BEFORE THE ADMINISTRATOR
U.S. ENVIRONMENTAL PROTECTIION AGENCY

In the Matter of the Title V Air Operating Permit
for Little Gypsy Unit 3 Solid Fuel Repowering Project
Montz, Louisiana

Permit No.: 2520-00009-V2
Activity No.: PER20080005
LDEQ Agency Interest No.: 687

Issued to Entergy Louisiana, LLC
By the Louisiana Department of Environmental Quality

PETITION REQUESTING THE ADMINISTRATOR OBJECT TO THE TITLE V OPERATING PERMIT FOR ENTERGY LOUSIANA, LLC'S LITTLE GYPSY UNIT 3 SOLID FUEL REPOWERING PROJECT

Pursuant to section 505(b) of the Act, 42 U.S.C. § 7661d(b)(2) and 40 C.F.R. § 70.8(d), the Sierra Club, Alliance for Affordable Energy, Gulf Restoration Network, Louisiana Environmental Action Network, and Sal Giardina, Jr. ("Petitioners") petition the Administrator of the U.S. Environmental Protection Agency ("Administrator") to object to the Title V Air Operating Permit No. 2520-00009-V2 issued February 25, 2009 by the Louisiana Department of Environmental Quality ("LDEQ") to Entergy Louisiana, LLC ("Entergy") for the Little Gypsy Unit 3 Solid Fuel Repowering Project ("Little Gypsy") in Montz, Louisiana. Petitioners also ask the EPA to require LDEQ to reopen and revise Entergy's Prevention of Significant Deterioration ("PSD") Permit No. PSD-LA-720.

Petitioners base this petition on comments they filed with LDEQ on September 25, 2008 during the public comment period for the Title V Permit. Petitioners incorporate by reference their comments on the draft MACT determination submitted to LDEQ on September 25, 2008, attached here as Exh. A.

INTRODUCTION

EPA must object to the Little Gypsy Title V/Part 70 Permit No. 2520-00009-V2 (hereinafter "the Title V Permit") because the Louisiana Department of Environmental Quality ("LDEQ") set MACT emission limits for mercury and other hazardous air pollutants that are less stringent than allowed by law. Both the Clean Air Act and Louisiana air regulations require LDEQ to establish emission limitations for hazardous air pollutants that are at least as stringent as the emission limitation "achieved in practice by the best controlled similar source." La. Admin. Code, tit. 33, pt. III, § 551.B; see also 42 U.S.C. § 7412(d)(2)-(3). In evaluating controls on similar sources, however, LDEQ ignored the Clean Air Act's instruction that MACT requires more than just add-on technology but also "measures which . . . reduce the volume of, or eliminate emissions of, such pollutants through process changes, substitution of materials or other modifications . . . ." 42 U.S.C. § 7412(e)(2) (emphasis added); *see Sierra Club v. EPA,* 479 F.3d 875, 883 (D.C. Cir. 2007) (rejecting as invalid EPA's argument that it need not consider cleaner "clay types" as MACT if floors based on clean clay would be unachievable because of the inability of kilns to switch clays."). Specifically, LDEQ failed set MACT below the floor created by better controlled similar sources that burn cleaner fuels, including lower sulfur coal.

In addition, LDEQ improperly set separate emission limits for mercury, hydrogen chloride, and hydrogen fluoride depending on fuel selection. The permit should have one emission limit for each of these hazardous air pollutants regardless of the fuel section, since, as discussed above, LDEQ should consider fuel type in making its MACT determination. *See also* 42 U.S.C. § 7602(k) (defining emission limitation as a requirement to limit pollution "on a continuous basis"). Furthermore, EPA must insist that the emissions limits include startup, shutdown, and malfunction periods. *Sierra Club v. EPA*, No. 551 F.3d 1019 (D.C. Cir. Dec. 19, 2008).

In addition to objecting to the Title V permit due to the flawed MACT determination, the EPA should require LDEQ to reopen and re-evaluate Entergy's PSD permit because LDEQ cannot issue a legally sufficient PSD permit without evaluating the implications of the MACT determination on PSD controls. In addition, EPA should require LDEQ to conduct a legally sufficient BACT analysis for nitrogen oxides. For these reasons and others discussed in more detail below, EPA should object to this Title V permit.

FACTS AND PROCEDURAL BACKGROUND

Entergy seeks to convert Little Gypsy, an existing natural gas-powered plant, by constructing two circulating fluidized bed (CFB) boilers that will burn petroleum coke and coal to produced 530 megawatts of power. The converted plant, if built, would constitute a new major source of hazardous air pollutants, requiring Entergy to use the maximum achievable control technology (MACT) for each hazardous air pollutant emitted from Little Gypsy. CAA § 112, 42 U.S.C. § 7412 (d)(1). Section 112 of the Clean Air Act forbids construction of a new major source of hazardous air pollutants unless the facility obtains a determination from the regulating authority that it meets MACT standards for every hazardous air pollutant the facility will emit.

LDEQ issued a Title V/Part 70 Permit No. 2520-00009-V1 for Little Gypsy on November 30, 2007, which did not contain a MACT determination. At that same time, LDEQ also issued Permit No. PSD-LA-720 that purports to meet the Clean Air Act's prevention of significant deterioration requirements. Petitioners filed a petition pursuant to section 505(b) of

Act on January 8, 2008 asking the Administrator to object to Title V permit No. 2520-00009-V1 and PSD-LA-720. That petition is still pending.

However, two months after LDEQ issued these permits, the D.C. Circuit, in *New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. Feb. 8, 2008) made clear that the Clean Air Act requires a MACT determination for such a permit. LDEQ reissued the Little Gypsy Title V/Part 70 Permit No. 2520-00009-V2 on February 25, 2009 with a determination that purported to meet MACT standards.

After the D.C. Circuit vacated EPA's effort to remove coal/petroleum coke-fired power plants from the list of sources that must meet MACT emission limitations under § 112(g) of the Act, LDEQ reopened Title V permit No. 2520-00009-V1 to address § 112(g) requirements. *See New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. Feb. 8, 2008). Entergy submitted an application to LDEQ for a determination that Little Gypsy will meet MACT emission limits in accordance with § 112(g), and on August 7, 2008, LDEQ issued Title V permit No. 2520-00009-V2 in draft for public comment on the agency's MACT determination for Little Gypsy. Petitioners filed comments during the public comment period objecting to the draft MACT determination.

Petitioners also filed a petition pursuant to section 505(b) of Act on November 21, 2008 asking the Administrator to object to Title V permit No. 2520-00009-V2. That petition is still pending. However, EPA extended its review of Title V permit No. 2520-00009-V2 to February 7, 2009. EPA's extended review creates a new 60-day period (beginning February 8, 2009 and ending April 9, 2009) during which the public may petition the EPA to object to the permit pursuant to § 505(b) of Act. Accordingly, Petitioners submit this Petition to EPA asking that it object to Title V permit No. 2520-00009-V2.

The Administrator has sixty days to grant or deny this Petition. CAA § 505(b)(2). If the Administrator determines that this permit does not comply with the Act, she must object to issuance of the permit. CAA § 505(b)(2).

LEGAL FRAMEWORK

The provisions of the Louisiana State Implementation Plan ("SIP") implementing Clean Air Act § 112, prohibit any person to "begin actual construction or reconstruction of a major source of hazardous air pollutants . . . unless the owner or operator obtains or revises a permit issued in accordance with Louisiana's Part 70 Program." La. Admin. Code, tit. 33, pt. III, § 551.D.1; *see also* 42 U.S.C. 7412 (g)(2)(B). The Louisiana SIP defines hazardous air pollutants as "any air pollutants listed in or pursuant to Section 112(b) of the Clean Air Act." La. Admin. Code, tit. 33, pt. III, § 551.B. The Louisiana SIP also provides that permits issued pursuant to Louisiana's Part 70 Program "shall comply with any federally applicable requirement, as defined in LAC 33:III.502, established under the federal Clean Air Act as amended or promulgated by the administrator pursuant to the federal Clean Air Act as amended." La. Admin. Code tit. 33, pt. III § 501.C.5; *see also* La. Admin. Code tit. 33, pt. III § 501.A.1 (applying these permit procedures and requirements to any "major source" as defined by § 502.A). "Federally applicable requirement," as defined by the SIP, includes "any standard or other requirement under Section 112 (Hazardous Air Pollutants) of the Clean Air Act." La. Admin. Code tit. 33, pt. III, § 502.

For a major source not specifically regulated pursuant to a nationally applicable MACT standard for the source category, the Louisiana SIP further provides,

> No person may begin actual construction or reconstruction of a major source of hazardous air pollutants . . . unless . . . [LDEQ] has made a final and effective case-by-case determination in accordance with the provisions of this Section such

> that emissions from the affected source will be controlled to a level no less stringent than the MACT emission limitation for new sources.

La. Admin. Code, tit. 33, pt. III, § 551.D.1.a; *see also* § 551.D.1.b. Here, because EPA has not promulgated national MACT standards for electric generating units such as Little Gypsy, LDEQ must determine the applicable MACT standard for Little Gypsy on a case-by-case basis. Moreover, the MACT determination must produce a limit for each hazardous air pollutant emitted by the proposed facility. Section 112(d) requires "the maximum degree of reduction in emissions of the hazardous air pollutants subject to this section." 42 U.S.C. § 7412(d)(2). Section 112 defines "hazardous air pollutants" to include "*any* air pollutant listed pursuant to [Section 112(b)]." 42 U.S.C. § 7412(a)(6) (emphasis added). *See National Lime Ass'n v. Environmental Protection Agency*,233 F.3d 625, 633-34 (D.C. Cir. 2000) (noting the "clear statutory obligation to set emission standards for each listed HAP").

Louisiana SIP regulations implementing the Clean Air Act MACT provisions define "Maximum Achievable Control Technology" as:

> the emission limitation that is not less stringent that the emission limitation achieved in practice by the best controlled similar source and that reflects the maximum degree of reduction in emissions that LDEQ, taking into consideration the cost of achieving such emission reduction and any non-air quality health and environmental impacts and energy requirements, determines is achievable by the constructed or reconstructed major source.

La. Admin. Code, tit. 33, pt. III, § 551.B; see also 42 U.S.C. § 7412(d)(2)-(3). The definition of "similar source" is: " [A] stationary source or process that has comparable emissions and is structurally similar in design and capacity to a constructed or reconstructed major source such that the source could be controlled using the same control technology." La. Admin. Code, tit. 33, pt. III, § 551.B; 40 C.F.R. § 63.41 (same). When making its case-by-case MACT determination, LDEQ shall not issue MACT emission limitations that are "less stringent than the emission control that is achieved in practice by the best controlled similar source as determined by [LDEQ].” La. Admin. Code, tit. 33, pt. III, § 551.E.1.

The MACT emission limitation and control technology approved by LDEQ when making its case-by-case MACT determination “shall achieve the maximum degree of reduction in emissions of hazardous air pollutants that can be achieved by utilizing those control technologies that can be identified from the available information, taking into consideration the costs of achieving such emission reduction, any non-air quality health and environmental impacts, and energy requirements associated with the emission reduction.” La. Admin. Code, tit. 33, pt. III, § 551.E.2.

The Clean Air Act defines MACT to include “measures which . . . reduce the volume of, or eliminate emissions of, such pollutants through process changes, substitution of materials or other modifications . . . .” 42 U.S.C. § 7412(d)(2)(A). In addition, the Clean Air Act defines “emission limitation” as:

> a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under this chapter.

42 U.S.C. § 7602(k).

SPECIFIC OBJECTIONS

I. THE EPA SHOULD OBJECT TO THE PERMIT BECAUSE LITTLE GYPSY IS A NEW SOURCE OF HAZARDOUS AIR POLLUTION THAT FAILS TO MEET REQUIREMENTS OF § 112 OF THE CLEAN AIR ACT.

A. LDEQ Failed to Base MACT Limits on the Emissions Achieved in Practice by The Best Controlled Similar Source.

MACT determinations begin by establishing the “MACT floor” – the “emissions control that is achieved in practice by the best controlled similar source. 42 U.S.C. § 7412(d)(3). The emission limitations in the Title V Permit for the hazardous air pollutants from Little Gypsy's CFB Boilers are less stringent than the emission controls achieved in practice by the best controlled similar source. This infirmity affects the hazardous air pollutants that have their own MACT limits in the permit – mercury, hydrochloric acid, and hydrofluoric acid – as well as those that are covered by limits for particulate matter and carbon monoxide as surrogates. LDEQ asserts that a "similar source" is a circulating fluidized bed boiler that burns precisely the same types of fuel: petroleum coke and certain types of coal. This narrow definition contravenes the applicable regulations. Response to Comments, pp. 9, 11, Exh. B. See also Statement of Basis – and Application, p. 4. It eliminates numerous similar sources that have achieved much lower emission limits than those proposed as MACT for Little Gypsy. Comments, pp. 15-33; *see also* Statement of Basis – and Application, p. 4.

The definition of "similar source" is:

> [A] stationary source or process that has comparable emissions and is structurally similar in design and capacity to a constructed or reconstructed major source such that the source could be controlled using the same control technology.

La. Admin. Code, tit. 33, pt. III, § 551.B; 42 U.S.C. § 7412(d)(3) (same). The law requires LDEQ "to make a reasonable estimate of the performance" of the best-controlled unit in the appropriate category. *Cement Kiln Recycling Coalition v. EPA*, 255 F.3d 855, 861-62 (D.C. Cir. 2001). LDEQ's application of similar source is not reasonable.

1. LDEQ cannot ignore power plants burning fuels other than the precise fuels Entergy selected for Little Gypsy.

LDEQ identified several CFB boilers that achieved lower hazardous pollutant emissions using different fuels in its MACT analysis. LDEQ Resp. to Cmmts, pp. 20-24. However, LDEQ rejected from consideration any CFB boiler that does not burn combination of petroleum coke, bituminous coal, and subbituminous coal, as proposed for Little Gypsy. Response to Comments, p. 12, Exh. B. LDEQ eliminated these options in determining the MACT floor for the following reason:

> Since the Little Gypsy CFB boilers are designed to burn petroleum coke, bituminous coal, and subbituminous coal, any CFB boiler that does not burn this combination would be different in "design and capacity" and would therefore be excluded from consideration.

Id. Thus, "LDEQ [] determined that it is not appropriate to require Little Gypsy to change the design of the CFB boilers in order to accommodate any of the alternative fuels that were eliminated from consideration." *Id.* This determination is inconsistent with the Clean Air Act's requirement that Little Gypsy attain a standard no less stringent than the "best controlled similar source." 42 U.S.C. § 7412(d)(3).

The Clean Air Act defines MACT to include more than just add-on technology but also "measures which . . . reduce the volume of, or eliminate emissions of, such pollutants through process changes, substitution of materials or other modifications . . . ." 42 U.S.C. § 7412(e)(2); *See Sierra Club v. EPA*, 479 F.3d 875, 883 (D.C. Cir. 2007) (rejecting as invalid EPA's argument that it need not consider cleaner "clay types" as MACT if floors based on clean clay would be unachievable because of the inability of kilns to switch clays.") The D.C. Circuit has ruled that, when identifying the MACT floor, "if factors other than MACT technology do indeed influence a source's performance, it is not sufficient that EPA considered sources using only well-designed and properly operated MACT controls," i.e., add-on technology. *Cement Kiln Recycling Coalition v. EPA,* 255 F.3d 855, 864-865 (D.C. Cir. 2001). The "best-performing sources" may be sources that "achieve[] their emission levels not just by using technology." 255 F.3d. at 866.

In addition, LDEQ's decision to set three separate limitations for mercury, hydrochloric acid, and hydrofluoric acid emissions for each fuel type the CFB Boiler will burn (petroleum coke and bituminous / subbituminous coals) is illegal because La. Admin. Code, tit. 33, pt. III, § 551 and Clean Air Act § 112 prohibit LDEQ from issuing a MACT emission limitation that is "less stringent than the emission control that is achieved in practice by the best controlled similar source." Under the Clean Air Act, LDEQ must set the MACT floor based on the "best controlled similar source" regardless of the fuel. Furthermore, LDEQ's decision to set separate limitations for each fuel type the CFB Boilers will burn is illegal because the emissions limitations do not offer a constant or continuous means of reducing emissions as required under the Clean Air Act. 42 U.S.C. § 7602(k).

Thus, any similar source that fires any one or any combination of these fuels is relevant for setting MACT limits for Little Gypsy.

LDEQ justifies setting separate limits for each fuel type based on EPA's subcategorization in the Clean Air Mercury Rule. Response to Comments, p. 22, Exh. B. This subcategorization was only for mercury, and the D.C. Circuit has vacated this rule. Id. EPA based the subcategorization on an extensive testing program conducted through an industry-wide Information Collection Request to determine achieved and achievable mercury emissions at existing electric generating units. 69 FR 4665. LDEQ cannot snatch out of thin air this subcategorization, or any other, without a similar testing program. LDEQ did not offer any test data to support its very narrow subcategorization.

EPA based the subcategorization in the Clean Air Mercury Rule on the relative ability of control technologies to remove mercury from various types of coal, as then understood. But those differences no longer exist. Indeed, EPA said:

> At some point in the future, the performance of control technologies on Hg emissions could advance to the point that the rank of coal being fired is irrelevant to the level of Hg control that can be achieved…If that occurs, EPA may consider adjusting the approach to Hg controls appropriately.

70 FR 28612. And, that point is here. In related matters, EPA, for example, transitioned from subcategorizing based on coal type for the NOx and SO_2 NSPS to one general coal category in the most recent NSPS due to advances in control technology. 70 FR 28606.

The same degree of mercury reduction can now be achieved from coals, regardless of rank, using advances in mercury control technology that have occurred since the research studies relied on in the 2005 rulemaking. Exhs. M-51A-51C. These advances include additives to increase the chlorine content of the coal, catalysts that oxidize over 90% of the mercury in coals, and a smorgasbord of sorbents to choose from. At the time of the subject rulemaking, there were no commercial sorbent injection systems required by permit in operation on any coal-fired power plant. As of July 2008, 93 such systems had been booked by pollution control vendors and several are in commercial operation. Ex. M-50. These advances allow comparable mercury reductions across all boiler and coal types. LDEQ did not attempt to evaluate test data to determine if its subcategorization scheme was reasonable, as EPA did.

2. LDEQ Cannot Ignore Similar Technologies.

The project consists of two circulating fluidized bed (CFB) boilers, a type of coal-fired boiler. LDEQ rejected all lower limits permitted for pulverized coal-fired boilers, even though the regulations provide that, to be considered a similar source, the design need only be similar such that the source could be controlled using the same control technology. La. Admin. Code, tit. 33, pt. III, § 551.B; 42 U.S.C. § 7412(d)(3). Entergy could burn the chosen fuels in pulverized coal-fired boilers, and the same control technologies can be used to control HAP emissions from both circulating fluidized bed boilers and pulverized coal-fired boilers. Thus, there is no reason to reject the pulverized coal-fired boiler HAP permit limits.

LDEQ cannot ignore sources using control technologies that may be transferable to Little Gypsy, or alternative combustion methods that may yield lower HAP emissions. In particular, LDEQ cannot ignore pulverized coal units, where such units are the "best performing" similar source.

In promulgating the similar source definition, EPA observed that:

> For purposes of section 112(g), two criteria should be used to determine if a source is similar: (1) whether the two sources have similar emission types, and (2) whether the sources can be controlled with the same type of control technology.

61 Fed. Reg. at 68,394. Rather than following EPA's direction, LDEQ simply ignores the beginning and end of the definition for similar source, which state that a similar source "has comparable emissions and …could be controlled using the same control technology." La. Admin. Code, tit. 33, pt. III, § 551.B; 42 U.S.C. § 7412(d)(3).

As explained by EPA, 61 Fed. Reg. at 68,394, the key question is whether a source has similar emissions such that the plant can use the same control technology. The source need only have "comparable emissions" that "could be controlled using the same control technology." The definition requires structural similarity only to the extent that the plant can use the same control technology. Differences in design that do not affect the emissions and controls in a significant way are not material. The narrow definition employed by LDEQ limits the MACT analysis to the controls the Applicant had previously determined it would like to use with the fuels it had previously selected, making a mockery of the MACT process.

The Response to Comments is replete with examples of LDEQ erroneously rejecting lower permitted limits or lower tested emissions because the source is not **identical** to the proposed source as originally permitted. Examples include: (1) HCl stack tests "because they are not similar sources." Response to Comments, p. 17, Exh. B; (2) HF stack tests "because they are not similar sources." Response to Comments, p. 19, Exh. B; (3) JEA Northside, a CFB that burns two of the fuels proposed for Little Gypsy because it does not also burn subbtiuminous coal (a ridiculous distinction as subbituminous coal generally emits less HAPs than the other candidate fuels). Response to Comments, p. 20, Exh. B; (4) NEVCO Sevier, a CFB, because it burns only one of the proposed fuels. Response to Comments, p. 23, Exh. B; (5) Intermountain Power 3 because it is a pulverized coal fired boiler. Response to Comments, p. 23, Exh. B; (6) Virginia Electric because it burns both bituminous coal and waste coal. Response to Comments, p. 23, Exh. B; and (7) other fluidized bed boilers as they burn waste coal, among others. Response to Comments, p. 24, Exh. B. The Application contains many more such examples, all of which point to the fact that MACT for all of the HAPs is much lower than the limits determined to be MACT if a legally correct, more inclusive definition of "similar source" is used rather than LDEQ's illegally narrow definition of "similar source."

The HAP emissions from all coal-fired boilers are comparable, in that they contain the same pollutants in similar amounts. EPA's emission estimating bible, AP-42, for example, reports that the same emission factor can be used for all boiler types and coal types to estimate emissions of the HAPs at issue here – hydrogen chloride, hydrogen fluoride, mercury, metals, and organics. Comments, Ex. M-4A.

The record contains no evidence that the emissions from the Little Gypsy CFBs are so unusual that they could not be controlled by the same types of pollution control systems that are currently widely used at pulverized coal and other solid fuel-fired boilers that have achieved much lower HAP emissions than proposed for Little Gypsy. The type of boiler and coal that is burned do not restrict the use of specific control technologies, they only affect the design and cost of these technologies.

Nevertheless, LDEQ excludes all electric generating boilers that are not CFB boilers. Response to Comments, p. 11, Exh. B. The EPA, in its proposed mercury MACT regulations for electric generating units, found that boiler type did not affect mercury emissions. For FBCs [fluidized bed combustor is the same thing as a CFB], the EPA concluded:

> Based on their unique firing designs, FBC units employ fundamentally different process for combusting coal from that employed by conventional-, stoker-, or cyclone-fired boilers. Fluidized-bed combustors are capable of combusting many coal ranks, including coal refuse. For these reasons, FBC units can be considered a distinct type of boiler. However, the Hg emissions test data results for FBC units were not substantially different from those at similarly-fueled conventionally-fired units with similar emission levels, either in mass of emissions or in emission characteristics. Therefore, EPA has decided not to establish a separate subcategory for FBC unit.

69 FR 4666 (Jan. 30, 2004) (emphasis added). LDEQ actually concedes this point elsewhere in the Response to Comments, admitting "EPA determined that, for the purposes of mercury control, there is no difference in the ability of pulverized coal and fluidized bed boilers to control mercury." Response to Comments, p. 22, Ex. B. Nevertheless, LDEQ uses boiler type (using permit limits for other identical CFBs) to reject all lower mercury limits. Response to Comments, p. 23, Exh. B (e.g., Intermountain 3).

The Clean Air Act includes "process changes" and "design" changes among the pollution-reduction methods that must be assessed as part of a MACT determination. 42 U.S.C. § 7412(d)(2). LDEQ cannot, consequently, define the term "similar source" to exclude such options – especially since the U.S. EPA has concluded that the term "similar source" is meant to broaden, rather than limit, the MACT-floor analysis. See 61 Fed. Reg. 63,384-385. Moreover, circulating fluidized bed (CFB) units (like Little Gypsy) and pulverized coal units, in most instances, have the “same emissions types” and “can be controlled with the same type of control technology.” *Id.* They meet, accordingly, the regulatory definition of “similar source.” 40 C.F.R. 63.41. Accordingly, the U.S. Environmental Protection Agency has refused to set separate MACT standards for CFBs and pulverized coal units when setting Clean Air Act standards for electric-generating units. See 69 Fed. Reg. 4,652, 4,657 (January 30, 2004); 70 Fed. Reg. 28,606, 28,609-10 (May 18, 2005).

In sum, LDEQ has failed to determine MACT because it has narrowly limited the universe of sources that it considered. The similar sources that it omitted, identified in Petitioners’ Comments, indicate that MACT emission limits for all HAPs should be much lower than proposed in the Title V Permit. In other words, the facility as permitted, will emit much higher amounts of hazardous air pollutants than allowed by law.

3. LDEQ Failed To Use Acceptable Data.

LDEQ rejected stack test data and most permit limits as a basis for determining MACT, basing its MACT determinations on only a very tiny subset of permit limits, those for identical facilities that are currently operating. Application, Sec. 4.0-5.0; Response to Comments, p. 9, Exh. B. While permit limits are a relevant source of information, relying exclusively on permit limits for operating plants to establish MACT necessarily underestimates the emissions reductions achievable, because it assumes that the previously-permitted plant emits the maximum emissions allowed under its permit, without looking at actual emissions. In reality, plants often emit far less pollution than their permits allow.

In response to LDEQ’s flawed approach, Petitioners provided a large amount of actual stack test data and additional permits, which, taken together, demonstrate that MACT emission limits should be much lower than the limits in the final Permit. Comments, pp. 21-33, Exh. A.

LDEQ rejected all of this information based on two unpersuasive arguments. First, LDEQ stated that stack tests are short-term tests conducted under controlled conditions that fail to address variability and are few in number. Second, LDEQ rejected most permit limits because the sources are not identical to the proposed source (see discussion of similar source) or have not yet been constructed. Response to Comments, pp. 15-21, Exh. B. Neither of these reasons justifies excluding this relevant data from consideration.

Permit Limits

Petitioners commented that LDEQ had not made a reasonable estimate of performance of the best controlled similar sources, as it based its MACT determinations on only a tiny subset of permit limits for only operating sources. Comments, p. 13, Exh. A. In response, LDEQ did not explain why it believed these permit limits, without more, were a reasonable estimate of what emissions reductions had actually been achieved. Permit limits, absent a demonstration that they reflect actual performance, are not reasonable. *Northeast Maryland Waste Disposal Authority v. E.P.A.*, 358 F.3d 936, 953-54 (D.C. Cir. 2004).

Using permit limits in a vacuum impermissibly stretches the statutory requirement that the MACT floor be based on the emission limit achieved by the best controlled similar source. Petitioners submitted data with their comments that demonstrate that permit limits for hydrogen chloride (HCl) and hydrogen fluoride (HF), for example, are much higher than the emissions that have been achieved in practice, rendering those limits unreasonable to establish the MACT floor.

This data is extracted from Petitioners exhibits, and supplemented by certain additional data identified in comments, but not in hand as of due date of comments, or data otherwise available to LDEQ by calling sister agencies. Comparisons of permit limits with stack tests are summarized in Table 1 for hydrogen fluoride and in Table 2 for hydrogen chloride. These tables show that hydrogen fluoride permit limits are 5 to 83 times higher than achieved emissions and that hydrogen chloride emissions are 9 to 73 times higher than achieved emissions.

Table 1
Comparison of HF
Permitted Limits and Test Results

Facility	Permit Lb/MMBtu	Test Lb/MMBtu	Ratio Permit/Test	Ex.
Hardin	0.00051	0.000050	10	M-26B
Weston 4	0.000217	0.000040	5	M-26H
Council Bluff 4 5/07	0.0009	0.000108	83	M-54A
Council Bluff 4 8/07		0.000029	31	M-54B
Springerville 3	0.00044	0.000063	7	M-26F
Gilbert 3	0.00047	0.000056	8	M-18A
Santee Cooper Cross 3	0.00030	0.0000415	7	M-57A

Note: LDEQ incorrectly claims the Gilbert 3 test result is 0.0056 lb/MMBtu. Response to Comments, p. 19, Exh. B.

Table 2
Comparison of HCl
Permitted Limits and Test Results

Facility	Permit Lb/MMBtu	Test Lb/MMBtu	Ratio Permit/Test	Ex.
Hardin	0.00118	0.000050	24	M-26B
Weston 4	0.000217	0.000040	55	M-26H
Council Bluff 4 5/07	0.0029	0.000038	73	M-54A
Council Bluff 4 8/07		0.000058	38	M-54B
Gilbert 3	0.0035	0.000056	63	M-18A
Santee Cooper Cross 3	0.0024	0.00027	9	M-57A

Note: LDEQ incorrectly claims the Gilbert 3 test result is 0.0056 lb/MMBtu. Response to Comments, p. 17, Exh. B.

LDEQ dismisses this data with the sweep of a hand, stating that "[w]hile other sources in the United States of America may be permitted with lower emission limitations, these sources have not yet been constructed." Response to Comments, p. 17, Exh. B. LDEQ evidently made no effort to determine which sources had actually been constructed and to acquire the supporting stack tests, even though Petitioners cautioned that "[w]e understand that the Hardin and Springerville limits also been [sic] confirmed, but we were unable to obtain the stack tests before these comments were due." Comments, p. 26, Exh. A.

These data are now supplied, as evidently, LDEQ made no effort to acquire them. The data in Tables 1 and 2 demonstrate that permit limits for hydrogen chloride and hydrogen fluoride represent an impermissible stretch of the statutory requirement that MACT be at least as stringent as the emission limit achieved by the best controlled similar source.

LDEQ also rejected permit limits for sources not yet constructed. Petitioners commented that LDEQ cannot ignore emissions limits at sources that have not yet commenced operations; the States establishing those limits did so based on specific information, which established (to that State's satisfaction) that such limits could be continuously, and cost-effectively, achieved. At a minimum, LDEQ is required to assess the information that led the Title V Permitting State to that conclusion for each of those sources. Comments, p. 17, Exh. A. LDEQ did not respond.

<u>Stack Tests</u>

LDEQ cannot ignore stack tests at existing sources. Source-wide MACT standards for other categories of sources have long been based on stack tests. See, e.g., 62 Fed. Reg., 960, 961 (Jan. 7, 1997). Indeed, EPA has formally stated that stack tests suffice to demonstrate continuous compliance with HAP emissions limits. See, e.g., 69 Fed. Reg. 55,217, 55, 224 (Sept. 13, 2004). Concerns regarding emissions variability at particular sources, for specific pollutants,[1] may be addressed by establishing longer averaging times, or using safety factors; LDEQ cannot, however, categorically exclude all stack testing from its analysis, as it did.

[1] The variability cited by the Title V Permit applicant derives mostly from the use of alternative, cleaner fuels – a pollution-reduction alternative that must be included in the MACT analysis. *See* Section II.A above.

LDEQ argues that sufficient data is not available to determine variability, arguing that a minimum of 2,801 stack tests would be required to achieve a 95% confidence level. Response to Comments, p. 14, Exh. B. These calculations are wholly erroneous. However, setting that aside, assuming an annual test, as required by most permits, this requirement would exceed the life of the facility and its coal supply and thus is nonsensical. If such long-term emissions data were a prerequisite, it would be impossible to make a MACT determination, contravening the intent of Section 112.

To address the data availability issue, the EPA has routinely used other approaches to determine the best controlled similar source. These other approaches include relying on short-term test data from a large number of similar sources (which we supplied) and a technology based approached. These and others have been upheld by the D.C. Circuit, so long as they are "reasonable."[2] These decisions indicate that measured, long-term emissions data is not required to establish the floor or beyond-the-floor MACT emissions rate.

Further, the Title V Permit only requires an annual stack test to determine compliance with the hydrochloric acid, hydrofluoric acid, and metallic HAP emission limitations.[3] Permit, p. 8. Thus, while stack tests are just a snapshot of operations under carefully observed and controlled conditions, as argued by LDEQ, these tests are all that is required to demonstrate compliance with MACT limits. The Title V Permit does not require any monitoring of the designated HAP to determine whether compliance is achieved for untested periods nor any

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[2] *See, e.g., Cement Kiln Recycling Coalition v. EPA*, 347 U.S. App. D.C. 127; 255 F.3d 859, 862, 865 (D.C. Circuit 2001); *Mossville Envtl. Action Now v. EPA*, 361 U.S. App. D.C. 508; F.3d 976, 1241 (D.C. Circuit 2004); *Sierra Club v. EPA*, 359 U.S. App. D.C. 251; 353 F.3d 982-983 (D.C. Circuit 2004); *National Lime Association v. EPA*, 344 U.S. App. D.C. 97; 233 F.3d 630-633, 637-640 (D.C. Circuit 2000).

[3] The Title V Permit indicates that metallic HAPs compliance would be by 40 CFR 64, which is Compliance Assurance Monitoring. This requires initial compliance by a stack test and using indicators thereafter. Response to Comments, p. 7, Exh. B.

monitoring of individual HAPs represented by surrogates. Thus, it follows that if periodic tests with no intervening compliance are adequate to demonstrate compliance with MACT limits, they are adequate to establish the limits that must be complied with in the first place. LDEQ cannot have it both ways. Either a stack test is adequate to determine compliance with MACT and thus adequate to determine MACT in the first place, or it is not.

Regardless, the use of periodic test data for a wide range of sources, as provided by Petitioners, provides an equally valid method of accounting for potential variability in normal operations.[4] Test data for a wide range of sources are available and some of it was submitted with Petitioners' comments. LDEQ ignored this data, made no effort to collect more, and based its MACT determinations only on permit limits without checking to see if the Title V Permit limits had been achieved and fairly represented the levels that were being achieved.

B. LDEQ's Use of Surrogates is Improper.

1. Particulate Matter

LDEQ may use surrogate limits in lieu of limits directly addressing each HAP only under limited circumstances. *National Lime*, 233 F.3d at 637-39. A pollutant can be used as a surrogate for a HAP if (1) the HAP is invariably present in the surrogate; (2) the control technology for the surrogate indiscriminately captures the HAP along with the surrogate; and (3) control of the surrogate is the only means by which facilities achieve reductions in the hazardous air pollutants. *Sierra Club I*, 353 F.3d at 984; *National Lime*, 233 F.3d at 639 . LDEQ ignored this required analysis when it used particulate matter and carbon monoxide as surrogates for metallic and organic HAPs, respectively.

[4] Second Supplemental Response to Comments, July 28, 2008, AR 2576 at 2599.

LDEQ used filterable particulate matter as a surrogate for certain metallic HAPs. Statement of Basis, p. 7. This is an illegitimate use of surrogates for two reasons. First, even if LDEQ used filterable particulate matter as a reasonable surrogate for metallic HAPs, the emissions limits set by LDEQ are too high to satisfy MACT. Other plants' permit limits and test results operate at lower particulate limits. *See* Ex. M-12, M-18A, M-26B, M-58C and M-58D, and M-54A and M-54B; *see also* Petitioners' Comments, pp. 17-24, incorporated herein by reference, Exh. A.

. Second, Petitioners argued that particulate matter was not an acceptable surrogate in this instance as it fails the three-step test set out in *National Lime*, 233 F.3d at 639. LDEQ responded by redefining the steps in *National Lime*, such that they bear little resemblance to the original test. Response to Comments, pp. 4-7, Exh. B.

Step 1: Metallic HAPs are Invariably Present in Particulate Matter

Petitioners commented that particulate matter is not a good surrogate for non-mercury metallic HAPs because some of these HAPs (selenium, arsenic, chromium, nickel) are not present in particulate matter, but rather occur as gases. Gases are not invariably present in particulate matter because they are not particulate matter.

Comments, pp. 6-7, Exh. A.

LDEQ responded with respect to selenium (Response to Comments, p. 5, Exh. B), but ignores the evidence as to other elements that are present as gases. Further, LDEQ discloses for the first time that metallic HAPs include cyanide and its compounds. Response to Comments, p. 4, Exh. B.

Cyanides

LDEQ used particulate matter as a surrogate for certain "metallic HAPs." Petitioners noted that the specific HAPs included in "metallic HAPs" were not identified. Comments, p. 6, Exh. A. Petitioners also noted that LDEQ failed to set a limit for cyanides. Comments, pp. 2, 6, Exh. A. In response, LDEQ revealed for the first time that "cyanide (and compounds)" were included in metallic HAPs. Response to Comments, p. 4, Exh. B.

LDEQ asserted this classification scheme without providing any evidence that cyanides are actually present as particulate matter. Evidence submitted by Petitioners (cited at footnote 28 of Petitioners comments) demonstrates that cyanides are not present in particulate matter. Tests at eight coal-fired power plants, conducted specifically to collect HAPs data to satisfy Title III, indicates that cyanides are primarily present in exhaust gases from coal fired power plants as hydrogen cyanide, which is an acid gas. Particulate-phase cyanide was below the analytical detection limits at most sites and contributed less than 5% of the total cyanide. Comments, Ex. M- 20.[5] As cyanides are thus present as a gas and not particulate matter, they are not invariably present in particulate matter, and particulate matter is not a reasonable surrogate for cyanides. A separate limit should be set for hydrogen cyanide, as for the other two acid gases, hydrogen fluoride and hydrogen chloride.

Selenium

Selenium was also classified by LDEQ as a metallic HAP that is represented by particulate matter. Response to Comments, p. 4, Exh. B. Petitioners commented that selenium is present as a gas, based on citations to research. Comments, Exh. A, Ex.M-3C. A particulate surrogate is not a reasonable choice for gases as gases are not invariably present in particulate

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[5] A Comprehensive Assessment of Toxic Emissions from Coal-Fired Power Plants: Phase I Results from the U.S. Department of Energy Study, September 1996, pp. ES-15/16 and Table A-11.

matter. LDEQ conceded that "LDEQ was able to determine that Selenium could possibly be in the vapor phase in the fabric filter." Response to Comments, p. 5, Exh. B. The EPA agreed that "[b]ecause of the volatility of Class 3 metals (primarily mercury and, in some cases, selenium), particulate controls have only a limited impact on emissions of these metals." Comments, Exh. A, Ex. M-4, p. 1.1-5. However, rather than setting a separate limit for selenium, which is warranted if it is present as a gas, LDEQ presented a new and unsupported theory that selenium is present as particulate matter.

LDEQ claimed with no citations to data, reports, research, studies, or analysis from fundamental physical and chemical mechanisms, that selenium will react with "excess lime" in the fabric filter cake, forming selenium oxide, thus being trapped thereon. Response to Comments, p. 5, Exh. B. LDEQ presented no evidence that excess lime and a filter cake are invariably present or that the conditions in the baghouse are ripe to allow gaseous selenium to react with lime, forming selenium oxide. In fact, a filter cake is not invariably present, as the filter bags are cleaned every 15-30 minutes. During cleaning, the filter cake is removed from the bags and only gradually builds back up. Thus, even assuming, *arguendo*, that LDEQ is right as to excess lime and formation of selenium oxide, there would be substantial periods of time during which the filter cake would not be present. Ex. M-55.[6]

<u>Step 2: Particulate Matter Control Technology Indiscriminately Captures Metallic HAPs</u>

Petitioners commented that particulate matter is not a reasonable surrogate for metallic HAPs because the majority of the metallic HAPs is concentrated in very tiny particles that are not efficiently captured by the proposed fabric filter baghouse unless special filtration media and design changes are implemented that were not otherwise required as BACT. Comments, pp. 7-8.

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[6] R.E. Snyder, K.E. Redinger, and M. McMenus, Impact to Fabric Filter Media and SDA Operations on Multi-Pollutant Emissions, Mega 2006.

LDEQ does not dispute the fact that metallic HAPs are concentrated in these tiny particles nor that they are poorly controlled. Instead, LDEQ asserts, without support, that "The fabric filer is unable to distinguish between those particles that contain HAP and those that do not." Response to Comments, p. 5, Exh. B.

LDEQ's response ignores the physical characteristics of the pollutants and the manner in which the baghouse functions. Petitioner's evidence shows that this is not true, and that, in fact, the baghouse does pass more of the fine material where the metallic HAPs are found than larger particles, thus discriminating based on particle size. In other words, a significant fraction of these smaller particles where most of the metallic HAPs reside, are not captured at all by the baghouse. A baghouse does, by its very nature, discriminate among particle sizes.

The EPA supports this position in AP-42 (Ex. M-4A), where it writes that "control of Class 2 metals [arsenic, cadmium, lead, antimony] depends on collection of fine particulate." Ex. M-4A, p. 1.1-5. Elsewhere, Ex. 4A shows that these fine particles are not efficiently captured. LDEQ does not refute this simple fact, or explain why our evidence is not relevant.

<u>Step 3: Particulate Matter Control is Only Means to Reduce Metallic HAPs</u>

In determining whether particulate matter control is the only means by which facilities 'achieve' reduction in metallic HAPs, the court in *National Lime* concluded that the role of inputs must be determined, specifically one must assure that "fuels and other inputs affect HAP metal emissions in the same fashion that they affect the other components of PM." *National Lime*, 233 F.3d 639.

Petitioners presented evidence that particulate matter is not a good surrogate for metallic HAPs because reductions and increases in metallic HAPs can be achieved by changes in the fuel composition, an inevitability at a source permitted to burn three separate fuels and any combination of mixtures thereof. Comments, pp. 8-10, Exh. A.

The Title V Permit allows three classes of fuels to be used: (1) bituminous coal; (2) subbituminous coal; and (3) coke and any combinations thereof. Permit, p. 8; Statement of Basis, p. 3. LDEQ selected particulate matter as a surrogate for metallic HAPs for all fuels. Petitioners commented that this is not a reasonable choice as the relationship between ash, which becomes particulate matter, and metallic HAPs, varies for different fuels in unpredictable ways. In other words, metallic HAPs in coal can increase without causing a corresponding increase or any change at all in particulate matter. Comments, pp. 9-10.

In response, LDEQ misses the point. Response to Comments, p. 6, Exh. B. LDEQ glosses over the evidence that metallic HAPs can increase or decrease without a concomitant increase in particulate matter, and claims instead that a reduction in particulates would result in a <u>change</u> in HAPs. The direction of the "change," up or down, determines whether particulate matter is a reasonable surrogate for HAPs. If a reduction in particulate matter resulted in a reduction in HAPs, then particulate matter might be a reasonable surrogate. However, if the reverse is true, that is, if a reduction in particulate matter resulted in an increase in HAPs, or if HAPs could change without any change at all in particulates, then particulate matter would not be a reasonable surrogate. Our data demonstrates the latter.

In *National Lime*, the court held that particulate matter "might not be an appropriate surrogate for HAP metals if switching fuels would decrease HAP metal emissions without causing a corresponding reduction in total PM emissions." *National Lime,* 233 F.3d at 639. *Sierra Club I* further held that alterations in fuel supply thus "affect HAP metal emissions" in a far different fashion than they affect particulate matter. *Sierra Club I*, 353 F.3d at 985.

Elsewhere, LDEQ reversed course and argued that "[a]ny reduction in the non-mercury metallic HAP content of a given fuel mix will invariably reduce the particulate matter emission rate. Conversely, any increase in the non-mercury metallic HAP content of a given fuel mix will invariably increase the particulate matter emission rate." Response to Comments, p. 7, Exh. B.

Both of these self contradictory arguments are plainly refuted by Petitioners evidence. Comments, pp. 8-10. Evidently, LDEQ has abandoned "fuel" which is the feed to Little Gypsy and narrowed in on "each batch of fuel used" or "a given fuel mix." These terms are not defined, but presumably are subsets of "fuel." The hypothesis appears to be that if you take a small enough batch, then the desired relationship to support surrogacy can be found. The issue, however, is the relationship of the surrogate to the HAP in the feed to Little Gypsy, not in some undefined ephemeral subset of that fuel that exists nowhere but in an instantaneous scoop of the coal pile.

The behavior of a batch is irrelevant. The relevant issue is the effect of changing the feed to Little Gypsy, which is continuous, not batch by batch, from one batch to another, on the relationship between HAPs and particulate matter. LDEQ has presented no evidence that coal quality is uniform within a batch, let alone plant feed. Further LDEQ has not refuted Petitioners coal quality data that plainly shows HAPs can increase or decrease with no concomitant change in particulate matter.

In *National Lime*, the court held that "the EPA must consider the potential impact upon emissions of changes in inputs to the cement manufacturing process, especially the possibility of fuel switching." *National Lime*, 233 F.3d at 635, 639. This is precisely the situation here. The data submitted by Petitioners demonstrate that HAPs could increase or decrease without causing a similar change in particulate matter. LDEQ failed entirely to rebut that point.

2. Carbon Monoxide

LDEQ selected carbon monoxide (CO) as a surrogate for all organic HAPs. Statement of Basis, p. 7. LDEQ failed to disclose which specific compounds are present in "organic HAPs." Comments, pp. 6, 13, Exh. A. We assume that any compound of carbon and another element is intended, based on the definition of "organic compound" in the Statement of Basis. Statement of Basis, p. 10. However, this definition sweeps in many compounds that are generally classified as inorganic, such as carbon disulfide, hydrogen cyanide, and carbonyl sulfide, and which are chemically and physically distinct from conventional organic compounds, casting doubt on the reasonableness of carbon monoxide as a surrogate for incomplete combustion

Regardless, as explained in Petitioners' comments, carbon monoxide is not a reasonable choice as a surrogate for unidentified "organic HAPs" as it fails to satisfy the three-step process set out in *National Lime*.

Step I: Organic HAPs are not Invariably Present in Carbon Monoxide

The first step requires that organic HAPs are invariably present in carbon monoxide. *Sierra Club I*, 353 F.3d at 984. Petitioners argued that organic HAPs are not present at all in CO and thus are clearly not invariably present. LDEQ concedes that organic HAPs are not present in CO, thus flunking Step I of *National Lime*.

LDEQ then changes the plain language of the test, that organic HAPs be invariably present, instead arguing that all organic HAPs have one common origin, incomplete combustion. Response to Comments, p. 7, Exh. B. Origin is not part of the test for surrogacy. Further, incomplete combustion is not the only source of organic HAPs. Finally, CO itself arises from other than incomplete combustion. Thus, CO is a poor surrogate for organic HAPs from electric generating units.

In fact, combustion is complete for many organic HAPs present in coal plant effluents including most aromatic and aliphatic hydrocarbons, e.g., toluene, xylenes, benzene. Organic HAPs form through other chemical mechanisms, such as alkylation, chlorination, and pyrolysis, processes in which carbon monoxide does not play a role. Organic HAPs may also devolatilize from organic material present in lime injected into the boiler and dry scrubber. Further, some CO forms post-combustion, from ammonia used for NOx control. Ex. M-52D,[7] M-52C,[8] and M-52B[9].

Petitioners also argued that there are three classes of organic HAPs that behave differently during combustion: (1) volatile organic compounds; (2) semi-volatile organic compounds; and (3) particulate organic compounds that are chemically and physically dissimilar. Petitioners, for example, demonstrated that dioxins could vary inversely with Little Gypsy's carbon monoxide emissions. Thus, a single indicator would not suffice. Comments, pp. 11-12. LDEQ also dispenses with this fact by reiterating the common origin theory.

The Court in *Mossville* rejected EPA's reliance on vinyl chloride as a surrogate for all HAP from PVC production facilities, ruling unambiguously that EPA was required to "establish a correlation between the surrogate and the HAP" and that to do so the agency was affirmatively required to identify each HAP that the facility would emit, and directly link each such HAP with the chosen surrogate. 370 F.3d at 1243. It was fatally insufficient for EPA to simply assert without detailed, HAP-specific analysis that vinyl chloride was an appropriate surrogate for all

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[7] G. Fernandez-Martinez and others, Distribution of Volatile Organic Compounds during the Combustion Process in Coal-fired Power Stations, Atmospheric Environment, v. 35, 2001, pp. 5823-5831.

[8] J.P. Garcia and others, Emissions of Volatile Organic Compounds by Coal-Fired Power Stations, Atmospheric Environment, v. 26A, issue 9, 1992, pp. 1589-1597.

[9] A.M. Mastral, M.S. Callen, and T. Garcia, Toxic Organic Emissions from Coal Combustion, Fuel Processing Technology, v. 67, issue 1, June 2000, pp. 1-10 ("the PAH emissions with the limestone are higher than those emitted with sand as fluidizing agent…It can be concluded that once combustion efficiency is optimized, PAH emissions are a function of the pyrolytic process and the combustion variables…").

HAP. Here, LDEQ has asserted without any detail that carbon monoxide is an adequate surrogate for a widely diverse collection of organic compounds (that are unidentified) and have very different chemical and physical properties and origins. Thus, a carbon monoxide surrogate is arbitrary and capricious and not supported in the record. *Mossville,* 370 F.3d at 1241.

Step 2: Control Technology Indiscriminately Captures Organic HAPs along with Carbon Monoxide

The second step of National Lime requires that carbon monoxide control technology indiscriminately captures organic HAPs along with carbon monoxide. Petitioners argued that there are pollution control methods that would reduce organic HAPs without producing a corresponding reduction in carbon monoxide. We further noted that CO emissions lack the necessarily "indiscriminating" correlation with organic HAPs due to very short "hot spot" incomplete combustion events that the long averaging time masks. Comments, pp. 12-13, Exh. A.

LDEQ ignores the "hot spot" argument and responds that good combustion control is the only method to control organic HAPs. Response to Comments, p. 8, Exh. B. It asserts that "good combustion practices are accepted as the best level of control for emissions of carbon monoxide since the best controlled similar sources all use this type of control technology." Response to Comments, p. 8, Exh. B. However, LDEQ does not define what constitutes good combustion control, which means different things for different pollutants. Good combustion control has no effect whatsoever on many organic HAPs, as explained *supra*, because they are not products of incomplete combustion. Further, combustion control to minimize NOx would increase CO. Thus, carbon monoxide flunks the second surrogacy test.

Regardless, the Title V Permit does not indiscriminately require good combustion practices. It sets two limits for organic HAPs, 0.10 lb/MMBtu CO when the unit operates at greater than or equal to 60% maximum steam production output, and 0.015 lb/MMBtu CO when it operates at less than 60% of its maximum steam production output capacity. Permit, p. 8. This two-tiered limit is necessary as a plant cannot maintain the CFB boiler bed temperature at optimal levels when the boiler is at less than 60%. In other words, it is impossible to optimize combustion to minimize organic HAPs during this condition. Other similar boilers do not include such a two-tiered CO limit. Comments, pp. 21-24. Thus, these limits do not correspond to the best controlled similar source.

<u>Step 3: Carbon Monoxide Control is not Only Means to Achieve Reduction in Organic HAP Emissions</u>

The third step of *National Lime* requires that carbon monoxide control is the only means to 'achieve' reductions in organic HAPs. In making this determination, *National Lime* concluded that one must assure that "fuels and other inputs affect HAP metal emissions in the same fashion that they affect the other components of PM." *National Lime*, 233 F.3d 639.

Petitioners identified two inputs that could fundamentally alter organic HAP emissions – fuel and ammonia. Comments, pp. 2, 12-13, 64. Petitioners commented, for example, that the fuel mix could affect the relationship between CO and organic HAP in such a way as to void surrogacy. For example, low chlorine fuels such as coke and subbituminous coals would form less dioxins than bituminous coals, which contain higher amounts of chlorine, resulting in an inverse relationship between the surrogate and dioxin, a situation that would void surrogacy. *National Lime*, 233 F.3d, 640; Comments, p. 12, Exh. A, Ex. M-47.

As to fuel, LDEQ countered that "fuel substitution" is not feasible based on the best seam or rank of coal. RTP, pp. 9-10. However, Petitioners were not arguing for a specific "seam" or "rank" of coal, but rather as to the blend. Rank arguments are irrelevant here as Entergy specified the CFBs design to accept three broad classes and various mixes of solid fuel and to burn natural gas during startup. These four fuels could be selected in any combination to minimize the formation of organic HAPs, independent of CO, as changes in volatile versus fixed carbon content as well as nitrogen and sulfur may affect the types and amounts of organic compounds that would form. Ex. M-52A.[10] Changes in the fuel mix could increase or decrease the amount of organic HAPs that would form, without affecting the amount of CO that is emitted.

Second, as to ammonia, Little Gypsy will use selective noncatalytic reduction (SNCR) to control NOx emissions. This process injects ammonia into the boiler at the appropriate temperatures, thereby causing CO emissions to increase. Comments, p. 64, Exh. A, Ex. M-22.[11] Thus, CO can change as a result of NOx control, independent of boiler combustion conditions, invalidating CO as a surrogate for organic HAPs.

Operational Standard

Petitioners commented that CO is not a reasonable surrogate because it is essentially an "operational standard" which may not be substituted for actual emission limits. Comments, p. 11. LDEQ did not respond to this directly, but concedes the point by admitting that CO is an indicator of combustion efficiency. Response to Comments, p. 11, B. Thus, CO is not a reasonable surrogate for organic HAPs.

Precedent

As a backstop, LDEQ asserts that CO surrogacy is valid based on established EPA precedent. Response to Comments, p. 8, Exh. B. CO surrogacy is not established EPA

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[10] C. Andrew Miller and others, Emissions of Organic Hazardous Air Pollutants from the Combustion of Pulverized Coal in a Small-Scale Combustor, Environmental Science & Technology, v. 28, no. 6, 1994, pp. 1150-1158.

[11] Matti Hiltunen and J.T. Tang, NOx Abatement in Ahlstrom Pyroflow Circulating Fluidized Bed Boilers, In: Circulating Fluidized Bed Technology II, P. Basu and J.F. Large (Eds.), Pergamon Press, 1988, p. 435, Fig. 5.

precedent for the subject source, solid-fuel fired electric generating units. There are some important differences between these other sources and the proposed CFBs. Nitrogen oxides and CO are inversely related; CO increases when NOx decreases. Because the Title V Permit contains limits on NOx that must also be met, combustion cannot be optimized to minimize CO and organic HAPs without increasing NOx emissions. Thus, there is an unacceptable conflict between the need to optimize combustion to minimize organic HAPs and to optimize combustion to minimize NOx.

II. EPA SHOULD REQUIRE LDEQ TO REOPEN AND REVISE THE PSD PERMIT ISSUED FOR LITTLE GYPSY IN LIGHT OF THE MACT PROCESS.

Until a case-by-case MACT review has been conducted – or at the very least until LDEQ has performed a meaningful assessment of the likely implications of MACT-related hazardous air pollutant ("HAP") emission limits – LDEQ has no way of assessing how the technology-forcing MACT requirements may affect the proposed plant's ability to control PSD pollutants. The technologies prescribed to meet MACT may allow for far greater cost-effective reductions in criteria pollutants than may have been true when LDEQ first issued Little Gypsy's PSD permit. Or changes in fuels required pursuant to MACT may necessitate entirely different pollution-control methods as BACT. Or the MACT limits may affect the emissions calculations that were the basis of LDEQ's earlier PSD analysis; most importantly, any CO-based MACT limit for organic HAP would increase Little Gypsy's NOx emissions, potentially exceeding the significance threshold. See below.

Both MACT and PSD are inherently technology-based, and technology-forcing in the broadest sense of that term, potentially affecting not just add-on control technology, but process technology, raw inputs, fuel quality, fuel mix, operational parameters, work practices, etc. Thus, the impact of one regulatory program on these "technology" choices for the project necessarily will have implications for what is achievable or appropriate under the other program. Furthermore, the MACT process is a more rigorous exercise than PSD's "Best Available Control Technology" requirements, with a more stringent set of technology-forcing criteria. See above. As a result of these fundamental differences between MACT and BACT, and the clearly more stringent nature of MACT analysis, LDEQ cannot conduct a reasonably complete PSD analysis without considering, to some significant degree, what will (or is likely to be) required by MACT.

By performing the MACT and PSD analyses in isolation, LDEQ has essentially allowed its PSD limits to determine its MACT limits. Indeed, LDEQ's MACT limits simply re-state Little Gypsy's BACT limits. That approach violates the law. The Act explicitly states, "In no event shall application of "best available control technology" result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to section 7411 or 7412 of this title" 42 U.S.C. § 7479(3); see also 42 U.S.C. § 7475(a)(3)(C). Moreover, LDEQ's approach deprives the public of an opportunity to comment upon critical elements of the agency's decision-making process – the potential interactions between the two programs, and the trade-offs LDEQ has made between them.

LDEQ cannot issue a legally sufficient PSD permit without meaningfully evaluating the potential implications of LDEQ's MACT determination on appropriate level of control under PSD, and providing an opportunity for public comment on that evaluation. The Act requires LDEQ to include compliance with "any other applicable emission standard or standard of performance" – including the standards of Section 112 – in its PSD analysis. 42 U.S.C. § 7475(a)(3)(C). LDEQ must, accordingly, re-open Little Gypsy's PSD permit to assess the impacts of Little Gypsy's MACT limits on its PSD determinations.

Therefore, EPA should require LDEQ should re-open its PSD permit, and allow the public an opportunity to comment on the agency's decision and its underlying technical and policy rationale.

III. EPA SHOULD REQUIRE LDEQ TO REOPEN AND CORRECT THE PSD PERMIT BEFORE IT CAN ISSUE THE TITLE V/PART 70 PERMIT.

A. LDEQ Must Revisit the BACT Analysis for Nitrogen Oxides.

LDEQ has proposed a carbon monoxide limit as a "surrogate" for a MACT limit on organic HAP. For the reasons set forth above, that surrogate limit is unlawful. If, however, LDEQ intends to impose CO limits, and thereby rely on combustion-optimization as a HAP-control strategy, it must revisit its netting analysis for NOx. Carbon monoxide emissions and nitrogen oxides emissions are inversely related in Little Gypsy's current configuration. Little Gypsy will use selective noncatalytic reduction (SNCR) to reduce NOx emissions to BACT levels. This process injects ammonia into the boiler at the appropriate temperatures – thereby causing carbon monoxide emissions to increase. Exh. M-22.[12] Conversely, a decrease in carbon monoxide to meet MACT will cause a corresponding increase in NOx. If LDEQ proposes to reduce Little Gypsy's CO emissions to a level consistent with MACT, it must re-visit Little Gypsy's NOx emissions under that MACT-equivalent combustion optimization. Further, we note that selective catalytic reduction reduces NOx without increasing carbon monoxide emissions – permitting Little Gypsy to minimize its emissions of both CO and NOx, an alternative that LDEQ failed to consider during its initial permitting process.

Moreover, the BACT analysis states that while NOx from the Little Gypsy is not subject to PSD requirements, the applicant nonetheless performed a NOx emission control technology

[12] Matti Hiltunen and J.T. Tang, NOx Abatement in Ahlstrom Pyroflow Circulating Fluidized Bed Boilers, In: Circulating Fluidized Bed Technology II, P. Basu and J.F. Large (Eds.), Pergamon Press, 1988, p. 435, Fig. 5.

evaluation.[13] Based on its analysis, Entergy incorrectly determined that the most effective control technology for NOx control is a combination of a CFB boiler and a SNCR.

First, neither LDEQ nor Entergy performed any actual analysis of the potential NOx emissions from Little Gypsy. There is no discussion of the range of either the fuel that Little Gypsy would burn, or the details of the combustion process Little Gypsy would use. Absent these details, the analysis lacks any intelligible starting point for its eventual determination of a specific numeric emission limit. It is important to determine the expected NOx emissions level from the boiler itself in order to determine the overall emissions after the subsequent air pollution control device. Entergy's failure to provide the expected "uncontrolled" NOx emissions from the boiler itself renders impossible any meaningful analysis of the efficacy of any proposed pollution-controls. It further precludes any analysis of whether different combustion processes ("in-boiler" reductions) or cleaner fuels could reduce Little Gypsy's NOx emissions.

Second, despite Entergy's statement otherwise, there is no discussion or analysis of NOx emission control technologies. For instance, Entergy fails to evaluate the use of a Selective Catalytic Reduction (SCR) system to reduce Little Gypsy's nitrogen oxides emissions. SCR systems achieve substantially greater NOx reductions than the non-catalytic system upon which Entergy's NOx emission levels rely. SCR systems achieve NOx reductions in excess of 90%. SCR systems can (as LDEQ acknowledges) feasibly be applied to CFB units.[14] Several proposals including the Highwood CFB in Montana,[15] the East Kentucky Power Cooperative

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[13] Little Gypsy Title V Application, Part 4, section 4.1.2.

[14] The Institute of Clean Air Companies reports that "while SNCR performance is specific to each unique application, NOx reduction levels ranging from 30% to over 75% have been reported." *NOx Controls Technologies*. (Exh. 85)

[15] Application for Air Quality and Operating Permits, SMEGTC, November 30, 2005, Section 5. (Exh. 86)

Spurlock Unit 4 in Ohio,[16] and the Gascoyne power plant in North Dakota[17] all considered SCR to be technically feasible. Information on each of these cases is publicly available.[18]

LDEQ has ignored, moreover, an enormously significant collateral environmental benefit of utilizing an SCR. The higher control efficiency of an SCR would allow Little Gypsy to operate its boiler at higher temperatures. Such high-temperature operations would reduce Little Gypsy's N_2O emissions – indeed, such operations are among very few practical means of controlling those emissions in a CFB boiler.[19] CFB boilers, because of their relatively low temperatures, produce greater amounts of N_2O,[20] a greenhouse gas[21] than conventional pulverized coal boilers. N_2O is over 300 times more potent than CO2 as a greenhouse gas.[22] Given N_2O's potent climate-change effects – many times that of carbon dioxide – those reductions are vitally important, both environmentally and (in the event of climate-change regulation) economically.

A properly designed and maintained CFB boiler should emit around 0.14 lb/MMBtu NOx or less, unless the fuel nitrogen is abnormally high. Assuming a boiler-out NOx level of 0.14 lb/MMBtu and an SCR efficiency of 90%, the calculated NOx emission limit for the source should be 0.014 lb/MMBtu. This is considerably lower than the 0.07 lb/MMBtu NOx emission

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[16] Preconstruction Review and Revised Final Determination/Statement of Basis, EKPC Spurlock 4, Feb. 2002. (Exh. 87)
[17] Gascoyne 500 Generating Station and Gascoyne Mine Application for A Permit To Construct and Air Quality Technical Analysis, Westmoreland Power, June 2006, Section 5. (Exh. 88). The full permit application is available at http://www.health.state.nd.us/AQ/Notices.htm.
[18] While we do not agree with the levels proposed as BACT in these instances, we provide these as examples of CFB units where SCR was deemed technologically feasible.
[19] Comments on Big Cajun I Draft Permit and Related Documents, Affidavit by Dr. Ron Sahu, (Jul. 13, 2007), at 20. (Exh. 89)
[20] Combustion and Gasification in Fluidized Beds, by Prabir Basu, Taylor and Francis, Section 5.4, 2006.
[21] *See*, for example, the Intergovernmental Panel on Climate Change (IPCC) and its website at http://www.grida.no/climate/ipcc_tar/wg1/130.htm. (Last visited on 9/22/08.)
[22] See Table ES-1, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2004, EPA #430-R-06-002, April 2006. Located at http://www.epa.gov/climatechange/emissions/downloads06/06ES.pdf. (Last visited 9/22/08.)

level proposed by Entergy. Even assuming a higher boiler-out NOx level of 0.2 lb/MMBtu, the target NOx emission limit using a SCR of 90% efficiency is 0.02 lb/MMBtu. The applicant and the agency should have conducted and required a full BACT analysis at this level.

The specified emission limit does not, furthermore, even correspond to possible reductions achievable using a non-catalytic SNCR system. Such systems are generally capable of achieving 75% reductions in NOx. Using that reduction rate along with a presumed boiler-out emission level of 0.14 lb/MMBtu results in a NOx emission level of 0.035 lb/MMBtu, far lower than the 0.07 lb/MMBtu proposed by Entergy.

CONCLUSION

For the foregoing reasons, Petitioners ask that the Administrator object to the proposed Title V Air Operating Permit # 2520-00009-V2 for Entergy and require LDEQ to reopen and revise Entergy's Prevention of Significant Deterioration Permit # PSD-LA-720.

Respectfully submitted April 9, 2009, by:

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I hereby certify that I have served a copy of this Petition on April 9, 2009 to those listed below.

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