

QUESTIONS AND ANSWERS

Wisconsin Landfill Air Emissions

Air/Waste Workgroup on Landfill Gas

July 2009

WA1358.09

Q1: When is a DNR Air Management (AM) Program construction permit needed for a landfill and what landfill activities are covered under an air operation permit? What specific activities require an AM construction permit? Doesn't the DNR Waste and Materials Management (WMM) Program approval process cover all the bases when it comes to modifying the landfill gas system design?

A1: Generally, if your landfill has received feasibility approval (the formal decision from the WMM Program by which the capacity of the landfill is determined, along with other facility conditions) for either a new landfill or a vertical and/ or horizontal expansion, you should apply for a construction permit with the AM Program.

Initial AM construction permits for landfills, generally are issued with a 42 month expiration date and may be extended once for an additional 18 months. Following successful installation and testing of landfill gas destruction devices, an air operation permit is issued to the landfill owner/operator. The air operation permit will likely look similar to the air construction permit, will expire in five years and will need to be renewed. Most of the activities outlined in the WMM plan of operation (phased liner and final cover construction; installation of gas extraction wells; construction of phased stormwater control structures; adding or replacing specific gas extraction wells; adding or modifying a blower or compressor; to name but a few specific activities) will not be covered under your air operation permit and will be approved by the WMM Program in the facility plan of operation or in subsequent plan modifications.

The installation, replacement or modification of any landfill gas destruction device (e.g., turbine, open flare, IC engine, also generically called "control devices") not covered in a current air construction permit will likely require a new construction permit from AM (see Q7).

Q2: My landfill was approved several years ago and no AM construction permit was ever applied for or issued. What now?

A2: If there is no future work to be done at the landfill requiring a construction permit, a new construction permit is not needed. However, all active landfills will need an air operation permit (unless exempt). If the DNR's AM Program determines that a construction permit was required for past construction, the AM Program will conduct an "after-the-fact" construction permit review in conjunction with the review for the air operation permit for

the landfill. The AM Program will evaluate each situation on a case-by-case basis to determine the level of any enforcement action that may be taken.

Q3: Do air permit requirements only apply to municipal solid waste (MSW) landfills? I checked with DNR a long time ago and was told that air construction permits only applied to MSW landfills. Now it appears that all new or expanding licensed landfills need air construction permits. Did I misunderstand what was told to me previously or did DNR change its position?

A3: Since the Federal New Source Performance Standard (NSPS) for MSW landfills was finalized in 1996, DNR has taken the position that each landfill should estimate its air emissions to determine if it needs an air permit. All air emission sources require an air permit, unless exempt. Exemption criteria for construction permits are listed in s. NR 406.04, Wis. Adm. Code; exemption criteria for operation permits are listed in s. NR 407.03, Wis. Adm. Code.

All new or expanding MSW landfills are affected by the NSPS for MSW landfills; and thus, need air construction and operation permits. Likely reasons why an existing MSW landfill needs an air operation permit are listed below. Existing MSW landfills may have needed “after-the-fact” construction permits for past construction (see A2 on previous page) because of any of the following reasons:

- Landfill gas destruction devices cause emission rates of certain criteria pollutants that exceed permit exemption thresholds.
- Emission rates of certain hazardous air pollutants are subject to emission limits.
- The landfill has one or more internal combustion engine that is subject to a federal NSPS.

Likely reasons why an industrial landfill would need an air construction and/or operation permit include the following:

- The landfill has landfill gas destruction devices that cause emission rates of certain criteria pollutants to exceed permit exemption thresholds.
- Emission rates of certain hazardous air pollutants are subject to emission limits.
- The landfill has one or more internal combustion engine that is subject to a federal NSPS.

Q4: How many air permits have been issued to landfills and under what authority are they issued?

A4: The AM Program has issued permits to approximately 27 MSW landfills, as of the date of this publication. Of those 27 landfills,

- 12 have non-methane organic compounds (NMOC) generation rates that exceed 50 Mg/year; and as required by the NSPS, have to operate landfill gas collection and landfill gas destruction devices;
- 12 have NMOC generation rates less than 50 Mg/year. The air permits require each of those landfills to operate active gas collection systems and landfill gas destruction devices to meet the limits specified in ch. NR 445, Wis. Adm. Code, that pertain to state hazardous air pollutants. These permits include NSPS conditions to ensure that the active gas collection system is operating properly; and
- three are not required by the AM Program to operate active gas collection systems or landfill gas destruction devices because NMOC generation rates do not exceed 50 Mg/year and such devices are not needed to meet the limits specified in ch. NR 445, Wis. Adm. Code, that pertain to state hazardous air pollutants.

Remember that s. NR 506.08(6), Wis. Adm. Code requires the installation of a department approved system to efficiently collect and combust hazardous air contaminants emitted from landfills which accepted MSW and had a design capacity greater than 500,000 cubic yards and were approved before 1988. Section NR 504.08(2), Wis. Adm. Code, requires the installation of a department approved system to efficiently collect and combust hazardous air contaminants and applies to MSW landfills of **any size** that were approved or expanded after February 1, 1988.

Q5: My landfill has a gas collection and control system in place. If the blower or flare shuts down, can the site vent to the atmosphere?

A5: Only if the down time is less than one hour. Most air permits issued under the authority of ch. NR 445, Wis. Adm. Code, or under the NSPS state: “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 one hour...” If not already in place, the owner or operator of the landfill may want to install an auto-dialer or other system to notify the operator of a blower or flare shut down.

Q6: How about the difficulty of restarting the control device (flare, engine, etc.) within one hour? This is often not possible.

A6: The DNR’s Air Program has consistently required sources to operate control devices at all times. Landfills are encouraged to have backup control devices. Many landfills have open flares in addition to internal combustion (IC) engines. Backup flares are indispensable when an electrical generating plant or other gas utilization option becomes inoperable or unavailable or extracted gas volumes exceed the utilization capacity of the electrical generating plant or other end user. Flares need to be upgraded as landfill waste placement increases. Since an MSW landfill produces gas continuously, the gas mover system needs a backup gas control device, such as a flare, to combust gas that cannot be utilized, and this should be part of the WMM plan of operation.

Whenever landfill gas is routed to a gas treatment system that processes that collected gas for subsequent use, any device that fires that treated landfill gas is not subject to operational requirements pertaining to landfill gas control devices, including restarting the device within one hour. For example, one MSW landfill located in central Wisconsin operates a landfill gas treatment system¹ that removes particulate matter from, removes moisture from, cools and compresses collected landfill gas. The treated landfill gas is then sent via a 1.5 mile pipeline to a food processing facility where that gas is used as a fuel in two steam boilers.

So long as the boilers at the food processor combust landfill gas that has undergone treatment, the boilers will not be subject to operational requirements that affect landfill gas control devices.

Q7: My landfill is now producing enough gas that I'd like to add another turbine or internal combustion engine. Do I need a separate construction permit to do this?

A7: Yes, if the change you are proposing is not included in the current air construction permit. If, for example, the current construction permit authorizes the installation of one turbine after Phase 1 is closed and a second after Phase 3 is closed, then an additional construction permit is not needed for the second turbine, provided the construction permit has not expired. However, if the current construction permit authorizes the installation of only one turbine (or has expired), then your landfill must apply for and be issued a separate construction permit prior to the installation of a second turbine.

Similarly, replacing a landfill gas destruction device (e.g., a turbine, open flare, IC engine) requires a separate air construction permit prior to commencing the replacement, unless that replacement is authorized in the current construction permit.

Q8: What kind of control device (flare, engine, turbine, etc.) do I need to specify to meet lowest achievable emission rate (LAER)? Also, if my flare can meet the 98 percent NMOC reduction criterion in the federal rules, will I also meet the presumptive LAER or best available control technology (BACT) standards (associated with the control of hazardous air pollutants, ch. NR 445, Wis. Adm. Code) previously specified by AM for hazardous air contaminant control?

A8: The NSPS authorizes the use of various control devices. We have interpreted the BACT and LAER requirements for landfills under ch. NR 445, Wis. Adm. Code, to include the control options under the landfill NSPS; and as a result, they include open flares.

The BACT and LAER requirements for MSW landfills under ch. NR 445, Wis. Adm. Code, now include the following:

¹ Based on several applicability determinations from U.S. EPA, a landfill gas treatment system shall include compression, dewatering and filtering landfill gas to at least 10 microns.

- The use of an active landfill gas collection and control system. The control system may include an open flare.
- The implementation of the active gas collection system, control requirements, monitoring, and recordkeeping requirements specified in the municipal solid waste landfill NSPS.

As noted above, a backup flare is still strongly encouraged for any MSW landfill that uses engines, turbines, etc., as primary gas destruction devices.

Q9: When siting a new landfill or expanding an existing landfill, can I get stuck having to go through two hearings - one for WMM and one for AM?

A9: Yes. The Waste and Material Management Program approval procedures in s. 289.27, Stats., allow for a contested case hearing to be requested during the feasibility determination stage of the process. The AM construction permit process under s. 285.61, Stats., and the operation permit process under s. 285.62, Stats., both allow for a public hearing to be requested during the public comment period. Under s. 285.66, Stats., AM also provides an opportunity to request a public hearing during the 30 day public comment period for five year renewals of operation permits. In addition, following issuance of AM permits, there is a process for appeal of these determinations which could lead to a contested case hearing.

Q10: Regarding the routine reporting required by air permits, to whom do I submit the information - DNR, EPA or both? Also, where should I send it within DNR or EPA?

A10: For landfills required to operate landfill gas collection and control devices under NSPS, reporting required by NSPS should be submitted to your regional DNR AM compliance staff. Compliance certifications should be submitted to regional DNR AM compliance staff and U.S. EPA Region V. Your AM permit that contains the reporting requirements will include the address of the regional DNR office. The address for EPA is:

Compliance Data - Wisconsin DNR
Air and Radiation Division
U.S. EPA Region V
77 W. Jackson Blvd.
Chicago, IL 60604

For permits issued under state authority (i.e., Ch. NR 445, Wis. Adm. Code) reporting should be done through the regional DNR AM office included in your air permit. If your landfill was constructed or expanded after May 30, 1991, and has a capacity greater than 2.5 million megagrams or 2.5 million cubic meters, compliance certifications should be submitted to regional DNR AM compliance staff and U.S. EPA Region 5.

Remember that your WMM plan approval may require more frequent electronic submittal of data. Ultimately, the intent is for landfills to submit all monitoring (whether required by WMM approval or AM permit) to the GEMS system.

Q11: Does it make any difference if my landfill is in a non-attainment area?

A11: Possibly. A landfill located in a non-attainment area could be subject to additional requirements. If more than one regulation applies, for example, the NSPS requires 98 percent control of NMOC and if the landfill is subject to a LAER requirement of 99.9 percent control because it was constructed or expanded in a non-attainment area, then the more stringent regulation applies. (Note: This situation would apply only if the landfill expansion/construction project was subject to LAER requirements because the construction or expansion required a permit under ch. NR 408, Wis. Adm. Code.)

Q12: What authority and discretion does DNR now have in implementing the NSPS now that the NSPS has been adopted into ch. NR 440, Wis. Adm. Code, (s. NR 440.75, Wis. Adm. Code)?

A12: The state can incorporate most of the alternatives under 40 CFR 60.752(b)(2)(i)(B), into permits on a case-by-case basis. However, the department will need concurrence from U.S. EPA on supplemental and/or temporary odor and gas control system (STOCS) and any reduction of quarterly surface emissions monitoring (SEM) at NSPS sites.

Q13: My landfill's design capacity* is over 2.5 million megagrams and 2.5 million cubic meters (3.27 million cubic yards), but I don't think I'm exceeding the emissions threshold of 50 megagrams per year of NMOC. Can I "test out" of NSPS-type requirements?

A13: If the landfill's most recent construction commenced after 1991 and the design capacity is over 2.5 million megagrams and 2.5 million cubic meters, then the NMOC emission rate must be calculated to determine under which authority the department issues an air pollution control permit. The calculations procedures are described in the federal rule 40 CFR 60.754 and at s. NR 440.75(5), Wis. Adm. Code, in the state NSPS. The first step in the calculation (Tier 1) uses default values to estimate emissions. If the NMOC emission rate using Tier 1 is over 50 Mg/yr, then the owner or operator can determine site specific parameters as described under Tier II and Tier III. Note that the Tier II calculation must be submitted within 180 days of the Tier I submittal and the Tier III calculation must be submitted within 1 year of the Tier I submittal (40 CFR 60.757(c)(1) and (2) and s. 440.75(8)(c)1. and 2., Wis. Adm. Code). Since many Wisconsin MSW landfills already have gas collection and control systems installed, it may be possible to test the collected landfill gas just before the blower using an approved EPA test method to determine the NMOC concentration of the landfill gas. Note that EPA guidance indicates that only uncontrolled emission values (i.e., samples collected before any control device) are used in the applicability calculation. Whenever the NMOC generation rate for a given landfill is less than 50 Mg/year, that landfill may be required to install an active landfill gas collection system and vent the collected gas to control device(s) to meet the hazardous air

pollutant requirements specified in ch. NR 445, Wis. Adm. Code. To show that the landfill gas collection system for that landfill is operating properly, the air permit will include NSPS requirements for the active gas collection system.

* Under 40 CFR 60.751 [and s. NR 440.75(2)(g), Wis. Adm. Code] “design capacity” is defined in the landfill NSPS in terms of only the maximum in-place waste. The state WMM Program’s definition in s. NR 500.03(58), Wis. Adm. Code, defines ”design capacity” as in-place waste **plus** daily and intermediate cover.

Q14: Do I have to do SEM year-round? Is annual SEM the "norm" for all landfills?

A14: If you are a landfill owner/operator with a landfill required to meet all the provisions of the landfill NSPS, yes, you need to continue to perform quarterly SEM, as required by your air permit and 40 CFR 40.755(c). Even now that the department has incorporated the NSPS into administrative code, s. NR 440.75(6)(c), Wis. Adm. Code, does not provide the department authority to reduce the **frequency** of SEM from quarterly to a lesser frequent interval. In the future, the department may investigate the potential for reducing the frequency of SEM required for NSPS sites. The guidance recommends - at a minimum - annual surface emissions monitoring for all landfills with active gas extraction systems. For landfill permitted under the authority of ch. NR 445, Wis. Adm. Code, air permits will require annual SEM. Waste and Materials Management Program plan of operation or plan modification conditions will specify what SEM must entail. It is anticipated that air permits for landfills not subject to ch. NR 445, Wis. Adm. Code, or the landfill NSPS will not include SEM, but WMM plan approvals may.

Q15: SEM “dangerous areas” need to be determined in the field and often can't be fixed. Are outboard 4:1 slopes considered steep and/or dangerous? What about steeper areas, such as drainage swales? What about areas on the working face with compactor, construction or haul vehicle traffic?

A15: Using U.S. EPA guidance, the department determines whether specific circumstances constitute a steep slope or a dangerous area on a case-by-case basis. Typically, 4:1 slopes are NOT considered steep and may be considered dangerous only under very specific conditions (such as wet clay soils or some conditions with wet grass). This monitoring can and should be scheduled when site conditions do not present dangerous conditions. Of course, personnel performing SEM should follow common sense and safety procedures. When in doubt, contact your air and waste program compliance staff assigned to your facility.

Q16: Will there be duplication of air permits and plan of operation requirements and won't that make it difficult to make changes?

A16: The ultimate goal is to have consistent requirements apply to all landfills, and to have requirements only appear once (in either a WMM approval, or an AM permit). At a minimum, air permits for landfills subject to the NSPS must contain the parameters with

operational standards as well as other criteria specified in the NSPS. WMM Program approvals will contain more comprehensive gas system monitoring, as they traditionally have. Duplication may happen before air permits and plan of operations are in-sync, and for those minimum parameters which have operational standards in air permits. WMM Program approvals will not have operational standards assigned to parameters, whereas air permits will. In addition, air management staff will have access to gas system data in the GEMS database required by WMM Program plan approvals.

Q17: What are the roles of the AM and WMM programs and are those roles clearly defined?

A17: The WMM Program is involved with the siting, construction, operation, monitoring and closure of landfills. The AM Program is required by state and federal law to regulate air emissions and the control of hazardous air pollutants from landfills, as it does for other air emissions sources across the state. It is the intent of both programs that air and waste staff collaborate on inspections and to coordinate technical requirements of permits and approvals.

Q18: Why is this guidance so stringent for "smaller" sites?

A18: Owners/operators of landfills consider regulatory consistency an important factor for making sound business decisions. Section NR 504.08(2), Wis. Adm. Code, already requires the installation of a department approved system to efficiently collect and combust hazardous air contaminants at MSW landfills of any size that were approved or expanded after February 1, 1988.

Whenever a landfill is not required to install an active landfill gas collection system under NSPS (because the NMOC generation rate for that landfill is less than 50 Mg/year), that same landfill may be required to install an active landfill gas collection system under WMM Program rules and to vent or combust the collected gas in control device(s) to meet the hazardous air pollutant requirements specified in ch. NR 445, Wis. Adm. Code. To show that the active landfill gas collection system for that landfill is operating properly, the air permit includes most NSPS requirements.

Q19: Why are so much data required to be submitted?

A19: A significant quantity of data are already collected and represents assurance to the department, as well as the general public, that these systems are operating properly. The department believes most landfills already collect this information for their own use in operating their landfill. Enabling electronic submittal of all DNR required monitoring to a single system (GEMS), should lessen the reporting burden for sources.

Q20: Can the GEMS database handle the huge volume of data from gas systems?

A20: The GEMS database system does have this capacity.

Q21: Why not monitor liquid levels annually, instead of semiannually?

A21: The department recognizes the challenges with liquid level measurements, but believe annual measurements may not be frequent enough to adequately assess the operation of gas collection systems. With practices such as leachate recirculation and the effects of gradients established by gas extraction, liquid levels may change fairly quickly.

Q22: Not all sites can provide totalizing gas flow. What should be done?

A22: Install gas totalizers or propose an acceptable alternative.

Q23: Why monitor STOCs at all?

A23: U.S. EPA requires monitoring of these points under NSPS rules. DNR may have some flexibility concerning these points for non-NSPS landfills. Regardless, these data may be useful for understanding how these systems are performing as supplemental and/or temporary collectors.

Q24: How does guidance "track" with federal rules? How will U.S. EPA Region V interpret?

A24: Air Program legal staff have reviewed the guidance in relation to the landfill NSPS and concluded that the guidance does "track" with the NSPS.

Q25: Will following guidance put source at greater risk for litigation?

A25: As discussed in the previous question, the guidance is consistent with NSPS requirements. If there is any concern about that the guidance is inconsistent with the NSPS, the NSPS must be complied with. Furthermore, one of the goals of the guidance is to increase cooperation and communication between the WMM Program and the AM Program. We believe that following the guidance will reduce litigation risk for sources.

Q26: Why make permits for facilities subject to ch. NR 445 requirements subject to most of the NSPS requirements?

A26: Even if the NMOC generation rate for a given MSW landfill is less than 50 Mg/year, in most instances that landfill is required under WMM rules to install an active landfill gas collection system and combust or vent the collected gas to control device(s) to meet the hazardous air pollutant requirements specified in ch. NR 445, Wis. Adm. Code. Permits for facilities subject to NR 445 requirements include most NSPS requirements because they are useful for demonstrating whether the landfill gas collection system for that landfill is operating properly.

Q27: What about permits for landfills which "model out" of ch. NR 445 requirements?

A27: Landfills that have maximum, uncontrolled emissions of state hazardous air pollutants below 25 percent of the threshold values (or “model out” of the requirements) specified in ch. NR 445, Wis. Adm. Code, will not be required to install an active gas collection system or landfill gas destruction device(s). However, WMM Program rules (s. NR 504.08(2), Wis. Adm. Code) require the installation of a department approved system to efficiently collect and combust hazardous air contaminants at MSW landfills of **any size** approved or expanded after February 1, 1988.

Q28: What changes, if any, are there in the final AM and WMM program guidance on landfill emissions (May 2007) when compared to the February 2, 2007 draft version?

A28: Aside from minor content and corrections, the guidance in large part remains unchanged. There are a few notable exceptions listed below. Please consult the guidance for more detail.

- For landfills which are required to follow all the provisions of the NSPS, the frequency of SEM is quarterly.
- Next day reporting applies to when corrections aren't completed within allotted time frames. See Appendix F, item 2. Remember that landfills are required to continue to record all deviations and may be encouraged by air compliance staff to provide monthly summaries of deviations.
- The department will need concurrence from U.S. EPA on STOCs (e.g., removal of supplemental and/or temporary odor and gas system components from compliance provisions of the NSPS) and any reduction in the frequency (quarterly) of SEM at NSPS sites.