

Illinois Environmental Protection Agency  
Bureau of Air  
Permit Section

December 2013

Responsiveness Summary For  
Questions and Comments on the  
Construction Permit Application from  
Hoosier Energy REC, Inc., for a  
Landfill Gas-To-Energy Facility at the  
Orchard Hills Landfill in  
Davis Junction, Illinois

Source Identification No.: 141017AAG  
Application No.: 11050042

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## **DECISION**

On December 23, 2013, the Illinois Environmental Protection Agency (Illinois EPA) issued an air pollution control construction permit/PSD approval to Hoosier Energy REC, Inc. (Hoosier) to construct a landfill gas-to-energy facility at the Orchard Hills landfill in Davis Junction. In response to comments on the draft permit, the issued permit includes a number of additional requirements for the proposed project compared to the draft permit, as well as various clarifications to permit conditions.

Copies of the documents can be obtained from the contact listed at the end of this document. The permit and additional copies of this document can also be obtained from the Illinois EPA website [www.epa.state.il.us/public-notices/](http://www.epa.state.il.us/public-notices/).

## **BACKGROUND**

On May 23, 2011, the Illinois EPA, Bureau of Air initially received a construction permit application from Hoosier requesting a permit to construct landfill gas-to energy facility at the Orchard Hills landfill in Davis Junction. The proposed facility would generate electricity using landfill gas collected at the Orchard Hills landfill as the fuel in six engine-generators. Before being fired in the engines, the landfill gas would be treated and processed as necessary for use in the engines.

The construction permit issued for this project identifies the applicable rules governing emissions from the proposed engines and other emission units that are part of the project, and establishes enforceable limitations on their emissions. The permit also establishes appropriate compliance procedures, including requirements for emissions testing, continuous emission monitoring, recordkeeping and reporting. Hoosier will be required to carry out these procedures on an ongoing basis to demonstrate that the proposed facility is operating within the limits established by the permit and that emissions are being properly controlled.

## **COMMENT PERIOD**

The Illinois EPA Bureau of Air evaluates applications and issues permits for sources of emissions. An air permit application must appropriately address compliance with applicable air pollution control laws and regulations before a permit can be issued. Following its review of Hoosier's application for the proposed facility, considering the revision to this application that was received by the Illinois EPA on September 19, 2013, the Illinois EPA Bureau of Air made a preliminary determination that the application met the standards for issuance of a construction permit and prepared a draft permit for public review and comment.

The public comment period began with the publication of a notice in the Rockford Register Star on October 16, 2013. The comment period closed on November 15, 2013.

## AVAILABILITY OF DOCUMENTS

The permit issued to Hoosier and this responsiveness summary are available at the Illinois EPA's internet site at <http://www.epa.state.il.us/public-notices/>.<sup>1</sup> Copies of these documents may also be obtained by contacting the Illinois EPA at the telephone numbers listed at the end of this document

## APPEAL PROVISIONS

The construction permit issued for the proposed project grants approval to construct pursuant to the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. Accordingly, individuals who submitted comments on the draft permit or participated in the public comment period may petition the United States Environmental Protection Agency (USEPA) to review the PSD provisions of the issued permit. In addition, any person who failed to file comments on the draft permit may petition for administrative review but only to the extent changes were made to the draft permit by the final permit decision.

As comments were submitted on the draft permit for the proposed project that requested a change in the permit, the issued permit does not become effective until after the period for filing of an appeal has passed. The procedures governing appeals are contained in the Code of Federal Regulations, "Appeal of RCRA, UIC and PSD permits," 40 CFR 124.19. If an appeal request will be submitted to USEPA by a means other than regular mail, refer to the Environmental Appeals Board website for instructions ([http://yosemite.epa.gov/oa/EAB\\_Web\\_Docket.nsf](http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf)). If an appeal will be sent by regular mail, it should be sent on a timely basis to the following address:

U.S. Environmental Protection Agency  
Clerk of the Board, Environmental Appeals Board (MC 1103B)  
Ariel Rios Building  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20460-0001  
Telephone: 202/233-0122

## QUESTIONS AND COMMENTS WITH RESPONSES BY THE ILLINOIS EPA

1. The exemption of emissions of greenhouse gases (GHG) from PSD review by the draft permit would be inconsistent with the decision on July 12, 2013 of the United States Court of Appeals, D.C. Circuit (*Center for Biological Diversity, et al. v. EPA*, No. 11-1101, decided July 12, 2013). In that decision, the Court vacated USEPA's rule deferring the application of PSD and Title V permitting requirements to biogenic carbon dioxide (CO<sub>2</sub>) emissions from bioenergy and other biogenic stationary sources for a period of three years (the Deferral Rule).

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<sup>1</sup> If necessary arrangements can be made with USEPA, this information may also be available on the Illinois Permit Database at <http://www.epa.gov/reg5oair/permits/ilonline.html>.

Although the Court has not yet issued a mandate vacating the Deferral Rule, it would be inconsistent with the Court's decision for the permit to rely on the Deferral Rule to exempt GHG from PSD review. According to the draft permit, Finding 3(b)(ii), the affected facility would not be a major modification under the PSD rules for emissions of GHGs "... because the emissions of GHG from the facility other than biogenic carbon dioxide (CO<sub>2</sub>) will not be significant. ... and USEPA has deferred regulation of biogenic CO<sub>2</sub> emissions under the PSD rules." If the mandate issues before the Illinois EPA issues a final permit decision, the vacatur would be in effect at that time, and the Illinois EPA would be unable to rely on the Deferral Rule to support its permitting decision. Even if the mandate has not issued when the Illinois EPA acts, a permit relying on the Deferral Rule may be difficult to defend if it is challenged. For these reasons, the Illinois EPA should not issue this permit as proposed.

**This comment does not show that it is inappropriate for the permit that has been issued to rely on the Deferral Rule. The Deferral Rule is still in effect because the court has not yet issued a mandate that would put its decision of July 12, 2013 into effect.<sup>2</sup> Until a mandate is issued, the Deferral Rule continues in effect irrespective of the formal decision of the court. Moreover, any mandate in this case will not be issued for a number of months and a mandate may ultimately never be issued. This is because the court has granted industry's request to coordinate the deadline for appealing its decision on the Deferral Rule until after the Supreme Court acts in a related case.<sup>3</sup> In these circumstances, with the Deferral Rule still being in effect, the comment merely cautions that it might be difficult to defend the permit if it were challenged. However, this comment does not address how a permit could be issued for the proposed facility that could lawfully apply requirements of the PSD rules to GHG emissions while the Deferral Rule is still in effect.**

**It is also noteworthy that this comment does not identify adverse consequences for the environment and control of emissions of GHG that would result in this permitting action from reliance on the Deferral Rule. The proposed facility will use landfill gas (LFG) collected at the Orchard Hills landfill that is currently being flared at the landfill. The use of this gas as fuel by the proposed facility will generally act to reduce GHG emissions to the environment. This is because the electricity generated by this facility will act to displace electricity that is generated**

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<sup>2</sup> These circumstances, i.e., that the Deferral Rule would be in place when this permit was issued, were contemplated by this comment. In this regard, this comment acknowledges that on November 14, 2013, when the comment was submitted, that the Deferral Rule was still in effect notwithstanding the Court's decision on July 12, 2013, four months earlier.

<sup>3</sup> On November 14, 2013, the United States Court of Appeals, D.C. Circuit, issued an order in *Center for Biological Diversity, et al. v. EPA*, No. 11-1101, that extended the deadline for filing a petition for review of its July 12, 2013 decision in that case until 30 days after the Supreme Court issues a decision in another case, *Utility Air Regulatory Group v. EPA*, S. Ct. Nos. 12-1146, et al. The case that is pending before the Supreme Court involves whether USEPA is properly regulating GHG emissions of stationary sources under the Clean Air Act based on earlier actions involving the GHG emissions of mobile sources. The Supreme Court could find that USEPA has proceeded improperly, with the result being that GHG emissions of stationary sources are not yet regulated, so that the validity of the Deferral Rule becomes moot.

**elsewhere by the firing of fossil fuels in boilers and turbines. As such, it is desirable for a permit to be issued for this project to enable it to proceed.**

2. The proposed frequency of fuel sulfur monitoring is inadequate to assure continuous compliance with the sulfur content limit or the sulfur dioxide (SO<sub>2</sub>) emissions limit in the draft permit. Hoosier's application submittal from September 2013, pages 4 and 5, states that the Orchard Hills Landfill "...has a history of variable sulfur compound emissions," with historical sulfur concentrations as high as 1,700 parts per million (ppm) and recent levels near 400 ppm of sulfur in the LFG. Both the application and the draft permit base emission limits and other calculations on a maximum sulfur content of 140 ppm. The draft permit, Conditions 2.3.9(a)(i) and (ii), would require the source to conduct sampling of LFG burned in the engines to determine the sulfur and heat content on a quarterly basis until three consecutive samples meet certain requirements and then sampling is required annually

Given the historical and expected variability in sulfur concentrations at this landfill, and the need to maintain sulfur levels in the LFG combusted by the engines to no more than 140 ppm, the frequency of fuel sulfur monitoring in Condition 2.3.9(a)(ii) (i.e., quarterly or annually) is not sufficient to assure continuous compliance with the 140 ppm sulfur content limit. The permit should require the source to monitor the sulfur content of the fuel gas being fired in the engines by either: (a) Daily monitoring with an onsite total sulfur analyzer; or (b) Daily monitoring with an onsite hydrogen sulfide (H<sub>2</sub>S) analyzer, provided that H<sub>2</sub>S comprises 95 percent or more of the total sulfur in the gas and SO<sub>2</sub> emissions from the engines are less than the limits in Condition 2.3.6, as measured during the most recent performance test. Under either option, the sulfur content of the gas must be determined and recorded once per operating day.

**As requested by this comment, the requirements for monitoring of the sulfur content of the fuel gas fired in the engines have been enhanced in the issued permit. At a minimum, daily monitoring of the H<sub>2</sub>S content of the fuel gas is required with an onsite analyzer, as specifically requested by this comment. This option is available even if the H<sub>2</sub>S comprises less than 95 percent of the total sulfur in the fuel gas. This is because the permit still requires the source to account for the total sulfur content of the fuel gas when determining SO<sub>2</sub> emissions. In addition, it is expected that day-to-day variation in the sulfur content and composition of the fuel gas will be due to variation in the performance of the sulfur removal system, rather than variation in the sulfur content of the raw LFG. The sulfur removal system is designed for removal of H<sub>2</sub>S from the raw LFG and is expected to provide limited removal of sulfur compounds other than H<sub>2</sub>S from the LFG. As such, the contribution of non-H<sub>2</sub>S sulfur compounds to the sulfur content of the fuel gas should be stable and largely unaffected by the operation of the sulfur system. Monitoring for H<sub>2</sub>S content will reasonably serve to address variation in the total sulfur content of the fuel gas.<sup>4</sup> Finally, H<sub>2</sub>S is still expected to comprise most of the**

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<sup>4</sup> If the source conducts monitoring for H<sub>2</sub>S content of the fuel gas, the issued permit now requires the source to conduct evaluations to develop a mathematical relationship or correlation between the measured H<sub>2</sub>S content of the fuel gas and the total sulfur content of the gas. For this purpose, the issued permit addresses

sulfur in the fuel gas, likely making up over 90 percent of the sulfur. Accordingly, it is not necessary for monitoring for H<sub>2</sub>S of the fuel gas to be restricted to circumstances in which H<sub>2</sub>S would make up 95 percent or more of the sulfur in the fuel gas, as suggested by this comment.

The issued permit also provides that the source, at its option, may conduct daily monitoring for the total sulfur content of the fuel gas with an on-site analyzer. This would accommodate future development in monitoring technology for the total sulfur content of the gas. Such developments might make such monitoring more practical for the proposed facility. The operation of this facility would otherwise be automated, without need for personnel to be at the facility for most of the time that it is operating. If monitoring for total sulfur content were implemented by the source, it would no longer have to conduct sampling and analysis of fuel gas as needed to support the determination of the total sulfur content of the fuel gas from the results of monitoring for the H<sub>2</sub>S.<sup>5</sup> Instead, the total sulfur content of the fuel gas would be directly measured.

It should be noted that certain provisions of the draft permit that dealt with monitoring of the sulfur content of the fuel gas, which were not addressed by this comment, have been retained in the issued permit. In particular, the issued permit requires the source to conduct continuous monitoring for the sulfur content of fuel gas, rather than daily measurements, if the sulfur content of the fuel gas produced by the sulfur system is not consistently 120 ppm or less (85 percent of the ceiling value of 140 ppm). In this regard, the daily measurements for the sulfur content of the fuel gas that are now required by the issued permit serve in place of certain periodic sampling and analysis of fuel gas that would have been required by the

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the two forms that this correlation could take. In the first form, the contribution of the non-H<sub>2</sub>S sulfur compounds to the total sulfur content of the fuel gas is essentially constant, being independent of the H<sub>2</sub>S content of the fuel gas and the operation of the sulfur system. In the second form, the contribution of the non-H<sub>2</sub>S sulfur compounds to the total sulfur content of the fuel gas also considers a variable contribution that is related to the H<sub>2</sub>S content of the fuel gas and the operation of the sulfur system. The form of the correlation that will actually apply will be empirically determined, with the second form of correlation being required if the sulfur system is found to remove a statistically significant portion of non-H<sub>2</sub>S sulfur compounds from the incoming gas.

Mathematically, the forms of these two equations for the correlation between the H<sub>2</sub>S content and the total sulfur content of fuel gas are as follows:

$$S_t = S_h + C, \text{ or}$$
$$S_t = S_h + C + C_I S_h,$$

Where,

S<sub>t</sub> is the total sulfur content of the fuel gas, ppm.

S<sub>h</sub> is the H<sub>2</sub>S content of the fuel gas, ppm.

C is a constant that accounts for non-H<sub>2</sub>S sulfur compounds in the fuel gas that are not controlled by the sulfur system.

C<sub>I</sub> is a constant, in ppm, that accounts for incidental control by the sulfur system of non-H<sub>2</sub>S sulfur compound in the fuel gas.

<sup>5</sup> Most notably, the source would not need to conduct the evaluation programs that are provided for by the issued permit to develop a mathematical correlation between the total sulfur content of fuel gas and its H<sub>2</sub>S content.

**draft permit. The issued permit does not relax requirements in the draft permit for continuous monitoring of the sulfur content of fuel gas and the performance of the sulfur system if the sulfur system does not routinely operate to provide a significant margin of compliance with the ceiling value for the sulfur content of the fuel gas.**

3. Because the draft permit would consider the sulfur removal system to be a control device for SO<sub>2</sub> emissions (*see* Condition 2.1.1), it is recommended that the permit require the engines to use fuel gas that has been processed by the sulfur removal system except that "raw" LFG (i.e., LFG that has not been processed by the sulfur removal system) may be fed directly to the engines if the sulfur content of the raw LFG is no more than 112 ppm (i.e., 80 percent of the sulfur content limit), based on daily measurements of the raw LFG using either an onsite total sulfur or H<sub>2</sub>S analyzer as discussed in another comment.

**The permit sets an appropriate limit for the sulfur content of the raw LFG if the gas is to be used as fuel in the engines without first having been processed by the sulfur system. Condition 2.3.5(a)(ii), as present in both the draft and issued permit, provides as follows:**

**Unless the sulfur content of LFG received from the landfill is no more than 130 ppm, all gas fired in the affected engines shall have undergone processing by the affected sulfur system (see Section 2.1 of this permit).**

**The limit set in this condition, 130 ppm, will provide a reasonable assurance that short-term variation in the sulfur content of raw LFG will not lead to firing of gas in the engines with an actual sulfur content that is greater than 140 ppm. Given the size of the Orchard Hills landfill, the sulfur content of the LFG collected from this landfill should change slowly over time due to gradual changes in the overall composition of the deposited waste and the age of the waste and other factors that affect the rate at which waste decomposes. This would be particularly true if the sulfur content of the collected LFG is "low," as would be the case if the sulfur content falls to levels at which the LFG that has not been processed by the sulfur system may be used in the engines. Accordingly, a change in the sulfur content of LFG of more than 10 ppm (from 130 ppm to 140 ppm) should not be expected to occur from one day to the next. Given these circumstances, the establishment of a lower limit for the sulfur content of the raw LFG if it is to not be processed by the sulfur system, as recommended by this comment, is not justified.<sup>6</sup>**

**If the sulfur content of the raw LFG is such that it need not be processed by the sulfur system, the permit already provides for monitoring for the sulfur content of raw LFG in the manner that this comment seeks. Draft Condition 2.1.4(b)(ii) provided as follows. This requirement has been retained in the issued permit as Condition 2.1.5(c).**

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<sup>6</sup> This comment does not provide any information that would suggest that the sulfur content of raw LFG could increase by more than 28 ppm, from 112 ppm to more than 140 ppm, during the course of a single day.

**If the affected sulfur system is not in routine service because the sulfur content of LFG collected from the landfill has decreased to less than 130 ppm, the above requirements [requirements for monitoring the sulfur content of the processed gas] shall be applied to the LFG from the landfill as delivered to or received at the facility.**

4. To demonstrate continuous compliance with the Best Available Control Technology (BACT) emission limits for the engines in Condition 2.3.2, the draft permit would require a combination of initial performance testing (Condition 2.3.7), work practices (Condition 2.3.5(c) and (d)), and recordkeeping (Condition 2.3.10(a)). After the initial performance tests, the engines are required to comply with certain work practices in the New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines, 40 CFR 60 Subpart JJJJ (the Engine NSPS). Pursuant to Condition 2.3.7(b), subsequent performance tests would only be required "... if the affected engines are non-certified by the manufacturer or the certified engines are not operated and maintained in accordance with the manufacturer's emissions related written instructions."

This proposed monitoring may be appropriate for some emission limits (e.g., emission limits derived from the Engine NSPS). However, I am concerned with the source's ability under the provisions of the draft permit to assure ongoing compliance with the BACT limits for the engines. This is because these limits are more stringent than the limits in the Engine NSPS. The monitoring required by the Engine NSPS in combination with the inspection and recordkeeping that would be required by the draft permit would not necessarily assure that the more stringent BACT limits in Condition 2.3.2 are not be exceeded. To address this concern, the permit should require subsequent performance tests on the engines at a frequency of at least once every five years.

**The issued permit requires performance testing of the engines at least every five years, as requested by this comment. In fact, this testing will likely occur much more frequently. This is because it is expected that these engines will not be certified under the Engine NSPS by their manufacturer since they will fire LFG rather than a commercial fuel.**

**In this regard, since the capacity of the subject engines will be over 500 horsepower, the requirement for performance testing in the Engine NSPS that applies to these engines is as follows:**

**(2) If you do not operate and maintain the certified stationary SI [spark ignition] internal combustion engine and control device according to the manufacturer's emission-related written instructions, your engine will be considered a non-certified engine, and you must demonstrate compliance according to (a)(2)(i) through (iii) of this section, as appropriate. ...**

**(iii) If you are an owner or operator of a stationary SI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and**

**operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test within 1 year of engine startup and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance. [Emphasis added]**

**40 CFR 60.4243(a)(2)**

**While the Engine NSPS will likely require performance testing to be conducted more frequently than every five years, new Condition 2.3.7(b)(ii) in the issued permit nevertheless explicitly requires that testing be conducted at least every five years. This addresses the possibility that the subject engines would ever become certified engines for purposes of the Engine NSPS.**

5. To facilitate the determination of compliance with BACT limits and the limits of the engine NSPS, which are expressed as grams per horsepower-hour or g/hp-hr (output) emissions, each performance test should include measurements of engine power output.

**For the subject engines, the source must collect the information on power output that is requested by this comment. This information must be collected and included in the reports for testing, together with the measured emission rates in g/hp-hr, pursuant to Condition 2.3.7(a)(v)(B).<sup>7</sup>**

6. To facilitate the calculation of short-term and annual emissions for compliance demonstration, the source should be required to use emission factors derived from the most recent performance test approved by the Illinois EPA unless an alternate method is approved in writing by Illinois EPA.

**In response to this comment, a condition has been added to the issued permit that provides the enhancement to the draft permit generally sought by this comment. The new condition provides that, for emission units for which performance testing has been conducted, compliance with emission limits set by the permit shall be determined using values for emission rates or emissions factors developed from the most recent testing for an emission unit unless it is determined that this would understate actual emissions of the unit, either as a general matter or for a particular period of operation, in which case alternative rates or factors shall be developed and used consistent with the principles of credible evidence. More generally, compliance with emission limits shall be determined from operating information for emission units and from appropriate values for emission rates or emission factors that do not understate actual emissions of the units as they are actually operated.**

**The enhancement to the permit is not identical to the one requested by the comment because it was necessary to maintain consistency with the principles of credible evidence, as adopted by USEPA. In this regard, it is certainly reasonable and**

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<sup>7</sup> Because the subject engines will be powering electrical generators, the output of the engines, in horsepower, will be able to be readily determined from data for the electrical output of the associated generators.

appropriate for the source to use emission factors derived from the most recent performance tests to verify compliance with annual emission limits if that testing and those factors are representative of the manner in which engines are being operated and their emissions. However, it is not appropriate to require or mandate that those emission factors must always be used. There may be periods or circumstances where those factors are not appropriate as they might understate actual emissions of the engines. The permit should not suggest that compliance with emission limits, including both permit limits and BACT limits, may be demonstrated on an on-going basis relying on the results of past testing without any need for consideration of the actual operation and condition of the engines. It also is not appropriate for the permit to suggest that an alternative method for determination of compliance with emission limits may be approved in writing by the Illinois EPA, as requested by the comment. This would suggest that an alternative to the explicit compliance provisions in the permit could be approved by the Illinois EPA by means of a letter independent of any permitting action. A permitting action is necessary to alter provisions of this permit, including the compliance provisions in this permit.<sup>8</sup>

7. In Finding 1(a), “Veolia” should be replaced with “Advanced Disposal Services.” The ownership of the landfill changes at the end of last year.

**An appropriate change was made in the issued permit. In particular, this finding now refers only to the Orchard Hills landfill without identifying its owner.**

8. In Finding 1(a), the word “compression” should be added to the description of the treatment system for landfill gas if this description is intended to reflect the terminology used by USEPA to describe treatment of landfill gas for purposes of the NSPS, 40 CFR 60 Subpart WWW.

**In the issued permit, “compression” has been added to the description of the treatment system, along with dewatering and filtration, as suggested by this comment. This will maintain consistency between the terminology used in this finding and the terminology used by USEPA to describe treatment of landfill gas for purposes of the Landfill NSPS, 40 CFR 60 Subpart WWW.**

9. In Condition 1.4(b)(ii), engines should not be included in the list of operations that are subject to the general requirement of the Landfill NESHAP for operation and maintenance in a manner consistent with safety and good air pollution control practice. This is because these engines would be combusting treated landfill gas and will therefore be exempt from this requirement, per previous USEPA determinations.

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<sup>8</sup> It also is not clear what this comment intends as it refers to performance tests approved by the Illinois EPA. While the Illinois EPA reviews all reports for performance tests that are submitted by sources, either rejecting or accepting each test, there is not a formal approval process for tests that are accepted. In addition, as testing at the proposed facility would be used to develop emission factors, as well as to verify compliance, the comment may contemplate a more rigorous review of the testing conducted at this facility than the Illinois EPA might currently provide.

**As requested by this comment, in the issued permit, engines are no longer mentioned in Condition 1.4(b)(ii). However, this is not expected to meaningfully change the requirements that actually apply to the engines. This is because the engines are subject to a similar requirement pursuant to the Engine NESHAP, 40 CFR 63.6605(b) and 63.6625(c). (See Condition 2.3.5(f)(i) and (ii).)**

10. Should the final sentence of the description in Condition 2.2.1 refer to “landfill gas” or “treated landfill gas”?

**The use of the word “fuel gas” in the last sentence of Condition 2.2.1 is appropriate. This is because the first sentence in this condition, which generally describes the proposed siloxane removal system, acts to substitute the term “fuel gas” for “treated landfill gas.”**

11. Draft Condition 2.2.6(a), as it uses the wording “Compliance ... shall be determined,” implies that the source has to determine compliance continuously (with a continuous emissions monitoring system?).

**In the issued permit, the wording of Condition 2.2.6(a) has been changed to address the concern presented by this comment. This condition no longer uses the wording that the comment found problematic. Instead, the condition more directly provides the periods of time or “averaging times” on which the various emission limits set by this condition “apply,” i.e., either on an hourly average basis or on a 3-hour average basis. (A similar change has also been made to Condition 2.3.6(a).) The new wording separates the averaging times, which are part of the short-term emission limits established in Condition 2.2.6(a), from the measures that the source must take on an on-going basis to verify compliance with those limits. The measures that the source must take to demonstrate compliance with the short-term emission limits are elsewhere in the permit than Condition 2.2.6, i.e., in the conditions that set operational requirements and in the conditions that require performance testing, operational monitoring and recordkeeping.**

12. Regarding Condition 2.2.7(d)(ii)(D), why would emission testing be required for SO<sub>2</sub> emissions of the siloxane removal system? This system is not subject to BACT for SO<sub>2</sub>. If testing for SO<sub>2</sub> is sought for some reason, SO<sub>2</sub> needs to be included in the list of pollutants for which testing is required and appropriate test method(s) need to be included in Condition 2.2.7(b)(i).

**The permit does not actually require testing of the siloxane removal system for SO<sub>2</sub> emissions. While Condition 2.2.7(d)(ii)(D) requires the report that is submitted for performance testing of the siloxane removal system to include information for SO<sub>2</sub> emissions during each test run, this information may be calculated based on operating information, i.e., the usage of fuel gas and its measured sulfur content. It is reasonable for the reports for these tests for the siloxane system to also include this information for SO<sub>2</sub> emissions. As a result, the test reports will serve to**

**document the compliance status of the siloxane system for SO<sub>2</sub> emissions as well as for the pollutants for which testing is actually conducted.**

13. Regarding Condition 2.2.9(d)(ii), is data really needed for hourly SO<sub>2</sub> emissions from the combustor in the siloxane removal system?

**The records related to SO<sub>2</sub> emissions required by this condition are necessary. This is because this condition actually only requires records for hour-by-hour SO<sub>2</sub> emissions when the sulfur content in the fuel gas is such that an exceedance of the applicable SO<sub>2</sub> emission limit might occur.<sup>9</sup> (At other times, hour-by-hour records of SO<sub>2</sub> emissions are not required.) The additional records that are required by Condition 2.2.9(d)(ii) will account for the additional emissions of SO<sub>2</sub> from this unit during any such periods. This is necessary to address compliance with the hourly limit as these periods would not be addressed by the records for routine, compliant operation of this system. The additional SO<sub>2</sub> emissions during these periods also would not otherwise necessarily be accounted for in the records that must be kept for this unit to verify compliance with the annual limit on SO<sub>2</sub> emissions.**

14. In Condition 3.1(b)(i), should this notification for performance testing be routine (to distinguish it from initial, which requires 60 days notice)?

**The change requested by this comment has not been made. This is because, as addressed by Condition 3.1(b), the source must provide at least 30 days advance notice to the Illinois EPA for the planned date of any performance testing. This notification requirement is applicable for all testing, not just the initial testing.**

**In response to this comment, a change has been to clarify Condition 3.1(a) which addresses the submittal of test plans, the other submittal that must be made by the source prior to performance testing. A test plan must be submitted prior to the initial performance testing. A test plan must also be submitted for subsequent performance testing if this testing will not be conducted in accordance with a previous test plan that has been accepted by the Illinois EPA. When a test plan must be submitted for performance testing, it must always be submitted at least 60 days in advance of the planned date of emission testing. The change to Condition 3.1(a) makes it clearer that a test plan must be submitted for a performance test, as addressed by Condition 3.1(a)(i), unless the planned performance test will meet the criteria laid out in Condition 3.1(a)(ii), so that the submittal of a new test plan is not required.**

15. In Attachment 1, please confirm that the emission limits in this attachment only apply to the proposed gas-to-energy facility, and not to the combination of this facility and the

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<sup>9</sup> Condition 2.2.9(d)(ii) only requires hour-by-hour records of SO<sub>2</sub> emissions when the sulfur content of the fuel gas is higher than the relevant value specified in Condition 2.2.9(d)(i). During such periods, hour-by-hour emission data is needed to whether SO<sub>2</sub> emissions exceeded 0.70 pounds/hour, the hourly SO<sub>2</sub> limit in Condition 2.6(a)(i). Any additional SO<sub>2</sub> emissions during such periods must also be accounted for when determining whether annual SO<sub>2</sub> emissions exceeded 3.1 tons per year, the limit set for annual SO<sub>2</sub> emissions of the siloxane removal system to ensure that the proposed facility is a minor project for SO<sub>2</sub>.

Orchard Hills landfill. (If they did, these limits would be too low.)

**The limits in Attachment 1 only apply to the proposed gas-to-energy facility. They will not apply to the source, i.e., the combination of this facility and the Orchard Hills landfill.**

## **FOR ADDITIONAL INFORMATION**

Questions about the public comment period and the permit decisions should be directed to:

Bradley Frost, Community Relations Coordinator  
Illinois Environmental Protection Agency  
Office of Community Relations  
1021 North Grand Avenue, East  
P.O. Box 19506  
Springfield, Illinois 62794-9506

217-782-7027 Desk line  
217-782-9143 TDD  
217-524-5023 Facsimile

[brad.frost@illinois.gov](mailto:brad.frost@illinois.gov)

## **LISTING OF SIGNIFICANT CHANGES BETWEEN THE DRAFT AND ISSUED PERMITS**

### Findings

Finding 1(a): This finding now does not identify the owner of the Orchard Hills landfill. This change was made in response to a comment that noted that Advanced Disposal Systems is now the owner of this landfill, rather than Veolia.

This finding now identifies “compression” as one of the elements of the required treatment system for landfill gas (LFG), along with dewatering and filtration. This change was made in response to a comment that observed that inclusion of “compression” would make the description in this finding of this treatment system consistent with the terminology used by USEPA to describe LFG treatment systems for purposes of the Landfill NSPS, 40 CFR 60 Subpart WWW.

### Section 1: Source-Wide Permit Conditions

Condition 1.4(b)(ii): This condition no longer includes engines in the list of operations at the proposed facility that are subject to the general requirement of the Landfill NESHAP for operation and maintenance in a manner consistent with safety and good air pollution control practice. This change was made in response to a comment that observed that this requirement would not be applicable because these engines would be combusting treated landfill gas and will therefore be exempt from this requirement, as confirmed by USEPA in various determinations.

Condition 1.7(d) (new): A condition has been added in the issued permit that generally addresses how compliance with emission limits set by the permit is to be shown by the source. Compliance with these limits is generally to be determined from operating information for emission units and from appropriate values for emission rates or emission factors that do not understate actual emissions of the units as they are actually operated. For emission units for which performance testing has been conducted, compliance with emission limits set by the permit shall be determined using values for emission rates or emissions factors developed from the most recent testing for an emission unit unless it is determined that this would understate actual emissions of the unit, either as a general matter or for a particular period of operation, in which case alternative rates or factors shall be developed and used consistent with the principles of credible evidence. This change was made in response to a comment that requested that the permit provide that the source must show compliance with emission limits set by the permit be based on emission factors from the most recent performance test. While this should generally be the case, the permit must be more broadly developed to accommodate circumstances in which use of emission factors from the most recent testing would be inconsistent with the principles of credible evidence.

## Section 2.1: Unit-Specific Conditions for the Sulfur System

Draft Condition 2.1.4(b)(i) (removed): This draft condition, which dealt with monitoring for the sulfur content of the fuel gas produced by the sulfur system, has not been carried over in the issued permit. Draft Condition 2.1.4(b)(i) would have required monitoring for the sulfur content of the fuel gas beginning 15 months after initial startup of the facility only if certain criteria related to the sulfur content of the fuel gas were not met. This would be inconsistent with Condition 2.1.5 in the issued permit, which now requires monitoring for the sulfur content of the fuel gas independent of the sulfur content of the fuel gas. The changes to Condition 2.1.5 that led to the removal of Draft Condition 2.1.4(b)(i) are discussed with the changes to Condition 2.1.5.

Draft Condition 2.1.4(b)(ii) (removed): This draft condition has now been incorporated into Condition 2.1.5 of the issued permit. This condition dealt with monitoring of the sulfur content of the fuel gas fired in the engines in circumstances where the sulfur content of the raw LFG is so low that the source does not need to operate the sulfur system. In such circumstances, the requirements for monitoring of the sulfur content of gas shift from fuel gas processed by the sulfur system to the raw LFG received at the facility from the landfill. In the absence of Condition 2.1.4(b)(i), the substance of this draft condition is more appropriately combined with Condition 2.1.5(c) in the issued permit, which also addresses these circumstances.

Condition 2.1.5(a): This condition now requires the source to monitor the sulfur content of the fuel gas being fired in the engines by either daily monitoring with an onsite total sulfur analyzer; or daily monitoring with an onsite H<sub>2</sub>S analyzer. This requirement replaces provisions in the Draft Condition 2.1.5(a) that would have required less frequent measurements of the sulfur content of the fuel gas by means of sampling and analysis. This change to the permit was made in response to a comment concerning the monitoring that would be required for the sulfur content of the fuel gas. This comment recommended that the permit require daily measurements of sulfur content of fuel gas by means of an on-site analyzer. These measurements will provide better data for the operation of the sulfur removal system and the sulfur content of fuel gas than would have been required by the draft permit. Upon further consideration, it has been determined that such monitoring would not be unreasonable. At the present time, the sulfur content of the raw LFG being generated at the Orchard Hills landfill is significantly more than the level that is needed for the facility to comply with the emission limits that have been set for SO<sub>2</sub> emissions. Effective operation of the sulfur system to remove sulfur from the raw LFG will be essential before the gas is used as fuel.

Condition 2.1.5(b): In the issued permit, this condition combines Draft Conditions 2.1.4(b)(i) and 2.1.5(c). It requires the source to conduct continuous monitoring for the sulfur content of fuel gas, rather than daily measurements, if the sulfur content of fuel gas produced by the sulfur removal system is not consistently 120 ppm or less (85 percent of the ceiling value of 140 ppm). In this regard, the daily measurements for the sulfur content of the fuel gas that are now required by Condition 2.1.5(a) in the issued permit serve in place of certain periodic sampling and analysis of fuel gas that would have been required by the draft permit. Requirements of the draft permit for continuous monitoring of the sulfur content of fuel gas and the performance of the sulfur system have not been relaxed in the issued permit. This change to the permit was a consequence of the changes to the permit made in response to the comment concerning the

monitoring that would be required for the sulfur content of the fuel gas. To maintain the rigor of monitoring required by the draft permit, as continuous monitoring would potentially be required, it was necessary to restructure the relevant conditions in the draft permit, combining them in revised Condition 2.1.5(b).

Condition 2.1.5(d) (new): If the source conducts monitoring for the H<sub>2</sub>S content of fuel gas rather than monitoring for total sulfur content, this new condition requires the source to conduct evaluations to develop an algebraic relationship or correlation between the measured H<sub>2</sub>S content of the fuel gas and its total sulfur content. These evaluations will involve collection of simultaneous data for the H<sub>2</sub>S content and total sulfur content of the fuel for at least ten days. These evaluations are needed to develop an authoritative correlation between the H<sub>2</sub>S content of the fuel gas and its total sulfur content. As part of these evaluations, the source must also conduct measurements for the total sulfur content of the raw LFG, as would have been required by Draft Condition 2.1.5(b). An initial evaluation must be completed within 180 days of the initial startup of the affected facility. A subsequent, follow-up evaluation must be completed within 12 months of the first evaluation. The second evaluation will identify possible changes in the nature of this correlation due to changes in the operation of the sulfur removal system that occur or were made during the early operation of the facility. These evaluations will provide a sound basis for development of periodic monitoring requirements for the sulfur content of the fuel gas in the Clean Air Act Permit Program (CAAPP) that will eventually be issued for the operation of the facility. This addition to the permit was also a consequence of the comment concerning the monitoring that would be required for the sulfur content of the fuel gas. The evaluations required by this condition are a logical outgrowth of the enhancements to this monitoring recommended by that comment as the monitoring for sulfur content of fuel gas is likely to be conducted, at least initially, for the H<sub>2</sub>S content of the gas.

## Section 2.2: Unit-Specific Conditions for the Siloxane Removal System

Condition 2.2.6(a): In the issued permit, this condition no longer uses the wording “Compliance ... shall be determined.” In its place, the condition more directly provides the periods of time or “averaging times” on which the various emission limits set by this condition “apply,” i.e., either on an hourly average basis or on a 3-hour average basis. This change was made in response to a comment expressing concern that the wording in draft condition implied that the source has to determine compliance continuously, i.e., with a continuous emissions monitoring system. The new wording separates the averaging times, which are part of the short-term emission limits that are established in Condition 2.2.6(a), from the manner in which compliance with these is to be verified on an on-going basis. The manner in which the source must demonstrate compliance with the short-term limits is addressed elsewhere in the issued permit than Condition 2.2.6(a).

Condition 2.2.7(d)(ii)(D): This condition, which addresses the contents of the required reports for performance testing of the combustor in the siloxane removal system, has been clarified. This condition now indicates that the information for SO<sub>2</sub> emissions that must be included in this test report is to be determined from operating data. That is, this information need not be determined by making actual measurements of SO<sub>2</sub> emissions as part of the required testing. This change

was made in response to a comment that questioned why the draft permit was requiring testing for SO<sub>2</sub> emissions. The addition to this condition makes it clearer that testing, i.e., actual measurements, is not required for SO<sub>2</sub> emissions. Rather the information for SO<sub>2</sub> emissions that must be included in the test reports is to be developed from operating data, i.e., the firing rate of the combustor and its sulfur content.

### Section 2.3: Unit-Specific Conditions for the Engines

Condition 2.3.6(a): Similar changes were made to the wording of this condition as were made to Condition 2.2.6(a). Refer to the description of the changes to Condition 2.2.6(a).

Condition 2.3.7(b)(ii) (new): This new condition requires that performance testing of the engines be conducted at least every five years. This addresses the possibility that these engines would ever become “certified” for purposes of the Engine NSPS so that periodic testing more frequently than every five years would not be required pursuant to the Engine NSPS. This change was made in response in a comment that expressed concern that the provisions of the Engine NSPS would not be adequate to address on-going compliance with the BACT limits that have been set for the engines. This was because the BACT limits that have been set for the engines are more stringent than the NSPS standards that apply to these engines. Given the more stringent limits that apply to these engines, it is not unreasonable for performance testing to be required at least every five years in the event that such testing is not required pursuant to the Engine NSPS.

Condition 2.3.9: Changes have made to this condition in conjunction with the changes to the provisions for monitoring of the sulfur content of fuel gas. This condition also addresses sampling and analysis of the fuel gas used in the engines. In the issued permit, measurements for the total sulfur content of fuel gas are no longer required if the source elects to conduct monitoring for the total sulfur content of the gas. If monitoring is conducted for the H<sub>2</sub>S content of fuel gas, measurements for total sulfur content are required on a monthly basis until an “evaluation” is completed, as provided for by Condition 2.1.5(d). (The draft permit would have provided for these measurements of total sulfur content to initially be conducted on a quarterly basis.) Since the completion of the evaluation will enable the total sulfur content of fuel gas to be reasonably determined based on its monitored H<sub>2</sub>S content, once an evaluation is completed routine measurement of total sulfur content of fuel gas are only needed annually. Moreover, once an evaluation has been completed, measurements for total sulfur content can specifically be required in response to the monitored levels of sulfur in the fuel gas. The issued permit requires such measurements within 30 days if the calculated total sulfur content of fuel gas is more than 125 ppm (approximately 90 percent of the 140 ppm ceiling). (The draft permit would have required quarterly measurements for total sulfur content to continue until three consecutive quarterly measurements indicated SO<sub>2</sub> emissions that were no more than 80 percent of the SO<sub>2</sub> emission limits for the engines, when measurements would only be required annually.) These changes to Condition 2.3.9 were also made in response to the comment concerning the monitoring that would be required by the draft permit for the sulfur content of the fuel gas. With monitoring now required for the sulfur content of the fuel, if the source elects to conduct monitoring for the H<sub>2</sub>S content of fuel gas, a different and more refined approach to measurements of the total sulfur content of fuel gas is now both required and possible. If

monitoring for total sulfur content is conducted, separate measurements for total sulfur content of fuel, as would have been required by the draft permit, are no longer necessary.

Condition 2.3.10(d)(iv) (new): This new condition provides that the records for the SO<sub>2</sub> emissions of the engines that are required by Conditions 2.3.10(d)(ii) and (iii) are to be based on the total sulfur content of the fuel gas burned in the engines even if day-to-day monitoring is not being conducted for the total sulfur content of fuel gas. For this purpose, if representative data for total sulfur content is available it should be used. If such data is not available, data for the total sulfur content of the gas developed from monitored data for the H<sub>2</sub>S content of the gas or other credible data must be used. This new condition was also added to the permit in response to the comment concerning monitoring for the sulfur content of the fuel gas used in the engines. The condition explicitly provides that the source must appropriately account for the total sulfur content of fuel gas when determining compliance with the SO<sub>2</sub> emissions limit for the engines.

### Section 3: General Permit Conditions

Condition 3.1(a)(i): A change has been to clarify Condition 3.1(a) which addresses the submittal of test plans by the source prior to performance testing. The change makes it clearer that test plans must be submitted to the Illinois EPA for performance testing, as addressed by Condition 3.1(a)(i), unless the specific criteria set out in Condition 3.1(a)(ii) will be met so that a test plan is not required. This clarification was made in response to a comment that confused the timing for the submittal of test plans to the Illinois EPA and the separate submittal of notifications for the date of testing. When test plans are required, they are to be submitted at least 60 days in advance of testing, which provides time for review of plans by the Illinois EPA. Notifications for testing, which are always required as they are needed to enable the Illinois EPA to observe testing, are to be submitted at least 30 days in advance of testing.

### Attachments

Attachment 2 (new): An attachment has been added in the issued permit that mathematically describes the two forms of the equation for the correlation between the total sulfur content of fuel gas and its H<sub>2</sub>S content that would be produced from the evaluations that are now required by Condition 2.1.5(d) of the issued permit. This addition is also a consequence of the changes to the permit made in response to the comment concerning the monitoring required by the draft permit for the sulfur content of the fuel gas.