_2e)	570,932 TPY CO_2e

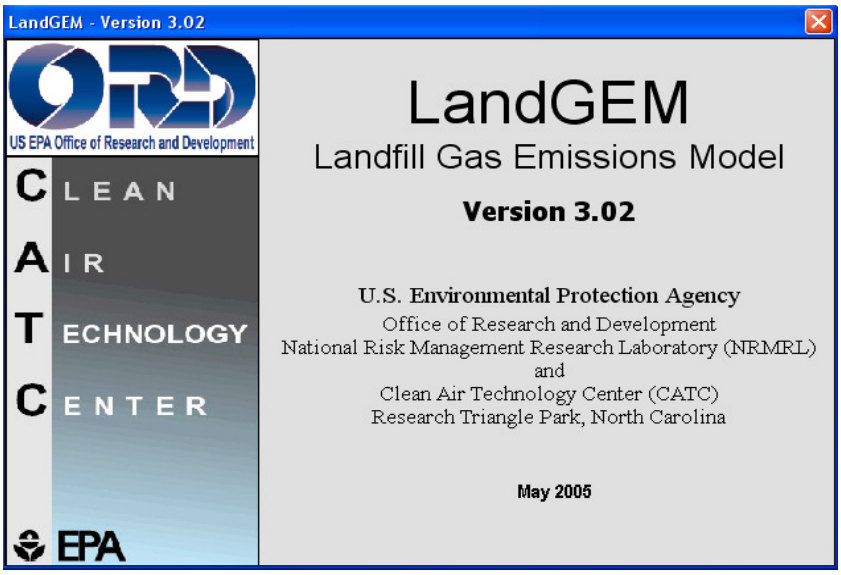
Limited and Controlled Potential to Emit (CO_2e)	
PTE Methane as CO_2e (Non-Biogenic with 98% Combustion)	10,099 TPY CO_2e
PTE CO_2 as CO_2e (Biogenic)	65,966 TPY CO_2e
Total GHG Emissions (CO_2e)	76,065 TPY CO_2e

INVENTORY

Landfill Name or Identifier: Sycamore Ridge Landfill - Existing Capacity

Enter year of emissions inventory: 2016

Gas / Pollutant	Emission Rate				
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(ft^3/year)*	*(short tons/year)*
Total landfill gas	1.030E+05	8.251E+07	5.544E+03	2.914E+09	1.133E+05
Methane	2.752E+04	4.125E+07	2.772E+03	1.457E+09	3.027E+04
Carbon dioxide	7.552E+04	4.125E+07	2.772E+03	1.457E+09	8.307E+04
NMOC	1.760E+02	4.909E+04	3.298E+00	1.734E+06	1.936E+02
1,1,1-Trichloroethane (methyl chloroform) - HAP	2.198E-01	3.960E+01	2.661E-03	1.399E+03	2.417E-01
1,1,2,2-Tetrachloroethane - HAP/VOC	6.336E-01	9.076E+01	6.098E-03	3.205E+03	6.970E-01
1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	8.151E-01	1.980E+02	1.330E-02	6.993E+03	8.966E-01
1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	6.653E-02	1.650E+01	1.109E-03	5.828E+02	7.319E-02
1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	1.392E-01	3.383E+01	2.273E-03	1.195E+03	1.532E-01
1,2-Dichloropropane (propylene dichloride) - HAP/VOC	6.980E-02	1.485E+01	9.979E-04	5.245E+02	7.677E-02
2-Propanol (isopropyl alcohol) - VOC	1.031E+01	4.125E+03	2.772E-01	1.457E+05	1.135E+01
Acetone	1.395E+00	5.776E+02	3.881E-02	2.040E+04	1.535E+00
Acrylonitrile - HAP/VOC	1.147E+00	5.198E+02	3.493E-02	1.836E+04	1.262E+00
Benzene - No or Unknown Co-disposal - HAP/VOC	5.093E-01	1.568E+02	1.053E-02	5.536E+03	5.602E-01
Benzene - Co-disposal - HAP/VOC	2.949E+00	9.076E+02	6.098E-02	3.205E+04	3.243E+00
Bromodichloromethane - VOC	1.743E+00	2.558E+02	1.719E-02	9.033E+03	1.917E+00
Butane - VOC	9.973E-01	4.125E+02	2.772E-02	1.457E+04	1.097E+00
Carbon disulfide - HAP/VOC	1.515E-01	4.785E+01	3.215E-03	1.690E+03	1.667E-01
Carbon monoxide	1.346E+01	1.155E+04	7.761E-01	4.079E+05	1.480E+01
Carbon tetrachloride - HAP/VOC	2.112E-03	3.300E-01	2.217E-05	1.166E+01	2.323E-03
Carbonyl sulfide - HAP/VOC	1.010E-01	4.043E+01	2.716E-03	1.428E+03	1.111E-01
Chlorobenzene - HAP/VOC	9.657E-02	2.063E+01	1.386E-03	7.284E+02	1.062E-01
Chlorodifluoromethane	3.858E-01	1.073E+02	7.207E-03	3.788E+03	4.243E-01
Chloroethane (ethyl chloride) - HAP/VOC	2.878E-01	1.073E+02	7.207E-03	3.788E+03	3.166E-01
Chloroform - HAP/VOC	1.229E-02	2.475E+00	1.663E-04	8.741E+01	1.352E-02
Chloromethane - VOC	2.079E-01	9.901E+01	6.652E-03	3.497E+03	2.287E-01
Dichlorobenzene - (HAP for para isomer/VOC)	1.059E-01	1.733E+01	1.164E-03	6.119E+02	1.165E-01
Dichlorodifluoromethane	6.639E+00	1.320E+03	8.870E-02	4.662E+04	7.303E+00
Dichlorofluoromethane - VOC	9.183E-01	2.145E+02	1.441E-02	7.576E+03	1.010E+00
Dichloromethane (methylene chloride) - HAP	4.081E+00	1.155E+03	7.761E-02	4.079E+04	4.489E+00
Dimethyl sulfide (methyl sulfide) - VOC	1.663E+00	6.436E+02	4.324E-02	2.273E+04	1.829E+00
Ethane	9.184E+01	7.343E+04	4.934E+00	2.593E+06	1.010E+02
Ethanol - VOC	4.270E+00	2.228E+03	1.497E-01	7.867E+04	4.697E+00
Ethyl mercaptan (ethanethiol) - VOC	4.904E-01	1.898E+02	1.275E-02	6.702E+03	5.394E-01
Ethylbenzene - HAP/VOC	1.676E+00	3.795E+02	2.550E-02	1.340E+04	1.843E+00
Ethylene dibromide - HAP/VOC	6.448E-04	8.251E-02	5.544E-06	2.914E+00	7.092E-04
Fluorotrichloromethane - VOC	3.583E-01	6.271E+01	4.213E-03	2.214E+03	3.941E-01
Hexane - HAP/VOC	1.952E+00	5.446E+02	3.659E-02	1.923E+04	2.147E+00
Hydrogen sulfide	4.210E+00	2.970E+03	1.996E-01	1.049E+05	4.631E+00
Mercury (total) - HAP	1.996E-04	2.393E-02	1.608E-06	8.450E-01	2.196E-04
Methyl ethyl ketone - HAP/VOC	1.757E+00	5.858E+02	3.936E-02	2.069E+04	1.933E+00
Methyl isobutyl ketone - HAP/VOC	6.531E-01	1.568E+02	1.053E-02	5.536E+03	7.184E-01
Methyl mercaptan - VOC	4.128E-01	2.063E+02	1.386E-02	7.284E+03	4.540E-01
Pentane - VOC	8.171E-01	2.723E+02	1.829E-02	9.615E+03	8.988E-01
Perchloroethylene (tetrachloroethylene) - HAP	2.106E+00	3.053E+02	2.051E-02	1.078E+04	2.316E+00
Propane - VOC	1.664E+00	9.076E+02	6.098E-02	3.205E+04	1.831E+00
t-1,2-Dichloroethene - VOC	9.315E-01	2.310E+02	1.552E-02	8.159E+03	1.025E+00
Toluene - No or Unknown Co-disposal - HAP/VOC	1.233E+01	3.218E+03	2.162E-01	1.136E+05	1.356E+01
Toluene - Co-disposal - HAP/VOC	5.375E+01	1.403E+04	9.424E-01	4.953E+05	5.912E+01
Trichloroethylene (trichloroethene) - HAP/VOC	1.263E+00	2.310E+02	1.552E-02	8.159E+03	1.389E+00
Vinyl chloride - HAP/VOC	1.566E+00	6.023E+02	4.047E-02	2.127E+04	1.722E+00
Xylenes - HAP/VOC	4.372E+00	9.901E+02	6.652E-02	3.497E+04	4.809E+00



Summary Report

Landfill Name or Identifier: Sycamore Ridge Landfill - Existing Capacity

Date: Thursday, June 13, 2013

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

Q_{CH_4} = annual methane generation in the year of the calculation ($m^3/year$)
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate ($year^{-1}$)
L_o = potential methane generation capacity (m^3/Mg)
M_i = mass of waste accepted in the i^{th} year (Mg)
t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	**1972**	
Landfill Closure Year (with 80-year limit)	**2017**	
Actual Closure Year (without limit)	***2017***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity	**14,755,000**	*megagrams*

MODEL PARAMETERS

Methane Generation Rate, k	**0.040**	*year^{-1}*
Potential Methane Generation Capacity, L_o	**100**	*m^3/Mg*
NMOC Concentration	**595**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	**Total landfill gas**
Gas / Pollutant #2:	**Methane**
Gas / Pollutant #3:	**Carbon dioxide**
Gas / Pollutant #4:	**NMOC**

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
1972	0	0	0	0
1973	73,300	80,630	0	0
1974	73,700	81,070	73,300	80,630
1975	73,000	80,300	147,000	161,700
1976	73,000	80,300	220,000	242,000
1977	73,000	80,300	293,000	322,300
1978	74,000	81,400	366,000	402,600
1979	73,000	80,300	440,000	484,000
1980	73,000	80,300	513,000	564,300
1981	73,000	80,300	586,000	644,600
1982	74,000	81,400	659,000	724,900
1983	73,000	80,300	733,000	806,300
1984	73,000	80,300	806,000	886,600
1985	73,000	80,300	879,000	966,900
1986	78,000	85,800	952,000	1,047,200
1987	70,000	77,000	1,030,000	1,133,000
1988	70,000	77,000	1,100,000	1,210,000
1989	80,000	88,000	1,170,000	1,287,000
1990	70,000	77,000	1,250,000	1,375,000
1991	70,000	77,000	1,320,000	1,452,000
1992	60,000	66,000	1,390,000	1,529,000
1993	110,000	121,000	1,450,000	1,595,000
1994	130,000	143,000	1,560,000	1,716,000
1995	130,000	143,000	1,690,000	1,859,000
1996	120,000	132,000	1,820,000	2,002,000
1997	110,000	121,000	1,940,000	2,134,000
1998	110,000	121,000	2,050,000	2,255,000
1999	240,000	264,000	2,160,000	2,376,000
2000	290,000	319,000	2,400,000	2,640,000
2001	320,000	352,000	2,690,000	2,959,000
2002	390,000	429,000	3,010,000	3,311,000
2003	420,000	462,000	3,400,000	3,740,000
2004	910,000	1,001,000	3,820,000	4,202,000
2005	910,000	1,001,000	4,730,000	5,203,000
2006	900,000	990,000	5,640,000	6,204,000
2007	910,000	1,001,000	6,540,000	7,194,000
2008	910,000	1,001,000	7,450,000	8,195,000
2009	910,000	1,001,000	8,360,000	9,196,000
2010	930,000	1,023,000	9,270,000	10,197,000
2011	900,000	990,000	10,200,000	11,220,000

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
2012	900,000	990,000	11,100,000	12,210,000
2013	900,000	990,000	12,000,000	13,200,000
2014	900,000	990,000	12,900,000	14,190,000
2015	900,000	990,000	13,800,000	15,180,000
2016	55,000	60,500	14,700,000	16,170,000
2017	0	0	14,755,000	16,230,500
2018	0	0	14,755,000	16,230,500
2019	0	0	14,755,000	16,230,500
2020	0	0	14,755,000	16,230,500
2021	0	0	14,755,000	16,230,500
2022	0	0	14,755,000	16,230,500
2023	0	0	14,755,000	16,230,500
2024	0	0	14,755,000	16,230,500
2025	0	0	14,755,000	16,230,500
2026	0	0	14,755,000	16,230,500
2027	0	0	14,755,000	16,230,500
2028	0	0	14,755,000	16,230,500
2029	0	0	14,755,000	16,230,500
2030	0	0	14,755,000	16,230,500
2031	0	0	14,755,000	16,230,500
2032	0	0	14,755,000	16,230,500
2033	0	0	14,755,000	16,230,500
2034	0	0	14,755,000	16,230,500
2035	0	0	14,755,000	16,230,500
2036	0	0	14,755,000	16,230,500
2037	0	0	14,755,000	16,230,500
2038	0	0	14,755,000	16,230,500
2039	0	0	14,755,000	16,230,500
2040	0	0	14,755,000	16,230,500
2041	0	0	14,755,000	16,230,500
2042	0	0	14,755,000	16,230,500
2043	0	0	14,755,000	16,230,500
2044	0	0	14,755,000	16,230,500
2045	0	0	14,755,000	16,230,500
2046	0	0	14,755,000	16,230,500
2047	0	0	14,755,000	16,230,500
2048	0	0	14,755,000	16,230,500
2049	0	0	14,755,000	16,230,500
2050	0	0	14,755,000	16,230,500
2051	0	0	14,755,000	16,230,500

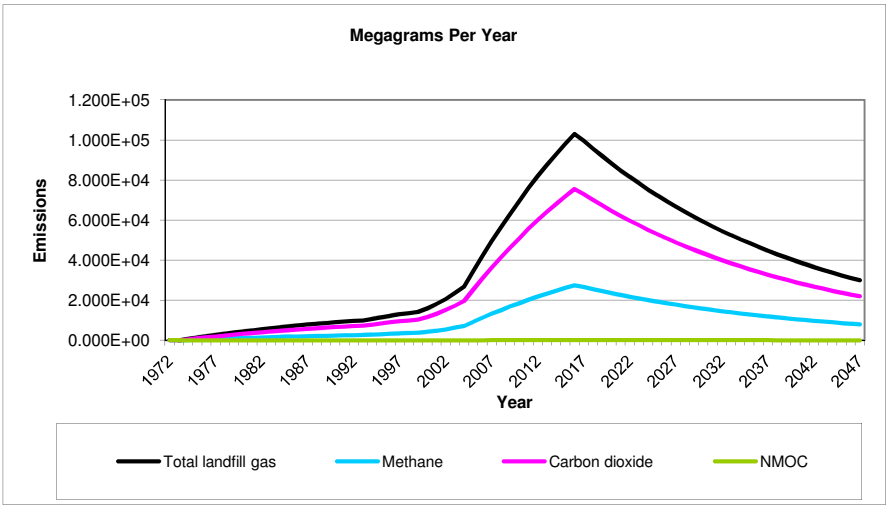
Pollutant Parameters

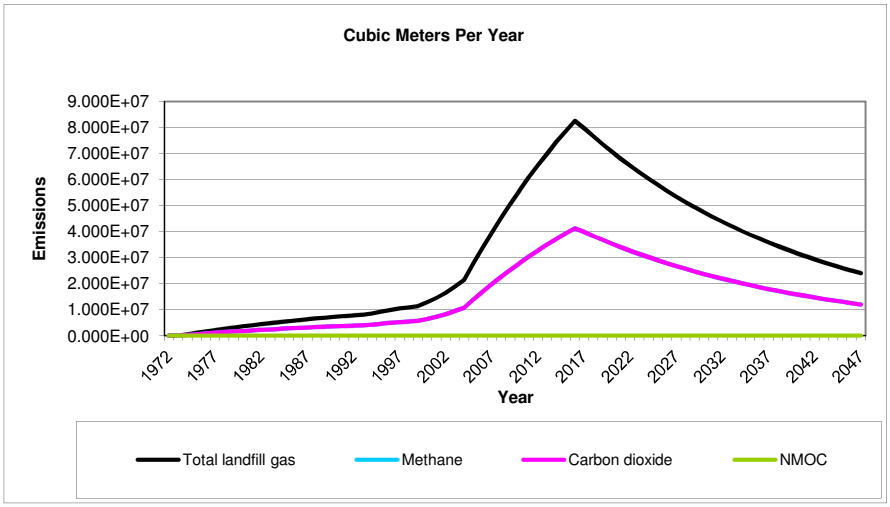
		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Gases	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
Pollutants	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

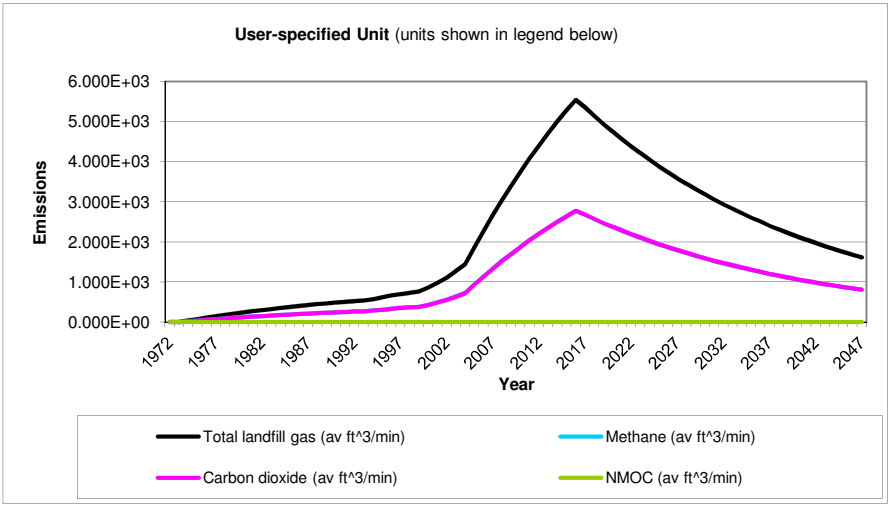
Pollutant Parameters (Continued)

		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Pollutants	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		

Graphs


Megagrams Per Year
Emissions
1.200E+05
1.000E+05
8.000E+04
6.000E+04
4.000E+04
2.000E+04
0.000E+00
1972
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022
2027
2032
2037
2042
2047
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
9.000E+07
8.000E+07
7.000E+07
6.000E+07
5.000E+07
4.000E+07
3.000E+07
2.000E+07
1.000E+07
0.000E+00
1972
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022
2027
2032
2037
2042
2047
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
6.000E+03
5.000E+03
4.000E+03
3.000E+03
2.000E+03
1.000E+03
0.000E+00
1972
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022
2027
2032
2037
2042
2047
Year
Total landfill gas (av ft^3/min)
Methane (av ft^3/min)
Carbon dioxide (av ft^3/min)
NMOC (av ft^3/min)

Results

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1972	0	0	0	0	0	0
1973	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1974	7.193E+02	5.760E+05	3.870E+01	1.921E+02	2.880E+05	1.935E+01
1975	1.414E+03	1.133E+06	7.609E+01	3.778E+02	5.663E+05	3.805E+01
1976	2.075E+03	1.662E+06	1.117E+02	5.543E+02	8.309E+05	5.583E+01
1977	2.710E+03	2.170E+06	1.458E+02	7.239E+02	1.085E+06	7.291E+01
1978	3.320E+03	2.659E+06	1.786E+02	8.869E+02	1.329E+06	8.932E+01
1979	3.916E+03	3.136E+06	2.107E+02	1.046E+03	1.568E+06	1.054E+02
1980	4.479E+03	3.587E+06	2.410E+02	1.196E+03	1.793E+06	1.205E+02
1981	5.020E+03	4.020E+06	2.701E+02	1.341E+03	2.010E+06	1.350E+02
1982	5.539E+03	4.436E+06	2.980E+02	1.480E+03	2.218E+06	1.490E+02
1983	6.048E+03	4.843E+06	3.254E+02	1.616E+03	2.422E+06	1.627E+02
1984	6.527E+03	5.227E+06	3.512E+02	1.744E+03	2.613E+06	1.756E+02
1985	6.988E+03	5.596E+06	3.760E+02	1.867E+03	2.798E+06	1.880E+02
1986	7.430E+03	5.950E+06	3.998E+02	1.985E+03	2.975E+06	1.999E+02
1987	7.904E+03	6.329E+06	4.253E+02	2.111E+03	3.165E+06	2.126E+02
1988	8.281E+03	6.631E+06	4.456E+02	2.212E+03	3.316E+06	2.228E+02
1989	8.643E+03	6.921E+06	4.650E+02	2.309E+03	3.461E+06	2.325E+02
1990	9.090E+03	7.279E+06	4.890E+02	2.428E+03	3.639E+06	2.445E+02
1991	9.420E+03	7.543E+06	5.068E+02	2.516E+03	3.772E+06	2.534E+02
1992	9.738E+03	7.797E+06	5.239E+02	2.601E+03	3.899E+06	2.620E+02
1993	9.945E+03	7.963E+06	5.350E+02	2.656E+03	3.982E+06	2.675E+02
1994	1.063E+04	8.515E+06	5.721E+02	2.840E+03	4.258E+06	2.861E+02
1995	1.149E+04	9.203E+06	6.183E+02	3.070E+03	4.601E+06	3.092E+02
1996	1.232E+04	9.864E+06	6.627E+02	3.290E+03	4.932E+06	3.314E+02
1997	1.301E+04	1.042E+07	7.001E+02	3.476E+03	5.210E+06	3.501E+02
1998	1.358E+04	1.088E+07	7.307E+02	3.628E+03	5.438E+06	3.654E+02
1999	1.413E+04	1.131E+07	7.602E+02	3.774E+03	5.657E+06	3.801E+02
2000	1.593E+04	1.276E+07	8.571E+02	4.255E+03	6.378E+06	4.285E+02
2001	1.815E+04	1.453E+07	9.766E+02	4.848E+03	7.267E+06	4.883E+02
2002	2.058E+04	1.648E+07	1.107E+03	5.497E+03	8.239E+06	5.536E+02
2003	2.360E+04	1.890E+07	1.270E+03	6.304E+03	9.449E+06	6.349E+02
2004	2.680E+04	2.146E+07	1.442E+03	7.157E+03	1.073E+07	7.208E+02
2005	3.467E+04	2.777E+07	1.866E+03	9.262E+03	1.388E+07	9.328E+02
2006	4.224E+04	3.383E+07	2.273E+03	1.128E+04	1.691E+07	1.136E+03
2007	4.942E+04	3.957E+07	2.659E+03	1.320E+04	1.979E+07	1.329E+03
2008	5.641E+04	4.517E+07	3.035E+03	1.507E+04	2.259E+07	1.518E+03
2009	6.313E+04	5.055E+07	3.397E+03	1.686E+04	2.528E+07	1.698E+03
2010	6.958E+04	5.572E+07	3.744E+03	1.859E+04	2.786E+07	1.872E+03
2011	7.598E+04	6.084E+07	4.088E+03	2.030E+04	3.042E+07	2.044E+03
2012	8.183E+04	6.553E+07	4.403E+03	2.186E+04	3.276E+07	2.201E+03
2013	8.746E+04	7.003E+07	4.705E+03	2.336E+04	3.502E+07	2.353E+03
2014	9.286E+04	7.436E+07	4.996E+03	2.480E+04	3.718E+07	2.498E+03
2015	9.805E+04	7.851E+07	5.275E+03	2.619E+04	3.926E+07	2.638E+03
2016	1.030E+05	8.251E+07	5.544E+03	2.752E+04	4.125E+07	2.772E+03
2017	9.954E+04	7.970E+07	5.355E+03	2.659E+04	3.985E+07	2.678E+03
2018	9.563E+04	7.658E+07	5.145E+03	2.554E+04	3.829E+07	2.573E+03
2019	9.188E+04	7.358E+07	4.944E+03	2.454E+04	3.679E+07	2.472E+03
2020	8.828E+04	7.069E+07	4.750E+03	2.358E+04	3.535E+07	2.375E+03
2021	8.482E+04	6.792E+07	4.564E+03	2.266E+04	3.396E+07	2.282E+03

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2022	8.149E+04	6.526E+07	4.385E+03	2.177E+04	3.263E+07	2.192E+03
2023	7.830E+04	6.270E+07	4.213E+03	2.091E+04	3.135E+07	2.106E+03
2024	7.523E+04	6.024E+07	4.047E+03	2.009E+04	3.012E+07	2.024E+03
2025	7.228E+04	5.788E+07	3.889E+03	1.931E+04	2.894E+07	1.944E+03
2026	6.944E+04	5.561E+07	3.736E+03	1.855E+04	2.780E+07	1.868E+03
2027	6.672E+04	5.343E+07	3.590E+03	1.782E+04	2.671E+07	1.795E+03
2028	6.411E+04	5.133E+07	3.449E+03	1.712E+04	2.567E+07	1.725E+03
2029	6.159E+04	4.932E+07	3.314E+03	1.645E+04	2.466E+07	1.657E+03
2030	5.918E+04	4.739E+07	3.184E+03	1.581E+04	2.369E+07	1.592E+03
2031	5.686E+04	4.553E+07	3.059E+03	1.519E+04	2.276E+07	1.530E+03
2032	5.463E+04	4.374E+07	2.939E+03	1.459E+04	2.187E+07	1.470E+03
2033	5.249E+04	4.203E+07	2.824E+03	1.402E+04	2.101E+07	1.412E+03
2034	5.043E+04	4.038E+07	2.713E+03	1.347E+04	2.019E+07	1.357E+03
2035	4.845E+04	3.880E+07	2.607E+03	1.294E+04	1.940E+07	1.303E+03
2036	4.655E+04	3.728E+07	2.505E+03	1.243E+04	1.864E+07	1.252E+03
2037	4.473E+04	3.581E+07	2.406E+03	1.195E+04	1.791E+07	1.203E+03
2038	4.297E+04	3.441E+07	2.312E+03	1.148E+04	1.720E+07	1.156E+03
2039	4.129E+04	3.306E+07	2.221E+03	1.103E+04	1.653E+07	1.111E+03
2040	3.967E+04	3.176E+07	2.134E+03	1.060E+04	1.588E+07	1.067E+03
2041	3.811E+04	3.052E+07	2.051E+03	1.018E+04	1.526E+07	1.025E+03
2042	3.662E+04	2.932E+07	1.970E+03	9.781E+03	1.466E+07	9.851E+02
2043	3.518E+04	2.817E+07	1.893E+03	9.397E+03	1.409E+07	9.464E+02
2044	3.380E+04	2.707E+07	1.819E+03	9.029E+03	1.353E+07	9.093E+02
2045	3.248E+04	2.601E+07	1.747E+03	8.675E+03	1.300E+07	8.737E+02
2046	3.120E+04	2.499E+07	1.679E+03	8.335E+03	1.249E+07	8.394E+02
2047	2.998E+04	2.401E+07	1.613E+03	8.008E+03	1.200E+07	8.065E+02
2048	2.880E+04	2.307E+07	1.550E+03	7.694E+03	1.153E+07	7.749E+02
2049	2.768E+04	2.216E+07	1.489E+03	7.392E+03	1.108E+07	7.445E+02
2050	2.659E+04	2.129E+07	1.431E+03	7.102E+03	1.065E+07	7.153E+02
2051	2.555E+04	2.046E+07	1.375E+03	6.824E+03	1.023E+07	6.873E+02
2052	2.455E+04	1.965E+07	1.321E+03	6.556E+03	9.827E+06	6.603E+02
2053	2.358E+04	1.888E+07	1.269E+03	6.299E+03	9.442E+06	6.344E+02
2054	2.266E+04	1.814E+07	1.219E+03	6.052E+03	9.072E+06	6.095E+02
2055	2.177E+04	1.743E+07	1.171E+03	5.815E+03	8.716E+06	5.856E+02
2056	2.092E+04	1.675E+07	1.125E+03	5.587E+03	8.374E+06	5.627E+02
2057	2.010E+04	1.609E+07	1.081E+03	5.368E+03	8.046E+06	5.406E+02
2058	1.931E+04	1.546E+07	1.039E+03	5.157E+03	7.731E+06	5.194E+02
2059	1.855E+04	1.485E+07	9.981E+02	4.955E+03	7.427E+06	4.990E+02
2060	1.782E+04	1.427E+07	9.590E+02	4.761E+03	7.136E+06	4.795E+02
2061	1.712E+04	1.371E+07	9.214E+02	4.574E+03	6.856E+06	4.607E+02
2062	1.645E+04	1.318E+07	8.852E+02	4.395E+03	6.588E+06	4.426E+02
2063	1.581E+04	1.266E+07	8.505E+02	4.223E+03	6.329E+06	4.253E+02
2064	1.519E+04	1.216E+07	8.172E+02	4.057E+03	6.081E+06	4.086E+02
2065	1.459E+04	1.169E+07	7.851E+02	3.898E+03	5.843E+06	3.926E+02
2066	1.402E+04	1.123E+07	7.543E+02	3.745E+03	5.614E+06	3.772E+02
2067	1.347E+04	1.079E+07	7.248E+02	3.598E+03	5.393E+06	3.624E+02
2068	1.294E+04	1.036E+07	6.964E+02	3.457E+03	5.182E+06	3.482E+02
2069	1.244E+04	9.958E+06	6.690E+02	3.322E+03	4.979E+06	3.345E+02
2070	1.195E+04	9.567E+06	6.428E+02	3.191E+03	4.784E+06	3.214E+02
2071	1.148E+04	9.192E+06	6.176E+02	3.066E+03	4.596E+06	3.088E+02
2072	1.103E+04	8.832E+06	5.934E+02	2.946E+03	4.416E+06	2.967E+02

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2073	1.060E+04	8.485E+06	5.701E+02	2.830E+03	4.243E+06	2.851E+02
2074	1.018E+04	8.153E+06	5.478E+02	2.719E+03	4.076E+06	2.739E+02
2075	9.782E+03	7.833E+06	5.263E+02	2.613E+03	3.916E+06	2.631E+02
2076	9.398E+03	7.526E+06	5.057E+02	2.510E+03	3.763E+06	2.528E+02
2077	9.030E+03	7.231E+06	4.858E+02	2.412E+03	3.615E+06	2.429E+02
2078	8.676E+03	6.947E+06	4.668E+02	2.317E+03	3.474E+06	2.334E+02
2079	8.336E+03	6.675E+06	4.485E+02	2.227E+03	3.337E+06	2.242E+02
2080	8.009E+03	6.413E+06	4.309E+02	2.139E+03	3.207E+06	2.154E+02
2081	7.695E+03	6.162E+06	4.140E+02	2.055E+03	3.081E+06	2.070E+02
2082	7.393E+03	5.920E+06	3.978E+02	1.975E+03	2.960E+06	1.989E+02
2083	7.103E+03	5.688E+06	3.822E+02	1.897E+03	2.844E+06	1.911E+02
2084	6.825E+03	5.465E+06	3.672E+02	1.823E+03	2.732E+06	1.836E+02
2085	6.557E+03	5.251E+06	3.528E+02	1.751E+03	2.625E+06	1.764E+02
2086	6.300E+03	5.045E+06	3.390E+02	1.683E+03	2.522E+06	1.695E+02
2087	6.053E+03	4.847E+06	3.257E+02	1.617E+03	2.423E+06	1.628E+02
2088	5.816E+03	4.657E+06	3.129E+02	1.553E+03	2.328E+06	1.564E+02
2089	5.588E+03	4.474E+06	3.006E+02	1.492E+03	2.237E+06	1.503E+02
2090	5.368E+03	4.299E+06	2.888E+02	1.434E+03	2.149E+06	1.444E+02
2091	5.158E+03	4.130E+06	2.775E+02	1.378E+03	2.065E+06	1.388E+02
2092	4.956E+03	3.968E+06	2.666E+02	1.324E+03	1.984E+06	1.333E+02
2093	4.761E+03	3.813E+06	2.562E+02	1.272E+03	1.906E+06	1.281E+02
2094	4.575E+03	3.663E+06	2.461E+02	1.222E+03	1.832E+06	1.231E+02
2095	4.395E+03	3.520E+06	2.365E+02	1.174E+03	1.760E+06	1.182E+02
2096	4.223E+03	3.382E+06	2.272E+02	1.128E+03	1.691E+06	1.136E+02
2097	4.057E+03	3.249E+06	2.183E+02	1.084E+03	1.624E+06	1.091E+02
2098	3.898E+03	3.122E+06	2.097E+02	1.041E+03	1.561E+06	1.049E+02
2099	3.745E+03	2.999E+06	2.015E+02	1.000E+03	1.500E+06	1.008E+02
2100	3.599E+03	2.882E+06	1.936E+02	9.612E+02	1.441E+06	9.681E+01
2101	3.457E+03	2.769E+06	1.860E+02	9.235E+02	1.384E+06	9.301E+01
2102	3.322E+03	2.660E+06	1.787E+02	8.873E+02	1.330E+06	8.936E+01
2103	3.192E+03	2.556E+06	1.717E+02	8.525E+02	1.278E+06	8.586E+01
2104	3.066E+03	2.456E+06	1.650E+02	8.191E+02	1.228E+06	8.249E+01
2105	2.946E+03	2.359E+06	1.585E+02	7.870E+02	1.180E+06	7.926E+01
2106	2.831E+03	2.267E+06	1.523E+02	7.561E+02	1.133E+06	7.615E+01
2107	2.720E+03	2.178E+06	1.463E+02	7.265E+02	1.089E+06	7.316E+01
2108	2.613E+03	2.092E+06	1.406E+02	6.980E+02	1.046E+06	7.030E+01
2109	2.511E+03	2.010E+06	1.351E+02	6.706E+02	1.005E+06	6.754E+01
2110	2.412E+03	1.932E+06	1.298E+02	6.443E+02	9.658E+05	6.489E+01
2111	2.318E+03	1.856E+06	1.247E+02	6.191E+02	9.279E+05	6.235E+01
2112	2.227E+03	1.783E+06	1.198E+02	5.948E+02	8.915E+05	5.990E+01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1972	0	0	0	0	0	0
1973	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1974	5.272E+02	2.880E+05	1.935E+01	1.228E+00	3.427E+02	2.303E-02
1975	1.037E+03	5.663E+05	3.805E+01	2.415E+00	6.738E+02	4.528E-02
1976	1.521E+03	8.309E+05	5.583E+01	3.544E+00	9.887E+02	6.643E-02
1977	1.986E+03	1.085E+06	7.291E+01	4.628E+00	1.291E+03	8.676E-02
1978	2.433E+03	1.329E+06	8.932E+01	5.670E+00	1.582E+03	1.063E-01
1979	2.870E+03	1.568E+06	1.054E+02	6.688E+00	1.866E+03	1.254E-01
1980	3.283E+03	1.793E+06	1.205E+02	7.649E+00	2.134E+03	1.434E-01
1981	3.679E+03	2.010E+06	1.350E+02	8.573E+00	2.392E+03	1.607E-01
1982	4.060E+03	2.218E+06	1.490E+02	9.460E+00	2.639E+03	1.773E-01
1983	4.433E+03	2.422E+06	1.627E+02	1.033E+01	2.882E+03	1.936E-01
1984	4.784E+03	2.613E+06	1.756E+02	1.115E+01	3.110E+03	2.090E-01
1985	5.121E+03	2.798E+06	1.880E+02	1.193E+01	3.329E+03	2.237E-01
1986	5.446E+03	2.975E+06	1.999E+02	1.269E+01	3.540E+03	2.379E-01
1987	5.793E+03	3.165E+06	2.126E+02	1.350E+01	3.766E+03	2.530E-01
1988	6.069E+03	3.316E+06	2.228E+02	1.414E+01	3.946E+03	2.651E-01
1989	6.335E+03	3.461E+06	2.325E+02	1.476E+01	4.118E+03	2.767E-01
1990	6.662E+03	3.639E+06	2.445E+02	1.552E+01	4.331E+03	2.910E-01
1991	6.904E+03	3.772E+06	2.534E+02	1.609E+01	4.488E+03	3.016E-01
1992	7.137E+03	3.899E+06	2.620E+02	1.663E+01	4.639E+03	3.117E-01
1993	7.288E+03	3.982E+06	2.675E+02	1.698E+01	4.738E+03	3.184E-01
1994	7.794E+03	4.258E+06	2.861E+02	1.816E+01	5.067E+03	3.404E-01
1995	8.423E+03	4.601E+06	3.092E+02	1.963E+01	5.476E+03	3.679E-01
1996	9.028E+03	4.932E+06	3.314E+02	2.104E+01	5.869E+03	3.943E-01
1997	9.537E+03	5.210E+06	3.501E+02	2.222E+01	6.200E+03	4.166E-01
1998	9.954E+03	5.438E+06	3.654E+02	2.319E+01	6.471E+03	4.348E-01
1999	1.035E+04	5.657E+06	3.801E+02	2.413E+01	6.732E+03	4.523E-01
2000	1.167E+04	6.378E+06	4.285E+02	2.720E+01	7.590E+03	5.099E-01
2001	1.330E+04	7.267E+06	4.883E+02	3.100E+01	8.648E+03	5.811E-01
2002	1.508E+04	8.239E+06	5.536E+02	3.515E+01	9.805E+03	6.588E-01
2003	1.730E+04	9.449E+06	6.349E+02	4.030E+01	1.124E+04	7.555E-01
2004	1.964E+04	1.073E+07	7.208E+02	4.576E+01	1.277E+04	8.578E-01
2005	2.541E+04	1.388E+07	9.328E+02	5.922E+01	1.652E+04	1.110E+00
2006	3.096E+04	1.691E+07	1.136E+03	7.215E+01	2.013E+04	1.352E+00
2007	3.622E+04	1.979E+07	1.329E+03	8.440E+01	2.355E+04	1.582E+00
2008	4.134E+04	2.259E+07	1.518E+03	9.634E+01	2.688E+04	1.806E+00
2009	4.627E+04	2.528E+07	1.698E+03	1.078E+02	3.008E+04	2.021E+00
2010	5.100E+04	2.786E+07	1.872E+03	1.188E+02	3.315E+04	2.228E+00
2011	5.569E+04	3.042E+07	2.044E+03	1.298E+02	3.620E+04	2.432E+00
2012	5.998E+04	3.276E+07	2.201E+03	1.398E+02	3.899E+04	2.620E+00
2013	6.410E+04	3.502E+07	2.353E+03	1.494E+02	4.167E+04	2.800E+00
2014	6.806E+04	3.718E+07	2.498E+03	1.586E+02	4.424E+04	2.973E+00
2015	7.186E+04	3.926E+07	2.638E+03	1.675E+02	4.672E+04	3.139E+00
2016	7.552E+04	4.125E+07	2.772E+03	1.760E+02	4.909E+04	3.298E+00
2017	7.295E+04	3.985E+07	2.678E+03	1.700E+02	4.742E+04	3.186E+00
2018	7.009E+04	3.829E+07	2.573E+03	1.633E+02	4.556E+04	3.061E+00
2019	6.734E+04	3.679E+07	2.472E+03	1.569E+02	4.378E+04	2.941E+00
2020	6.470E+04	3.535E+07	2.375E+03	1.508E+02	4.206E+04	2.826E+00
2021	6.216E+04	3.396E+07	2.282E+03	1.449E+02	4.041E+04	2.715E+00

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2022	5.973E+04	3.263E+07	2.192E+03	1.392E+02	3.883E+04	2.609E+00
2023	5.738E+04	3.135E+07	2.106E+03	1.337E+02	3.731E+04	2.507E+00
2024	5.513E+04	3.012E+07	2.024E+03	1.285E+02	3.584E+04	2.408E+00
2025	5.297E+04	2.894E+07	1.944E+03	1.234E+02	3.444E+04	2.314E+00
2026	5.090E+04	2.780E+07	1.868E+03	1.186E+02	3.309E+04	2.223E+00
2027	4.890E+04	2.671E+07	1.795E+03	1.139E+02	3.179E+04	2.136E+00
2028	4.698E+04	2.567E+07	1.725E+03	1.095E+02	3.054E+04	2.052E+00
2029	4.514E+04	2.466E+07	1.657E+03	1.052E+02	2.935E+04	1.972E+00
2030	4.337E+04	2.369E+07	1.592E+03	1.011E+02	2.819E+04	1.894E+00
2031	4.167E+04	2.276E+07	1.530E+03	9.710E+01	2.709E+04	1.820E+00
2032	4.004E+04	2.187E+07	1.470E+03	9.329E+01	2.603E+04	1.749E+00
2033	3.847E+04	2.101E+07	1.412E+03	8.964E+01	2.501E+04	1.680E+00
2034	3.696E+04	2.019E+07	1.357E+03	8.612E+01	2.403E+04	1.614E+00
2035	3.551E+04	1.940E+07	1.303E+03	8.274E+01	2.308E+04	1.551E+00
2036	3.412E+04	1.864E+07	1.252E+03	7.950E+01	2.218E+04	1.490E+00
2037	3.278E+04	1.791E+07	1.203E+03	7.638E+01	2.131E+04	1.432E+00
2038	3.149E+04	1.720E+07	1.156E+03	7.339E+01	2.047E+04	1.376E+00
2039	3.026E+04	1.653E+07	1.111E+03	7.051E+01	1.967E+04	1.322E+00
2040	2.907E+04	1.588E+07	1.067E+03	6.774E+01	1.890E+04	1.270E+00
2041	2.793E+04	1.526E+07	1.025E+03	6.509E+01	1.816E+04	1.220E+00
2042	2.684E+04	1.466E+07	9.851E+02	6.254E+01	1.745E+04	1.172E+00
2043	2.578E+04	1.409E+07	9.464E+02	6.008E+01	1.676E+04	1.126E+00
2044	2.477E+04	1.353E+07	9.093E+02	5.773E+01	1.611E+04	1.082E+00
2045	2.380E+04	1.300E+07	8.737E+02	5.546E+01	1.547E+04	1.040E+00
2046	2.287E+04	1.249E+07	8.394E+02	5.329E+01	1.487E+04	9.989E-01
2047	2.197E+04	1.200E+07	8.065E+02	5.120E+01	1.428E+04	9.597E-01
2048	2.111E+04	1.153E+07	7.749E+02	4.919E+01	1.372E+04	9.221E-01
2049	2.028E+04	1.108E+07	7.445E+02	4.726E+01	1.319E+04	8.859E-01
2050	1.949E+04	1.065E+07	7.153E+02	4.541E+01	1.267E+04	8.512E-01
2051	1.872E+04	1.023E+07	6.873E+02	4.363E+01	1.217E+04	8.178E-01
2052	1.799E+04	9.827E+06	6.603E+02	4.192E+01	1.169E+04	7.858E-01
2053	1.728E+04	9.442E+06	6.344E+02	4.028E+01	1.124E+04	7.550E-01
2054	1.661E+04	9.072E+06	6.095E+02	3.870E+01	1.080E+04	7.254E-01
2055	1.595E+04	8.716E+06	5.856E+02	3.718E+01	1.037E+04	6.969E-01
2056	1.533E+04	8.374E+06	5.627E+02	3.572E+01	9.966E+03	6.696E-01
2057	1.473E+04	8.046E+06	5.406E+02	3.432E+01	9.575E+03	6.433E-01
2058	1.415E+04	7.731E+06	5.194E+02	3.297E+01	9.199E+03	6.181E-01
2059	1.360E+04	7.427E+06	4.990E+02	3.168E+01	8.839E+03	5.939E-01
2060	1.306E+04	7.136E+06	4.795E+02	3.044E+01	8.492E+03	5.706E-01
2061	1.255E+04	6.856E+06	4.607E+02	2.925E+01	8.159E+03	5.482E-01
2062	1.206E+04	6.588E+06	4.426E+02	2.810E+01	7.839E+03	5.267E-01
2063	1.159E+04	6.329E+06	4.253E+02	2.700E+01	7.532E+03	5.061E-01
2064	1.113E+04	6.081E+06	4.086E+02	2.594E+01	7.236E+03	4.862E-01
2065	1.069E+04	5.843E+06	3.926E+02	2.492E+01	6.953E+03	4.672E-01
2066	1.028E+04	5.614E+06	3.772E+02	2.394E+01	6.680E+03	4.488E-01
2067	9.873E+03	5.393E+06	3.624E+02	2.301E+01	6.418E+03	4.312E-01
2068	9.486E+03	5.182E+06	3.482E+02	2.210E+01	6.167E+03	4.143E-01
2069	9.114E+03	4.979E+06	3.345E+02	2.124E+01	5.925E+03	3.981E-01
2070	8.756E+03	4.784E+06	3.214E+02	2.040E+01	5.692E+03	3.825E-01
2071	8.413E+03	4.596E+06	3.088E+02	1.960E+01	5.469E+03	3.675E-01
2072	8.083E+03	4.416E+06	2.967E+02	1.884E+01	5.255E+03	3.531E-01

Results (Continued)

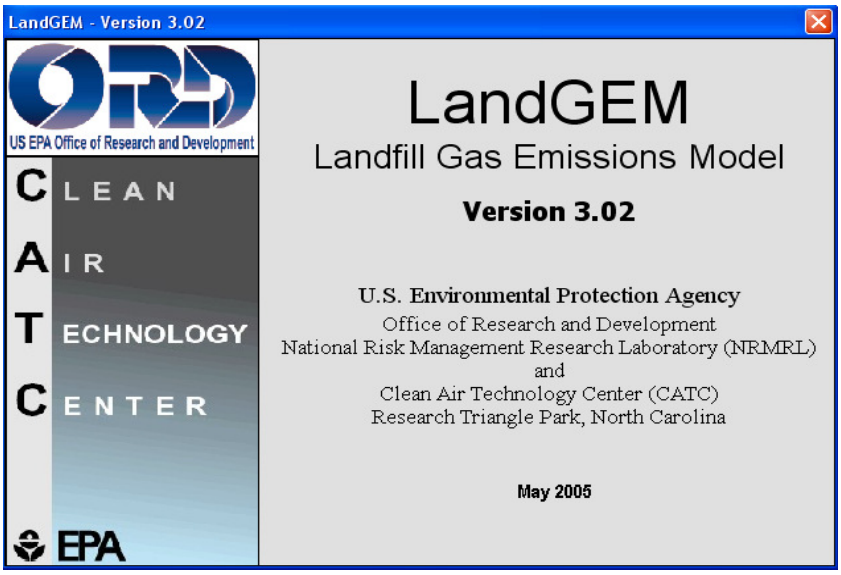
Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2073	7.766E+03	4.243E+06	2.851E+02	1.810E+01	5.049E+03	3.392E-01
2074	7.462E+03	4.076E+06	2.739E+02	1.739E+01	4.851E+03	3.259E-01
2075	7.169E+03	3.916E+06	2.631E+02	1.671E+01	4.661E+03	3.131E-01
2076	6.888E+03	3.763E+06	2.528E+02	1.605E+01	4.478E+03	3.009E-01
2077	6.618E+03	3.615E+06	2.429E+02	1.542E+01	4.302E+03	2.891E-01
2078	6.358E+03	3.474E+06	2.334E+02	1.482E+01	4.134E+03	2.777E-01
2079	6.109E+03	3.337E+06	2.242E+02	1.424E+01	3.971E+03	2.668E-01
2080	5.870E+03	3.207E+06	2.154E+02	1.368E+01	3.816E+03	2.564E-01
2081	5.639E+03	3.081E+06	2.070E+02	1.314E+01	3.666E+03	2.463E-01
2082	5.418E+03	2.960E+06	1.989E+02	1.263E+01	3.522E+03	2.367E-01
2083	5.206E+03	2.844E+06	1.911E+02	1.213E+01	3.384E+03	2.274E-01
2084	5.002E+03	2.732E+06	1.836E+02	1.166E+01	3.252E+03	2.185E-01
2085	4.806E+03	2.625E+06	1.764E+02	1.120E+01	3.124E+03	2.099E-01
2086	4.617E+03	2.522E+06	1.695E+02	1.076E+01	3.002E+03	2.017E-01
2087	4.436E+03	2.423E+06	1.628E+02	1.034E+01	2.884E+03	1.938E-01
2088	4.262E+03	2.328E+06	1.564E+02	9.932E+00	2.771E+03	1.862E-01
2089	4.095E+03	2.237E+06	1.503E+02	9.542E+00	2.662E+03	1.789E-01
2090	3.934E+03	2.149E+06	1.444E+02	9.168E+00	2.558E+03	1.719E-01
2091	3.780E+03	2.065E+06	1.388E+02	8.809E+00	2.457E+03	1.651E-01
2092	3.632E+03	1.984E+06	1.333E+02	8.463E+00	2.361E+03	1.586E-01
2093	3.490E+03	1.906E+06	1.281E+02	8.132E+00	2.269E+03	1.524E-01
2094	3.353E+03	1.832E+06	1.231E+02	7.813E+00	2.180E+03	1.464E-01
2095	3.221E+03	1.760E+06	1.182E+02	7.506E+00	2.094E+03	1.407E-01
2096	3.095E+03	1.691E+06	1.136E+02	7.212E+00	2.012E+03	1.352E-01
2097	2.974E+03	1.624E+06	1.091E+02	6.929E+00	1.933E+03	1.299E-01
2098	2.857E+03	1.561E+06	1.049E+02	6.658E+00	1.857E+03	1.248E-01
2099	2.745E+03	1.500E+06	1.008E+02	6.396E+00	1.784E+03	1.199E-01
2100	2.637E+03	1.441E+06	9.681E+01	6.146E+00	1.715E+03	1.152E-01
2101	2.534E+03	1.384E+06	9.301E+01	5.905E+00	1.647E+03	1.107E-01
2102	2.435E+03	1.330E+06	8.936E+01	5.673E+00	1.583E+03	1.063E-01
2103	2.339E+03	1.278E+06	8.586E+01	5.451E+00	1.521E+03	1.022E-01
2104	2.247E+03	1.228E+06	8.249E+01	5.237E+00	1.461E+03	9.817E-02
2105	2.159E+03	1.180E+06	7.926E+01	5.032E+00	1.404E+03	9.432E-02
2106	2.075E+03	1.133E+06	7.615E+01	4.834E+00	1.349E+03	9.062E-02
2107	1.993E+03	1.089E+06	7.316E+01	4.645E+00	1.296E+03	8.707E-02
2108	1.915E+03	1.046E+06	7.030E+01	4.463E+00	1.245E+03	8.365E-02
2109	1.840E+03	1.005E+06	6.754E+01	4.288E+00	1.196E+03	8.037E-02
2110	1.768E+03	9.658E+05	6.489E+01	4.120E+00	1.149E+03	7.722E-02
2111	1.699E+03	9.279E+05	6.235E+01	3.958E+00	1.104E+03	7.419E-02
2112	1.632E+03	8.915E+05	5.990E+01	3.803E+00	1.061E+03	7.128E-02

INVENTORY

Landfill Name or Identifier: Sycamore Ridge Landfill - Expanded Capacity

Enter year of emissions inventory: 2022

Gas / Pollutant	Emission Rate				
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(ft^3/year)*	*(short tons/year)*
Total landfill gas	1.051E+05	8.419E+07	5.657E+03	2.973E+09	1.157E+05
Methane	2.808E+04	4.210E+07	2.828E+03	1.487E+09	3.089E+04
Carbon dioxide	7.706E+04	4.210E+07	2.828E+03	1.487E+09	8.476E+04
NMOC	1.796E+02	5.009E+04	3.366E+00	1.769E+06	1.975E+02
1,1,1-Trichloroethane (methyl chloroform) - HAP	2.242E-01	4.041E+01	2.715E-03	1.427E+03	2.467E-01
1,1,2,2-Tetrachloroethane - HAP/VOC	6.466E-01	9.261E+01	6.223E-03	3.271E+03	7.112E-01
1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	8.318E-01	2.021E+02	1.358E-02	7.136E+03	9.150E-01
1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	6.789E-02	1.684E+01	1.131E-03	5.947E+02	7.468E-02
1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	1.421E-01	3.452E+01	2.319E-03	1.219E+03	1.563E-01
1,2-Dichloropropane (propylene dichloride) - HAP/VOC	7.122E-02	1.515E+01	1.018E-03	5.352E+02	7.834E-02
2-Propanol (isopropyl alcohol) - VOC	1.052E+01	4.210E+03	2.828E-01	1.487E+05	1.158E+01
Acetone	1.424E+00	5.894E+02	3.960E-02	2.081E+04	1.566E+00
Acrylonitrile - HAP/VOC	1.171E+00	5.304E+02	3.564E-02	1.873E+04	1.288E+00
Benzene - No or Unknown Co-disposal - HAP/VOC	5.197E-01	1.600E+02	1.075E-02	5.649E+03	5.717E-01
Benzene - Co-disposal - HAP/VOC	3.009E+00	9.261E+02	6.223E-02	3.271E+04	3.310E+00
Bromodichloromethane - VOC	1.778E+00	2.610E+02	1.754E-02	9.217E+03	1.956E+00
Butane - VOC	1.018E+00	4.210E+02	2.828E-02	1.487E+04	1.119E+00
Carbon disulfide - HAP/VOC	1.546E-01	4.883E+01	3.281E-03	1.725E+03	1.701E-01
Carbon monoxide	1.373E+01	1.179E+04	7.920E-01	4.163E+05	1.511E+01
Carbon tetrachloride - HAP/VOC	2.155E-03	3.368E-01	2.263E-05	1.189E+01	2.370E-03
Carbonyl sulfide - HAP/VOC	1.031E-01	4.125E+01	2.772E-03	1.457E+03	1.134E-01
Chlorobenzene - HAP/VOC	9.854E-02	2.105E+01	1.414E-03	7.433E+02	1.084E-01
Chlorodifluoromethane	3.936E-01	1.095E+02	7.354E-03	3.865E+03	4.330E-01
Chloroethane (ethyl chloride) - HAP/VOC	2.937E-01	1.095E+02	7.354E-03	3.865E+03	3.231E-01
Chloroform - HAP/VOC	1.254E-02	2.526E+00	1.697E-04	8.920E+01	1.380E-02
Chloromethane - VOC	2.122E-01	1.010E+02	6.788E-03	3.568E+03	2.334E-01
Dichlorobenzene - (HAP for para isomer/VOC)	1.081E-01	1.768E+01	1.188E-03	6.244E+02	1.189E-01
Dichlorodifluoromethane	6.774E+00	1.347E+03	9.051E-02	4.757E+04	7.452E+00
Dichlorofluoromethane - VOC	9.371E-01	2.189E+02	1.471E-02	7.731E+03	1.031E+00
Dichloromethane (methylene chloride) - HAP	4.164E+00	1.179E+03	7.920E-02	4.163E+04	4.581E+00
Dimethyl sulfide (methyl sulfide) - VOC	1.697E+00	6.567E+02	4.412E-02	2.319E+04	1.867E+00
Ethane	9.372E+01	7.493E+04	5.035E+00	2.646E+06	1.031E+02
Ethanol - VOC	4.357E+00	2.273E+03	1.527E-01	8.028E+04	4.793E+00
Ethyl mercaptan (ethanethiol) - VOC	5.004E-01	1.936E+02	1.301E-02	6.839E+03	5.504E-01
Ethylbenzene - HAP/VOC	1.710E+00	3.873E+02	2.602E-02	1.368E+04	1.881E+00
Ethylene dibromide - HAP/VOC	6.579E-04	8.419E-02	5.657E-06	2.973E+00	7.237E-04
Fluorotrichloromethane - VOC	3.656E-01	6.399E+01	4.299E-03	2.260E+03	4.022E-01
Hexane - HAP/VOC	1.992E+00	5.557E+02	3.734E-02	1.962E+04	2.191E+00
Hydrogen sulfide	4.296E+00	3.031E+03	2.036E-01	1.070E+05	4.726E+00
Mercury (total) - HAP	2.037E-04	2.442E-02	1.641E-06	8.623E-01	2.241E-04
Methyl ethyl ketone - HAP/VOC	1.793E+00	5.978E+02	4.016E-02	2.111E+04	1.972E+00
Methyl isobutyl ketone - HAP/VOC	6.664E-01	1.600E+02	1.075E-02	5.649E+03	7.331E-01
Methyl mercaptan - VOC	4.212E-01	2.105E+02	1.414E-02	7.433E+03	4.633E-01
Pentane - VOC	8.338E-01	2.778E+02	1.867E-02	9.812E+03	9.171E-01
Perchloroethylene (tetrachloroethylene) - HAP	2.149E+00	3.115E+02	2.093E-02	1.100E+04	2.363E+00
Propane - VOC	1.698E+00	9.261E+02	6.223E-02	3.271E+04	1.868E+00
t-1,2-Dichloroethene - VOC	9.505E-01	2.357E+02	1.584E-02	8.325E+03	1.046E+00
Toluene - No or Unknown Co-disposal - HAP/VOC	1.258E+01	3.284E+03	2.206E-01	1.160E+05	1.384E+01
Toluene - Co-disposal - HAP/VOC	5.485E+01	1.431E+04	9.617E-01	5.055E+05	6.033E+01
Trichloroethylene (trichloroethene) - HAP/VOC	1.288E+00	2.357E+02	1.584E-02	8.325E+03	1.417E+00
Vinyl chloride - HAP/VOC	1.598E+00	6.146E+02	4.130E-02	2.170E+04	1.757E+00
Xylenes - HAP/VOC	4.461E+00	1.010E+03	6.788E-02	3.568E+04	4.907E+00



Summary Report

Landfill Name or Identifier: Sycamore Ridge Landfill - Expanded Capacity

Date: Thursday, June 13, 2013

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

Q_{CH_4} = annual methane generation in the year of the calculation ($m^3/year$)
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate ($year^{-1}$)
L_o = potential methane generation capacity (m^3/Mg)
M_i = mass of waste accepted in the i^{th} year (Mg)
t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	**1972**	
Landfill Closure Year (with 80-year limit)	**2023**	
Actual Closure Year (without limit)	***2023***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity	**17,230,000**	*megagrams*

MODEL PARAMETERS

Methane Generation Rate, k	**0.040**	*year^{-1}*
Potential Methane Generation Capacity, L_o	**100**	*m^3/Mg*
NMOC Concentration	**595**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	**Total landfill gas**
Gas / Pollutant #2:	**Methane**
Gas / Pollutant #3:	**Carbon dioxide**
Gas / Pollutant #4:	**NMOC**

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
1972	66,636	73,300	0	0
1973	66,636	73,300	66,636	73,300
1974	67,000	73,700	133,272	146,599
1975	66,364	73,000	200,272	220,299
1976	66,364	73,000	266,636	293,300
1977	66,364	73,000	333,000	366,300
1978	67,273	74,000	399,364	439,300
1979	66,364	73,000	466,637	513,301
1980	66,364	73,000	533,001	586,301
1981	66,364	73,000	599,365	659,302
1982	67,273	74,000	665,729	732,302
1983	66,364	73,000	733,002	806,302
1984	66,364	73,000	799,366	879,303
1985	66,364	73,000	865,730	952,303
1986	70,909	78,000	932,094	1,025,303
1987	63,636	70,000	1,003,003	1,103,303
1988	63,636	70,000	1,066,639	1,173,303
1989	72,727	80,000	1,130,275	1,243,303
1990	63,636	70,000	1,203,002	1,323,302
1991	63,636	70,000	1,266,638	1,393,302
1992	54,545	60,000	1,330,274	1,463,301
1993	100,000	110,000	1,384,819	1,523,301
1994	118,182	130,000	1,484,819	1,633,301
1995	118,182	130,000	1,603,001	1,763,301
1996	109,091	120,000	1,721,183	1,893,301
1997	100,000	110,000	1,830,274	2,013,301
1998	100,000	110,000	1,930,274	2,123,301
1999	218,182	240,000	2,030,274	2,233,301
2000	263,636	290,000	2,248,456	2,473,302
2001	290,909	320,000	2,512,092	2,763,301
2002	354,545	390,000	2,803,001	3,083,301
2003	761,262	837,388	3,157,546	3,473,301
2004	936,318	1,029,950	3,918,808	4,310,689
2005	1,035,973	1,139,570	4,855,126	5,340,639
2006	995,433	1,094,976	5,891,099	6,480,209
2007	983,135	1,081,449	6,886,532	7,575,185
2008	941,644	1,035,808	7,869,667	8,656,634
2009	779,123	857,035	8,811,311	9,692,442
2010	555,169	610,686	9,590,434	10,549,477
2011	521,642	573,806	10,145,603	11,160,163

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
2012	500,305	550,336	10,667,245	11,733,970
2013	659,576	725,534	11,167,550	12,284,305
2014	659,576	725,534	11,827,126	13,009,839
2015	659,576	725,534	12,486,702	13,735,372
2016	659,576	725,534	13,146,278	14,460,906
2017	659,576	725,534	13,805,854	15,186,439
2018	659,576	725,534	14,465,430	15,911,973
2019	659,576	725,534	15,125,006	16,637,507
2020	659,576	725,534	15,784,582	17,363,040
2021	659,576	725,534	16,444,158	18,088,574
2022	126,266	138,893	17,103,734	18,814,107
2023	0	0	17,230,000	18,953,000
2024	0	0	17,230,000	18,953,000
2025	0	0	17,230,000	18,953,000
2026	0	0	17,230,000	18,953,000
2027	0	0	17,230,000	18,953,000
2028	0	0	17,230,000	18,953,000
2029	0	0	17,230,000	18,953,000
2030	0	0	17,230,000	18,953,000
2031	0	0	17,230,000	18,953,000
2032	0	0	17,230,000	18,953,000
2033	0	0	17,230,000	18,953,000
2034	0	0	17,230,000	18,953,000
2035	0	0	17,230,000	18,953,000
2036	0	0	17,230,000	18,953,000
2037	0	0	17,230,000	18,953,000
2038	0	0	17,230,000	18,953,000
2039	0	0	17,230,000	18,953,000
2040	0	0	17,230,000	18,953,000
2041	0	0	17,230,000	18,953,000
2042	0	0	17,230,000	18,953,000
2043	0	0	17,230,000	18,953,000
2044	0	0	17,230,000	18,953,000
2045	0	0	17,230,000	18,953,000
2046	0	0	17,230,000	18,953,000
2047	0	0	17,230,000	18,953,000
2048	0	0	17,230,000	18,953,000
2049	0	0	17,230,000	18,953,000
2050	0	0	17,230,000	18,953,000
2051	0	0	17,230,000	18,953,000

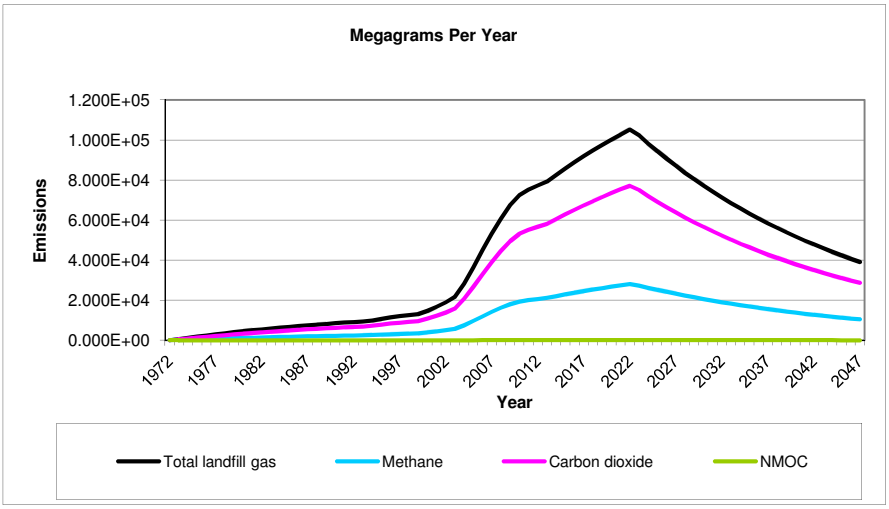
Pollutant Parameters

		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Gases	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
Pollutants	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

Pollutant Parameters (Continued)

		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Pollutants	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		

Graphs


Megagrams Per Year
Emissions
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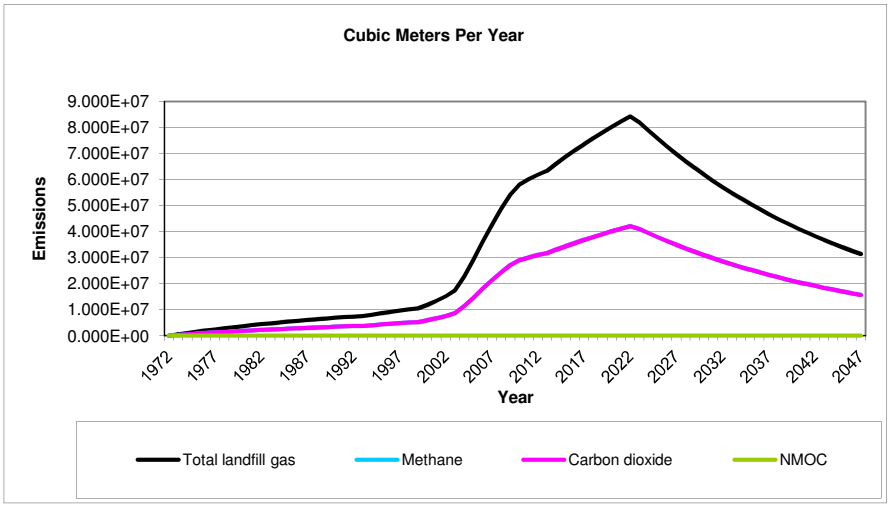
1.000E+05
8.000E+04
6.000E+04
4.000E+04
2.000E+04
0.000E+00
1972
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022
2027
2032
2037
2042
2047
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
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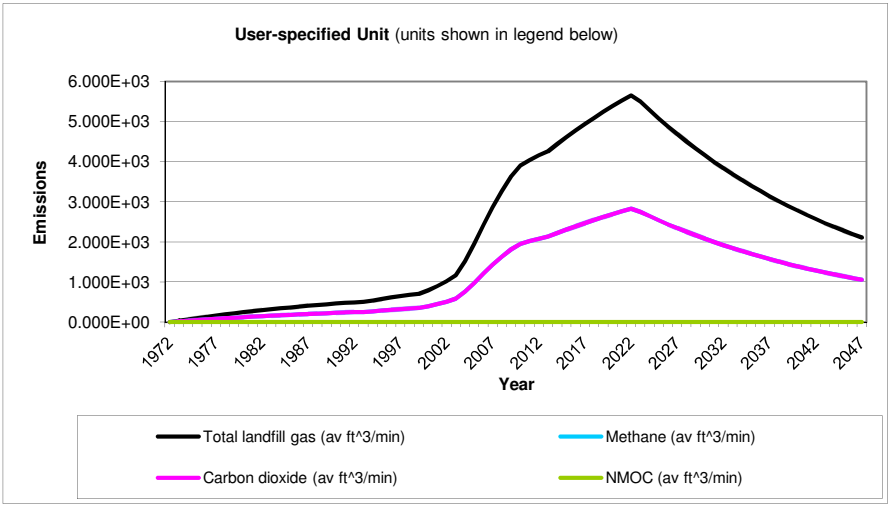
8.000E+07
7.000E+07
6.000E+07
5.000E+07
4.000E+07
3.000E+07
2.000E+07
1.000E+07
0.000E+00
1972
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022
2027
2032
2037
2042
2047
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
6.000E+03
5.000E+03
4.000E+03
3.000E+03
2.000E+03
1.000E+03
0.000E+00
1972
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022
2027
2032
2037
2042
2047
Year
Total landfill gas (av ft^3/min)
Methane (av ft^3/min)
Carbon dioxide (av ft^3/min)
NMOC (av ft^3/min)

Results

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1972	0	0	0	0	0	0
1973	6.539E+02	5.236E+05	3.518E+01	1.747E+02	2.618E+05	1.759E+01
1974	1.282E+03	1.027E+06	6.898E+01	3.425E+02	5.133E+05	3.449E+01
1975	1.889E+03	1.513E+06	1.017E+02	5.047E+02	7.565E+05	5.083E+01
1976	2.467E+03	1.975E+06	1.327E+02	6.588E+02	9.875E+05	6.635E+01
1977	3.021E+03	2.419E+06	1.625E+02	8.069E+02	1.210E+06	8.127E+01
1978	3.554E+03	2.846E+06	1.912E+02	9.493E+02	1.423E+06	9.560E+01
1979	4.075E+03	3.263E+06	2.192E+02	1.088E+03	1.631E+06	1.096E+02
1980	4.566E+03	3.656E+06	2.457E+02	1.220E+03	1.828E+06	1.228E+02
1981	5.038E+03	4.034E+06	2.711E+02	1.346E+03	2.017E+06	1.355E+02
1982	5.492E+03	4.398E+06	2.955E+02	1.467E+03	2.199E+06	1.477E+02
1983	5.937E+03	4.754E+06	3.194E+02	1.586E+03	2.377E+06	1.597E+02
1984	6.355E+03	5.089E+06	3.419E+02	1.698E+03	2.544E+06	1.710E+02
1985	6.757E+03	5.411E+06	3.636E+02	1.805E+03	2.705E+06	1.818E+02
1986	7.144E+03	5.720E+06	3.843E+02	1.908E+03	2.860E+06	1.922E+02
1987	7.559E+03	6.053E+06	4.067E+02	2.019E+03	3.027E+06	2.034E+02
1988	7.887E+03	6.316E+06	4.244E+02	2.107E+03	3.158E+06	2.122E+02
1989	8.202E+03	6.568E+06	4.413E+02	2.191E+03	3.284E+06	2.207E+02
1990	8.595E+03	6.882E+06	4.624E+02	2.296E+03	3.441E+06	2.312E+02
1991	8.882E+03	7.112E+06	4.779E+02	2.372E+03	3.556E+06	2.389E+02
1992	9.158E+03	7.333E+06	4.927E+02	2.446E+03	3.667E+06	2.464E+02
1993	9.334E+03	7.475E+06	5.022E+02	2.493E+03	3.737E+06	2.511E+02
1994	9.950E+03	7.967E+06	5.353E+02	2.658E+03	3.984E+06	2.677E+02
1995	1.072E+04	8.583E+06	5.767E+02	2.863E+03	4.292E+06	2.884E+02
1996	1.146E+04	9.176E+06	6.165E+02	3.061E+03	4.588E+06	3.083E+02
1997	1.208E+04	9.673E+06	6.499E+02	3.227E+03	4.836E+06	3.250E+02
1998	1.259E+04	1.008E+07	6.772E+02	3.362E+03	5.040E+06	3.386E+02
1999	1.308E+04	1.047E+07	7.035E+02	3.493E+03	5.235E+06	3.517E+02
2000	1.470E+04	1.177E+07	7.911E+02	3.927E+03	5.887E+06	3.955E+02
2001	1.671E+04	1.338E+07	8.993E+02	4.465E+03	6.692E+06	4.496E+02
2002	1.891E+04	1.515E+07	1.018E+03	5.052E+03	7.573E+06	5.088E+02
2003	2.165E+04	1.734E+07	1.165E+03	5.783E+03	8.669E+06	5.824E+02
2004	2.827E+04	2.264E+07	1.521E+03	7.552E+03	1.132E+07	7.606E+02
2005	3.635E+04	2.911E+07	1.956E+03	9.710E+03	1.455E+07	9.779E+02
2006	4.509E+04	3.611E+07	2.426E+03	1.204E+04	1.805E+07	1.213E+03
2007	5.309E+04	4.251E+07	2.857E+03	1.418E+04	2.126E+07	1.428E+03
2008	6.066E+04	4.857E+07	3.264E+03	1.620E+04	2.429E+07	1.632E+03
2009	6.752E+04	5.407E+07	3.633E+03	1.804E+04	2.703E+07	1.816E+03
2010	7.252E+04	5.807E+07	3.902E+03	1.937E+04	2.903E+07	1.951E+03
2011	7.512E+04	6.015E+07	4.042E+03	2.007E+04	3.008E+07	2.021E+03
2012	7.730E+04	6.190E+07	4.159E+03	2.065E+04	3.095E+07	2.079E+03
2013	7.917E+04	6.340E+07	4.260E+03	2.115E+04	3.170E+07	2.130E+03
2014	8.254E+04	6.610E+07	4.441E+03	2.205E+04	3.305E+07	2.220E+03
2015	8.578E+04	6.869E+07	4.615E+03	2.291E+04	3.434E+07	2.308E+03
2016	8.889E+04	7.118E+07	4.782E+03	2.374E+04	3.559E+07	2.391E+03
2017	9.187E+04	7.357E+07	4.943E+03	2.454E+04	3.678E+07	2.472E+03
2018	9.474E+04	7.587E+07	5.097E+03	2.531E+04	3.793E+07	2.549E+03
2019	9.750E+04	7.808E+07	5.246E+03	2.604E+04	3.904E+07	2.623E+03
2020	1.002E+05	8.020E+07	5.388E+03	2.675E+04	4.010E+07	2.694E+03
2021	1.027E+05	8.223E+07	5.525E+03	2.743E+04	4.112E+07	2.763E+03

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2022	1.051E+05	8.419E+07	5.657E+03	2.808E+04	4.210E+07	2.828E+03
2023	1.023E+05	8.188E+07	5.502E+03	2.731E+04	4.094E+07	2.751E+03
2024	9.825E+04	7.867E+07	5.286E+03	2.624E+04	3.934E+07	2.643E+03
2025	9.440E+04	7.559E+07	5.079E+03	2.521E+04	3.779E+07	2.539E+03
2026	9.070E+04	7.262E+07	4.880E+03	2.423E+04	3.631E+07	2.440E+03
2027	8.714E+04	6.978E+07	4.688E+03	2.328E+04	3.489E+07	2.344E+03
2028	8.372E+04	6.704E+07	4.504E+03	2.236E+04	3.352E+07	2.252E+03
2029	8.044E+04	6.441E+07	4.328E+03	2.149E+04	3.221E+07	2.164E+03
2030	7.729E+04	6.189E+07	4.158E+03	2.064E+04	3.094E+07	2.079E+03
2031	7.426E+04	5.946E+07	3.995E+03	1.983E+04	2.973E+07	1.998E+03
2032	7.134E+04	5.713E+07	3.838E+03	1.906E+04	2.856E+07	1.919E+03
2033	6.855E+04	5.489E+07	3.688E+03	1.831E+04	2.744E+07	1.844E+03
2034	6.586E+04	5.274E+07	3.543E+03	1.759E+04	2.637E+07	1.772E+03
2035	6.328E+04	5.067E+07	3.404E+03	1.690E+04	2.533E+07	1.702E+03
2036	6.079E+04	4.868E+07	3.271E+03	1.624E+04	2.434E+07	1.635E+03
2037	5.841E+04	4.677E+07	3.143E+03	1.560E+04	2.339E+07	1.571E+03
2038	5.612E+04	4.494E+07	3.019E+03	1.499E+04	2.247E+07	1.510E+03
2039	5.392E+04	4.318E+07	2.901E+03	1.440E+04	2.159E+07	1.451E+03
2040	5.181E+04	4.148E+07	2.787E+03	1.384E+04	2.074E+07	1.394E+03
2041	4.977E+04	3.986E+07	2.678E+03	1.330E+04	1.993E+07	1.339E+03
2042	4.782E+04	3.829E+07	2.573E+03	1.277E+04	1.915E+07	1.286E+03
2043	4.595E+04	3.679E+07	2.472E+03	1.227E+04	1.840E+07	1.236E+03
2044	4.415E+04	3.535E+07	2.375E+03	1.179E+04	1.768E+07	1.188E+03
2045	4.242E+04	3.396E+07	2.282E+03	1.133E+04	1.698E+07	1.141E+03
2046	4.075E+04	3.263E+07	2.193E+03	1.089E+04	1.632E+07	1.096E+03
2047	3.915E+04	3.135E+07	2.107E+03	1.046E+04	1.568E+07	1.053E+03
2048	3.762E+04	3.012E+07	2.024E+03	1.005E+04	1.506E+07	1.012E+03
2049	3.614E+04	2.894E+07	1.945E+03	9.654E+03	1.447E+07	9.723E+02
2050	3.473E+04	2.781E+07	1.868E+03	9.276E+03	1.390E+07	9.342E+02
2051	3.336E+04	2.672E+07	1.795E+03	8.912E+03	1.336E+07	8.976E+02
2052	3.206E+04	2.567E+07	1.725E+03	8.563E+03	1.283E+07	8.624E+02
2053	3.080E+04	2.466E+07	1.657E+03	8.227E+03	1.233E+07	8.286E+02
2054	2.959E+04	2.370E+07	1.592E+03	7.904E+03	1.185E+07	7.961E+02
2055	2.843E+04	2.277E+07	1.530E+03	7.594E+03	1.138E+07	7.648E+02
2056	2.732E+04	2.187E+07	1.470E+03	7.297E+03	1.094E+07	7.349E+02
2057	2.625E+04	2.102E+07	1.412E+03	7.011E+03	1.051E+07	7.060E+02
2058	2.522E+04	2.019E+07	1.357E+03	6.736E+03	1.010E+07	6.784E+02
2059	2.423E+04	1.940E+07	1.304E+03	6.472E+03	9.700E+06	6.518E+02
2060	2.328E+04	1.864E+07	1.252E+03	6.218E+03	9.320E+06	6.262E+02
2061	2.237E+04	1.791E+07	1.203E+03	5.974E+03	8.955E+06	6.017E+02
2062	2.149E+04	1.721E+07	1.156E+03	5.740E+03	8.603E+06	5.781E+02
2063	2.065E+04	1.653E+07	1.111E+03	5.515E+03	8.266E+06	5.554E+02
2064	1.984E+04	1.588E+07	1.067E+03	5.298E+03	7.942E+06	5.336E+02
2065	1.906E+04	1.526E+07	1.025E+03	5.091E+03	7.631E+06	5.127E+02
2066	1.831E+04	1.466E+07	9.852E+02	4.891E+03	7.331E+06	4.926E+02
2067	1.759E+04	1.409E+07	9.466E+02	4.699E+03	7.044E+06	4.733E+02
2068	1.690E+04	1.354E+07	9.094E+02	4.515E+03	6.768E+06	4.547E+02
2069	1.624E+04	1.300E+07	8.738E+02	4.338E+03	6.502E+06	4.369E+02
2070	1.560E+04	1.249E+07	8.395E+02	4.168E+03	6.247E+06	4.198E+02
2071	1.499E+04	1.200E+07	8.066E+02	4.004E+03	6.002E+06	4.033E+02
2072	1.440E+04	1.153E+07	7.750E+02	3.847E+03	5.767E+06	3.875E+02

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2073	1.384E+04	1.108E+07	7.446E+02	3.697E+03	5.541E+06	3.723E+02
2074	1.330E+04	1.065E+07	7.154E+02	3.552E+03	5.324E+06	3.577E+02
2075	1.278E+04	1.023E+07	6.873E+02	3.412E+03	5.115E+06	3.437E+02
2076	1.227E+04	9.829E+06	6.604E+02	3.279E+03	4.914E+06	3.302E+02
2077	1.179E+04	9.443E+06	6.345E+02	3.150E+03	4.722E+06	3.172E+02
2078	1.133E+04	9.073E+06	6.096E+02	3.027E+03	4.537E+06	3.048E+02
2079	1.089E+04	8.717E+06	5.857E+02	2.908E+03	4.359E+06	2.929E+02
2080	1.046E+04	8.375E+06	5.627E+02	2.794E+03	4.188E+06	2.814E+02
2081	1.005E+04	8.047E+06	5.407E+02	2.684E+03	4.024E+06	2.703E+02
2082	9.655E+03	7.732E+06	5.195E+02	2.579E+03	3.866E+06	2.597E+02
2083	9.277E+03	7.428E+06	4.991E+02	2.478E+03	3.714E+06	2.496E+02
2084	8.913E+03	7.137E+06	4.795E+02	2.381E+03	3.569E+06	2.398E+02
2085	8.563E+03	6.857E+06	4.607E+02	2.287E+03	3.429E+06	2.304E+02
2086	8.228E+03	6.588E+06	4.427E+02	2.198E+03	3.294E+06	2.213E+02
2087	7.905E+03	6.330E+06	4.253E+02	2.112E+03	3.165E+06	2.127E+02
2088	7.595E+03	6.082E+06	4.086E+02	2.029E+03	3.041E+06	2.043E+02
2089	7.297E+03	5.843E+06	3.926E+02	1.949E+03	2.922E+06	1.963E+02
2090	7.011E+03	5.614E+06	3.772E+02	1.873E+03	2.807E+06	1.886E+02
2091	6.736E+03	5.394E+06	3.624E+02	1.799E+03	2.697E+06	1.812E+02
2092	6.472E+03	5.183E+06	3.482E+02	1.729E+03	2.591E+06	1.741E+02
2093	6.218E+03	4.979E+06	3.346E+02	1.661E+03	2.490E+06	1.673E+02
2094	5.975E+03	4.784E+06	3.214E+02	1.596E+03	2.392E+06	1.607E+02
2095	5.740E+03	4.597E+06	3.088E+02	1.533E+03	2.298E+06	1.544E+02
2096	5.515E+03	4.416E+06	2.967E+02	1.473E+03	2.208E+06	1.484E+02
2097	5.299E+03	4.243E+06	2.851E+02	1.415E+03	2.122E+06	1.425E+02
2098	5.091E+03	4.077E+06	2.739E+02	1.360E+03	2.038E+06	1.370E+02
2099	4.892E+03	3.917E+06	2.632E+02	1.307E+03	1.958E+06	1.316E+02
2100	4.700E+03	3.763E+06	2.529E+02	1.255E+03	1.882E+06	1.264E+02
2101	4.515E+03	3.616E+06	2.429E+02	1.206E+03	1.808E+06	1.215E+02
2102	4.338E+03	3.474E+06	2.334E+02	1.159E+03	1.737E+06	1.167E+02
2103	4.168E+03	3.338E+06	2.243E+02	1.113E+03	1.669E+06	1.121E+02
2104	4.005E+03	3.207E+06	2.155E+02	1.070E+03	1.603E+06	1.077E+02
2105	3.848E+03	3.081E+06	2.070E+02	1.028E+03	1.541E+06	1.035E+02
2106	3.697E+03	2.960E+06	1.989E+02	9.875E+02	1.480E+06	9.945E+01
2107	3.552E+03	2.844E+06	1.911E+02	9.488E+02	1.422E+06	9.555E+01
2108	3.413E+03	2.733E+06	1.836E+02	9.116E+02	1.366E+06	9.181E+01
2109	3.279E+03	2.626E+06	1.764E+02	8.758E+02	1.313E+06	8.821E+01
2110	3.150E+03	2.523E+06	1.695E+02	8.415E+02	1.261E+06	8.475E+01
2111	3.027E+03	2.424E+06	1.628E+02	8.085E+02	1.212E+06	8.142E+01
2112	2.908E+03	2.329E+06	1.565E+02	7.768E+02	1.164E+06	7.823E+01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1972	0	0	0	0	0	0
1973	4.792E+02	2.618E+05	1.759E+01	1.117E+00	3.115E+02	2.093E-02
1974	9.397E+02	5.133E+05	3.449E+01	2.190E+00	6.109E+02	4.105E-02
1975	1.385E+03	7.565E+05	5.083E+01	3.227E+00	9.002E+02	6.048E-02
1976	1.808E+03	9.875E+05	6.635E+01	4.212E+00	1.175E+03	7.896E-02
1977	2.214E+03	1.210E+06	8.127E+01	5.159E+00	1.439E+03	9.671E-02
1978	2.605E+03	1.423E+06	9.560E+01	6.069E+00	1.693E+03	1.138E-01
1979	2.986E+03	1.631E+06	1.096E+02	6.959E+00	1.941E+03	1.304E-01
1980	3.346E+03	1.828E+06	1.228E+02	7.798E+00	2.175E+03	1.462E-01
1981	3.692E+03	2.017E+06	1.355E+02	8.604E+00	2.400E+03	1.613E-01
1982	4.025E+03	2.199E+06	1.477E+02	9.379E+00	2.617E+03	1.758E-01
1983	4.351E+03	2.377E+06	1.597E+02	1.014E+01	2.829E+03	1.901E-01
1984	4.658E+03	2.544E+06	1.710E+02	1.085E+01	3.028E+03	2.034E-01
1985	4.952E+03	2.705E+06	1.818E+02	1.154E+01	3.219E+03	2.163E-01
1986	5.235E+03	2.860E+06	1.922E+02	1.220E+01	3.404E+03	2.287E-01
1987	5.540E+03	3.027E+06	2.034E+02	1.291E+01	3.602E+03	2.420E-01
1988	5.781E+03	3.158E+06	2.122E+02	1.347E+01	3.758E+03	2.525E-01
1989	6.012E+03	3.284E+06	2.207E+02	1.401E+01	3.908E+03	2.626E-01
1990	6.299E+03	3.441E+06	2.312E+02	1.468E+01	4.095E+03	2.751E-01
1991	6.510E+03	3.556E+06	2.389E+02	1.517E+01	4.232E+03	2.843E-01
1992	6.712E+03	3.667E+06	2.464E+02	1.564E+01	4.363E+03	2.932E-01
1993	6.841E+03	3.737E+06	2.511E+02	1.594E+01	4.447E+03	2.988E-01
1994	7.292E+03	3.984E+06	2.677E+02	1.699E+01	4.740E+03	3.185E-01
1995	7.856E+03	4.292E+06	2.884E+02	1.831E+01	5.107E+03	3.431E-01
1996	8.398E+03	4.588E+06	3.083E+02	1.957E+01	5.459E+03	3.668E-01
1997	8.853E+03	4.836E+06	3.250E+02	2.063E+01	5.755E+03	3.867E-01
1998	9.225E+03	5.040E+06	3.386E+02	2.150E+01	5.997E+03	4.030E-01
1999	9.583E+03	5.235E+06	3.517E+02	2.233E+01	6.230E+03	4.186E-01
2000	1.078E+04	5.887E+06	3.955E+02	2.511E+01	7.005E+03	4.707E-01
2001	1.225E+04	6.692E+06	4.496E+02	2.854E+01	7.963E+03	5.351E-01
2002	1.386E+04	7.573E+06	5.088E+02	3.230E+01	9.011E+03	6.055E-01
2003	1.587E+04	8.669E+06	5.824E+02	3.698E+01	1.032E+04	6.931E-01
2004	2.072E+04	1.132E+07	7.606E+02	4.828E+01	1.347E+04	9.051E-01
2005	2.664E+04	1.455E+07	9.779E+02	6.208E+01	1.732E+04	1.164E+00
2006	3.305E+04	1.805E+07	1.213E+03	7.701E+01	2.148E+04	1.444E+00
2007	3.891E+04	2.126E+07	1.428E+03	9.067E+01	2.530E+04	1.700E+00
2008	4.446E+04	2.429E+07	1.632E+03	1.036E+02	2.890E+04	1.942E+00
2009	4.948E+04	2.703E+07	1.816E+03	1.153E+02	3.217E+04	2.161E+00
2010	5.315E+04	2.903E+07	1.951E+03	1.238E+02	3.455E+04	2.321E+00
2011	5.506E+04	3.008E+07	2.021E+03	1.283E+02	3.579E+04	2.405E+00
2012	5.665E+04	3.095E+07	2.079E+03	1.320E+02	3.683E+04	2.474E+00
2013	5.803E+04	3.170E+07	2.130E+03	1.352E+02	3.772E+04	2.535E+00
2014	6.049E+04	3.305E+07	2.220E+03	1.410E+02	3.933E+04	2.642E+00
2015	6.287E+04	3.434E+07	2.308E+03	1.465E+02	4.087E+04	2.746E+00
2016	6.514E+04	3.559E+07	2.391E+03	1.518E+02	4.235E+04	2.846E+00
2017	6.733E+04	3.678E+07	2.472E+03	1.569E+02	4.377E+04	2.941E+00
2018	6.944E+04	3.793E+07	2.549E+03	1.618E+02	4.514E+04	3.033E+00
2019	7.146E+04	3.904E+07	2.623E+03	1.665E+02	4.645E+04	3.121E+00
2020	7.340E+04	4.010E+07	2.694E+03	1.710E+02	4.772E+04	3.206E+00
2021	7.527E+04	4.112E+07	2.763E+03	1.754E+02	4.893E+04	3.288E+00

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2022	7.706E+04	4.210E+07	2.828E+03	1.796E+02	5.009E+04	3.366E+00
2023	7.494E+04	4.094E+07	2.751E+03	1.746E+02	4.872E+04	3.274E+00
2024	7.201E+04	3.934E+07	2.643E+03	1.678E+02	4.681E+04	3.145E+00
2025	6.918E+04	3.779E+07	2.539E+03	1.612E+02	4.498E+04	3.022E+00
2026	6.647E+04	3.631E+07	2.440E+03	1.549E+02	4.321E+04	2.903E+00
2027	6.386E+04	3.489E+07	2.344E+03	1.488E+02	4.152E+04	2.790E+00
2028	6.136E+04	3.352E+07	2.252E+03	1.430E+02	3.989E+04	2.680E+00
2029	5.895E+04	3.221E+07	2.164E+03	1.374E+02	3.833E+04	2.575E+00
2030	5.664E+04	3.094E+07	2.079E+03	1.320E+02	3.682E+04	2.474E+00
2031	5.442E+04	2.973E+07	1.998E+03	1.268E+02	3.538E+04	2.377E+00
2032	5.229E+04	2.856E+07	1.919E+03	1.218E+02	3.399E+04	2.284E+00
2033	5.024E+04	2.744E+07	1.844E+03	1.171E+02	3.266E+04	2.194E+00
2034	4.827E+04	2.637E+07	1.772E+03	1.125E+02	3.138E+04	2.108E+00
2035	4.637E+04	2.533E+07	1.702E+03	1.081E+02	3.015E+04	2.026E+00
2036	4.456E+04	2.434E+07	1.635E+03	1.038E+02	2.897E+04	1.946E+00
2037	4.281E+04	2.339E+07	1.571E+03	9.976E+01	2.783E+04	1.870E+00
2038	4.113E+04	2.247E+07	1.510E+03	9.584E+01	2.674E+04	1.797E+00
2039	3.952E+04	2.159E+07	1.451E+03	9.209E+01	2.569E+04	1.726E+00
2040	3.797E+04	2.074E+07	1.394E+03	8.848E+01	2.468E+04	1.658E+00
2041	3.648E+04	1.993E+07	1.339E+03	8.501E+01	2.372E+04	1.593E+00
2042	3.505E+04	1.915E+07	1.286E+03	8.167E+01	2.279E+04	1.531E+00
2043	3.367E+04	1.840E+07	1.236E+03	7.847E+01	2.189E+04	1.471E+00
2044	3.235E+04	1.768E+07	1.188E+03	7.539E+01	2.103E+04	1.413E+00
2045	3.109E+04	1.698E+07	1.141E+03	7.244E+01	2.021E+04	1.358E+00
2046	2.987E+04	1.632E+07	1.096E+03	6.960E+01	1.942E+04	1.305E+00
2047	2.870E+04	1.568E+07	1.053E+03	6.687E+01	1.865E+04	1.253E+00
2048	2.757E+04	1.506E+07	1.012E+03	6.425E+01	1.792E+04	1.204E+00
2049	2.649E+04	1.447E+07	9.723E+02	6.173E+01	1.722E+04	1.157E+00
2050	2.545E+04	1.390E+07	9.342E+02	5.931E+01	1.655E+04	1.112E+00
2051	2.445E+04	1.336E+07	8.976E+02	5.698E+01	1.590E+04	1.068E+00
2052	2.349E+04	1.283E+07	8.624E+02	5.475E+01	1.527E+04	1.026E+00
2053	2.257E+04	1.233E+07	8.286E+02	5.260E+01	1.467E+04	9.860E-01
2054	2.169E+04	1.185E+07	7.961E+02	5.054E+01	1.410E+04	9.473E-01
2055	2.084E+04	1.138E+07	7.648E+02	4.856E+01	1.355E+04	9.102E-01
2056	2.002E+04	1.094E+07	7.349E+02	4.665E+01	1.302E+04	8.745E-01
2057	1.924E+04	1.051E+07	7.060E+02	4.482E+01	1.250E+04	8.402E-01
2058	1.848E+04	1.010E+07	6.784E+02	4.307E+01	1.201E+04	8.072E-01
2059	1.776E+04	9.700E+06	6.518E+02	4.138E+01	1.154E+04	7.756E-01
2060	1.706E+04	9.320E+06	6.262E+02	3.975E+01	1.109E+04	7.452E-01
2061	1.639E+04	8.955E+06	6.017E+02	3.820E+01	1.066E+04	7.160E-01
2062	1.575E+04	8.603E+06	5.781E+02	3.670E+01	1.024E+04	6.879E-01
2063	1.513E+04	8.266E+06	5.554E+02	3.526E+01	9.837E+03	6.609E-01
2064	1.454E+04	7.942E+06	5.336E+02	3.388E+01	9.451E+03	6.350E-01
2065	1.397E+04	7.631E+06	5.127E+02	3.255E+01	9.080E+03	6.101E-01
2066	1.342E+04	7.331E+06	4.926E+02	3.127E+01	8.724E+03	5.862E-01
2067	1.289E+04	7.044E+06	4.733E+02	3.005E+01	8.382E+03	5.632E-01
2068	1.239E+04	6.768E+06	4.547E+02	2.887E+01	8.054E+03	5.411E-01
2069	1.190E+04	6.502E+06	4.369E+02	2.774E+01	7.738E+03	5.199E-01
2070	1.144E+04	6.247E+06	4.198E+02	2.665E+01	7.434E+03	4.995E-01
2071	1.099E+04	6.002E+06	4.033E+02	2.560E+01	7.143E+03	4.799E-01
2072	1.056E+04	5.767E+06	3.875E+02	2.460E+01	6.863E+03	4.611E-01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2073	1.014E+04	5.541E+06	3.723E+02	2.363E+01	6.594E+03	4.430E-01
2074	9.745E+03	5.324E+06	3.577E+02	2.271E+01	6.335E+03	4.257E-01
2075	9.363E+03	5.115E+06	3.437E+02	2.182E+01	6.087E+03	4.090E-01
2076	8.996E+03	4.914E+06	3.302E+02	2.096E+01	5.848E+03	3.929E-01
2077	8.643E+03	4.722E+06	3.172E+02	2.014E+01	5.619E+03	3.775E-01
2078	8.304E+03	4.537E+06	3.048E+02	1.935E+01	5.398E+03	3.627E-01
2079	7.978E+03	4.359E+06	2.929E+02	1.859E+01	5.187E+03	3.485E-01
2080	7.666E+03	4.188E+06	2.814E+02	1.786E+01	4.983E+03	3.348E-01
2081	7.365E+03	4.024E+06	2.703E+02	1.716E+01	4.788E+03	3.217E-01
2082	7.076E+03	3.866E+06	2.597E+02	1.649E+01	4.600E+03	3.091E-01
2083	6.799E+03	3.714E+06	2.496E+02	1.584E+01	4.420E+03	2.970E-01
2084	6.532E+03	3.569E+06	2.398E+02	1.522E+01	4.247E+03	2.853E-01
2085	6.276E+03	3.429E+06	2.304E+02	1.462E+01	4.080E+03	2.741E-01
2086	6.030E+03	3.294E+06	2.213E+02	1.405E+01	3.920E+03	2.634E-01
2087	5.794E+03	3.165E+06	2.127E+02	1.350E+01	3.766E+03	2.531E-01
2088	5.566E+03	3.041E+06	2.043E+02	1.297E+01	3.619E+03	2.431E-01
2089	5.348E+03	2.922E+06	1.963E+02	1.246E+01	3.477E+03	2.336E-01
2090	5.138E+03	2.807E+06	1.886E+02	1.197E+01	3.340E+03	2.244E-01
2091	4.937E+03	2.697E+06	1.812E+02	1.150E+01	3.209E+03	2.156E-01
2092	4.743E+03	2.591E+06	1.741E+02	1.105E+01	3.084E+03	2.072E-01
2093	4.557E+03	2.490E+06	1.673E+02	1.062E+01	2.963E+03	1.991E-01
2094	4.379E+03	2.392E+06	1.607E+02	1.020E+01	2.847E+03	1.913E-01
2095	4.207E+03	2.298E+06	1.544E+02	9.803E+00	2.735E+03	1.838E-01
2096	4.042E+03	2.208E+06	1.484E+02	9.419E+00	2.628E+03	1.766E-01
2097	3.884E+03	2.122E+06	1.425E+02	9.050E+00	2.525E+03	1.696E-01
2098	3.731E+03	2.038E+06	1.370E+02	8.695E+00	2.426E+03	1.630E-01
2099	3.585E+03	1.958E+06	1.316E+02	8.354E+00	2.331E+03	1.566E-01
2100	3.444E+03	1.882E+06	1.264E+02	8.026E+00	2.239E+03	1.505E-01
2101	3.309E+03	1.808E+06	1.215E+02	7.712E+00	2.151E+03	1.446E-01
2102	3.180E+03	1.737E+06	1.167E+02	7.409E+00	2.067E+03	1.389E-01
2103	3.055E+03	1.669E+06	1.121E+02	7.119E+00	1.986E+03	1.334E-01
2104	2.935E+03	1.603E+06	1.077E+02	6.840E+00	1.908E+03	1.282E-01
2105	2.820E+03	1.541E+06	1.035E+02	6.571E+00	1.833E+03	1.232E-01
2106	2.709E+03	1.480E+06	9.945E+01	6.314E+00	1.761E+03	1.183E-01
2107	2.603E+03	1.422E+06	9.555E+01	6.066E+00	1.692E+03	1.137E-01
2108	2.501E+03	1.366E+06	9.181E+01	5.828E+00	1.626E+03	1.092E-01
2109	2.403E+03	1.313E+06	8.821E+01	5.600E+00	1.562E+03	1.050E-01
2110	2.309E+03	1.261E+06	8.475E+01	5.380E+00	1.501E+03	1.008E-01
2111	2.218E+03	1.212E+06	8.142E+01	5.169E+00	1.442E+03	9.690E-02
2112	2.131E+03	1.164E+06	7.823E+01	4.967E+00	1.386E+03	9.310E-02

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We Protect Hoosiers and Our Environment.
100 N. Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov

Michael R. Pence
Governor

Thomas W. Easterly
Commissioner

SENT VIA U.S. MAIL: CONFIRMED DELIVERY AND SIGNATURE REQUESTED

TO: Jerry Kreuzman
Sycamore Ridge Landfill, General Manager
5621 East Cottom Drive
Pimento, Indiana 47866

DATE: February 27, 2014

FROM: Matt Stuckey, Branch Chief
Permits Branch
Office of Air Quality

SUBJECT: Final Decision
Title V – Significant Permit Modification
167-32729-00116

Enclosed is the final decision and supporting materials for the air permit application referenced above. Please note that this packet contains the original, signed, permit documents.

The final decision is being sent to you because our records indicate that you are the contact person for this application. However, if you are not the appropriate person within your company to receive this document, please forward it to the correct person.

A copy of the final decision and supporting materials has also been sent via standard mail to:
Nick Stefkovich, Acting Area President / Sycamore Ridge Landfill
OAQ Permits Branch Interested Parties List

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178, or toll-free at 1-800-451-6027 (ext. 3-0178), and ask to speak to the permit reviewer who prepared the permit. If you think you have received this document in error, please contact Joanne Smiddie-Brush of my staff at 1-800-451-6027 (ext 3-0185), or via e-mail at jbrush@idem.IN.gov.

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Commissioner

February 27, 2014

TO: Vigo County Public Library

From: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

Subject: **Important Information for Display Regarding a Final Determination**

Applicant Name: Sycamore Ridge Landfill
Permit Number: 167-32729-00116

You previously received information to make available to the public during the public comment period of a draft permit. Enclosed is a copy of the final decision and supporting materials for the same project. Please place the enclosed information along with the information you previously received. To ensure that your patrons have ample opportunity to review the enclosed permit, **we ask that you retain this document for at least 60 days.**

The applicant is responsible for placing a copy of the application in your library. If the permit application is not on file, or if you have any questions concerning this public review process, please contact Joanne Smiddie-Brush, OAQ Permits Administration Section at 1-800-451-6027, extension 3-0185.

Enclosures
Final Library.dot 6/13/2013

Mail Code 61-53

IDEM Staff	AWELLS 2/27/2014 Sycamore Ridge Landfill 167-32729-00116 Final		
Name and address of Sender	▶	Indiana Department of Environmental Management Office of Air Quality – Permits Branch 100 N. Senate Indianapolis, IN 46204	Type of Mail: **CERTIFICATE OF MAILING ONLY**

AFFIX STAMP HERE IF USED AS CERTIFICATE OF MAILING

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1		Jerry Kreuzman Sycamore Ridge Landfill 5621 E Cottom Dr Pimento IN 47866 (Source CAATS) confirmed delivery									
2		Nick Stefkovich Acting Area President Sycamore Ridge Landfill 832 Langsdale Ave Indianapolis IN 46202 *(RO CAATS)*									
3		Vigo County Board of Commissioners County Annex, 121 Oak Street Terre Haute IN 47807 *(Local Official)*									
4		Terre Haute City Council and Mayors Office 17 Harding Ave Terre Haute IN 47807 *(Local Official)*									
5		Vigo County Health Department 147 Oak Street Terre Haute IN 47807 *(Health Department)*									
6		Vigo Co Public Library 1 Library Square Terre Haute IN 47807-3609 *(Library)*									
7		J.P. Roehm PO Box 303 Clinton IN 47842 *(Affected Party)*									
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