

**DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY**

DOCUMENT NUMBER: 275-2101-007

TITLE: Best Available Technology and Other Permitting Criteria for
Municipal Solid Waste Landfills

EFFECTIVE DATE: Effective upon publication in the *Pennsylvania Bulletin*

AUTHORITY: Act of January 8, 1960, P.L. (1959) 2119, No 787, as amended,
known as The Air Pollution Control Act, (35 P.S. § 4001 et seq.)

POLICY: Guides public on BAT applicability and provides general
guidance.

PURPOSE: To assist the permit reviewers in their review of plan approval
applications.

APPLICABILITY: Staff/Regulated Public

DISCLAIMER:

The policies and procedures outlined in this guidance document are intended to supplement existing requirements. Nothing in the policies or procedures shall affect applicable statutory or regulatory requirements.

The policies and procedures herein are not adjudication or a regulation. There is no intent on the part of DEP to give these rules that weight or deference. This document establishes the framework for the exercise of the DEP's administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.

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This document provides the minimum Best Available Technology (BAT) requirements for the collection and control of air contaminants from active municipal solid waste landfills (MSW landfills). The BAT requirements apply to new and/or proposed expansion(s) of MSW landfills as described below. The actual BAT determination will be determined on a case-by-case basis prior to issuance of a plan approval for the new sources. See 25 *Pa. Code* §127.1 (relating to purpose). This BAT determination will not be applied retroactively.

The BAT requirements set forth in this document are for guidance purposes and are not meant to be a regulation. BAT is a technology-forcing regulation and, therefore, the applicant must examine technologies that are more effective than those specified in this document. The BAT analysis must include a list of all possible control technologies, a technology feasibility analysis and an economic analysis of the feasible control technologies. If an applicant proposes technology that is less effective than that specified in this document, then the application for the less effective technology must be accompanied by a feasibility analysis for all of the technologies considered and an economic evaluation of all the feasible technologies.

This document also provides guidance for the minimization of fugitive dust emissions from the landfill and emissions of air contaminants from leachate storage systems. Fugitive particulate matter emissions from the construction of the MSW landfill are not covered as part of this policy. Fugitive particulate matter emissions from the construction of the MSW landfill are regulated by the applicable regulations contained in Title 25 of the *Pennsylvania Code*.

Construction activities generally include the preparation of the site, the installation of the liner system, the installation of the final cap, and other related activities. Fugitive particulate matter emissions due to construction activities include the emissions from construction truck traffic.

The collection and control of air contaminants from closed landfills are not covered by this document. Collection and control of air contaminants from closed landfills will be determined by DEP on a case-by-case basis in accordance with applicable federal and state regulations. These requirements should be negotiated with the appropriate Regional Office and/or local host municipality.

GAS COLLECTION SYSTEMS AT ACTIVE LANDFILLS

A Plan Approval is required for the construction of a new MSW landfill, its associated landfill gas collection system, and air cleaning device(s), if the estimated emissions of volatile organic compounds (VOCs) from the new MSW landfill (calculated as the sum of the fugitive VOCs and VOCs before an air cleaning device) is greater than 2.7 tons per year.

A Plan Approval is required for the expansion of an existing MSW landfill, its associated landfill gas collection system, and air cleaning device(s), if the estimated emissions of VOCs from the expansion (calculated as the sum of the fugitive VOCs from the proposed expansion and VOCs of the proposed expansion before an air cleaning device) is greater than 2.7 tons per year. A Plan Approval may also be needed for the expansion of an existing MSW landfill if the estimated increase in emissions of VOCs (calculated as the sum of the fugitive VOCs from the expansion

and VOCs of the proposed expansion before an air cleaning device) is greater than 1 ton per year.

The owner and/or operator should submit a Request for Determination (RFD) to DEP when the estimated increase in VOC emissions from the expansion of the MSW landfill is between 1 ton per year and 2.7 tons per year. The Plan Approval Application or RFD for the landfill, landfill gas collection system, and air cleaning device(s) should be submitted to the appropriate DEP Regional Air Quality program at the same time that the application to construct or expand the landfill is submitted to the appropriate Regional Bureau of Waste Management.

In general, active gas collection systems will be considered for landfills with design capacities in excess of 1 million tons (irrespective of the activity status of the individual cells) and, in general, shall be required for MSW landfills with design capacities in excess of 2.5 million mega grams (2.75 million tons) and 2.5 million cubic meters. The most important factor in selecting the appropriate gas collection system is the landfill gas generation rate. If a passive landfill gas collection system is proposed, it is the applicant's responsibility to show why it is technically and/or economically infeasible to install an active gas extraction system.

The gas collection system will be designed to handle the maximum expected gas flow rate from the entire area of the MSW landfill that warrants control over the intended use period of the gas control or treatment system. The gas collection system will be operated to collect gas at a sufficient extraction rate (40 C.F.R. Section 60.752(b) (2) (ii) (A)). In order to assure this, no positive pressure shall be measurable at the wells, except as allowed in 40 C.F.R. Section 60.753(b). Each well should be equipped with a throttling valve or equivalent to enable adjustment of the gas collection rate, if necessary.

BAT REQUIREMENTS FOR THE COLLECTION AND CONTROL OF LANDFILL GAS

If the proposed emissions of VOCs prior to the construction or installation of an air cleaning device are less than 2.7 tons per year but greater than or equal to 1 ton per year, then BAT for the MSW landfill will be determined on a case-by-case basis.

If the proposed emissions of VOCs prior to the construction or installation of an air cleaning device are greater than or equal to 2.7 tons per year and the landfill capacity is less than or equal to 1 million tons municipal solid waste, then the determination of BAT is a case-by-case decision and may be as described below.

If the proposed emissions of VOCs prior to the construction or installation of an air cleaning device are greater than or equal to 2.7 tons per year and the landfill capacity is greater than 1 million tons municipal solid waste, then BAT is the following:

- (1) The owner or operator of the landfill should install an active landfill gas collection system as described in 40 C.F.R. Section 60.752(b)(2)(ii)(A) and collect the landfill gas in accordance with 25 *Pa. Code* Section 273.292 so as to prevent off-site migration. The gas collection system shall be designed to:

- a. collect gas from the entire MSW landfill that warrants control over the intended use period of the gas control or treatment system, and be operated to collect gas at a sufficient extraction rate (40 C.F.R. Section 60.752(b)(2)(ii)(A)); and,
 - b. accommodate the maximum proposed gas flow rate of the landfill.
- (2) The collected landfill gas should be treated in accordance with 40 C.F.R. Part 60, Subpart WWW for subsequent use or sale, or controlled by one of the following technologies:
 - a. A horizontal incinerator;
 - b. A boiler;
 - c. An enclosed flare;
 - d. An internal combustion engine;
 - e. Combustion turbine;
 - f. Carbon adsorption system; or
 - g. Other technologies approved by DEP.

Please note that open or candlestick flares are appropriate only when installed and operated within the limitations set forth in this document.

- (3) The control system will be designed to achieve and maintain the less stringent of:
 - a. a destruction/removal efficiency of at least 98%, by weight, of non-methane organic compounds (NMOC); or
 - b. an outlet NMOC concentration of less than 20 parts per million, by volume, dry basis, as hexane, corrected to 3% oxygen.
- (4) For combustion devices fueled by untreated landfill gas, source tests should be conducted for:
 - a. The destruction/removal efficiency or the concentration in the outlet of total non-methane organic compounds, corrected to 3% oxygen on a dry basis;
 - b. Nitrogen oxides (NO_x) measured as NO₂ and corrected to 3% oxygen on a dry basis;
 - c. Carbon monoxide (CO) corrected to 3% oxygen on a dry basis; and,
 - d. Volatile organic compounds (VOCs) measured as hexane and corrected to 3% oxygen on a dry basis.
 - e. Formaldehyde, corrected to 3% oxygen on a dry basis, if testing an internal combustion engine or combustion turbine.

DEP reserves the right to require source tests for sources that combust treated landfill gas. Source testing should be performed if specified under the applicable BAT determination for the combustion device.

Source tests should be conducted in accordance with the latest version of DEP's "Source Testing Manual" and 40 C.F.R. Section 60.754(d) or the latest guidance from the EPA. Test procedures will be approved by DEP prior to the actual testing. DEP reserves the right to require the owner and/or operator to conduct further tests at any time after the initial compliance tests.

- (5) Source tests may be performed at different temperatures to develop a range at which the air cleaning device(s) will be operated. DEP will not allow or accept data from a source test that is lower than 1500°F (815.6°C) unless testing at the lower temperature is explicitly approved in the plan approval and must be addressed in the stack test protocol. See special requirements for enclosed flares identified in this document on Page No. 7.
- (6) The operating temperature in the combustion zone of the horizontal incinerator or enclosed flare should be continuously measured and recorded. Compliance should be determined by maintaining temperature records that meet the requirements in 25 *Pa. Code* Section 139.101(12).
- (7) An enclosed combustor should maintain, for each 3-hour period of operation based on rolling hourly data, an average combustion temperature no more than 28°C (50.4°F) below the average combustion temperature during the most recent performance test in which compliance with the destruction/removal requirement was demonstrated. If there has been no performance test, then a minimum temperature of 1500°F will be necessary.
- (8) BAT for a combustion turbine may be determined by using the applicable requirements of 40 C.F.R. Part 60, Subpart WWW, and 40 C.F.R. Part 60, Subparts GG or KKKK and the emission limits as set forth in General Plan Approval/Operating Permit for Landfill Gas Fired Simple Cycle Turbines (document number 2700-PM-AQ0026).
- (9) BAT for the reduction of nitrogen oxides from a boiler may be one of the following:
 - a. Low NOx or Ultra-low NOx burners;
 - b. Selective non-catalytic reduction system; or
 - c. Other technology (ies) approved by DEP.

The analysis of the technical feasibility of the low NOx burners, ultra-low NOx burners or other technologies shall be included in the Plan Approval application.

- (10) The BAT for the reduction of nitrogen oxides from an internal combustion engine is:
 - a. Lean-burn technology; or
 - b. Other method(s) approved by DEP.

- (11) The air cleaning device(s) should be installed, operated and maintained in accordance with the manufacturer's specifications.
- (12) There should be no landfill gas leaks which result in concentrations of 500 ppmv or more, measured as propane (or 1375 ppmv, or more, measured as methane), at a distance of 0.5 inches from any equipment. Non-repeatable and momentary readings shall not be considered to be leaks, nor should measurements taken during routine equipment maintenance. The landfill equipment subject to this requirement includes gas extraction equipment designed to operate under positive pressure. This includes the blower, the control device or treatment system, above ground piping connecting these components and applicable fittings and valves. Routine equipment maintenance includes, but is not limited to, the following:
 - a. Gas piping repair;
 - b. Flare station blower repair or replacement;
 - c. Flare relight system testing or repair;
 - d. Flare thermocouple or temperature switch repair or replacement;
 - e. Flare liner inspection, repair, or replacement;
 - f. Flare actuator valve repair or replacement;
 - g. Flare flame arrestor basket cleaning;
 - h. Flare control panel timer adjustment or replacement;
 - i. Condensate trap pump repair or replacement;
 - j. Condensate pump pump-outs;
 - k. Electrical service repairs; and
 - l. Other repairs as determined by DEP.
- (13) The comparison and submission of the theoretical and actual landfill gas collection rates should be included in the annual emission statement submitted to DEP.
- (14) Landfill gas that is routed to a treatment system that processes the collected landfill gas for subsequent sale or beneficial use meets BAT standards if it is processed in accordance with 40 C.F.R. Section 60.752(b)(2)(iii)(C), including:
 - a. Compressed, de-watered and filtered to at least 10 microns; or
 - b. The Administrator has determined, through issuance of an "Applicability Determination" to the facility, that the landfill gas for that site has been treated as defined in 40 C.F.R. Section 60.752(b)(2)(iii)(C); or
 - c. The landfill gas processing meets a regulatory definition of "treated," "treatment," or similar term in any revision to 40 C.F.R. Part 60, Subpart WWW or other guidance document issued by the EPA subsequent to the adoption of this policy.

Please note that “beneficial use” is an inclusive term that includes, but is not limited to, energy recovery uses such as electrical generation, steam generation, use as a mobile source fuel, etc.

- (15) As part of establishing the BAT for the landfill, an emission limit for VOCs will be established in the plan approval.

SPECIAL REQUIREMENTS FOR ENCLOSED FLARES

If an enclosed flare is specified as the air cleaning device for the landfill gas, then the enclosed flare should comply with the following BAT standards:

- (1) Enclosed flares should be designed such that there are no visible flames during normal operations.
- (2) Enclosed flares should be operated with no visible emissions, except for periods not to exceed a total of five minutes during any two consecutive hours.
- (3) Enclosed flares should maintain, for each 3-hour period of operation based on rolling hourly data, an average combustion temperature of no more than 28°C (50.4°F) below the average combustion temperature during the most recent performance test in which compliance with the destruction/removal was demonstrated. If there has been no performance test, then a minimum temperature of 1500°F (815.6°C) will be necessary.
- (4) Enclosed flares may be operated at a lower temperature provided that the company has demonstrated, by a stack test that the flare will achieve the 98% destruction/removal efficiency or 20 ppm_{dv}, measured as hexane and corrected to 3% oxygen, at the lower temperature and complies with all the emission limits established in the plan approval. If compliance has been demonstrated at the lower temperature, the owner or operator of the landfill should submit a plan approval application to make the lower operating temperature enforceable. If the MSW landfill has an operating permit, then a minor operating permit modification application, which complies with 25 *Pa. Code* Section 127.462, should be submitted to the appropriate DEP Regional Office. Operation at the lower temperature cannot occur until approved by DEP. Under no circumstance will DEP approve an operating temperature less than 1200°F.
- (5) The enclosed flare should be equipped with an automatic pilot ignition source using an auxiliary fuel (e.g. propane or natural gas).
- (6) The enclosed flare should be operated with a flame present at all times. The enclosed flare should be equipped with an automatic shut-off mechanism designed to immediately stop the flow of gases when a flame-out occurs. During the restart or start-up, there should be sufficient flow of auxiliary fuel to the burners such that unburned landfill gases are not emitted to the atmosphere.

- (7) The flue gas temperature of the enclosed flare should be measured and recorded in the combustion zone as per the manufacturer's specifications based on the flow into the flare. The temperature in the combustion zone should be used to determine compliance with the minimum temperature requirement. The temperature monitoring device should meet the 40 C.F.R. Section 60.756(b) requirements.

OPEN FLARE POLICY FOR BENEFICIAL USE OF LANDFILL GAS

The use of open flares may be allowed when a company will undertake a beneficial use project of the landfill gas. A beneficial use project is where the landfill gas will be used or sold for energy recovery uses such as electrical generation, steam generation, use as a mobile source fuel, etc.

- (1) Each open flare will be limited to 500 dscfm, at 50% methane (net heat input not to exceed 15 million Btu per hour, calculated on the higher heating value of the landfill gas).
- (2) The total landfill gas combusted in open flare(s) at a facility should not exceed the greatest of either 500 dscfm, at 50% methane (net heat input not to exceed 15 million Btu per hour, calculated on the higher heating value of the landfill gas) or 20% of the total landfill gas flow, at 50% methane.
- (3) The DEP may approve the use of an open flare for flow rates higher than 500 dscfm, at 50% methane (net heat input can exceed 15 million Btu per hour, calculated on the higher heating value of the landfill gas), provided that the company provides a detailed technical and economic analysis of the use of an open flare versus an enclosed flare.
- (4) The total landfill gas combusted in open flare(s) at a facility should not exceed the minimum flow necessary to support combustion in the facility's enclosed flare, based on manufacturer specified turn-down ratio and Btu requirements, if the enclosed flare has unused capacity to support the landfill gas flow.
- (5) The open flare must be designed in accordance with the requirements of 40 C.F.R. Section 60.18 (40 C.F.R. Section 60.752(b) (2) (iii) (A)).
- (6) The landfill owner or operator will monitor, on a daily basis (except holidays and weekends), the flow in dry standard cubic feet or the temperature and flow rate of the landfill gas combusted in the open flare, unless 40 C.F.R. Part 60, Subpart WWW requires more frequent monitoring.
- (7) The landfill owner or operator will record, on a daily basis (except holidays and weekends), the amount of landfill gas combusted in the flare. All flares should be equipped with an automatic pilot ignition source.

- (8) The open flare should be operated with a flame present at all times.
- (9) The open flare should be equipped with an automatic shut-off mechanism designed to immediately stop the flow of gases when a flame-out occurs.
- (10) In addition to the requirements of 40 C.F.R. Section 60.18, open flares should be located in a manner to mitigate visual impacts by meeting any one of the following requirements:
 - a. Blocking the view of the flare with screening or plantings;
 - b. Erecting a berm or similar earthwork barrier (berm) approved by the Waste Management;
 - c. Locating the open flare behind an existing berm, or placing it in a hollow or other depression;
 - d. Placing the flare at least 900 feet from the nearest occupied dwelling for areas of the landfill first permitted after December 23, 2000, and at least 500 feet for areas of the landfill permitted after April 8, 1988, and before December 23, 2000, (an occupied dwelling that is owned by the landfill or any entity affiliated with the landfill is not deemed an occupied dwelling); or
 - e. Installing a shroud that has been designed to minimize visible flames during normal operation.
- (11) Passive control devices such as vent or wellhead flares may be considered on a case-by-case basis.

OPEN FLARE POLICY FOR THE CONTROL OF LANDFILL GAS OTHER THAN BENEFICIAL USE

Open flare(s) may be proposed as the BAT for MSW landfills that have a design capacity less than or equal to 1 million tons.

Open flares may be used in the following situations at landfills without beneficial use projects:

- (1) For temporary control of landfill gas from areas of the landfill that have not yet been connected to the primary gas collection system or have been temporarily removed from the primary gas collection system for an initial period not to exceed 180 days. The flow of landfill gas to the open flare cannot exceed 500 dscfm, at 50% methane (net heat input not to exceed 15 million Btu per hour).
- (2) For temporary control of landfill gas from areas of the landfill where an enclosed flare is infeasible or unsafe for an initial period not to exceed 180 days. The landfill owner or operator should document the infeasible or unsafe conditions in writing and submit the documentation to DEP. Examples of infeasible or unsafe situations include control of landfill gas from areas of active waste deposition, uneven topography that does not allow for the larger footprint and height of an

enclosed flare, and where flare placement without a foundation (which are necessary for enclosed ground flare installations) due to weather or other conditions is not feasible. The flow of landfill gas to the open flare cannot exceed 500 dscfm, at 50% methane (net heat input not to exceed 15 million Btu per hour).

- (3) The use of open flares as a back-up control device may be allowed, provided that they are used only when the primary control is not operational due to maintenance, malfunction, repair or other similar activities. The landfill owner or operator should keep the following records when maintenance, malfunction, repair or other similar activity happens:
 - a. Date of the maintenance, malfunction, repair or other similar activity.
 - b. The duration of the maintenance, malfunction, repair or other similar activity.
 - c. A record of the work performed and, in the case of a malfunction, the cause of the malfunction.
- (4) Operation of the open flare may be extended upon submission of a RFD and DEP's approval. Each extension of operation of the open flare will not exceed 180 days.
- (5) The landfill owner or operator will monitor, on a daily basis (except holidays and weekends), the flow in dry standard cubic feet or the temperature and flow rate of the landfill gas combusted in the open flare, unless 40 C.F.R. Part 60, Subpart WWW requires more frequent monitoring.
- (6) The landfill owner or operator will record, on a daily basis (except holidays and weekends), the amount of landfill gas combusted in the flare. This recordkeeping requirement does not apply to MSW landfills that are subject to 40 C.F.R. Part 60, Subpart WWW, unless 40 C.F.R. Part 60, Subpart WWW requires more frequent monitoring.
- (7) Open flares should be equipped with an automatic pilot ignition source.
- (8) The open flare should be operated with a flame present at all times.
- (9) The open flare should be equipped with an automatic shut-off mechanism designed to immediately stop the flow landfill gas when a flame-out occurs.
- (10) The open flare should be designed and operated in accordance with the requirements of 40 C.F.R. Section 60.18 (40 C.F.R. Section 60.752(b) (2) (iii)).
- (11) In addition to the requirements of 40 C.F.R. Section 60.18, open flares should be located in a manner to mitigate visual impacts by meeting any one of the following requirements:

- a. Blocking the view of the flare with screening or plantings;
- b. Erecting a berm or similar earthwork barrier (berm) approved by the Waste Management;
- c. Locating the open flare behind an existing berm, or placing it in a hollow or other depression;
- d. Placing the flare at least 900 feet from the nearest occupied dwelling for areas of the landfill first permitted after December 23, 2000, and at least 500 feet for areas of the landfill permitted after April 8, 1988 and before December 23, 2000 (an occupied dwelling that is owned by the landfill or any entity affiliated with the landfill is not deemed an occupied dwelling); or
- e. Installing a shroud that has been designed to minimize visible flames during normal operation.

(12) Passive control devices such as vent or wellhead flares may be considered on case-by-case basis.

LEACHATE STORAGE

Expected VOC emissions from leachate storage should be quantified in a Plan Approval application for a new landfill. Where the VOC emissions from leachate storage and/or treatment are expected to be greater than 1 ton per year at a new landfill, BAT will be determined by DEP on a case-by-case basis.

The owner and/or operator should submit a RFD to DEP when the estimated increase in emissions of VOCs from the addition of leachate storage at existing landfills would result in an expected VOC emissions increase between 1 ton per year and 2.7 tons per year. A Plan Approval and case-by-case BAT determination shall be required when the expected VOC emission increase from a new or expanded leachate storage system is greater than 2.7 tons per year.

LEACHATE RECIRCULATION

Leachate recirculation is a technique whereby the leachate withdrawn from the landfill is reintroduced to the municipal solid waste to maximize the generation of landfill gas. Leachate recirculation can be used to accelerate the bio-stabilization of the waste mass, increase the generation and/or quality of the landfill gas, reduce the quantity of the effluent, and reduce the long term environmental concerns. When leachate is recirculated, it typically enhances the generation of landfill gas such that the peak generation of gas occurs sooner than a MSW landfill that does not recirculate leachate. While the total amount of landfill gas generated over the life of the MSW landfill typically will not change, the timing and peak amount of landfill gas may change, and installation of additional air cleaning device(s) may be necessary.

If the owner or operator of a new MSW landfill or expansion of an existing landfill proposes to begin leachate recirculation (or apply other approved liquids to the disposal area), the Plan

Approval application will clearly state that intent and the landfill gas collection system and air cleaning device(s) shall be sized for the expected maximum amount of landfill gas.

If the owner or operator of an existing MSW landfill proposes to initiate recirculation (or apply other approved liquids to the disposal area), the recirculation will constitute a change in the method of operation of the source. The increase in maximum VOC emissions, if any, must be quantified and submitted to DEP prior to implementation. Pre-control maximum VOC emission increases of 2.7 tons per year or more (calculated as the sum of the fugitive VOCs from the proposed expansion and VOCs of the proposed expansion before an air cleaning device) will be subject to Plan Approval requirements. Pre-control maximum VOC emission increases of less than 2.7 tons per year (calculated as the sum of the fugitive VOCs from the proposed expansion and VOCs of the proposed expansion before an air cleaning device) may not require a Plan Approval, provided the MSW landfill submits a RFD application that provides documentation that it has sufficient capacity for the control of the increased gas production.

LANDFILL FUGITIVE EMISSION CONTROL CRITERIA

In accordance with 25 *Pa. Code* Section 123.1(c), the landfill owner or operator, should take all reasonable actions to prevent particulate matter from becoming airborne. Landfill owners and operators are required by 25 *Pa. Code* Section 273.217 to implement fugitive dust control measures. This criterion specifies the reasonable actions that are necessary for the prevention of fugitive dust emissions from the operation of landfills in accordance with these requirements.

The Plan Approval will require that landfill owners and operators use Best Management Practices (BMPs), as appropriate in the MSW landfill industry, to minimize fugitive emissions from landfill operations. These BMPs should be appropriate for the landfill and determined based on actual site conditions. The Plan Approval will specify that in no event will any activity, action or requirement cause the MSW landfill to engage in unsafe activities.

BAT for MSW landfills is to take all reasonable actions to prevent particulate matter from becoming airborne.

MSW landfill owners and operators should determine their site-specific BMPs, which generally will include one or more of the following:

- (1) Paved and unpaved internal roadways should not be allowed to generate excessive dust emissions or the tracking of dirt/soils onto public roads (carryout). BMPs to prevent excessive emissions and carryout include, but are not limited to, sweeping and/or use of a tire washing system. Relevant factors to determine whether such activities are a BMP include the length of the paved road between unpaved portions of truck traffic and the public road, the type of soils at the landfill, weather, etc. Generally, whether sweeping or tire washing is necessary should be a function of actual, daily site conditions.

- (2) Water or other chemical dust suppressants could be applied to the unpaved road surface to reduce fugitive dusts, if necessary based on daily site conditions. Water, if used, shall not be applied if the result would be a potentially unsafe condition, such as ice formation. In no event shall waste oil be used as a dust suppressant.
- (3) An appropriate speed limit will be established within 120 days of the issuance of the Plan Approval and posted on all unpaved roadways within the MSW landfill. The MSW landfill owner or operator will submit the proposed speed limit to DEP, in writing, for approval. If the proposed speed limit is approved, it will be incorporated into the MSW landfill's air quality's operating permit. The owner or operator of the landfill should speed limit signs consistent with the requirements of Pennsylvania Department of Transportation (PennDOT) (overall dimension 20 inches x 24 inches, "SPEED LIMIT" in 4-inch letters and 10-inch numerals).
- (4) Parking lots/areas and the landfill access roadways from the public highway to the landfill and other haul roads inside the landfill shall be paved, maintained, and cleaned by vacuum sweeping or any other approved means. The vacuum sweeping should be performed when necessary.
- (5) Upon leaving the landfill, the undercarriage, wheels and chassis of the vehicles which were used to transport wastes and earth should be washed to prevent earthen carryout onto roadways.
- (6) The access roadways if unpaved at the unloading areas (active cells) should have a crown and/or pitch so that water runs off and does not pool. Water or other chemical dust suppressants should be applied to the unpaved road surface to reduce fugitive dusts. Water or chemical dust suppressants should also be applied as needed.
- (7) Water or other chemical dust suppressants should be applied on the shoulder of access roadways and the shoulder of the public highway for a distance of 500 feet in both directions. Water, if used, should be applied at least twice per day. Chemical dust suppressants, if used, should be applied at least once per month. Application of dust suppressants on the public highway should be done in accordance with the appropriate PennDOT Bulletins.
- (8) Earth or other materials should not be deposited by trucking or other means on the public roadways. MSW landfills shall take all reasonable steps necessary to meet this performance standard.

- (9) If any earth or other material is deposited by trucking or other means on public roadways, it shall be removed promptly.

Please note, one method for estimating fugitive emissions of particulate matter is the most recent emission factors contained in the latest edition of *AP-42 Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*.

RECORD KEEPING AND REPORTING REQUIREMENTS FOR FUGITIVE DUST CONTROL ACTIVITIES

Records describing those fugitive dust control activities that were undertaken should be maintained for on-site review by DEP personnel.

- (1) A written manual documenting the BMPs utilized at the MSW landfill to control fugitive particulate matter emissions should be maintained on-site.
- (2) The company shall keep sufficient records to demonstrate that the BMPs are being implemented.
- (3) The BMP manual and records documenting implementation of the BMPs should be maintained at the office of the MSW landfill for 5 years and shall be made available to DEP upon request.