

**COMMENTS AND RESPONSES ON
BAQ-GPA/GP-22 (Landfill Gas-fired Simple Cycle Turbines)**

On March 26, 2005, notice was published in the *Pennsylvania Bulletin*, Vol. 35, Pa.B. 1937, regarding the Department of Environmental Protection's above mentioned draft air quality general plan approval and/or general operating permit.

A 45-day comment period, as prescribed by the Department's regulations, followed. The following comments were received from a landfill turbine manufacturer, Pennsylvania Waste Industries Association, Pennsylvania Chamber of Business and Industry, Waste Management and other groups identified below.

Commentators: **Leslie Witherspoon, Solar Turbines, Inc.**

General Comments:

Comment 1:

Solar Turbines, Inc. (Solar) is not convinced that a General Permit (GP) is necessary because there is and will be an insignificant volume of landfill gas-fired turbines in Pennsylvania to justify the resources necessary to draft, finalize, and administer a General Permit.

Response:

Regardless of how many landfill gas-fired turbines are currently operating or will be installed in the future in Pennsylvania, these new turbines are required to obtain a plan approval followed by an operating permit in accordance with 25 Pa. Code Chapter 127.

These turbines must control emissions to the maximum extent, consistent with Best Available Technology (BAT) as determined by the Department at the time of the issuance of the plan approval. Applications are reviewed for BAT requirements on a case-by-case basis, which may take from 90 to 180 days, depending on the type of landfill facility, number of turbines located at the facility, and complexity of regulatory requirements for each turbine.

By issuing a General Permit, the Department approves the activities authorized by the General Permit, provided that the owner or operator of the source registers with the Department and meets the emission limits and other terms and conditions comparable in the GP. 25 Pa. Code §127.621 requires the Department to take action on the application submitted for use of general plan approval and general operating permit within 30 days of receipt. This General Permit would provide a streamlined alternative to permitting for pre-construction authorization of landfill gas-fired turbines while implementing emission limitations of these engines that are protective of the environment.

Comment 2:

Solar also believes that most new landfill applications may choose not to use the GP because of its complexity and inconsistencies and instead obtain a permit via the normal permitting process.

Response:

This General Permit would provide a streamlined alternative to the case-by-case permitting process, which takes from 90 to 180 days. The Department will take an action on the application, submitted for use of general plan approval and general operating permit, within 30 days of receipt. Also, the General Permit conditions include pre-established Best Available Technology (BAT) emission limits for “new sources” and other terms and conditions comparable to recently permitted or constructed sources.

Therefore, the Department believes that most new landfill applicants will choose to use the General Permit over a case-by-case permitting approach.

Specific Comments:

Comment 1:

Turbine Overhaul:

Combustion turbines are designed with requirements for certain maintenance and/or repair activities to maintain the safety, reliability, efficiency, and life expectancy. An overhaul is the complete disassembly, inspection, rework, reassembly and test of a combustion turbine to original thermodynamic and mechanical performance. There will not be any increase in emissions as a result of the overhaul program. A routine combustion turbine overhaul meets the EPA’s criteria for Routine Maintenance Repair and Replacement (RMRR) rule. In addition to many other States, San Joaquin Valley Air Pollution Control District (SJVAPCD) and Missouri State have allowed in their rules for routine combustion turbine overhauls to occur, without permitting. A letter from William Sullivan of New Jersey Department of Environmental Protection to John Parodi of Hoffmann-LaRoche, Inc. describes a typical combustion turbine overhaul and determines that no pre-construction permit or State-of-the-Art (SOTA) review is required for the 15-year period (useful life of turbine) from the original turbine’s commencement of operation under New Jersey regulations.

It is Solar’s position, based on the routineness and nature of an overhaul, that an engine exchange does not trigger re-permitting. Solar suggests that Pennsylvania follow the lead of the other states that have allowed for routine combustion turbine overhauls to occur, without permitting.

NSR Issues:

EPA’s guidance on the subject of routine maintenance, repair and replacement under NSR depends upon a consideration of a number of factors, including the frequency, extent, nature, purpose and cost of the activity. Each of the factors supports the conclusion that such combustion turbines engine exchanges should be considered as routine maintenance, repair and replacement.

NSPS Issues:

EPA support documentation for NSPS, 40 CFR 60 Subpart GG indicates that replacement of the gas producer module or gas producer and power turbine module should be considered routine replacement. In Section 5.2.3, EPA states that a substantial portion of a gas turbine may be replaced as a matter of routine maintenance during normal overhauls. It is Solar’s position, based on review of EPA rules and guidance, that a routine combustion turbine overhaul does not trigger NSPS requirements.

Based on the above, combustion turbine overhaul should be exempted from air permitting activity.

Response:

The Department has included a new Condition 6 entitled “Physical Changes Qualifying for an Exemption” to address the concern related to the nature of turbine overhauls. As a result, turbine overhauls that qualify for this exemption will only need to go through the plan approval process and a best available technology review every 15 years. Once approved, the turbine core replacement may occur pursuant to this exemption for another fifteen (15) years, before a new plan approval and best available technology evaluation is required. For engines existing at the time this general permit is first issued and made available for use, this exemption is for no more than fifteen (15) years from the date of the first replacement. For new turbine compression engines, turbine core replacements may not occur pursuant to this exemption for no more than fifteen (15) years after the turbine compression engine first commences operation. The Department believes that this fifteen (15) years exemption period is appropriate since it is unlikely that new technology with lower emitting turbines will be developed before then.

This exemption is consistent with a settlement reached in the case *Tennessee Gas Pipeline Co. v. DEP*, (Docket number 2005-261). The Department and the company agreed to this settlement in the form of a consent adjudication that provides, among other things, that turbine core replacements may occur for no more than fifteen (15) years after which a plan approval application and best available technology evaluation must be submitted to the Department for its review and approval. Notice of settlement in the form of consent adjudication was published in the Pennsylvania Bulletin on July 1, 2006. 36 Pa.B. 3354. No comments were received on this consent adjudication.

Any owner or operator replacing the turbine core of a turbine compression engine that does not meet the requirements of Condition 6 shall apply for a plan approval that meets the requirements of 25 Pa. Code, Chapter 127, Subchapter B.

Comment 2:

Combustion turbine related routine maintenance does not trigger the definitions of “new,” “modification,” or “reconstruction” and therefore there is no justification for a BAT review each time the recommended routine maintenance is performed.

Combustion turbines used in landfill gas applications are generally much smaller than the 100 MMBtu/hr minimum threshold for RACT regulations to apply. The emission limitation for turbines regulated by RACT is approximately equal to 54 ppm NO_x at 15% O₂. It does not seem reasonable or consistent policy to require a much smaller combustion turbine to achieve a lower emission level than what is considered RACT for larger turbines burning natural gas.

BAT determination should only be imposed on an existing combustion turbine when it is truly a new, modified, or reconstructed source and not legally required for combustion turbine overhauls which occur routinely in the life of a combustion turbine.

Response:

See response to Comment 1, page 2. In addition, the RACT requirements for existing sources are applicable to only NO_x and VOC emissions, precursors for ozone unlike BAT requirements that are applicable to all criteria pollutants. Also, RACT requirements for NO_x and VOC emissions for an existing source may be relatively less stringent than BAT requirements for the identical new sources because higher cost-effectiveness thresholds are used during BAT determination.

Comment 3:

The proposed 35 ppm NO_x limit is inconsistent with the Department's published BAT determination of 42 ppm for other companies in Pennsylvania. Solar's typical NO_x emission warranty offering landfill gas-fired turbines is 42 ppm. Solar has compiled seventy-eight NO_x emissions test data for landfill gas-fired turbines operating at greater than 80% load. The data concluded that in 13% of the cases, NO_x emissions exceeded the 35 ppm level proposed in the GP. Since NO_x emissions from landfill gas turbines are highly dependent on the landfill gas composition, Solar believes that at least a 20% buffer should be added into the typically achieved NO_x emission (35 ppm) because of uncertainties involved in different landfill compositions and recommends the NO_x emission rate of 42 ppmvd corrected to 15% oxygen.

Response:

The Department has analyzed more than 100 stack test results for NO_x emissions from various landfill gas-fired turbines provided by Waste Management. Most of these test runs were performed during full load turbine operation, and in 86% of the cases the turbine NO_x emissions were lower than 35 ppmvd corrected to 15% oxygen. Since the NO_x emissions from landfill gas-fired turbines are dependent on composition of landfill gas and its heating value, the Department agrees to revise the allowable NO_x emission rate from 35 ppmvd to 42 ppmvd corrected to 15% oxygen in Condition 8.a.i.

Comment 4:

The proposed CO emissions limit of 100 ppm is only appropriate if limited to full-load operation. A level of 200 ppm would be more appropriate to account for CO emissions across the normal/typical operating load range of landfill gas-fired combustion turbine.

Response:

The Department has analyzed more than 60 stack test results for CO emissions from various landfill gas-fired turbines provided by Waste Management. The CO emissions range from 14.71 to 81.71 ppmvd corrected to 15% oxygen. Since CO emissions from landfill gas-fired turbine(s) are also dependent on fuel composition, and landfill gas compositions vary at different sites, a buffer should be added to the achievable CO emission level for all turbine types, landfill compositions, and operating modes. Therefore, a CO emission rate of 100 ppmvd corrected to 15% oxygen is considered as BAT for CO for landfill gas-fired turbine(s).

Comment 5:

Solar suggests adding a 98% destruction efficiency alternative to the VOC limit so that a facility has an option for compliance.

Solar recommends removing the NMOC requirements. Having both a VOC and NMOC standard is redundant and has no net environmental benefit. To be consistent with the MSW

NSPS it may make more sense to limit NMOC in the General Permit and remove the reference to VOC.

Response:

The Department has streamlined the conditions pertaining to VOC emission limit by removing Condition 7(a)(iii) (VOC limitation) in the proposed General Permit.

The facility has an option to show compliance with non-methane organic compounds (NMOC) from landfill gas-fired turbines by limiting the emissions to 98% percent by weight less than the amount entering the turbine or by achieving 20 ppmvd as hexane corrected to 3% oxygen.

The Department will also revise conditions pertaining to compliance verification for VOC and replace them with the conditions of compliance using a NMOC emission limit in the General Permit.

Comment 6:

Is a SO₂ emission limit necessary for landfill gas?

As with almost any pollutant from a landfill gas-fired turbine, you “get” what you “get.” Any sulfur in the fuel will exit the combustion turbine. Solar requests PA DEP provide the documentation to support the proposed SO₂ emission standard. Any SO₂ emission level should be based on a mass balance calculation based on the sulfur content of the fuel.

Response:

Section 127.12 (relating to content of applications) of Title 25 requires any new or modified source to “show that the emissions from a new source will be the minimum attainable through the use of the best available technology.” Therefore, an SO₂ emission limit is necessary for landfill gas turbines.

The Department has analyzed the actual stack test results for SO₂ emissions from landfill gas-fired turbines and found that all turbines were able to achieve an SO₂ emission rate of 30 ppmv or lower corrected to 15% oxygen. Therefore, the Department has established an SO₂ emission limit of 30 ppmvd corrected to 15% oxygen for landfill gas-fired turbines as BAT.

Comment 7:

Solar recommends using the PM₁₀ emission factor found in Table 3.1-1 in the October 1996 version of AP-42 instead of proposed PM level for landfill gas-fired turbines based on April 2000 AP-42. Solar appreciates that the October 1996 version of AP-42 does not provide an emission factor for landfill gas-fired turbines, but Solar concludes based on PM test data from their customers that 2000 version of AP-42 PM levels are not representative of small turbines burning natural gas. Also, Solar believes there is not sufficient documentation in the AP-42 background document to feel comfortable with the landfill emission level in the 2000 version of AP-42. Therefore, Solar recommends PADEP use the natural gas emission factor of 0.0419 lb/MMBtu fuel input (HHV) for landfill gas-fired turbines.

Response:

GP-22 has specifically been developed for landfill gas-fired turbines and not for natural gas fired turbines. Table 3.1-2a of EPA's AP-42 document released in April 2000 represents a PM-10 emission factor of 0.0232 lb/MMBtu for uncontrolled landfill gas-fired turbines. EPA has identified this emission factor rating as "B" in a hierarchy of levels of sophistication for quality of estimate and costs for estimation. Therefore, the Department has established an emission rate for Particulate Matter based on EPA's AP-42's emission rate of PM-10 for landfill gas turbines. PM will be assumed to be 100% PM10.

Comment 8:

Proposed Section 7 d. should be deleted as 40 CFR 63 Subpart YYYY does not apply to landfill gas-fired turbines. Therefore the proposed limits of 10 tons for any single hazardous air pollutant (HAP) and 25 tons aggregate for any combination of HAPs is irrelevant.

Response:

Area source stationary combustion turbines burning landfill gas or digester gas as their primary fuel do not have emission limitations, but new turbines must submit an initial notification and other applicable requirements in 40 CFR Part 63 Section 63.6090(b)(2). This provision does not apply to stationary combustion turbines located at an area source of HAP emissions as defined in 40 CFR Section 63.2.

Comment 9:

Solar suggests PA DEP appropriately add references to Subpart KKKK as the applicable NSPS for new combustion turbines. While the EPA-proposed 42 ppm NOx level is not appropriate for most alternative fuels, it would cover most new landfill gas applications. On that basis, Solar again suggests PADEP consider the 42 ppm NOx level proposed by EPA as a precedent for landfill gas for the GP.

Response:

Since EPA has proposed the NOx emission limitation for combustion turbines under 40 CFR Part 60, Subpart KKKK and may change it in the final rule to accommodate responses to comments, the Department has not added reference to Subpart KKKK in the General Permit.

As mentioned in the response to Comment 3 above, the Department will change the NOx emission limit to 42 ppmvd corrected to 15% oxygen.

Comment 10:

Proposed Section 8.a., 10.a.iv., and 10.a.v. There is no regulatory justification for the requirement to test for or record HAP emissions from landfill gas-fired turbines.

Response:

As per 25 Pa. Code Section 127.12(a)(3), the owners and operators of facilities are required to submit an application that "show that the source will be equipped with reasonable and adequate facilities to monitor and record the emissions of air contaminants and operating conditions, which may affect the emissions of air contaminants and that the records are being and will continue to be maintained and that the records will be submitted to the Department at specified intervals or upon request."

Section 127.12b(c) of 25 Pa. Code authorizes the Department to incorporate the monitoring, recordkeeping, and reporting provisions required by Chapter 139 (relating to sampling and testing).

Comment 11:

Proposed Section 20. Solar recommends that the term “low or transient loads” be added to the start-up and shutdown exclusion as following:

“The emission limitations stated in Condition 8 shall apply at all times except during periods of start-up and shutdown and low or transient loads, provided, however, that the duration of start-up and shut-down and low or transient loads do not exceed one hour per occurrence.

Response:

The test results for landfill gas-fired turbines typically show that emissions from these turbines decrease compared to emissions from the same turbines operating at full or rated load. The Department has revised the NOx emission limit from 35 ppmvd to 42 ppmvd corrected to 15% oxygen, which is an achievable emission rate for most of the landfill gas turbines operating at full or rated load applications. Therefore, there is no need to revise Condition 8 in the General Permit.

Commentator: **Tom McMonigle, Pennsylvania Waste Industries Association**

Comment 1:

The replacement of engine cores on existing landfill gas turbines is routine maintenance and outside of the scope of activities that require either a new or modified air permit. The routine repair of gas turbines, including replacement of wear components, should not be addressed in the proposed General Permit.

Response:

The Department has included a new Condition 6 entitled “Physical Changes Qualifying for an Exemption” to address the concern related to the nature of turbine overhauls. As a result, turbine overhauls that qualify for this exemption will only need to go through the plan approval process and a best available technology review every 15 years. Once approved the turbine core replacement may occur pursuant to this exemption for another fifteen (15) years, before a new plan approval and best available technology evaluation is required. For engines existing at the time this general permit is first issued and made available for use, this exemption is for no more than fifteen (15) years from the date of the first replacement. For new turbine compression engines, turbine core replacements may not occur pursuant to this exemption for no more than fifteen (15) years after the turbine compression engine first commences operation. The Department believes that this fifteen (15) years exemption period is appropriate since it is unlikely that new technology with lower emitting turbines will be developed before then.

This exemption is consistent with a settlement reached in the case *Tennessee Gas Pipeline Co. v. DEP*, (Docket number 2005-261). The Department and the company agreed to this settlement in the form of a consent adjudication that provides, among other things, turbine core replacements may occur for no more than fifteen (15) years after which a plan approval application and best available technology evaluation must be submitted to the Department for its review and approval. Notice of settlement in form of consent adjudication was published in

the Pennsylvania Bulletin on July 1, 2006. 36 Pa.B. 3354. No comments were received on this consent adjudication.

Any owner or operator replacing the turbine core of a turbine compression engine that does not meet the requirements of Condition 6 shall apply for a plan approval that meets the requirements of 25 Pa. Code, Chapter 127, Subchapter B.

Comment 2:

PWIA requests a public hearing held by the Department concerning this General Permit.

Response:

According to 25 Pa. Code Section 127.611, the Department is required to publish a notice in the *Pennsylvania Bulletin* to provide an opportunity to comment on a proposed general plan approval and general operating permit.

The Department has on March 25, 2005, published a notice in the *Pennsylvania Bulletin*, Vol. 35, Pa.B. 1937, regarding the draft air quality general plan approval and/or general operating permit for landfill gas-fired turbines. A 45-day comment period as prescribed by the Department's regulations followed. Therefore, an additional public hearing is not required concerning this general permit.

Commentator: Gene Barr, Pennsylvania Chamber of Business and Industry

Comment 1:

The turbine core change-out system developed by the turbine industry appears to accomplish maintenance on a turbine component, the turbine core, through an off-site overhaul and replacement program which has advantages in terms of quality control, safety, reliability and cost relative to an equivalent on-site core maintenance program, with no detrimental impact on emissions. The turbine core "change out" should not be viewed to constitute "construction" or "modification" under 25 Pa. Code § 127.11, and should be viewed to qualify for the "routine maintenance, repair and replacement" exclusion from regulatory definition of modification. The Chamber recommends that the Department modify the General Permit so as not to impose new authorization, re-permitting, or technology review requirements for landfill gas-fired turbines undergoing turbine core change out.

Response:

The Department has included a new Condition 6 entitled "Physical Changes Qualifying for an Exemption" to address the concern related to the nature of turbine overhauls. As a result, turbine overhauls that qualify for this exemption will only need to go through the plan approval process and a best available technology review every 15 years. Once approved, the turbine core replacement may occur pursuant to this exemption for another fifteen (15) years, before a new plan approval and best available technology evaluation is required. For engines existing at the time this general permit is first issued and made available for use, this exemption is for no more than fifteen (15) years from the date of the first replacement. For new turbine compression engines, turbine core replacements may not occur pursuant to this exemption for no more than fifteen (15) years after the turbine compression engine first commences operation. The Department believes that this fifteen (15) years exemption period is appropriate.

since it is unlikely that new technology with lower emitting turbines will be developed before then.

This exemption is consistent with a settlement reached in the case *Tennessee Gas Pipeline Co. v. DEP*, (Docket number 2005-261). The Department and the company agreed to this settlement in the form of a consent adjudication that provides, among other things, that turbine core replacements may occur for no more than fifteen (15) years after which a plan approval application and best available technology evaluation must be submitted to the Department for its review and approval. Notice of settlement in the form of consent adjudication was published in the Pennsylvania Bulletin on July 1, 2006. 36 Pa.B. 3354. No comments were received on this consent adjudication.

Any owner or operator replacing the turbine core of a turbine compression engine that does not meet the requirements of Condition 6 shall apply for a plan approval that meets the requirements of 25 Pa. Code, Chapter 127, Subchapter B.

Commentator: Tina Daly, Pennsylvania Environmental Network

Comment 1:

The PEN Sludge Team is opposed to all General Permits and to General Permitting over all. All General permits should be banned.

Response:

Subchapter H of 25 Pa. Code Chapter 127 contains provisions for the issuance of General Plan Approvals and General Operating permits for source categories that are similar in nature and can be adequately regulated using standard specifications and conditions. As required under Section 6.1 of the Pennsylvania Air Pollution Control Act (“APCA”) and its implementing regulations, the Department issues air quality plan approvals and operating permits for air contamination sources. Chapter 127 of 25 Pa. Code requires that all new sources shall control the emissions to the maximum extent, consistent with the Best Available Technology (BAT) as determined by the Department at the time of the issuance of the plan approval. Applications are reviewed for BAT requirements on a case-by-case basis, which may take from 90 to 180 days depending on the type of facility, number of sources located at the facility, and complexity of regulatory requirements for each source. The Department acknowledges the need for the ability to quickly authorize construction and/or operation of the several sources, and therefore has developed general permits for a specific class of significant sources. A General Permit is a pre-approved plan approval and/or operating permit, which applies to these sources. By issuing a General Permit, the Department approves the activities authorized by the General Permit, provided that the owner or operator of the source registers with the Department and meets emission limits and other terms and conditions. General permits are best suited for similar facilities or sources. The authorization to construct and authorization to operate under the General Permits emphasize on streamlining the process by using a simplified application and issuance process. Section 127.621 requires the Department to take action on the application submitted for use of general plan approval and general operating permit within 30 days of receipt.

General Permits are not mandatory. The owners or operators of facilities which do not want to use general plan approvals or general permits may apply to the Department for a case-by-case

review of air quality plan approval requirements in accordance with 25 Pa. Code Chapter 127, Subchapter B.

Therefore, general permits are an important and useful tool, and necessary for specific sources that are required to construct and operate quickly and for which the Department has pre-determined BAT requirements.

Comment 2:

“The Public, especially at the local level, has no way to make its opinions known on projects that are permitted in this way” (through a general permit).

Response:

According to 25 Pa. Code Section 127.611, the Department is required to publish a notice in the *Pennsylvania Bulletin* to provide an opportunity to comment on a proposed general plan approval and general operating permit.

The Department published a notice in the *Pennsylvania Bulletin* on March 25, 2005, Vol. 35, Pa.B. 1937, regarding the draft air quality general plan approval and/or general operating permit for landfill gas-fired turbines. A 45-day comment period as prescribed by the Department’s regulations followed. The Department also published notice in six newspapers of general circulation for the opportunity to provide comments.

Commentator: **Dr. Lewis Cuthbert, The Alliance For a Clean Environment (ACE)**

Comment 1:

ACE is opposed to the authorization of the construction of landfill gas-fired turbines to meet the misleading and deceptive term, best available technology (BAT). BAT does not mean the safest technology to prevent harm to human health, but instead the most cost-effective technology for landfill owners.

Response:

BAT is not the most cost-effective technology; instead, BAT is an evolving standard and is defined as equipment, devices, methods or techniques as determined by the Department that will prevent, reduce or control emissions of air contaminants to the maximum degree possible and that are available or may be made available.

Comment 2:

The only way to protect the interests of the public and to reduce public health risks to the greatest extent possible from landfill gas combustion is to require landfill owners to filter their gas with the most effective filtration system possible, prior to burning it in turbines.

Response:

The proposed general permit for landfill gas-fired turbines does contain the following condition requiring the permittee to treat the landfill gas prior to burning in the combustion turbine:

8f. The owner or operator of a landfill gas-fired turbine(s) is not subject to the new source performance standards (NSPS) in 40 CFR Part 60, Subpart WWW, Emission Guidelines in 40

CFR Part 60, Subpart Cc, or the NESHAP requirements for municipal solid waste landfills specified in 40 CFR Part 63, Subpart AAAA if it uses treated landfill gas in accordance with 40 CFR § 60.752(b)(2)(iii)(C). The compression, de-watering, and filtering of landfill gas down to at least 10 microns shall be considered as “treatment.” If the landfill gas does not qualify as a “treated” gas, the permittee shall comply with Subpart WWW and the NESHAP requirements in 40 CFR Part 63, Subpart AAAA.

If the permittee treats the landfill gas and combusts the gas in the turbine, the turbine is not subject to Subpart WWW or the NESHAP requirements in Subpart AAAA. Notwithstanding this exception, the emissions from any atmospheric vent from the treatment system shall be subject to the NSPS requirements of 40 CFR § 60.752(b)(2)(iii)(A) and (B), as well as the NESHAP requirements.

Comment 3:

The permit for Pottstown Landfill’s turbines claims it has the best available technology; however, there is absolutely no filtration for toxics. All the hazardous materials combusted, including metals and radiation, are simply broadcast into the air.

Response:

The permit for the Pottstown Landfill gas facility has been issued in accordance with 25 Pa. Code §127.12b and §§127.441 – 445.

Comment 4:

The pipeline for Pottstown Landfill gas was permitted under a five year old general permit for natural gas in another part of the state, even though there are major differences between landfill gas and natural gas that should have prevented a general permit for a natural gas pipeline to be used for a landfill gas pipeline. Yet, the natural gas general permit was indiscriminately and irresponsibly used to permit the Pottstown Landfill gas pipeline.

Response:

The Air Quality Program of the Department has never developed any general permits for a natural gas pipeline, nor has the Air Quality Program established specific standards for natural gas pipelines. The permit for the Pottstown Landfill gas facility has been issued in accordance with 25 Pa. Code §127.12b and §§127.441 – 445.

Comment 5:

The terms and conditions in this general permit rely on the landfill owner doing its own stack testing, monitoring, recordkeeping, and reporting. Experience has shown us this is neither a reliable nor protective way to prevent excessive threats to public health from unnecessary air pollution.

Response:

Though the stack testing for air pollutants is to be performed by the facilities, a condition requiring them to perform these tests in accordance with methods defined in Section 60.335 of the NSPS, Subpart GG, for NO_x, and in accordance with 25 Pa. Code, Chapter 139 has been established in the general permit.

The owners and operators of affected facilities are also required to submit within sixty (60) days after completion of the stack test, two (2) copies of the complete test report, including all operating conditions to the Department for approval.

In accordance with 40 CFR§ 60.334, the permittee is required to sample daily the landfill gas being fired for nitrogen and sulfur content.

The facility owners and operators are required to retain these records for a minimum of five (5) years and make them available to the Department upon request. The Department reserves the right to expand the list contained in this condition as it may reasonably prescribe pursuant to the provisions of Section 4 of the Pennsylvania Air Pollution Control Act (35 P. S. §§ 4001-4015), and as it may deem necessary to determine compliance with any conditions contained in the general permit.

Therefore, the general permit contains an adequate number of conditions to show facility compliance with allowable emissions standards and for the Department to verify these standards.

Comment 6:

The draft permit states that the landfill gas-fired turbine shall be operated in such a manner as not to cause air pollution. This is not possible, as turbines cannot be operated in a way not to cause air pollution. The only way to minimize the air pollution would be to filter the gas for all contaminants possible, before it is burned.

Response:

The term “air pollution” is defined in 25 Pa. Code §121.1 as “the presence in the outdoor atmosphere of any form of contaminant, including, but not limited to, the discharging from stacks, chimneys, openings, buildings, structures, open fires, vehicles, processes or any other source of any smoke, soot, fly ash, dust, cinders, dirt, noxious or obnoxious acids, fumes, oxides, gases, vapors, odors, toxic, hazardous or radioactive substances, waste or other matter in a place, manner or concentration inimical or which may be inimical to public health, safety or welfare or which is or may be injurious to human, plant or animal life or to property or which unreasonably interferes with the comfortable enjoyment of life or property.”

In reference to the comment about landfill gas to be treated for contaminants prior to burning in turbines, the proposed general permit for landfill gas-fired turbines does contain the following condition encouraging the permittee to treat the landfill gas prior to burning in the combustion turbine:

8f. The owner or operator of a landfill gas-fired turbine(s) is not subject to the new source performance standards (NSPS) in 40 CFR Part 60, Subpart WWW, Emission Guidelines in 40 CFR Part 60, Subpart Cc, or the NESHAP requirements for municipal solid waste landfills specified in 40 CFR Part 63, Subpart AAAAA if it uses treated landfill gas in accordance with 40 CFR § 60.752(b)(2)(iii)(C). The compression, de-watering, and filtering of landfill gas down to at least 10 microns shall be considered as “treatment.” If the landfill gas does not qualify as a “treated” gas, the permittee shall comply with Subpart WWW and the NESHAP requirements in 40 CFR Part 63, Subpart AAAAA.

If the permittee treats the landfill gas and combusts the gas in the turbine, the turbine is not subject to Subpart WWW or the NESHAP requirements in Subpart AAAAA. Notwithstanding this exception, the emissions from any atmospheric vent from the treatment system shall be

subject to the NSPS requirements of 40 CFR § 60.752(b)(2)(iii)(A) and (B), as well as the NESHAP requirements.

Comment 7:

There is no provision for DEP to accurately determine how much of which kind of air pollution is being released from a particular turbine.

Response:

In accordance with Condition 9 of the proposed general permit, the permittee is required to perform a stack test on a new landfill gas-fired turbine within sixty (60) days after achieving the maximum production rate, but not later than one hundred and eighty (180) days after initial startup of the facility. Each turbine shall be stack tested for NO_x (oxides of nitrogen), CO (carbon monoxide), NMOC (non-methane organic compounds), HAPs (Hazardous Air Pollutants), SO₂ and visible emissions. Stack testing is required to be performed in accordance with methods defined in Section 60.335 of the NSPS, Subpart GG, for NO_x, and in accordance with 25 Pa. Code, Chapter 139 for NO_x, CO, NMOC, HAPs, and visible emissions.

In addition to the above stack testing requirements, the General Permit also requires NO_x and CO emissions testing using a portable gas analyzer or a stack test approved by the Department for a landfill gas-fired turbine following replacement with a new “turbine core.”

Therefore, the general permit contains conditions to determine how much of which kind of air pollution is being released from a particular turbine.

Comment 8:

One time stack test will provide only a snapshot result in time and will not necessarily guarantee the landfill gas-fired turbine during equipment failure, excess flows, and other problems from turbines burning unfiltered gas produced from a wide variety of dangerous wastes.

Response:

In addition to stack testing requirements, the general permit also requires NO_x and CO emissions testing using a portable gas analyzer or a stack test approved by the Department for a landfill gas-fired turbine following replacement with a new “turbine core.” Condition 7 of the general permit also requires the permittee to notify the Department, in writing, within 24 hours of the discovery of any malfunction during a business day or by 4:00 p.m. on the first business day after a weekend or holiday of any malfunction of the landfill gas-fired turbine(s) which results in, or may result in, the emission of air contaminants in excess of the limitations specified in, or established pursuant to, any applicable rule or regulation contained in 25 Pa. Code, Subpart C, Article III (relating to air resources).

Comment 9:

The permittee would only be required to monitor daily for nitrogen and sulfur content and not the other hazardous chemicals and metals which can be in the gas.

Response:

The potential for metal content in landfill gas is minimal because landfill gas is produced as a result of anaerobic decomposition of organic wastes. As per condition 8.f. of the general permit, the permittee is required to treat the landfill gas for contaminants prior to burning in turbines, if opting out of 40 CFR Part 60, Subpart WWW, Emission Guidelines in 40 CFR Part 60, Subpart Cc or the NESHAP for municipal solid waste landfills in 40 CFR Part 63, Subpart AAAA. The general permit requires the permittee to limit the emissions of non-methane organic compounds (NMOC) from turbine to 98 percent by weight less than the amount entering the turbine or 20 ppmvd corrected to 3% oxygen as hexane. The general permit also limits the permittee to emit any single Hazardous Air Pollutants (HAP) at less than 10 tons per year and 25 tons per year aggregate for any combination of HAPs during consecutive rolling 12-month period. Therefore, monitoring of hazardous chemicals and metals in the landfill gas is not necessary.

Commentator: **Harold Miller, The Southwestern Pennsylvania Growth Alliance**

Comment 1:

The General permit needs to give permittee the flexibility to make changes that will not increase air emissions. In particular, the general permit requires a new permit review for each turbine maintenance overhaul or turbine core exchange.

Response:

The Department has included a new Condition 6 entitled “Physical Changes Qualifying for an Exemption” to address the concern related to the nature of turbine overhauls. As a result, turbine overhauls that qualify for this exemption will only need to go through the plan approval process and a best available technology review every 15 years. Once approved, the turbine core replacement may occur pursuant to this exemption for another fifteen (15) years, before a new plan approval and best available technology evaluation is required. For engines existing at the time this general permit is first issued and made available for use, this exemption is for no more than fifteen (15) years from the date of the first replacement. For new turbine compression engines, turbine core replacements may not occur pursuant to this exemption for no more than fifteen (15) years after the turbine compression engine first commences operation. The Department believes that this fifteen (15) years exemption period is appropriate since it is unlikely that new technology with lower emitting turbines will be developed before then.

This exemption is consistent with a settlement reached in the case *Tennessee Gas Pipeline Co. v. DEP*, (Docket number 2005-261). The Department and the company agreed to this settlement in the form of a consent adjudication that provides, among other things, that turbine core replacements may occur for no more than fifteen (15) years after which a plan approval application and best available technology evaluation must be submitted to the Department for its review and approval. Notice of settlement in the form of consent adjudication was published in the Pennsylvania Bulletin on July 1, 2006. 36 Pa.B. 3354. No comments were received on this consent adjudication.

Any owner or operating replacing the turbine core of a turbine compression engine that does not meet the requirements of Condition 6 shall apply for a plan approval that meets the requirements of 25 Pa. Code, Chapter 127, Subchapter B.

Commentator: **Ballard Spahr Andrews & Ingersoll, LLP**

Comment 1:

The Coalition urges the Department not to establish inappropriate regulatory practices with respect to landfill gas-fired turbines, particularly in connection with turbine core changeovers, that might also be extended to natural gas-fired pipeline turbines. The Coalition is concerned that embedded within the proposed General Permit lies an implicit determination that turbine core exchanges in landfill gas-fired simple cycle turbines are not routine maintenance, repair, and replacement, but that they are source construction or modification.

Comment 2:

Since the 1960s – well before the federal or state New Source Review (“NSR”) requirements, or even Pennsylvania’s present BAT requirements, were established – these turbines have been designed for routine, periodic off-site maintenance. Indeed, typical designs do not allow cost-effective on-site maintenance of these turbines. Instead, the manufacturer calls for “component exchange” of the turbine by removing the components in need of maintenance and replacing them with like-kind components from the manufacturer’s inventory. Typically, the component exchange involves only the gas producer and power train because the stresses of normal operation most particularly affect those components.

Most component exchanges leave the important turbine operating specifications unaffected. They do not change mass flow, firing temperature, or control parameters. Under standard industry practice, turbine operators use these component exchanges for routine maintenance, and not to increase horsepower, heat input capacity or emission rate. Typically, when a turbine system’s capacity or emission rate is increased, other regulatory obligations (both environmental and non-environmental) apply.

Comment 3:

Imposing a requirement that a unit whose turbine core comes up for regularly scheduled component exchange meet BAT standards in effect at the time of the maintenance will have several unintended adverse effects. Turbine system operators may be more inclined to avoid new BAT controls by abandoning the typical component exchange procedure and performing turbine core maintenance on site. Some operators might choose to delay component exchanges beyond the manufacturer’s recommended intervals. Under these altered circumstances, the advantages of the component exchange system described above in terms of enhanced reliability, safety, efficiency and cost would be markedly diminished. In addition, deterring maintenance by imposing a BAT requirement at the time of maintenance may perversely reduce environmental performance otherwise achievable by efficiently operating units.

This is not a case where imposing technology-based requirements at the time of an equipment replacement is needed to serve any significant environmental purpose. Moreover, these requirements would be more stringent than mandated under the federal Clean Air Act, Pennsylvania’s Air Pollution Control Act, and even the permitting programs of other states, as explained below. The turbine-core component exchanges are like kind and do not constitute construction of a new source. No change occurs to the operation of the unit, although it does maintain its efficiency and safety. To the extent that any benefits arise from imposing new BAT requirements at the time of turbine core component exchanges, they are not justified in relation to the attendant adverse impacts.

Comment 4:

Pennsylvania law not only authorizes exclusion of turbine core component exchanges from new permitting or new reauthorization requirements, but such exclusion for component exchange is also supported by other Pennsylvania policy objectives. Excluding maintenance component exchanges from BAT requirements will not lead to increased emissions from turbines, otherwise covered by the general permit, and thus will not present additional impacts on air quality or public health. Furthermore, by maintaining a regulatory approach consistent with other jurisdictions, Pennsylvania will not have a competitive disadvantage with other jurisdictions; Pennsylvania will not have a competitive disadvantage in decisions on where to place these units (and associated employment opportunities).

Response to Comments 1-4:

The Department has included a new Condition 6 entitled “Physical Changes Qualifying for an Exemption” to address the concern related to the nature of turbine overhauls. As a result, turbine overhauls that qualify for this exemption will only need to go through the plan approval process and a best available technology review every 15 years. Once approved, the turbine core replacement may occur pursuant to this exemption for another fifteen (15) years, before a new plan approval and best available technology evaluation is required. For engines existing at the time this general permit is first issued and made available for use, this exemption is for no more than fifteen (15) years from the date of the first replacement. For new turbine compression engines, turbine core replacements may not occur pursuant to this exemption for no more than fifteen (15) years after the turbine compression engine first commences operation. The Department believes that this fifteen (15) years exemption period is appropriate since it is unlikely that new technology with lower emitting turbines will be developed before then.

This exemption is consistent with a settlement reached in the case *Tennessee Gas Pipeline Co. v. DEP*, (Docket number 2005-261). The Department and the company agreed to this settlement in the form of a consent adjudication that provides, among other things, that turbine core replacements may occur for no more than fifteen (15) years after which a plan approval application and best available technology evaluation must be submitted to the Department for its review and approval. Notice of settlement in the form of consent adjudication was published in the Pennsylvania Bulletin on July 1, 2006. 36 Pa.B. 3354. No comments were received on this consent adjudication.

Any owner or operator replacing the turbine core of a turbine compression engine that does not meet the requirements of Condition 6 shall apply for a plan approval that meets the requirements of 25 Pa. Code, Chapter 127, Subchapter B.

Comment 5:

In Section 2 of GP-22, under the heading “Plan Approval”, the General Permit only authorizes construction of a turbine that meets BAT requirements. It would seem within the spirit of efficiency promoted by this permit to include within its scope other actions which otherwise trigger plan approval requirements under 25 Pa. Code §127.11, namely modification, reactivation and installation of air cleaning devices. These actions, presumably, would have to meet the notice and authorization requirements of Section 6 and BAT requirements of Section 7, although for the same reasons listed above, the coalition believes that the last paragraph of Section 6 as drafted also, should not be employed in this context. Consistent with this

approach, it would also seem that the third line of the second paragraph of Section 5 should read “without Department authorization ...” rather than “without Department approval ...”.

Response:

In Condition 2, under the heading “Plan Approval,” it is clearly stated that the General Permit authorizes the construction of landfill gas turbine(s) that meet the best available technology (BAT) required under 25 Pa. Code §§127.1 and 127.12(a)(5), and BAT for any landfill gas-fired turbine shall include the installation and operation of available control measures that reduce emissions to the limitations specified in Condition 8 of the General Permit.

Condition 2 covers installation of air cleaning devices. Condition 5 states that “Authorization to operate the landfill gas turbine(s) under this General Permit shall be suspended, if, at any time, the permittee causes, permits or allows any modification without Department approval ...”. Modifications must be approved by the Department. Finally, reactivation of a landfill gas turbine would require approval and issuance of a new General Permit by the Department.

Comment 6:

To the extent that the Department seeks to establish new or more restrictive BAT requirements going forward, other than those set forth in a General Permit it once issued in final, presumably it will do so by modifying the General Permit. Such a modification should be preceded by a public notice and opportunity for comment. The Coalition believes the General Permit should explicitly identify that this would be the procedure it would use for establishing more restrictive BAT standards. The coalition reserves its right to comment on any specific BAT requirements the Department might chose to propose for natural gas transmission turbines.

Response:

According to 25 Pa. Code §127.612(a), “The Department will provide notice and an opportunity to comment on a proposed general plan approval or general operating permit. The notice will be published in the *Pennsylvania Bulletin* and in six local newspapers of general circulation, one in the area of each Department regional office. The notice will also be sent to the EPA and a copy of PA Bulletin containing the notice was sent to Ohio, West Virginia, Virginia, Maryland, Delaware, New Jersey and New York.” Therefore, it is not necessary to explicitly state this procedure in the General Permit, and the Coalition is certainly entitled to comment on more restrictive BAT requirements during the comment period.

Comment 7:

Section 7.C appears to set BAT standards for opacity, but it only speaks in terms of limits on “emissions.” This provision should be clarified.

Response:

The Department agrees and has add the word “opacity” after the word “percent” throughout the renumbered Condition 8.

Comment 8:

Because Section 6 of the General Permit should not contain reauthorization and new BAT implementation requirements, Section 8 of the General Permit should be conformed. Performance testing requirements should be removed from Section 8.b, and the references to Section 8.b and portable gas analyzer testing in Sections 8.c and 8.d should also be removed.

Response:

See response to Comments 1-4, page 16. In addition, it is reasonable to require a demonstration within 30 days after achieving the maximum production rate, after replacing with a new “turbine core”, that the landfill gas fired turbine is meeting the NOx and CO emission limits in Condition 8.

Commentator: Eli R. Brill, Waste Management

General Comment 1:

The turbine engine exchange/routine overhaul does not alter the turbine capacity, does not alter performance, and does not result in any increase in emission rates. The turbine core exchange procedures for landfill gas-fired turbines should neither trigger plan approval requirements nor implicate any federal permitting or regulatory standards. Instead of requiring BAT reviews after every turbine core overhaul, the Department can address this concern in the existing permit by requiring advance notice before and emission verification after overhaul.

Response:

The Department has included a new Condition 6 entitled “Physical Changes Qualifying for an Exemption” to address the concern related to the nature of turbine overhauls. As a result, turbine overhauls that qualify for this exemption will only need to go through the plan approval process and a best available technology review every 15 years. Once approved, the turbine core replacement may occur pursuant to this exemption for another fifteen (15) years, before a new plan approval and best available technology evaluation is required. For engines existing at the time this general permit is first issued and made available for use, this exemption is for no more than fifteen (15) years from the date of the first replacement. For new turbine compression engines, turbine core replacements may not occur pursuant to this exemption for no more than fifteen (15) years after the turbine compression engine first commences operation. The Department believes that this fifteen (15) years exemption period is appropriate since it is unlikely that new technology with lower emitting turbines will be developed before then.

This exemption is consistent with a settlement reached in the case *Tennessee Gas Pipeline Co. v. DEP*, (Docket number 2005-261). The Department and the company agreed to this settlement in the form of a consent adjudication that provides, among other things, that turbine core replacements may occur for no more than fifteen (15) years after which a plan approval application and best available technology evaluation must be submitted to the Department for its review and approval. Notice of settlement in the form of consent adjudication was published in the Pennsylvania Bulletin on July 1, 2006. 36 Pa.B. 3354. No comments were received on this consent adjudication.

Any owner or operator replacing the turbine core of a turbine compression engine that does not meet the requirements of Condition 6 shall apply for a plan approval that meets the requirements of 25 Pa. Code, Chapter 127, Subchapter B.

Specific Comments:

Comment 1.A:

The Department should specify in a background document what control measures it believes are presently available and reasonable to achieve these emissions reductions.

Response:

The allowable emissions levels in the general permit are established for uncontrolled turbines operating with good combustion practices. The Department will include such language in the background document, which is attached hereto.

Comment 1.B:

In regard to the Condition 7, several of the emission limitations go beyond BAT and cannot be achieved on a consistent basis.

Response:

The Department has analyzed more than 100 stack test results for NO_x, CO and SO₂ emissions from various landfill gas-fired turbines. The Department evaluated the emissions data from these tests and appropriate BAT emissions limits were determined for this GP as demonstrated to be achievable in practice. The details of this analysis are contained in the attached background document.

Comment 1.C:

It is unclear whether a general permit can be used at a Title V facility for turbine engine exchanges, given the last sentence in sub-paragraph 4 of Condition 2. Condition 18 provides more clarity and the Department should consider striking and/or editing the last sentence in the sub-paragraph 4.

Response:

The Department agrees and has deleted the last sentence in its entirety.

Comment 2.A:

Conditions 3 and 6 appear to require prior written approval before proceeding with a turbine core overhaul/replacement. Waiting for the Department's approval for seven days or longer will cause problems in the event of catastrophic failure of the turbine core.

Response:

In the event of catastrophic failure of a turbine core, the owner or operator may replace the turbine core with an identical turbine core without notification to the Department. In accordance with 25 Pa. Code §127.14 (a)(9) 15, a Plan Approval is not required for the temporary (no longer than 6 months) replacement of a source with a source of equal or less potential emissions.

Comment 2.B:

Condition 11(a) requires 5 days advance notice prior to completion of construction of the sources. If this is intended to apply to turbine engine exchanges/replacements, it will be difficult to comply, since replacement of the core can take place in one day or two days.

Response:

The requirement for advance notice established in renumbered Condition 12(a) is for a “new source” and does not apply to the turbine core replacement.

Comment 3:

Condition 4 requires the owner to operate “in accordance with manufacturer’s specifications.” Please note that Condition 12 and possibly other sections in the permit specify work practice requirements, which may or may not be similar to manufacturer’s specifications.

Response:

The permittee is required to comply with all conditions established in the general permit. If the landfill gas-fired turbine(s) at the facility cannot be regulated by the requirements of this General Permit, a plan approval and/or an operating permit issued in accordance with 25 Pa. Code Chapter 127, Subchapter B (relating to plan approval requirements) and/or Subchapter F (relating to operating permit requirements) will be required.

Comment 4.A:

Condition 7(a)(iii): The VOC limit of 20 ppm (corrected to 3% oxygen as hexane) is more stringent than other permits issued to landfill gas-fired turbines in Commonwealth. The limit would be acceptable if the alternative destruction efficiency of 98% was also provided.

Response:

The Department has streamlined the conditions pertaining to VOC emission limit by removing the renumbered Condition 8(a)(iii) in the General Permit.

The facility owner or operator may demonstrate compliance with non-methane organic compounds (NMOC) from landfill gas-fired turbine whether by limiting the emissions to 98% percent by weight less than the amount entering the turbine or by achieving 20 ppmvd as hexane corrected to 3% oxygen.

The Department has also revised the conditions pertaining to compliance verification for VOC limit and replace them with the conditions for compliance for NMOC emission limit in the general permit.

Comment 4.B:

Condition 7(a)(i): The NOx emission limit of 35 ppm is too stringent. The appropriate limit is 42 ppm.

Response:

The Department has analyzed more than one hundred stack test results for NOx emissions from various landfill gas-fired turbines provided by Waste Management. Most of these test runs

were performed during full turbine load operation and in 86% of the cases the turbines were able to meet NOx emission at lower than 35 ppmvd corrected to 15% oxygen. Since the NOx emissions from landfill gas-fired turbines are dependent on composition of landfill gas and its heating value, the Department agrees to revise the allowable NOx emission rate from 35 ppmvd to 42 ppmvd corrected at 15% oxygen.

Comment 4.C:

Condition 7(a)(iv): Further discussion for the basis for the particulate matter limit (0.0232 lb/MMBtu) expressed in heat input terms is needed.

Response:

Table 3.1-2a of EPA's AP-42 document released on April, 2000 represents the PM-10 emission factor of 0.0232 lb/MMBtu for uncontrolled landfill gas-fired turbines. EPA has identified this emission factor rating as "B" in a hierarchy of levels of sophistication for quality of estimate and costs for estimation. Therefore, the Department has established an emission rate for particulate matter based on EPA's AP-42's emission rate of PM-10 for landfill gas turbines. PM will be assumed to be 100% PM10.

Comment 4.D:

Condition 7(b): A NMOC emission limit is not necessary and should not be applicable if the landfill is pretreating the gas prior to reuse in the turbine. Establishing a VOC limit in place of an NMOC emission limit should address the Department's need to establish BAT for the relevant criteria pollutant.

Response:

In fact, the Department has decided to make it easier by streamlining the conditions pertaining to VOC emission limit by removing the renumbered Condition 8(a)(iii) in the general permit.

The facility has an option to show compliance with non-methane organic compounds (NMOC) from landfill gas-fired turbines whether by limiting the emissions to 98% percent by weight less than the amount entering the turbine or by achieving 20 ppmvd as hexane corrected to 3% oxygen.

The Department has also revised the conditions pertaining to compliance verification for VOC limit and replace them with the conditions for compliance for NMOC emission limit in the general permit.

Comment 4E:

Condition 7(c): We are unaware of any regulatory basis for a 10 percent opacity limitation during "normal operations." The 20 percent opacity standard for periods aggregating more than three (3) minutes in any one-hour and 60 % opacity limits should be the general standard that applies. The use of the 20% and 60% standards should not be limited to startup/shutdown situations.

Even if the 10 percent opacity limitation should apply, no averaging period is specified. The method of compliance is also not provided.

Response:

Visible emission limitation of 10 percent at normal operation has been established in accordance with the case-by-case BAT determination as authorized to the Department by 25 Pa. Code §127.12b.

The visible emission limitation shall apply at all times except during periods of start-up and shutdown, provided, however, that the duration of start-up and shutdown do not exceed one hour per occurrence.

Visible emissions may be measured using either of the following:

(1) A device approved by the Department and maintained to provide accurate opacity measurements.

(2) Trained observers qualified to measure plume opacity with the naked eye or with the aid of devices approved by the Department.

Comment 4.F:

Condition 7(d): The proposed general permit creates potential confusion with respect to Subpart YYYY applicability and unnecessarily imposes a limit of 10 ton per year/25 ton per year on individual and total hazardous air pollutant emissions. 40 CFR Part 63, Subpart YYYY does not apply to landfill gas-fired turbines at area sources. Existing stationary combustion turbines in all subcategories do not have to meet the requirements of this subpart and of subpart A of Part 63. No notification is necessary for any existing turbine, even if a new or reconstructed turbine in the same category would require an initial notification.

Response:

Stationary Combustion Turbines located at a source of HAP emissions as defined at 40 CFR Section 63.2 and burning landfill gas or digester gas as their primary fuel do not have emission limitations, but new turbines must submit an initial notification and other applicable requirements in 40 CFR Part 63, Subpart YYYY, Section 63.6090(b)(2).

Comment 4.G:

Condition 7(f): The second sentence purports to define “treatment” under the NSPS, Subpart WWW, §60.752(b)(2)(iii)(C). EPA has not yet specified by regulation the definition of “treatment” pursuant to the NSPS. Rather than attempting to codify the definition of treatment in a state issued document as it pertains to a federal program, the issue of whether a landfill or turbine owner/operator sufficiently treats landfill gas should be addressed in site-specific applicability determinations directed to the Administrator.

Response:

The Department agrees with this comment, although it does not believe it has codified “treatment.” We understand, however, that EPA has defined “treatment” of landfill gas.

Comment 5:

Condition 8(a): For new landfill sites, the testing requirements should be more clearly specified. The federal and state standards should be reconciled.

The timing of source testing required within 60 days of achieving maximum production is problematic, as the turbine operation tends to achieve maximum production rate immediately. Condition 8 (c), which requires submission of stack test protocol 60 days in advance of stack test, making simultaneous compliance with both conditions potentially impossible.

Testing requirements for HAPs do not appear in existing permits such as Green Knight facility and Pottstown facility. HAP emissions are expected to be small, there are reliable emission factors available for the unit type, and cost of testing is not justified in such context. HAP testing should be limited to (a) to those facilities that appear to have emissions potentially close to 10 tpy/25 tpy major source threshold; and (b) HAP found in a pre-test sampling of landfill gas entering the turbine at concentrations greater than the detection limit and other relevant threshold criteria.

Response:

Some basic planning would allow the facility to submit the stack test protocol 60 days prior to the stack test and perform the test prior to 60 days after reaching maximum production. Since it is argued that maximum production is achieved immediately, the protocol should be sent to the Department a couple of days before startup. EPA Test Method 18 is used to measure speciated HAPs and can be used to determine the turbine emissions.

Source testing for visible emissions should not be necessary. Visible emissions may be measured using either of the following:

(1) A device approved by the Department and maintained to provide accurate opacity measurements.

(2) Trained observers qualified to measure plume opacity with the naked eye or with the aid of devices approved by the Department.

Comment 6:

Condition 9: In the case of a turbine engine core exchange, daily sampling of nitrogen and sulfur content should not be required if an alternative plan for sampling has already been established at the facility per EPA or PA DEP.

Response:

Daily sampling of nitrogen and sulfur content is required in accordance with 40 CFR § 60.334. The permittee may submit to the Department and EPA for approval an alternative plan for sampling of the above compounds. The submission shall be in accordance with the requirements of 40 CFR Part 60.

Comment 7:

Condition 10(a): The requirement to record 12 month rolling totals of landfill gas-fired turbine emissions is new and the regulatory basis for imposing such recording requirements is unclear, particularly for pollutants other than NO_x and VOC.

Response:

This General Permit authorizes the construction of landfill gas-fired turbine(s) that meet the best available technology (BAT) required under 25 Pa. Code §§ 127.1 and 127.12(a)(5). Section 6.1(f) of the Air Pollution Control Act authorizes the Department to establish general plan approvals and general operating permits for sources or source categories that can be adequately regulated using standardized specifications and conditions. Therefore, the Department is authorized to include recordkeeping requirements for emission standards established in the general permit. In addition, as required under 25 Pa. Code Section 127.612(b)(3), the Department must publish notice of monitoring, recordkeeping and reporting requirements applicable to each source.

Comment 8:

Condition 10(e): There should be no requirement to record start-up, shutdown, and malfunction (SSM) of the turbine if the gas is treated in accordance with Subpart WWW, as recording of SSM events is not required per MACT. Rather, the permittee would record and report upon applicable SSM events relating to the treatment system.

Response:

Section 6.1(f) of the Air Pollution Control Act authorizes the Department to establish general plan approvals and general operating permits for sources or source categories that can be adequately regulated using standardized specifications and conditions. Therefore, the Department is authorized to include recordkeeping requirements for emission standards established in the general permit. In addition, as required under 25 Pa. Code Section 127.612(b)(2), the Department must publish notice of performance standards or emission limits applicable to each source. Consequently, the Department is authorized to include performance standards to address start-ups, shutdowns and malfunctions.

Comment 9:

Condition 10(f): The proposed NMOC recording requirements are confusing, unnecessary and go beyond any requirements specified in Subpart WWW.

Response: The finalized General Permit includes terms and conditions necessary for the proper operation of the source.

Comment 10:

Condition 12(a): The leak check requirements are new and go beyond turbine operations and intended scope of the general permit, as well as Subpart WWW requirements. In some cases, the equipment referenced in this section may be owned by a separate entity.

Response:

Section 6.1(f) of the Air Pollution Control Act authorizes the Department to establish general plan approvals and general operating permits for sources or source categories that can be adequately regulated using standardized specifications and conditions. Therefore, the Department is authorized to include recordkeeping requirements for emission standards established in the general permit. In addition, as required under 25 Pa. Code Section 127.612(b)(2), the Department must publish notice of performance standards or emission limits applicable to each source. In accordance with Condition 13(a) of the General Permit, the permittee shall, at a minimum, conduct leak checks on the landfill gas handling and processing

equipment. Alternatively, the turbine owner or operator may submit an application for a Plan Approval under 25 Pa. Code Chapter 127, Subchapter B.

Comment 11:

Condition 12(b): Condition 12(b)(i) requires annual replacement (if needed) of “fuel-burning equipment.” This is in direct contravention of the general permit, which requires submission of an application and a mandatory waiting period for the replacement of engine cores.

Response:

Condition 12.b.i., which has been renumbered as Condition 13.b.i. in the final GP, deals with annual adjustment and/or tune-up of engines as specified by the manufacturer. Replacement of engine core has been addressed exclusively in Condition 6.

Comment 12:

Condition 15: Condition 15 sets the permit fee at \$1000.00, the maximum allowed under the 25 Pa. Code. Within the last month, the Department issued a new General Permit (BAQ-GPA/GP-9) for Diesel/No. 2 oil-fired engines with an application fee of only \$375. The differences in the fees are startling, especially given that GP-9 covers sources that can be much larger than the largest gas turbine, and the fact that the proposed Gas Turbine GP will require submission of fees every 4 years for performance of routine maintenance.

Response:

Since landfill gas-fired turbines act as emission control devices, as well as energy recovery units, permit applications for these units require more in-depth review. It should be noted that the Plan Approval application fee for sources subject to NSPS and the Emission Guidelines is currently \$1,700. Therefore, the \$1,000 application fee for GP-22 is not unreasonable.

Comment 13:

Condition 21: A language authorizing the permittee to opt for a regular plan approval and a case-by-case BAT determination instead of a general permit should be included in the general permit.

Response:

Condition 2 of the general permit contains such language.

Comment 14:

Condition 22: The small sources of NOx rule in 25 Pa. Code should not be deemed applicable to landfill gas-fired turbines, as opposed to fossil fuel-fired turbines (including natural gas-fired turbines). The rationale for excluding LFG units is similar to the rationale provided for excluding municipal waste combustors.

Response:

The requirements in 25 Pa. Code §§ 129.201 through 129.205 pertaining to small sources of NOx are applicable to any “Stationary Combustion Turbines with a nameplate rated capacity of

greater than 100 mmbtu/hour” and located in Philadelphia, Bucks, Chester, Delaware, or Montgomery Counties.

Therefore, according to Condition 22 of GP-22, each landfill gas-fired turbine rated at greater than 100 mmBtu/hr and located in Philadelphia, Bucks, Chester, Delaware, or Montgomery Counties are required to comply with small sources of NO_x requirements as established in 25 Pa. Code §§ 129.201 through 129.205.

Commentator: M. Militana, Ambient Air Quality Services, Inc.

Comment 1:

Condition 2 – Source Applicability and Condition 6 (Notice Requirements): The general permit is silent on whether the gas turbine is a separate source or an integrated emission unit of the landfill supplying landfill gas. The general permit should contain a condition that the applicant evaluates whether the proposed gas turbine is a separate entity from the landfill providing the landfill gas and that this evaluation becomes a Notice Requirement. If it cannot be demonstrated that the gas turbine is a separate entity from the landfill, then the applicant should be required to evaluate New Source Review applicability and Title V permit modification implications and submit a Plan Approval application.

Response:

Condition 2, under the subheading of Plan Approval, states:

“This General Permit authorizes the construction of landfill gas-fired turbine(s) that meet the best available technology (BAT) required under 25 Pa. Code §§ 127.1 and 127.12(a)(5)... For purposes of this General Permit, BAT for any landfill gas-fired turbine shall include the installation and operation of available control measures that reduce emissions to the limitations described in Condition 8 of this General Permit.”

In Condition 19 (relating prohibited use), it is stated that the General Permit cannot be used as an operating permit if the facility is subject to PSD, NSR or Title V requirements. A turbine located at a Title V facility may use the General Permit as a General Plan approval, and the conditions of the General Permit will be rolled into the Title V permit.

Comment 2:

Condition 7 – Emissions Limitation for Landfill Gas-fired Turbines: There is no technical basis for the Carbon Monoxide (CO) emission limit of 100 ppmvd corrected at 15% oxygen. As discussed in the General Permit Conditions Analysis and Justification the CO emissions from uncontrolled landfill gas turbines at 100% load, based on emission testing data, range from 21.7 to 50.1 ppmvd corrected at 15% oxygen. The Department has arbitrarily added a 100% safety factor to establish the proposed CO emission limit of 100 ppmvd corrected at 15% safety factor to establish the proposed CO emission limit of 100 ppmvd corrected at 15% oxygen. The CO emission limit should be based upon a statistical factor above the maximum measured CO limit of 50 ppmvd to account for the variability of landfill gas composition and operating conditions.

Response:

In addition to the stack test results mentioned in the background document for GP-22, the Department also analyzed more than 60 test data for CO emissions from landfill gas-fired turbines located at various facilities operated by Waste Management. The CO emissions range from 14.71 to 81.71 ppmvd corrected to 15% oxygen. Since CO emissions from landfill gas-fired turbine(s) are also dependent on fuel composition, and landfill gas compositions vary at different sites, a buffer should be added to the achievable CO emission level for all turbine types, landfill compositions, and operating modes. Therefore, a CO emission rate of 100 ppmvd corrected to 15% oxygen is considered as BAT for CO for landfill gas-fired turbine(s).