

**BEFORE THE ADMINISTRATOR  
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

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An Operating Permit for Indiana Gasification,  
LLC, Rockport, Indiana.

Proposed by the Indiana Department of  
Environmental Management.

Permit No. T147-30464-00060

Petition No. V-2012-\_\_\_\_\_

PETITION FOR OBJECTION TO A TITLE V PERMIT FOR INDIANA GASIFICATION,  
LLC

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## I. INTRODUCTION

### A. SUMMARY

Pursuant to Clean Air Act § 505(b)(2) and 40 CFR § 70.8(d), the Natural Resources Defense Council, Sierra Club, and Valley Watch, Inc. petition the Administrator of the United States Environmental Protection Agency (“EPA”) to object to Title V Operating Permit for Indiana Gasification, LLC (“Indiana Gasification”), Permit Number T147-30464-00060 (“Permit”) issued by the Indiana Department of Environmental Management (“IDEM”). The Permit was proposed to U.S. EPA by the Indiana Department of Environmental Management (“IDEM”) more than 45 days ago. *See* Ex. 1. A copy of the Permit is attached as Exhibit 2.

EPA must object because: (1) the air quality impact analysis is flawed because of numerous flaws in the emission rates and other parameters IDEM used in the analysis and the use of significant impact levels not supported by the record; (2) IDEM did not allow for public comment on the ozone ambient impacts analysis; (3) IDEM incorrectly conclude that Indiana Gasification is a synthetic minor source of hazardous air pollutants; (4) IDEM erred in estimating fugitive particulate matter emissions from roads, thus rendering the particulate matter ambient impact analysis flawed; and (5) IDEM failed to comply with Best Available Control Technology (“BACT”) and Title V requirements for carbon pollution emissions from the acid gas recovery vents. Many of these issues are very similar to issues in recent objections in *In the Matter of Kentucky Syngas, LLC*, Petition No. IV-2010-9, Order Granting in Part and Denying in Part Petition for Objection to Permit (EPA June 22, 2012)(“*Kentucky Syngas*”) and *In the Matter of Cash Creek Generation LLC*, Petition No. IV-2010-4, Order Granting in Part and Denying in Part Petition for Objection to Permit, (EPA June 22, 2012)(“*Cash Creek*”).

## B. BACKGROUND

IDEM administers a combined PSD and Title V permitting program for major new sources of air pollution. In spring 2011, Indiana Gasification, LLC (a subsidiary of Leucadia National Corporation) submitted an air permit application to IDEM to construct a coal gasification plant in Rockport, Indiana. Rockport is located along the Ohio River in the southern portion of the state, between Evansville, Indiana and Louisville, Kentucky and just North of Owensboro, Kentucky. The proposed site is in the Ohio Township of Spencer County. The Plant would consume approximately 3.5 million tons of coal annually to produce up to 48 billion standard cubic feet of synthetic natural gas (“SNG”).

In the gasification process, the acid gas removal unit (“AGR”) would produce an enormous concentrated stream of carbon dioxide (“CO<sub>2</sub>”), totaling 6,494,536 tons per year (“tpy”). The application describes Indiana Gasification’s intent to capture and liquefy a portion of this byproduct and sell the approximately 5 million tons of liquefied CO<sub>2</sub> to the Denbury Corporation for use in its enhanced oil recovery (“EOR”) operations in the Gulf Coast. The CO<sub>2</sub> would be transported by a pipeline that has yet to be built.

In addition to CO<sub>2</sub>, the Project would emit a number of other regulated New Source Review (“NSR”) pollutants and hazardous air pollutants. The Applicant claimed that the plant would emit below the major source threshold for PM<sub>2.5</sub>, in terms of both PM<sub>2.5</sub> and SO<sub>2</sub> (a precursor). It similarly claimed that it would be a minor source of hazardous air pollutants (“HAPs”), at only 10.1 tpy for all HAPs combined. According to the application, the Project would be a major PSD source for NO<sub>x</sub>, CO and greenhouse gases, and above the PSD significance thresholds for NO<sub>x</sub>, CO, PM<sub>10</sub>, SO<sub>2</sub>, and H<sub>2</sub>SO<sub>4</sub>.

IDEM issued a draft permit for public comment in December 2011 and held a public hearing on January 25, 2012, with written comments due January 30, 2012. Sierra Club, Natural Resources Defense Council, and Valley Watch commented to IDEM on the draft permit. *See* Ex. 3, 4, and 5, respectively. IDEM's response to comments is in Exhibit 2 starting at pdf page 361. To Petitioners' knowledge, EPA has not objected to the Permit. This Petition is filed within sixty days following the end of U.S. EPA's 45-day review period, as required by Clean Air Act ("CAA") § 505(b)(2).<sup>1</sup>

### C. STANDARD OF REVIEW

The Administrator must grant or deny this petition within sixty days after it is filed. 42 U.S.C. § 7661d(b)(2). If the Administrator determines that the Permit does not comply with the requirements of the CAA, including failing to include any "applicable requirement," she must object to issuance of the permit. 42 U.S.C. § 7661b(b); 40 C.F.R. § 70.8(c)(1) ("The [U.S. EPA] Administrator will object to the issuance of any proposed permit determined by the Administrator not to be in compliance with applicable requirements or requirements under this part."). "Applicable requirements" include, *inter alia*, any provision of the Indiana State Implementation Plan ("SIP"), including any term or condition of any preconstruction permit, any standard or requirement under Clean Air Act sections 111, 112, 114(a)(3), or 504, and acid rain program requirements. 40 C.F.R. § 70.2.

To guide her review, the Administrator has looked to the standard of review applied by the Environmental Appeals Board ("EAB") in making parallel determinations under the federal PSD permit program.<sup>2</sup> The EAB has emphasized the importance of BACT determinations,

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<sup>1</sup> EPA's forty-five (45) day comment period expired on June 21, 2012. *See* Ex. 1. The public's time for petitioning the Administrator extends through, at least, August 20, 2012.

<sup>2</sup> *In the Matter of Louisville Gas and Electric Company, Trimble County, Kentucky, Title V/PSD Air Quality Permit # V-02-043 Revisions 2 and 3*, Order Responding to Issues Raised in April 28, 2008 and March 2, 2006 Petitions,

stating that they are “one of the most critical elements in the PSD permitting process and thus ‘should be well documented in the record, and any decision to eliminate a control option should be adequately explained and justified.’” *In re Desert Rock Energy Company, LLC*, PSD Appeal Nos. 08-03, 08-04, 08-05, & 08-06, Slip Op. at 50 (September 24, 2009) (“*Desert Rock*”). The Board has remanded permits where the permitting authority’s BACT analyses were “incomplete or the rationale was unclear.” *Id.* Thus, the Administrator should review IDEM’s BACT determinations with an eye to the completeness of the record and underlying rationale. If either of these aspects is inadequate as demonstrated by Petitioners, the Administrator must object. Given the similar centrality of the air quality demonstration, Petitioners believe at least this level of inquiry is needed on air quality modeling issues as well.

The CAA and Indiana regulations require that a construction permit issued to a major new source of air pollution in an attainment area include BACT limits for each regulated air pollutant that the facility will emit in significant amounts, including greenhouse gases. 42 U.S.C. §§ 7471, 7475(a)(2), 7479(3); 40 C.F.R. 51.166(b)(48) and (j); 326 IAC 2-2, *see supra* note 1. A permit cannot issue without proper BACT limits. 42 U.S.C. § 7475(a)(4); *Alaska Dep’t of Env’tl Conservation v. EPA*, 540 U.S. 461 (2004) (hereinafter “*Alaska DEC*”) (upholding U.S. EPA’s authority to block a PSD permit where the state permitting authority’s BACT determination was unreasonable).

In addition, IDEM is charged with issuing to each major stationary source a comprehensive operating permit containing not only applicable emission limits, but also “requirements to assure compliance with the permit terms and conditions.” *Sierra Club v.*

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and Denying in Part and Granting in Part Requests for Objection to Permit, August 12, 2009 (“August 2009 Trimble Order”) *Id.* at fnt. 6. Petitioners note that they disagree with the importation of the EAB’s clearly erroneous standard into the Title V process. A “preponderance of the evidence” standard is more appropriate for reviewing state agency Title V determinations, due to, among other things, the centrality of the U.S. EPA’s oversight function in Title V.

*Environmental Protection Agency*, 536 F.3d 673, 674 (D.C.Cir. 2008), 42 U.S.C. § 7661c (a) and (c), 326 IAC 2-7-5(1).

Finally, because this Petition establishes that the Permit fails to assure compliance with applicable requirements and contains material errors and inaccurate or unclear statements, EPA must reopen and revise the permit pursuant to 42 U.S.C. § 7661d(e) and 40 CFR §§ 70.7(g) and 70.8.

## II. GROUNDS FOR OBJECTIONS

### A. THE AIR QUALITY IMPACTS ANALYSIS IS FLAWED

#### 1. IDEM FAILED TO USE THE PROPER SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub> AND PM<sub>2.5</sub> EMISSION RATES FOR THE HYDROCARBON FLARE AND THE ACID GAS FLARE

EPA must object because the SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> modeling for the ambient impacts analysis fails to consider SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> emissions when the flares are doing what they are designed to do, flare off substances from the facility. This included the hydrocarbon flare, EU-001 and the acid gas flare, EU-002. The one exception is the modeling does consider the hydrocarbon flare during startup on methanol and planned shutdowns but it ignores emissions when the flares are used in other situations like upsets and malfunctions. *See* spreadsheet submitted to IDEM under a September 29, 2011 cover letter, SO<sub>2</sub> tab. The Technical Support Document (“TSD”) acknowledges that during an upset as well as malfunctions, acid gases can be routed to the acid gas flare. TSD, Ex 2 at pdf page 546, 633, RTC, Ex. 2 at 426. However, the emission rates used for the ambient impacts analysis as well as for potential to emit (“PTE”) completely ignored emissions when acid gases are routed to the acid gas flare and when the hydrocarbon flare is used in situations other than startup and planned shutdowns. *See* Application, Ex. 6 at pdf page 254. Thus, the applicant has failed to establish that the source will not cause or contribute to a violation of the SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> NAAQS or increment,

as required by 326 IAC 2-2-5(a). *See also* 326 IAC 2-1.1-5. The modeling must model SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> impacts when the flares are flaring substances during upsets or malfunctions, which again is what they are designed to so it is a completely reasonable scenario.

IDEM does not dispute that the modeling fails to consider emissions from the flares when the flare is flaring substances outside of startup and planned shutdown operations such as during upsets and malfunction. *See* Response to Comments (RTC), Ex. 2 at pdf page 424-426. Rather, IDEM claims that as a matter of law, they are not required to consider these emissions in the ambient air impacts analysis. *Id.*

EPA has already rejected this argument for a very similar Title V petition. Like Indiana Gasification, *In the Matter of Kentucky Syngas, LLC*, Petition No. IV-2010-9 (EPA June 22, 2012)(“*Kentucky Syngas*”)<sup>3</sup> involved a combined PSD/Title V permit for a proposed coal-to-gas facility. In *Kentucky Syngas*, EPA objected to the permit because the permit failed to include emissions from the flares during periods other than startup and planned shutdowns. *Id.* at 29-30. So to with Indiana Gasification.

The fact that the *Kentucky Syngas* decision was in the context of potential to emit rather than air quality impact analysis is of no moment. IDEM implicitly concedes as much by citing a case about potential to emit in its response to this issue. *See* Ex. 2 at pdf page 424 *citing United States v. Louisiana-Pacific Corp.*, 682 F. Supp. 1141, 1158 (D. Colo. 1988)(discussing potential to emit). The underlying issue is the same. The use of the flares outside of startup and shutdown is a reasonable scenario and thus must be considered in the permit analysis including potential to emit and ambient impact analysis. This is not a case where petitioners are arguing that something like emissions from meteorites striking the coal pile have to be included in the permit

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<sup>3</sup> Available at [http://www.epa.gov/region7/air/title5/petitiondb/petitions/kentuckysyngas\\_response2010.pdf](http://www.epa.gov/region7/air/title5/petitiondb/petitions/kentuckysyngas_response2010.pdf)

analysis. Rather, the flares flaring outside of startup and planned shutdown is one of the things the flares are designed to do. Therefore, they must be included in the analysis.

This is consistent with EPA's long standing interpretation of the Clean Air Act. EPA has long held that national ambient air quality standards have to apply all the time. *See e.g. U.S. Magnesium, LLC v. EPA*, No. 11-9533 (10th Cir. Aug. 6, 2012) at 7 (Clean Air Act sections 110(a)(2)(A) and (C) require achievement of "the NAAQS and other relevant CAA requirements *at all times.*" (emphasis added, citation omitted)). After all, people breathe all the time. A child having an asthma attack, for example, does not care about what caused the emissions. Rather, that child is entitled under the Clean Air Act to air that is at least is no dirtier than the NAAQS. Thus, emissions that are reasonably foreseeable must be included in the analysis to see if the proposed facility will cause or contribute to NAAQS violation.

IDEM's citation to *United States v. Louisiana-Pacific Corp.*, 682 F. Supp. 1141, 1158 (D. Colo. 1988) does not refute any of this. As explained above, the operation of the flares to flare substances outside of startup and shutdown is not the "maximum emissions that can be generated by a source hypothesizing the worst conceivable operation." Rather, the flares performing a function that they are designed to routinely perform, and for which there are no prohibition on performing in the permit, is well within the bounds of scenarios needed to be considered in the ambient air quality analysis.

IDEM also responded to this issue by citing its regulatory definition of malfunction which requires that a malfunction be an "unavoidable" failure of process equipment to operate in a normal and usual manner. RTC, Ex. 2 at pdf page 425. However, the use of the hydrocarbon flare outside of startup and planned shutdown is not limited by the Permit to times of malfunction as that term is defined in the 326 IAC 1-2-39. The same is true of the acid gas flare

flaring acid gas product streams. Thus, that definition is irrelevant. Rather, the facility is perfectly free to operate in a manner that maximizes their production but regularly risks upsets and malfunctions. Similarly, IDEM claims that the “facility has been designed in such a way as to prevent the need for flaring in normal operation, outside of startups and shutdowns, to minimize the possibility of malfunction flaring, and to minimize the amount of emissions that must be flared when flaring does occur.” *Id.* However, IDEM provides no citation for this claim and more importantly, points to no enforceable permit condition that requires this to actually be true.

IDEM does explain that the “permit contains several operating requirements regarding flare minimization and flare best practices which are applicable at all times, including upsets and malfunctions.” RTC, Ex. 2 at pdf page 426. IDEM’s response is inadequate because it does not identify these conditions of which it speaks. More importantly, IDEM does not claim, nor could it, that these conditions actually limit the amount of SO<sub>2</sub> emitted from the flares. Without a mass emission limit or even a way to calculate a mass emission limit, these are not enforceable conditions that can be used to base the modeled emission rate.

Most importantly, IDEM misses the key point. NAAQS are not technology based standards. They are health and public welfare based standards. *See* 42 U.S.C. § 7409(b). *See also Whitman v. American Trucking Association*, 531 U.S. 457, 464 (2001). Adverse health and public welfare impacts occur regardless of the subjective intent of the polluter in operating their pollution source. The plain language of 326 IAC 2-2-5(a) admits no exceptions, much less a specific exception for malfunctions. Thus, the subjective intent of the polluter is irrelevant to compliance with the NAAQS. *See generally Whitman v. American Trucking Association*, 531 U.S. 457, 464 (2001). The duty to prove that a source does not violate a NAAQS is absolute, as

compared to, for example, setting Best Available Control Technology emission limits, which does consider a variety of factors in the determination, including what is achievable. *See generally Id.* at 467.

IDEM's citation to Appendix W also does not provide a rational response. IDEM points to Appendix W which says "the source should be modeling using the design capacity . . ." RTC, Ex. 2 at 425. But Indiana Gasification is designed to use the flares outside of startup and planned shutdown so this part of Appendix W supports Petitioners.

IDEM also cites to 40 C.F.R. Part 51, Appendix W, Sec. 8.1.2 fn. A. *Id.* This footnote provides:

Malfunctions which may result in excess emissions are not considered to be a normal operating condition. They **generally** should not be considered in determining allowable emissions. However, if the excess emissions are the result of poor maintenance, careless operation, or other preventable conditions, it may be necessary to consider them in determining source impact.

40 C.F.R. Part 51, Appendix W, Sec. 8.1.2 fn. A (emphasis added). This language appears to be a vestige of EPA's past errors of startup, shutdown and malfunction provisions. These past errors are inconsistent with the Clean Air Act and EPA's long standing interpretation of the Clean Air Act and should be corrected. *See e.g. Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008); *US Magnesium, LLC v. EPA*, 11-9533 (10<sup>th</sup> Cir. Aug. 6, 2012).

However, regardless of the language in Appendix W, in this case, as noted above, the use of the flares outside of startups and planned shutdowns is not limited to malfunctions that are not the result of poor maintenance, careless operation or preventable conditions. Thus, the use of the flares must be included in the ambient impact analysis. In addition, this footnote in Appendix W says "generally." The use of flares at Indiana Gasification is not the sort of malfunction that EPA would exclude from ambient impacts analysis even if other malfunctions generally would

be excluded because the use of flares outside of startup and planned shutdowns is part of the design of the facility. This is different than, for example, the operating of emergency firewater pumps when there is a fire and grid power is not available. The facility is not designed to be on fire but it is designed to use its flares.

Finally, IDEM cites to Guidance from EPA on modeling for the 1-hour NO<sub>2</sub> NAAQS. RTC, Ex. 2 at PDF page 425. Of course, guidance that has not even gone through notice and comment cannot trump Supreme Court and Circuit Court case law discussed above that establishes that there is no “malfunction” exception to the requirement that PSD applicants establish that they do not cause or contribute to a violation of a NAAQS.

In any event, the Guidance that IDEM cites actually states:

Recommends that compliance demonstrations for the 1-hour NO<sub>2</sub> NAAQS address emission scenarios that can logically be assumed to be relatively continuous **or** which occur frequently enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations based on existing modeling guidelines, which provide sufficient discretion for reviewing authorities to not include intermittent emissions from emergency generators or startup/shutdown operations from compliance demonstrations for the 1-hour NO<sub>2</sub> standard under appropriate circumstances.

Tyler Fox, Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO<sub>2</sub> National Ambient Air Quality Standard, March 1, 2011 at 2.<sup>4</sup> The flares would only have to operate outside of startup and planned shutdowns on 4 separate days per year to significantly contribute to the annual distribution of daily maximum 1-hour concentrations for the cumulative analysis and only once per year over the course of five years to significantly contribute to the significant impact level analysis. IDEM’s response to comment did not offer any quantitative evidence of how often the flares would operate outside of startup and planned shutdown, much less evidence that they would operate less than once per year. Furthermore, this

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<sup>4</sup> Available at [http://www.epa.gov/ttn/scram/guidance/clarification/Additional\\_Clarifications\\_AppendixW\\_Hourly-NO2-NAAQS\\_FINAL\\_03-01-2011.pdf](http://www.epa.gov/ttn/scram/guidance/clarification/Additional_Clarifications_AppendixW_Hourly-NO2-NAAQS_FINAL_03-01-2011.pdf)

issue does not involve startup and planned shutdowns or an emergency generator. An emergency generator is fundamentally different from the flares at Indiana Gasification in that an emergency generator is used in emergency and IDEM has never disputed that the use of the flares outside of startups and planned shutdowns is not limited to emergencies. Therefore, EPA's March 1, 2011 Guidance does not provide a rational basis for IDEM's failure to include emissions from the hydrocarbon flare during periods outside of startup and planned shutdowns.

## 2. IDEM IMPROPERLY USED A SO<sub>2</sub> SIL OF 7.80 UG/M<sup>3</sup>

IDEM based its analysis of whether Indiana Gasification will cause or contribute to a violation of the one-hour SO<sub>2</sub> NAAQS on a significant impact level (SIL) of 7.80 ug/m<sup>3</sup>. Ex. 2 at 954. IDEM found that because the preliminary analysis of Indiana Gasification's impacts, by themselves, were below this SIL, Indiana Gasification need do no further analysis. *Id.* This is a critical issue for Indiana Gasification because it is located in the same county as a huge coal-fired power plant which would obviously create tremendous impacts in a cumulative impact analysis for the one-hour SO<sub>2</sub> NAAQS.

Petitioners commented that IDEM failed to justify the use of a SIL in general for the one-hour SO<sub>2</sub> NAAQS or specifically the use of the 7.80 ug/m<sup>3</sup> SIL in this case. Ex. 3. at 2. IDEM responded to the comment about the use of SILs in general. *See* RTC, Ex. 2 at 422-423. However, IDEM failed to respond to the comment about the use of the 7.80 ug/m<sup>3</sup> SIL. Therefore, EPA must object because IDEM has failed to offer any record support for the 7.80 ug/m<sup>3</sup> SIL and failed to respond to Petitioners comment on this issue.

IDEM's response to comments tries to justify a SIL of the 7.86 ug/m<sup>3</sup> SIL. *See Id.* However, EPA has already addressed a very similar situation and found it grounds for a remand. *In Re Mississippi Lime Company*, PSD Appeal No. 11-01 (EAB August 9, 2011), it was unclear

whether the permitting authority had used a one-hour SO<sub>2</sub> SIL of the 7.85 ug/m<sup>3</sup> SIL, the 7.9 ug/m<sup>3</sup> SIL, or 10 ug/m<sup>3</sup> SIL. *Id.* at 39. The EAB found that because there was no justification in the record for the SIL of 7.9 ug/m<sup>3</sup> or 10 ug/m<sup>3</sup> the permit must be remanded. *Id.* at 39-41. The fact that the 7.9 ug/m<sup>3</sup> SIL was only 0.05 ug/m<sup>3</sup> different than the SIL justified in the record did not affect the EAB's decision to remand the permit.

Petitioners also note that Indiana Gasification "annualized" the SO<sub>2</sub> emissions from the shutdown venting of the gasifier. *See* Application, Ex. 6 at pdf page 254. "Annualized" means that they took the tons per year of SO<sub>2</sub> emissions permitted for the shutdown venting of the gasifier and divided that value by 8760 hours per year to get the emission rate used in the modeling. That is 1.92 tons per year divided by 8760 hours per year equals 0.4384 lb/hr used in the 1-hour SO<sub>2</sub> modeling. This is totally unrealistic and inconsistent with EPA's position on this issue. IDEM determined that the unit will only have 15 shutdowns per year. IDEM does not explain how long each shutdown is but if we assume it lasts 1 hour, then the appropriate emission rate would have been 256 lb/hour. Using this emission rate, or any emission rate based on a reasonable length of a shutdown would have resulted in a modeled impact substantially above any significant impact level IDEM may use.

Petitioners acknowledge that they did not raise this issue in their comments to IDEM. Petitioners raise this issue here for two reasons. One is so that EPA understands the importance of the issues in this petition regarding SO<sub>2</sub> model. The other is that Petitioners request that EPA consider this issue a petition to reopen the Title V permit under EPA's authority in under 42 U.S.C. section 7661d(e) and 40 C.F.R. section 70.7(g)(1).

3. THE AMBIENT IMPACT ANALYSIS IS FLAWED BECAUSE THE PERMIT DOES NOT CONTAIN SO<sub>2</sub> AND NO<sub>x</sub> 1-HOUR AVERAGING TIME EMISSION LIMITS FOR THE WET SULFURIC ACID TRAINS

Petitioners commented that the SO<sub>2</sub> ambient impact analysis is flawed because the Permit “does not contain any enforceable 1-hour averaging time emission limits for any other emission units. Therefore, the modeling must use 1-hour averaging time PTE.” Ex. 3 at 3 (emphasis added). Similarly, Petitioners commented that the NO<sub>x</sub> ambient impacts analysis is flawed because the Permit “does not contain any enforceable 1-hour averaging time emission limits” for NO<sub>x</sub>. Ex 3. at 6 (emphasis added).

For example, the Permit limits the SO<sub>2</sub> emissions from the two Wet Sulfuric Acid plant train stacks to 8.3 lbs/hour “based on a 24-hour block daily average.” Permit, Ex. 2 at pdf page 86, Condition D.5.7.<sup>5</sup> IDEM relied on this 8.3 lbs/hour rate in the 1-hour SO<sub>2</sub> modeling, even though it is based on a 24-hour block daily averaging time. *See* Application, Ex. 6 at pdf page 254.

Similarly, the Permit limits the NO<sub>x</sub> emissions from the two Wet Sulfuric Acid plant train stacks to 10.2 lbs/hour “based on a 24-hour block daily average.” Permit, Ex. 2 at pdf page 86, Condition D.5.8.<sup>6</sup> IDEM relied on this 10.2 lbs/hour rate in the 1-hour NO<sub>x</sub> modeling, even

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<sup>5</sup> We note that the Permit lacks enforceable monitoring for this requirement. *See* Ex. 2 at pdf page 87, Condition D.5.13 setting the compliance determination requirement as simply operating the peroxide scrubber regardless of the actual SO<sub>2</sub> emissions. It is possible that Condition D.5.15(a) requires a CEMS to monitor for SO<sub>2</sub> but the condition is very unclear. EPA should clarify that when IDEM revises the permit to include a one-hour averaging time emission limit, the public should also be given the opportunity to comment on the enforceability, including monitoring, testing and reporting, for the new one-hour emission limit.

<sup>6</sup> Similarly, the Permit lacks enforceable monitoring for this requirement. *See* Ex. 2 at pdf page 87, Condition D.5.12 setting the compliance determination requirement as simply operating the SCR regardless of the actual NO<sub>x</sub> emissions. It is possible that Condition D.5.15(a) requires a CEMS to monitor for NO<sub>x</sub> but the condition is very unclear. EPA should clarify that when IDEM revises the permit to include a one-hour averaging time emission limit, the public should also be given the opportunity to comment on the enforceability, including monitoring, testing and reporting, for the new one-hour emission limit.

though it is based on a 24-hour block daily averaging time. *See* Application, Ex. 6 at pdf page 253.

IDEM did not respond to Petitioners comment with regard to the lack of 1-hour SO<sub>2</sub> and NO<sub>x</sub> emission limits for emission units other than the flares, such as the wet sulfuric acid plant trains. *See* RTC, Ex. 2 at pdf pages 426 – 429, Response 9; 434, Response 19. IDEM’s complete failure to respond to the comment is grounds enough for an objection. *See In the Matter of Wheelabrator Baltimore, L.P.*, 2010 EPA CAA Title V LEXIS 4 (EPA Adm. April 14, 2010)(*Wheelabrator*) at \*17-18. However, it would be best if EPA objected based on the substance, that is the lack of a 1-hour averaging time SO<sub>2</sub> and NO<sub>x</sub> emission limits for the wet sulfuric acid trains.

*In Re Mississippi Lime Company*, PSD Appeal No. 11-01 (EAB August 9, 2011) is very much on point on this issue. The EAB held that EPA has issued a “clear directive” to permitting authorities to “ensure that source’s PSD permit defines a maximum allowable hour emission limitation for SO<sub>2</sub>[.]” *Id.* at 45. The source in question had a three-hour averaging time emission limit. *Id.* at 42. The EAB remanded the permit in that case, despite the permitting agency’s attempt to justify the lack of a one-hour averaging time to protect the one-hour averaging time SO<sub>2</sub> NAAQS.

So to with the Indiana Gasification permit. It lacks a one-hour averaging time SO<sub>2</sub> and NO<sub>x</sub> emission limit for the wet sulfuric acid trains or even a three-hour averaging time limit as in the case of *Mississippi Lime Company*. Therefore, EPA must object to the permit.

4. **IDEM FAILED TO RESPOND TO PETITIONERS’ COMMENTS REGARDING THE TEMPERATURE AND EXIT VELOCITY USED IN THE MODELING FOR THE HYDROCARBON FLARE**

Petitioners’ commented that:

In addition, the spreadsheet claims that the temperature and exit velocity for the hydrocarbon flare are the same whether it is just burning natural gas in the pilot or burning methanol during gasifier start-up. This does not seem physically possible. Therefore, these values must be corrected if they are wrong in all of the modeling for all of the pollutants, the modeling re-run and a new public comment period held.

See Ex 3 at 4. IDEM obviously saw this comment because they placed it in their response to comments. See Ex. 2 at pdf page 429 quoting above. See also Ex. 2 at pdf page 435 (same comment). However, IDEM completely failed to respond to this comment. See Ex. 2 at pdf page 429-430, Response 12; pdf page 435, Response 21. Therefore, EPA must object based on IDEM's complete failure to respond to this comment. *Wheelabrator* at \*17-18

Temperature and exit velocity are two modeling input parameters that impact the results of the modeling. This issue is significant because it impacts the modeling for SO<sub>2</sub>, NO<sub>x</sub>, CO and PM<sub>10</sub>. See Ex. 6 at pdf page 253 – 256. IDEM claimed that Indiana Gasification's impacts were just under the significant impact level for the 1-hour SO<sub>2</sub> and NO<sub>x</sub> NAAQS. Thus, even minor changes to modeling inputs could affect the results. Also, 326 IAC 2-2-5(a) provides that the "owner or operator of the proposed major stationary source or major modification shall demonstrate that allowable emissions increases in conjunction with all other applicable emissions increases or reductions (including secondary emissions) will not cause or contribute to air pollution in violation of any" NAAQS or increment. Thus Petitioners need only prove that the applicant failed to demonstrate that there will not be a violation. IDEM has rendered the ambient impact analysis unreliable by failing to address the issue of the validity of two key modeling parameters.<sup>7</sup>

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<sup>7</sup> Similarly, IDEM failed to respond to the second half of Sierra Club's comment 52. See RTC, Ex. 2 at pdf page 455.

5. IDEM ERRED IN ISSUING THE PERMIT BECAUSE IT WILL CAUSE OR CONTRIBUTE TO A VIOLATION OF THE PM2.5 NAAQS

Petitioners explained in their comments that:

IDEM acknowledges that it modeled a violation of the 24-hour PM2.5 NAAQS to which IG is contributing. However, IDEM claims that IG can still obtain its PSD permit because the contribution from IG is below the SIL. . . .

[T]he use of SILs is illegal. We explained this in the Opening Brief of Sierra Club in *Sierra Club v. United States Environmental Protection Agency*, 10-1413 (D.C. Cir) which we are attaching as Exhibit 4 and hereby incorporating by reference.

Ex. 3 at 7. IDEM explained that it believes the arguments made in *Sierra Club*, 10-1413, have been repeatedly rejected by the U.S. EPA and the federal courts alike. RTC, Ex. 2 at 436-437.

IDEM acknowledges that Indiana Gasification contributed to the controlling PM2.5 violations but offers no analysis of whether Indiana Gasification's contribution actually caused these violations. *Id.* at 436. EPA's position now seems to be that a contribution below the SIL is still a violation of the prohibition on cause or contributing to a violation of a NAAQS if the contribution causes the violation. Thus, EPA should object based on IDEM's failure to address this issue.

In any event, the D.C. Circuit will likely rule on this issue before EPA responds to this petition. If the D.C. Circuit strikes down the SIL, then IDEM's response to comments will be inadequate for the reasons explained by the D.C. Circuit in striking down the PM2.5 SIL.

B. IDEM FAILED TO ALLOW FOR PUBLIC COMMENT ON ITS OZONE IMPACTS ANALYSIS

Petitioners commented that IDEM failed to conduct an analysis of whether Indiana Gasification will cause or contribute to a violation of the ozone NAAQS. Ex. 3 at 4. In response to this comment, IDEM conducted what it believes is an analysis of whether Indiana Gasification will cause or contribute to a violation of the ozone NAAQS. *See* Ex. 2 at pdf page 362 – 364.

However, IDEM did not allow for public comment on this ozone analysis that it has shared with the public for the first time in response to comments. Therefore, EPA must object. Obviously, Petitioners could not have raised this issue of failure to allow for public comment on IDEM's ozone analysis at the time of the public comment period because IDEM's ozone analysis did not exist at that time.

EPA has decided essentially the same issue in the *Kentucky SynGas* decision. In that Order, EPA explained:

Nonetheless, depending on the circumstances, EPA may determine that an objection is warranted on the basis that the unavailability of the omitted information during the public comment period contravened 40 C.F.R. § 70.7(h) because the absence of that information deprived the public of the opportunity to meaningfully participate in the permitting process, especially where the missing information resulted in, or may have resulted in, a deficiency in the content of the permit.

*Kentucky Syn Gas* at 9. In the *Kentucky Syn Gas* order, EPA granted the petition to object because Kentucky DAQ did not provide an opportunity for the public to comment on the PM2.5 ambient air quality analysis. *Kentucky Syn Gas* at 14-15. This is the exact same issue except it is the ozone ambient air quality analysis rather than the PM2.5 analysis that was not subject to public comment. Therefore, EPA must reach the same result and object to the Indiana Gasification permit.

This is critical because the area around Spencer County has a serious ozone problem. For example, as explained in Petitioners' comments, nearby Clark County has a 2009 -2011 design value of 75.3 ppb, Greene County has a 2009 – 2011 design value of 74 ppb, and the monitor at the Green Valley Elementary School in Floyd County had a 4<sup>th</sup> high value in 2011 of 80 ppb and exhibits a disturbing upward trend in recent years. Also, many of the ozone monitors near Spencer County are trending upward in recent years. *See Ex. 2* at pdf page 405 – 407. In light of this serious problem, it is especially important that EPA provide the public with the opportunity

to ensure that IDEM conducts a scientifically credible analysis of Indiana Gasification's impacts to ambient ozone levels.

C. IDEM ERRED IN CONCLUDING THAT INDIANA GASIFICATION IS A SYNTHETIC MINOR SOURCE FOR HAPS AND THUS NOT APPLYING THE APPROPRIATE MACT LIMITS.

IDEM admitted that Indiana Gasification could be a major source of hazardous air pollutants (HAPs). *See* TSD, Ex. 2 at pdf pages 504-505. However, IDEM determined that the Permit contained sufficient conditions so that Indiana Gasification would be a synthetic minor source for hazardous air pollutants (HAPs) and therefore not subject to any of the major source MACT standards. *See* TSD, Ex. 2 at pdf page 508, 518; Permit, Ex. 2 at pdf page 20, 30, 66. However, by IDEM's own calculations, Indiana Gasification would just barely be a synthetic minor source. Total HAPs would be 24.79 tons per year versus the major source threshold of 25 tons per year. *See* TSD, Ex. 2 at pdf page 508. For numerous reasons explained below, EPA must object because IDEM's conclusion that Indiana Gasification is a synthetic minor source of HAPs is in error.

1. BACKGROUND ON THE REGULATION OF HAZARDOUS AIR POLLUTANTS

The Clean Air Act reserves its strictest controls for hazardous air pollutants— air toxics posing serious health effects (often carcinogenic or neurotoxic) even in relatively small quantities. *See* 42 U.S.C. § 7412(b)(1)-(2) (listing hazardous pollutants and instructing EPA to add additional substances “reasonably anticipated to be carcinogenic, mutagenic, teratogenic, neurotoxic, which cause reproductive dysfunction, or which are acutely or chronically toxic.”). The regulatory regime controlling hazardous air pollutants reflects the enormity of those pollutants' health effects. *See* S. Rep. No. 101-228, at 127 (1989), *as reprinted in* 1989 U.S.C.A.N. 3385, 3513-14 (noting that “ample margin of safety” might require “zero exposure

to carcinogens, because any amount of exposure may cause a cancer”). It also reflects Congress’ frustration with state and federal agencies’ persistent failures to properly regulate air toxics; Congress described past regulatory efforts as a “record of false starts and failed opportunities.” *Id.* at 3517.

As a consequence of those congressional concerns, *id.* at 3517, Section 112 of the Clean Air Act bears three distinguishing features: (1) strict limits, set by the federal EPA; (2) direct, mandatory prohibitions that leave no room to avoid those limits; and, (3) express federal jurisdiction to address violations of those limits and prohibitions. *See id.* at 3513 (noting Congress’ intent to “entirely restructure the existing law, so that toxics might be adequately regulated by the Federal Government”).

The limits prescribed for hazardous air pollutants are those reflecting the “maximum achievable control technology” (“MACT”), defined as the “maximum degree of reduction in emissions.... that the Administrator [of the federal EPA] .... determines is achievable,” considering costs, non-air quality health and environmental impacts, and energy requirements. 42 U.S.C. § 7412(d)(2). EPA sets MACT limits for categories of industrial facilities; once set, they apply nation-wide to all major sources within those categories. 42 U.S.C. § 7412(d)(1). *See, e.g.,* 74 Fed. Reg. 21,136, 21,140-41 (May 6, 2009) (setting standards for portland cement manufacturing facilities). These MACT limits for categories of industrial facilities are often referred to as National Emission Standards for Hazardous Air Pollutants or “NESHAPs.”

Unlike other similar limits in the Act, Congress added a “floor” to the MACT definition: MACT limits for new plants may “not be less stringent than the emission control that is achieved in practice by the best controlled similar source, as determined [EPA].” 42 U.S.C. § 7412(d)(3). That floor is the heart of the MACT limit, resulting in standards that are substantially stricter

than some of those the Act requires elsewhere. *See* 59 Fed. Reg. 15,504, 15,564 (May 10, 1994) (“[T]he MACT floor is a fundamental requirement of the section 112(g) determination.”). Mindful of agencies’ reluctance to impose restrictions that might be “potentially very costly for some [regulated industries],” 1989 U.S.C.C.A.N. at 3517, Congress gave the federal EPA, rather than states, the authority and obligation to set nation-wide MACT standards for major sources of hazardous air pollutants. 42 U.S.C. § 7412(e). Congress further pre-empted state authority to set “any emission standard or limitation which is less stringent than” the standards required by Section 112. 42 U.S.C. § 7416.

Under Clean Air Act Section 112(g), “no person may construct or reconstruct any major source of hazardous air pollutants, unless [EPA] (or the State) determines that the [MACT] emission limitation . . . for new sources will be met.” 42 U.S.C. § 7412(g)(2)(B) (emphasis added). *See* 40 C.F.R. § 63.42(c). Accordingly, the first step in the section 112 process is to determine whether a facility is a “major” or “minor” source of hazardous air pollutants. A major source of HAPs is defined as a stationary source or group of stationary sources located in a contiguous area and under common ownership and control which have the potential to emit at least 10 tons per year (“tpy”) of any single HAP or at least 25 tpy of all HAPs in total.

“Potential to emit” is defined as:

the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation is enforceable by USEPA.

40 C.F.R. §§ 63.2, 63.41.

IDEM has proposed to issue a permit for Indiana Gasification that does not fully regulate HAP emissions because it claims that this facility is a synthetic minor source because permit

conditions would limit its HAP emissions to less than major source HAP emission thresholds. However, the administrative record and Permit do not support these claims.

## 2. LEGAL REQUIREMENTS FOR RESTRICTING A SOURCE'S POTENTIAL TO EMIT TO LESS THAN A MAJOR SOURCE LEVEL

The definition of “potential to emit” requires first that “potential to emit” reflect the maximum capacity to emit a pollutant. Second, it requires that, to the extent that the applicant or agency claims that maximum capacity to emit is constrained in any way, the permit must explicitly set forth the constraint as a physical or operational limit – *e.g.*, a specific limit on fuel, hours of operation, or pollution control equipment operating parameters – that is federally and practically enforceable.

The definition of potential to emit in 40 C.F.R. Part 63 is virtually identical to the definition of potential to emit in the PSD regulations at 40 C.F.R. § 52.21(b)(4). Courts have interpreted the definition of potential to emit in 40 C.F.R. § 52.21(b)(4) to require restrictions on operating hours or production levels or types of material combusted, rather than simply imposing limits on tons of pollutants emitted per year. Courts have emphasized the need to ensure that any constraints assumed on potential to emit are grounded in enforcement reality. *See e.g. Weiler v. Chatham Forest Products*, 392 F.3d 532, 535 (2d Cir. 2004) (“In short, then, a proposed facility that is physically capable of emitting major levels of the relevant pollutants is to be considered a major emitting facility under the Act unless there are legally and practicably enforceable mechanisms in place to make certain that the emissions remain below the relevant levels”). *See, also, U.S. EPA Objection to Proposed Title V Permit for Quebecor World Franklin located in Franklin, Kentucky* (Aug. 29, 2002); *United States v. Questar Gas Mgmt. Co.*, 2:08-CV-167 TS, 2011 WL 1793172 (D. Utah 2011) (“the Court finds that, as it relates to

the NESHAP regulations [HAP regulations], limitations on a facility's emissions may only be considered when they are legally and practicably enforceable”).

3. IDEM COMMITTED NUMEROUS ERRS IN CONCLUDING THAT INDIANA GASIFICATION IS A SYNTHETIC MINOR SOURCE OF HAPS

Petitioners commented that IDEM failed to include HAPs emissions in its potential to emit calculation for operations when acid gases are routed to the acid gas flare. Ex. 3 at 3, *citing* what is now Ex. 2 at pdf page 546, 633; Ex. 3 at 13.<sup>8</sup> IDEM responded to this comment by explaining that because the acid gas flare is only used during upsets and malfunctions, IDEM does not need to include its emissions when flaring acid gases in its potential to emit calculations. Ex. 2 at pdf page 426. The same is true for the hydrocarbon flare. Petitioners commented that IDEM ignored its emissions when it was flaring outside of startup and planned shutdown. Ex. 3 at 13. IDEM responded by claiming that it can ignore those emissions of hazardous air pollutants. RTC, Ex. 2 at pdf page 442. Petitioners have already explained why that response is incorrect in Section II.A.1, above. Therefore, consistent with EPA’s decision in *Kentucky Syngas*, EPA must object to the permit.

Petitioners commented that the TSD assumes that the syngas hydrocarbon flare, the acid gas flare, the emergency diesel generators and the emergency firewater pumps each have a PTE of 0 TPY HAPs. Ex. 3 at 13 *citing* what is now Ex. 2 at pdf page 506-507. This assumption is not correct. IDEM originally provided no information on how it calculated that HAP emissions from the emergency diesel generators and emergency firewater engines are zero. In response to comments, IDEM now shows its calculations of HAPs emissions from the diesel engines. Ex. 2 at pdf page 485 referencing AP-42 Section 3.4 Table 3.4-2 & 3.4-3; Section 3.3, Table 3.3-2.

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<sup>8</sup> Petitioners made it perfectly clear in their comments that they were addressing multiple issues under single headings and that the headings did not limit the scope of the comments. *See* Ex. 3 at 1, fnt 1. Because of the cross cutting issues as well as the limited time Petitioners are provided to prepare comments, this is a necessity.

EPA has long rejected the use of AP-42 emission factors, rather than enforceable emission limits to establish that a source is synthetic minor. AP-42 itself explains that use “of these factors as source-specific permit limits and/or as emission regulation compliance determinations is not recommended by EPA.” AP-42 Introduction at 2.

The Environmental Appeals Board decision in *In re Peabody Western Coal Co.*, 12 E.A.D. 22, CAA Appeal No. 04-01 (Feb. 18, 2005) demonstrates why relying on emission factors is not sufficient in a potential to emit analysis. In that case, Peabody tried to establish that one of its facilities was a synthetic minor source for purposes of PSD. Peabody’s request for a PTE limit of 185 ton/year relied on a quantitative estimate of the Facility’s capacity to emit PM10. This estimate, in turn, relied on emission factors and assumed emission control efficiencies. Peabody estimated the uncontrolled emissions from each emissions unit based on the application of AP-42 emission factors. Peabody then estimated the net emissions from these units by applying assumed control efficiencies, and requested that Region IX establish a PTE limit for the Facility based on the cumulative total estimated net emissions. Similarly, Peabody’s proposed compliance regimen did not include direct measurement of PM emissions.

U.S. EPA, Region IX, however, found a fundamental conceptual difference between PTE and actual emission performance that made Peabody’s complete reliance on emission factors inappropriate in this instance. “While PTE is intended to identify the highest possible level of emissions that a facility is capable of releasing in light of its physical design and operational characteristics (considering enforceable restrictions on emission capacity), emission factors are intended to provide a generalized estimate of the average emissions performance of a particular type of emission source. According to AP-42, ‘[i]n most cases, these factors are simply averages

of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category (i.e., a population average).’ As a result, according to Region IX, emission factors do not necessarily reflect the level of emission appropriate for calculating PTE.” *In re Peabody Western Coal Co.*, 12 E.A.D. 22. Region IX stated that it “was not ‘disputing Peabody’s use of emission factors and control efficiencies for the purpose of calculating actual emissions,’ but that because ‘PTE is meant to be a worst case emissions calculation,’ Peabody’s approach was not adequate for ‘the creation of a practically enforceable PTE limit for regulatory purposes.’” *Id.* The Environmental Appeals Board upheld the Region’s decision that this could not be a synthetic minor source when its PTE were based on emission factors. *Id.* Similarly, IG’s reliance of emission factors in its potential to emit HAPs analysis is inadequate.

It is particularly problematic in this case because IDEM used AP-42 emission factors that have a reliability rating of E. See <http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s04.pdf> Table 3.4-3, 3.4-4; <http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf> at Table 3.3-2. AP-42 explains “a single observation based on questionable methods of testing would be assigned an “E”.” AP-42 Introduction at 9. Ratings of E are “Poor.” *Id.* at 10. Therefore, because IDEM has failed to establish that emissions of the diesel engines, in combination with the other emission units, will not be below the major source threshold for HAPs, EPA must object to the Permit.

Petitioners commented that the Permit lacked adequate testing for the acid gas recovery unit’s regenerative thermal oxidizer (RTO) to ensure HAPs emissions stay below the major source threshold. Ex. 3 at 18. Specifically, Petitioners commented that the stack tests of the RTO does not provide any data about emissions during startup, shutdown or malfunction.

IDEM responded by adding testing requirements for additional HAPs and requiring a calculation of emissions based on flow times, an emission factor developed during the stack test. *See Ex. 2 at pdf page 448.* IDEM explained: “Because the gases that are vented from the AGR to the RTOs are otherwise a process product stream, the composition of that stream and the emissions from the RTOs are not expected to vary.” *Id.* The problem with this response is that limits on PTE must be based on practically enforceable emission limits, not expectations. Because there are no enforceable requirements that the composition of the process product stream and more importantly the emissions from the RTO will not vary during various operating scenarios, EPA must object.

This same problem manifests itself with the new stack testing and emission calculations that IDEM has added to the Permit.<sup>9</sup> The emission calculation method assumes there is a linear relationship because the flow and emissions during the stack test and any other level of flow and emissions that the RTO may experience in the five years between stack tests. IDEM offers no justification for this assumption. In some cases, where emissions are based solely on the chemical makeup of the input into a control device and there is guarantee that the control device works at a consistent level, this is reasonable. However, many HAPs, such as formaldehyde and even carbonyl sulfide are influenced by a variety of factors in the combustion process. For those HAPs, there is no justification for IDEM’s linear relationship assumption. It would be enough grounds to object that IDEM offered no justification in the record. However, here, where no justification is even possible, it is even more critical that EPA object.

In addition, IDEM has provided default emission factors for methanol, carbonyl sulfide, hexane, formaldehyde and unspecified “other HAPs” besides methanol, carbonyl sulfide, hexane

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<sup>9</sup> Obviously, Petitioners could not have addressed these recently added conditions during the public comment period because they did not exist.

and formaldehyde to be used if there are no stack test results. Ex. 2 at pdf page 369 -370. EPA must objection because IDEM has not provided a basis for these emission factors which are provided for the first time in response to comments. For methanol and carbonyl sulfide, IDEM claims these emission factors are based on “engineering estimates” but provides no information about who provided these engineering estimates or how they came up with them. *Id.*

“Engineering estimates” is not some talisman that allows for unsupported, that is arbitrary, provisions to be included in a permit. The default value is particularly problematic for methanol as IDEM has changed the value by two orders of magnitude between the draft permit and the RTC without any explanation. *Id.* at pdf page 369 (changing default factor for methanol from 12.7 lbs/million SCF to 0.127). For hexane, formaldehyde and “other HAPs,” IDEM does not even claim these are engineering estimates. IDEM cannot use emission factors without any basis in the record.

**D. IDEM ERRED IN ESTIMATING FUGITIVE DUST FROM PAVED ROADS, RENDERING THE PM AIR QUALITY ANALYSIS INVALID**

The Applicant and IDEM failed to properly calculate fugitive particulate emissions from paved roads, thereby violating the requirements to accurately estimate emissions and apply BACT, as well as invalidating the PM10 and PM2.5 air quality impact analysis. Fugitive dust from industrial sites can be a serious air quality problem, in many instances itself causing air quality violations. With some 32,659 vehicle miles traveled (VMT) annually on paved roads, the Applicant calculated particulate emissions at a mere 0.4531 tpy for PM, 0.0906 tpy for PM10 and 0.0222 tpy, or 44.4 pounds of PM2.5, using AP-42 Chapter 13, Section 2.1 for Paved Roads. TSD Appendix A, “Calculation Sheet,” Ex. 2 at pdf page 715. These emissions levels are far too small to be credible. The problem arises in large part from the use of an unrealistic and inaccurate value for a key variable, silt loading, and an unreasonably high control efficiency for

wet suppression. Because the emission estimates are invalid, the required air quality demonstration based on those emissions is invalid as well. For these reasons, the Administrator must object.

In the recent Cash Creek Title V order, the Administrator highlighted the need for accurate estimation of fugitive emissions from haul roads and material handling, including the key role of practically enforceable permit terms and conditions for fugitives.<sup>10</sup> This case presents many of the same errors and omissions as in the Cash Creek case, similarly justifying an objection.

1. IDEM FAILED TO SUPPORT THAT ITS SELECTED DEFAULT SILT LOADING VALUE IS APPROPRIATE FOR THE FACILITY'S PAVED ROADS.

The PM emission estimates and modeling are based on an unreasonably low and unsupported silt loading factor that does not reflect conditions at the proposed facility. Silt loading is a critical assumption in estimating PM emissions from roads, as the PM emissions vary directly with the silt content. Here, the Applicant and IDEM failed to link the specific facility roads and their uses to the assumed silt loading factor. As a result, they failed to establish that the extremely low 1.0 g/m<sup>2</sup> assumed value reflects the worst-case silt conditions allowed under the Permit for purposes of estimating PM emissions from paved roads and modeling the impact of these emissions. Their entire argument boils down to a qualitative claim that because emission sources at the facility will employ BACT for PM, the silt will presumptively be low. However, the record is devoid of any data supporting this claim, and the agency failed to require any collection of site-specific data to confirm the low silt value.

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<sup>10</sup> Ex. 7, In the Matter of Cash Creek Generation LLC, Order Granting in Part and Denying in Part Petition for Objection to Permit, June 22, 2012 (“Cash Creek Order”).

As an initial matter, IDEM used default baseline values, despite their being highly disfavored for emissions estimation. AP-42 specifically states that the use of a tabulated default value for silt loading results in only an order-of-magnitude estimate of the emission factor for fugitive dust from truck traffic on paved roads, and, therefore, the collection and use of site-specific silt loading data is “highly recommended.” AP-42, 13.2.1-8. This is even truer for industrial sites, given that “the collection of site specific silt loading data from industrial roads is easier and safer than for public roads.” *Id.* at 13.2.1-9. Therefore, to ensure that the permit is based on an accurate assessment of emissions and that any emission limits on fugitives are enforceable, IDEM should have required at least daily monitoring and reporting to confirm that the silt load used in permitting comports with reality. IDEM instead failed to require any silt monitoring, as discussed in more detail below.

In the event that a site-specific value is not available, AP-42 recommends the selection of an appropriate mean value from a table listing silt loadings that were experimentally determined for a variety of industrial roads, but cautions that the quality rating of the equation then decreases by two levels. The paved roads of interest here are within the boundary of an industrial site and thus are industrial roadways. The AP-42 industrial roadway table provides a range of mean silt loading values from 7.4 to 292 g/m<sup>2</sup>. AP-42 Sec. 13.2.1-4, Table 13.2.1-4. Rather than identify an analogous industry and select an appropriate mean value from the table, IDEM used a silt loading value of 1 g/m<sup>2</sup>, providing only a note of explanation in the calculation sheet stating “(Conservative value considering planned frequent watering)”. Fugitive Road Calculation Sheet, Ex. 2 at pdf page 715.

Petitioners raised comments calling into question the use of 1 g/m<sup>2</sup>, a value well below the bottom of the range given in AP-42, and noted that IDEM had provided no data supporting

its selection. They set forth that a more appropriate value would be  $9.7 \text{ g/m}^2$ , the mean silt loading of an iron and steel production facility, because it is near the lower end of the AP-42 industrial roadway range and because iron and steel production facilities, like the Project, use coal. *See* Comments, Ex. 3 at 22 (citing AP-42, 13.2.1-10, Table 13.2.1-3). Petitioners further demonstrated that if this value were used in the calculation, the PM emissions from paved roads would increase to 7.165 tpy of PM10 and 1.759 tpy of PM2.5, an increase of more than an order of magnitude. If the upper end of the industrial road range of  $292 \text{ g/m}^2$  is used, which is appropriate for a potential to emit calculation here given the lack of enforceable limits on PM, the emissions increase hugely to 159 tpy of PM10 and 39 tpy of PM2.5.

IDEM responded to these comments by providing two primary justifications:

- This silt factor is higher (i.e.: more conservative) than silt factors used for several other recent permitting actions for similar facilities.
- The IG facility is not similar to any of the industry types for which silt information is provided in AP42; for example IG is not an iron and steel production facility. Further, the industrial silt values in AP42 (for other types of facilities) are from testing approximately 30 years ago, and are not necessarily relevant to modern facilities with extremely high levels of particulate controls (BACT) on all plant PM emission sources.

TSD Ex. 2 at pdf page 456 - 458. Regarding its first point, IDEM went on to cite the silt factors at three other recently permitted gasification facilities, the Duke Edwardsport IGCC project, Cash Creek Generation Station, and Kentucky NewGas. As to identifying analogous road types, IDEM (a) suggested that the facility's industrial roads are similar to public roads, and (b) claimed that the AP-42 values for industrial paved roads are not "particularly applicable" to the Project because none of the industries are similar, there is a wide range in values, the data is from older facilities, and the value selected is within the range of silt loadings in the data underlying AP-42. *Id.* at pdf pp.458-459. These points do not make an affirmative technical case based in

data for the number that IDEM did select, but argue primarily about what is an *inappropriate* silt value. IDEM's case essentially boils down to its last assertion that since "IG will be a new facility with BACT level control on all particulate sources, roadway silt deposits from nearby operations should be low and it is reasonable to assume that silt levels will be consistent with tests from the better/lower end of the range for the industrial data available." *Id.* at 459. All of these arguments fall short of PSD requirements.

IDEM erred in its reliance on the three cited gasification facilities' silt factors, as none of these facilities provided any acceptable justification for the low values that they employed. Indeed, as noted above, the Administrator has objected to the Cash Creek silt value (the same as that used for Duke Edwardsport) and sent it back to the agency to reconsider.<sup>11</sup> In rejecting the Kentucky agency's silt value, the Administrator cited AP-42 that a wide range of silt loading factors emphasizes the need for site-specific silt loading data, and that collection and use of such data is "preferred and highly recommended." Cash Creek Order at 28. She affirmed that AP-42 "recommends" selecting an appropriate "*mean*" value from the industrial silt table where site-specific silt loading data cannot be obtained, *id.* (emphasis original), contrary to IDEM's assertion that AP-42 only "states that an appropriate value 'may' be selected from those tables." TSD at pdf p460. In addition, the Administrator noted that "a more detailed analysis is needed to justify use of one of the lowest reported silt loading factors from another industry type." Cash Creek Order at 28. Here, IDEM failed in all of these respects.

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<sup>11</sup> Similar problems attended the Kentucky Newgas facility, *see* Ex. 8, Petition Requesting That the Administrator Object to the Issuance of the Proposed Title V Operating Permit for the Kentucky Syngas Facility, October 27, 2010, at 57-59. The Administrator declined to reach these claims in her Title V order of June 22, 2012 due to a failure to raise them adequately below. In addition, the Edwardsport permit poses the same problems. *See* Ex. 9, *In the Matter of Objection to the Issuance of Significant Modification of a Part 70 Source and Significant Permit Modification To a Part 70 Operating Permit for Duke Energy Indiana-Edwardsport Generating Station in Knox County*, Verified Petition for Review and for Stay of Effectiveness, February 12, 2008, at 28-29.

At the outset, the agency went so far as to suggest that the roads at the Project are more analogous to public roads than industrial roads because “the silt loading is a function of [sic] nature of the road, its use, and its location – not who owns it...” *Id.* at pdf p458. Yet IDEM omitted any discussion of how the nature of this plant road, its use and its location are similar to public roads. Given that significant amounts of coal and petroleum coke will be transported on the roads by heavy equipment for use at the facility, and that traffic volumes on the road will not resemble those on public roads, it is difficult to see the analogy.

The agency then claimed, again without analysis, that none of the AP-42 listed industries are similar. *Id.*; *see also id.* at 460 (concluding that values from the iron and steel industry are not appropriate simply because the plant is not an iron and steel facility, with no evaluation of the operations at each in response to a comment explaining that coal is used at both types of facilities). IDEM furthermore concluded that the data used for the AP-42 table are not relevant to this project because they represent older facilities, yet once again provided no data from more modern facilities supporting its claims that such facilities are “likely” to “have significantly lower roadway silt levels” (let alone data demonstrating that a specific silt value of 1.0 g/m<sup>2</sup> is reasonable for this facility or any other “modern” facility). *Id.* at pdf p459. Ignoring the recommendation to use a mean value, IDEM then sought to justify its low silt value based on the low end of the data supporting AP-42, again omitting any analysis of that data by industry characteristics and claiming that its selection was reasonable because it was “within the range of silt loading found at industrial facilities.” IDEM essentially asked to be taken on faith that the Project’s worst case silt value will be low because it is employing PM controls at other emission sources. This qualitative plea does not satisfy the requirement to accurately estimate emissions.

Nor despite this lack of supporting data did IDEM require the plant to show that it will actually achieve such low levels, as AP-42 highly recommends. The agency rejected collection of site-specific data on the basis that a requirement for such testing is “not common,” then claimed that the default value used was reasonable and conservative. TSD, Ex. 2 at pdf p459. The failure of other agencies to require collection of site-specific data is no justification, especially where, as here, the applicant and agency have provided no data from other analogous facilities to support their assertions of an exceedingly low silt value.

2. THE PERMIT LACKS ENFORCEABLE CONDITIONS ENSURING 90% CONTROL EFFICIENCY

The emission estimates of fugitive PM, PM10 and PM2.5 used in the air quality modeling assume 90% control efficiency, which IDEM claims is the BACT level of control required by the Permit. However, the Permit does not contain enforceable terms and conditions that ensure 90% control is achieved, much less continuously achieved.

The Administrator explained in her recent objection to the Cash Creek fugitive dust permit terms and conditions that 90% control efficiency using wet suppression “is one of the highest achievable control efficiencies” for this method. Cash Creek Order at 26. To attain this high level of control, “the wetting agent must be applied frequently and in large amounts,” e.g., by “continuous chemical treating of material loaded into piles, coupled with watering or treatment of roadways.” *Id.* The Administrator found that the Cash Creek permit fell far short, as it lacked “any requirement governing how frequently wet suppression must be applied, the atmospheric and operational conditions under which wet or chemical suppression should be applied, the time of day that wet or chemical suppression should be applied, or the amount that should be applied.” *Id.* The same vagueness and omissions are evident here.

The Applicant gave this description of its initial proposed controls for fugitives:

These emissions are very small, even uncontrolled result in only 0.53 tons/yr. Because of the very small amount of emission, no formal controls are proposed beyond just good housekeeping, i.e.: cleaning off the roadways of any material spilled or other road cleaning if visible emissions are observed.

BACT for PM10 is proposed to be good housekeeping of roadways by cleaning roads if visible emissions are observed or if material is spilled onto roadways.

Application p. 5-36 pdf 82. In the draft permit, IDEM assumed these “good housekeeping” practices would achieve a 90% control factor. Draft Permit at pdf p774. The draft permit terms and conditions supposedly achieving this high control efficiency were as follows:

**Emission Limitations and Standards [326 IAC 2-7-5(1)]**

D.12.4 PM, PM10 and PM2.5 PSD BACT [326 IAC 2-2-3]

... [T]he Best Available Control Technologies (BACT) for the Paved Plant Haul Roads (FUG-ROAD) shall be as follows:

The PM, PM10 and PM2.5 emissions from the paved road (FUG-ROAD) shall be controlled by;

1. Paving all plant haul roads;
2. Use of wet or chemical suppression;
3. Prompt cleanup of any spilled materials; and

with a control efficiency of 90%.

**Compliance Determination Requirements**

D.12.5 Compliance Determination Requirements

To demonstrate compliance status with Condition D.12.4 - PM, PM10 and PM2.5 PSD BACT:

- (a) Wet Suppression shall be performed on paved Haul Roads, except when:
- Rainfall of 0.1 or more inches has accumulated during the 24-hour period prior to the scheduled treatment,
  - It is raining or snowing at the time of the scheduled treatment,
  - The ambient air temperature is at or below 32 degrees, or forecast to be so within the next 24 hours,
  - A significant portion of the haul road is covered by ice or snow or a majority of the road remains wet from recent precipitation or the previous watering, or
  - The road is not being used as a haul road on that day.

(b) Compliance shall be demonstrated using records of haul road usage and control measures and the following formula or an equivalent:

$$\text{Control Efficiency} = 96 - (0.263 * (T/C))$$

Where:

Control Efficiency = percent control efficiency

T = Daily truck trips on roadway (truck trips/calendar day)

C = Number of Wet Suppression treatments per day (watering events / calendar day)

### **Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]**

#### D.12.6 Record Keeping Requirements

To document the compliance status with Condition D.12.4 - PM, PM10 and PM2.5 PSD BACT and Condition D.12.5 – Compliance Determination Requirements, the Permittee shall maintain the following daily records for haul roads:

- (1) The number of trucks on the haul road each calendar day.
- (2) The date, approximate time, and type of each roadway dust control treatment.
- (3) If a treatment is sipped, records shall be maintained of the reason (i.e., ambient temperature, recent rainfall, road conditions observation (snow, etc.))[sic].

Draft Permit at pdf p110.

Petitioners submitted comments arguing that IDEM had failed to adequately explain how it arrived at a control factor of 90% from the above terms and conditions. Specifically, Petitioners noted that wet suppression was the only control to be used on the paved roads, that the permit terms governing use of wet suppression were exceedingly vague, and that the requirement to use wet suppression was subject to a number of exceptions that made compliance a mathematical impossibility. Comments at 24-25.

In response, IDEM noted that its initial requirement to use wet suppression was based on the BACT review of two other recently permitted facilities, the Ohio River Clean Fuels and Cash Creek permits. TSD at pdf p464. Neither of these two facilities supports the fugitive dust analysis here. As an initial matter, the draft permit terms and conditions governing wet

suppression here did not resemble those in the two cited permits.<sup>12</sup> IDEM failed to explain how the draft terms and conditions here are equivalent to the terms and conditions in those permits. It appears that IDEM simply adopted the high control efficiency inappropriately used in those cases. Notably, the Administrator recently rejected the assumption of 90% control for the Cash Creek permit. *See supra* 32-33.

IDEM then stated that “[u]pon further review, several revisions to the permit conditions are appropriate to add clarity and reduce the amount of time when the allowable exceptions to the use of wet suppression would be in effect, and either vacuum sweeping or wet suppression will be required when the ambient air temperature is below 32° F.” TSD at pdf p464. The changes included eliminating an exemption based on a threshold amount of rain in favor of an exemption based on the roadway remaining “wet from recent precipitation.” *Id.* at 464-65. IDEM also changed an exemption based on forecasted low temperatures to require actual ambient temperatures below 32 degrees for an exemption and added a requirement for such cold days to “clean the roadway dust with a vacuum sweeper in lieu of the wet suppression treatment.” In addition to these exemptions, IDEM retained its 90% control compliance calculation – including the language that “an equivalent” to the listed formula may be used – but changed some aspects of the wording. Finally, IDEM added a speed limit of 15 mph on the haul roads. *Id.* at 465-66. These changes do not ensure continuous achievement of an exceptionally high control efficiency of 90%.

First, the minor language changes do not transform the previously vague terms into enforceable, concrete and measurable directives ensuring the highest degree of control. IDEM did not explain how “the subject portion of the haul road” would be identified, or how it would

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<sup>12</sup> *See* Ex. 10, Final Air Quality Permit No. V-09-006, May 5, 2010, issued to Cash Creek Generating, L.L.C. by the Kentucky Division for Air Quality, at 75-79; Ex. 11, Final Air Pollution Permit-to-Install, Permit No. 02-22896, November 20, 2008, issued to Ohio River Clean Fuels by the Ohio Environmental Protection Agency, at 74-77.

be determined that this portion “remains wet from recent precipitation or the previous wet suppression.” Nor is there any discussion of what vacuum sweeping would entail when the ambient temperature is low, e.g., frequency or duration. The wet suppression condition itself lacks any discussion of the amount of water used or the duration of treatment or the time of day of the application, but solely speaks in terms of wetting events. IDEM did not attempt to quantify the reductions from the added speed limit or to show that greater PM control could be achieved with a more stringent speed limit, simply noting that the limit chosen would result in “some additional control.” TSD, Ex. 2 at pdf p464. Finally, the compliance calculation itself is left open-ended, as “an equivalent” may be used without any limitations on what that equivalent is or what public process would be used to vet it. For these reasons, the Administrator must object.

**E. THE PERMIT FAILS TO MEET BACT AND TITLE V REQUIREMENTS FOR CO<sub>2</sub> FROM THE AGR VENTS.**

The Administrator must object because the Permit fails to meet BACT and Title V requirements for CO<sub>2</sub> from the AGR vents, which alone have the potential to emit nearly 6.5 million tons of carbon dioxide per year. While the Permit includes an emission limit on the two AGR vents based on partial capture of CO<sub>2</sub>, this term does not meet BACT and Title V obligations.

Rather than conduct a comprehensive evaluation of the maximum degree of reduction in CO<sub>2</sub> from the AGR vents, IDEM presupposed a baseline of emissions reflecting the Applicant’s business plan to sell and pipe the CO<sub>2</sub> offsite, then set the AGR vents’ emission limit based on that plan. It thus failed to meet BACT requirements in a number of ways. First, IDEM failed to consider the AGR vents’ full potential to emit (“PTE”) as the starting point for BACT, instead taking the Applicant’s business plan as a baseline and presuming that the pipeline will be

constructed and operated. Nor did IDEM fully evaluate carbon capture and sequestration (“CCS”) for enhanced oil recovery (“EOR”) as an available control technology. IDEM then carried forward these errors by failing to consider control options consisting of CCS for EOR and geological sequestration in combination, as well as in its flawed determination that geological sequestration is technically infeasible. Despite not even including CCS for EOR in the list of available control technologies (and so omitting any determination that the vent limit represents the maximum degree of reduction achievable), IDEM claimed that the vent limit based on the Applicant’s EOR plan is a BACT limit.

Finally, IDEM omitted from the compliance measures any terms and conditions to ensure permanent isolation of captured CO<sub>2</sub> from the atmosphere.

1. IDEM’S BACT DETERMINATION FOR CO<sub>2</sub> FROM THE AGR VENTS

As described above, the Project will not only produce SNG by gasifying coal, but also intends to capture CO<sub>2</sub> from the gasification process and sell approximately 5 million tons of the compressed gas to a supplier of CO<sub>2</sub> for EOR.<sup>13</sup> The gas would be transported from the AGR to the EOR site via a pipeline that is yet to be built.<sup>14</sup> IDEM recognized that the AGR vents’ potential to emit CO<sub>2</sub> is nearly 6.5 million tons without the pipeline, as reflected in the first year of operation.<sup>15</sup> Rather than beginning with this PTE, IDEM started its BACT analysis for CO<sub>2</sub> assuming that the pipeline will be built and operated, and considered control options only for 1.29 million tons of CO<sub>2</sub>.

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<sup>13</sup> Ex. 6, Application at 1-1.

<sup>14</sup> See TSD, Ex. 2 at pdf p923: “... a pipeline is needed to transport the CO<sub>2</sub> from the plant site to the Gulf Region. No such pipeline currently exists.”

<sup>15</sup> See Appendix B, BACT Analyses, Technical Support Document, Ex. 2 at pdf p505, note 1 to table entitled “PTE Before Controls.”

In BACT Step 1, IDEM considered a single control option, “sequestration of the AGR vent CO<sub>2</sub>.” Appendix B to TSD, BACT Analyses, Ex. 2 at pdf p919.<sup>16</sup> It made no mention of CCS for EOR. IDEM explained that in Step 2, “In any situation when the sale of liquefied CO<sub>2</sub> via the pipeline will not occur, geological sequestration in lieu of venting has been considered.” *Id.* It then concluded that “[w]hile sequestration is being studied for use in the region where the plant will be located, there is presently no practical option.” *Id.* at pdf p920.

In so doing, IDEM rejected several sequestration sites based primarily on a general claim that sequestration at these sites is not far enough along to show that they are feasible sites for the Plant’s CO<sub>2</sub>. IDEM rejected the ADM Decatur site in Illinois on the basis that the results of the 1 million ton injection project “won’t be known for some time.” *Id.* at pdf p920-21. It similarly rejected the FutureGen site in Morgan County, Illinois because “[g]iven the unprecedented nature of the proposed sequestration, many technical and legal issues remain to be addressed including the public acceptability of the proposed site...” and “[i]t is also not clear whether or by how much it will be sized to accept CO<sub>2</sub> beyond that produced by the FutureGen power plant, what criteria will be used to determine who can potentially use the site for CO<sub>2</sub> storage, or when the site might actually be completed and begin CO<sub>2</sub> storage operations.” *Id.* at pdf p921. Finally, IDEM rejected a site in Hancock County, Kentucky because “... the small scale of the injection... makes clear that significant additional research is needed to demonstrate the viability of large-scale sequestration in this region.” *Id.*

IDEM went on to consider government funding by generally citing to a Department of Energy CCS research and development roadmap. It concluded that “[t]his RD&D roadmap

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<sup>16</sup> In contrast, the Applicant also considered “[l]imiting the amount of CO<sub>2</sub> venting” as a control for the AGR vent. Ex. 6, Application at 3-2. It discussed the measures it would be taking to “reduce the incidences when CO<sub>2</sub> must be vented.” *Id.* However, IDEM completely omitted any determination regarding these measures and whether 1.29 million tpy does in fact reflect the maximum degree of reduction in CO<sub>2</sub> from the AGR vents.

makes clear that... CCS has many risks without significant additional government research, development and demonstration of sequestration methods.” *Id.* On availability of a pipeline for geologic sequestration, the agency noted that it was unaware of any pipeline infrastructure other than “the EOR pipeline contemplated for use by this project” that would have the capacity needed for the Project and could be on-line for commencement of the facility. *Id.* at pdf p922. It rejected constructing a pipeline on the basis that the unsold CO<sub>2</sub> would be only intermittent, and that the logistics of determining a route for the pipeline were impossible given that no sequestration sites had been identified.

The resulting purported BACT limit for CO<sub>2</sub> from the AGR consists of an emission limit on the two vents that varies over the first three years of the Plant’s operations. *See* Cond. D.4.9, Permit, Ex. 2 at pdf pp75-76. The limit allows the AGR vents to emit 1.29 million tons per year of CO<sub>2</sub> starting in the third 12 months of operation and thereafter. *Id.* As compliance measures, IDEM included only a calculation for CO<sub>2</sub> emissions from the AGR vents and AGR vent flow monitoring. Cond. D.4.16, Permit, Ex. 2 at pdf p79, and D.4.22, *id.* at pdf p82.

2. IDEM FAILED TO DEMONSTRATE THAT THE VENT LIMIT REPRESENTS THE MAXIMUM DEGREE OF REDUCTION IN CO<sub>2</sub> ACHIEVABLE FROM THE AGR

IDEM’s BACT determination, rather than identifying the best means of controlling *all* of the Plant’s CO<sub>2</sub> emissions, supposedly identified BACT for only a portion of those emissions. The AGR has the uncontrolled potential to emit of nearly 6.5 million tpy. Yet IDEM performed the BACT analysis for only 1.29 million tpy of that amount, and simply removed from the analysis the 5 million tpy that Indiana Gasification plans to sell for use in EOR. This approach

violates the CAA. IDEM was required to conduct the BACT analysis for the full uncontrolled PTE, not merely the CO<sub>2</sub> that is not in the Applicant's current sales plan.

Indeed, while IDEM claims that the vent limit is BACT, *see* Appendix B at pdf p924 and Cond. D.4.9, Permit, Ex. 2 at pdf p75, nowhere in the analysis does the agency demonstrate that a vent reduction of 5 million tons per year is the maximum degree of reduction in emissions achievable. As noted above, the agency explained in Step 2 that for "any situation when the sale of liquefied CO<sub>2</sub> via the pipeline will not occur, geological sequestration in lieu of venting has been considered." *Id.* No discussion was provided as to why this is the starting point for BACT, instead of the full 6.5 million tons of uncontrolled emissions. This process and outcome do not satisfy BACT requirements.

Under the statute and applicable regulations, BACT must reflect the maximum reduction in emissions of CO<sub>2</sub> "which would be emitted" from the Project or an emission unit or units. *See* 42 U.S.C. § 7479(3); 40 C.F.R. 51.166(b)(12). The starting point for BACT thus is the plant's or unit's potential to emit ("PTE"). While at the applicability stage an applicant may limit its PTE by taking a federally enforceable limit on emissions, and hence hold its emissions below the major source threshold, *see* 40 C.F.R. 51.166(b)(4) (definition of "potential to emit") and (b)(1)(i)(a) and (i)(b) (definition of "major stationary source" based on a source's "potential to emit" exceeding certain thresholds)<sup>17</sup>, that is not what occurred here. In this instance, the Plant was clearly over the PSD and BACT significance thresholds for CO<sub>2</sub> under any design or

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<sup>17</sup> *See also United States v. Louisiana Pacific Corp.*, 682 F. Supp. 1122 (D. Colo. 1987); *Weiler*, 392 F.3d at 535 ("In short, then, a proposed facility that is physically capable of emitting major levels of the relevant pollutants is to be considered a major emitting facility under the Act unless there are legally and practicably enforceable mechanisms in place to make certain that the emissions remain below the relevant levels"). The *Louisiana Pacific* court described PTE as "the cornerstone of the entire PSD program," and observed that allowing illusory and unenforceable limits to curtail PTE would create a loophole that could effectively wipe out PSD requirements entirely. 682 F. Supp. at 1133.

operating scenario. IDEM acknowledged PSD and BACT applicability for CO<sub>2</sub>, but then declined to apply the BACT analysis to the Plant/AGR's full PTE. Allowing a source to limit its PTE for BACT purposes and thereby escape use of a more effective but potentially more expensive control technology defeats the goal of BACT, which is the maximum degree of reduction achievable. For example, under this approach, a project could state its intent to use the less expensive selective noncatalytic reduction for control of NO<sub>x</sub> and thereby reduce the emissions under consideration for NO<sub>x</sub> BACT to the point that the more expensive – but more effective – selective catalytic reduction is considered cost prohibitive.

Even assuming *arguendo* that a source may generally limit its PTE for BACT purposes, no enforceable limitation exists here. Indiana regulations define “potential to emit” as follows:

"Potential to emit" means the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. *Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation is enforceable* by the U.S. EPA, the department, or the appropriate local air pollution control agency.

326 IAC 2-1.1-1 Sec. 1(12) (emphasis added); *see also* 40 C.F.R. 51.166 (b)(4). The pipeline is not a necessary part of the plant's design, as the plant may gasify coal – and generate millions of tons of CO<sub>2</sub> – without construction and operation of the pipeline. While the applicant has stated its intent to only operate the gasifier if the EOR pipeline is constructed, the Permit contains no terms and conditions requiring construction of this pipeline or limiting construction of the gasifier if the pipeline is not built. And even if the Permit did require construction and use of the pipeline, such terms and conditions on their own would be insufficient to create an enforceable limit on the Plant's CO<sub>2</sub> emissions without additional measures to ensure permanent isolation of

CO<sub>2</sub> from the atmosphere. *See infra* 53-57. Unenforceable promises, however well intentioned, do not constitute limits on PTE and most certainly cannot set the starting point for BACT.

Thus, IDEM should have looked at the available control options for the full 6.5 million tons of CO<sub>2</sub> from the AGR and not solely the portion for which the Applicant does not currently have a buyer and so intends to vent. By choosing an improper starting point for the BACT analysis, grounded in exclusion of the CO<sub>2</sub> that the Applicant wishes to sell to EOR developers, IDEM failed in a number of ways. First, it omitted any discussion of CCS for EOR itself as a BACT control option (either for the 5 million tons that it will sell or for the 1.29 million tons to be vented), even though it is clearly “available” because the Project in fact intends to employ CCS for EOR. It is incongruous to omit a control option from the BACT analysis and then base an alleged BACT limit on its use. In failing to consider CCS for EOR for the remaining 1.29 million tpy not currently slated for sale, IDEM failed to determine if additional sales of CO<sub>2</sub> behind the current business plan might be feasible, either now or later down the road. Finally, IDEM failed to consider EOR in varying combinations with geological sequestration to determine if greater than 5 million tons in reduction could be achieved between these two methods. This error also skewed the analysis for the geological sequestration control scenario that IDEM did consider for the 1.29 million tons, as IDEM in part found a second pipeline for geological sequestration unjustified due to the limited and intermittent nature of the remaining CO<sub>2</sub> stream. Both of these factors could have been obviated had IDEM considered geological sequestration for a larger portion of the total CO<sub>2</sub>, i.e., for a portion of the CO<sub>2</sub> that the Applicant intends to sell.

In response to NRDC’s comment raising the omission of EOR as a control option, IDEM stated as follows:

Enhanced oil recovery was not in Step 1 because this is a case of a product sale not regulated under the Clean Air Act. In addition, EPA has not even identified EOR as “available” for purposes of BACT if a party was not selling a product but attempting to comply with an emissions standard. It is important to distinguish between high-purity CO<sub>2</sub> produced by the AGR and delivered to the pipeline, and the high-purity CO<sub>2</sub> produced by the AGR but routed to the AGR vent. As explained on page one of the TSD, CO<sub>2</sub> produced by the AGR, compressed, and delivered to the pipeline is a product of the Indiana Gasification facility... As a product, that CO<sub>2</sub> is not an “air pollutant” as that term is defined by the Clean Air Act, and therefore no BACT analysis is required for the product CO<sub>2</sub>. Conversely, CO<sub>2</sub> produced by the AGR that is vented is an “air pollutant” as that term is defined by the Clean Air Act, and for which a BACT determination is required. The CO<sub>2</sub> from the AGR vent... are the GHGs for which a BACT determination was made.

RTC at pdf p384. There are numerous errors in and problems with this statement.

First, there is no general “product” exception to the CAA’s definition of “air pollutant.”

The term is broad, encompassing “any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive... substance or matter which is emitted into or otherwise enters the air.” 42 U.S.C. § 7602(g); *Massachusetts v. EPA*, 549 U.S. 497, 528-533 (2007). IDEM notably omits any discussion of the CAA’s language in its assertion that a product is not an air pollutant. Given this omission, the Administrator must object and at least require IDEM to explain the statutory basis for its project exemption theory.

To the extent that IDEM is claiming that the CO<sub>2</sub> directed to the pipeline cannot be considered an air pollutant because it is not emitted or otherwise released into the air but rather captured and sold, this claim is factually and legally in error.<sup>18</sup> Even leaving aside the lack of statutory justification for a “product” exception to the Clean Air Act’s definition of “air

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<sup>18</sup> That an applicant may prevent some of the potential emissions from actually being emitted and then sell the captured pollution does not take those emissions out of the BACT analysis. For example, dust from PM captured in a baghouse may be sold as a product, but the facility must still base its BACT analysis on the uncontrolled PTE for PM and commit to enforceable limits requiring use of the baghouse.

pollutant,” IDEM’s novel theory would create a huge loophole in BACT. Every pollutant that is controlled before release is not actually emitted or otherwise released; this truism is recognized by the BACT definition, which requires the maximum degree of reduction in each pollutant “which *would be* emitted.” *See* 42 U.S.C. § 7479(3) (emphasis added). As explained above, allowing any form of control – including for sale as a product – to remove emissions “which would be emitted” from the BACT inquiry would gut the BACT requirement by allowing sources to employ cheaper and less effective controls.

In addition, IDEM’s product theory as applied to the facts of this case would gut the concept of Potential to Emit, as the Permit lacks terms and conditions requiring the construction and use of the pipeline. *See supra* 41-42. Nor does the Permit’s vent limit make the pipeline’s construction and use a necessary component of operating the gasifier. In response to one commentor who raised concerns that the EOR pipeline might never be built and the plant would simply dump the CO<sub>2</sub> into the air, IDEM claimed that the vent limit “expressly prohibits” such a scenario. RTC at pdf p379. However, IDEM failed to explain how the alleged prohibition works, *i.e.*, how the permit will ensure construction and use of the pipeline to avoid this scenario when the pipeline is not an enforceable aspect of the design or a condition of the permit. Because the permit lacks any terms and conditions regarding the fate of the CO<sub>2</sub> past the fenceline, the Applicant may comply with the vent limit by operating the gasifier and merely piping the 5 million tons of captured CO<sub>2</sub> to the fence line and releasing it there. Such a practice would most certainly qualify that pollution as “otherwise enter[ing] the air,” if not “emitted into... the air.” *See* 42 U.S.C. § 7602(g)). For these reasons, IDEM’s “product” claim and ensuing omission of CCS for EOR from its BACT analysis are in error.

Second, IDEM's statement regarding EPA guidance on EOR (in the second sentence of the above IDEM block quote) only *supports* that EOR should have been included as an available control option for BACT purposes in this case. EPA considers EOR as a subset of CCS, making it an "available" BACT control option. In EPA's recent PSD and Title V Permitting Guidance for Greenhouse Gases ("GHG Permitting Guidance")<sup>19</sup>, the agency states that it "generally considers CCS ["carbon capture and sequestration"] to be an 'available' add-on pollution control technology for facilities emitting CO<sub>2</sub> in large amounts and industrial facilities with high-purity CO<sub>2</sub> streams." *Id.* at 35. It later discusses EOR within the ambit of CCS, noting that opportunities to sell captured CO<sub>2</sub> for EOR would weigh in favor of CCS in the assessment of energy, environmental impacts, and cost in BACT Step 4. *Id.* at 43. In other words, EPA considers the opportunity to sell CO<sub>2</sub> for EOR to weigh in favor of a BACT permit limit based on EOR sale of CO<sub>2</sub>. Because EOR opportunities clearly exist here, CCS with EOR should have been included in the full BACT analysis. IDEM instead omitted it completely.

For these reasons, IDEM erred in failing to consider BACT for the full 6.5 million tons of CO<sub>2</sub> from the AGR, and in omitting CCS for EOR from consideration as a control option. This error was prejudicial to the BACT determination. First, it prevented IDEM from considering control scenarios based on greater EOR sales than in the applicant's current business plan. Even if additional sales are not feasible now, as pointed out by commentors the Clean Air Task Force, the Applicant over time will learn how to "optimize the operation of the Project to capture and sell CO<sub>2</sub> from it," and thus actual future sales are likely to exceed the current projected sales. *See* RTC, Ex. 2 at pdf p379. Second, IDEM failed to consider CCS for EOR in combination with geological sequestration in varying tonnages for each, to determine whether greater overall

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<sup>19</sup> Available at: <http://www.epa.gov/nsr/ghgdocs/ghgpermittingguidance.pdf>.

reductions in CO<sub>2</sub> are feasible.<sup>20</sup> Third, omission of the CO<sub>2</sub> associated with EOR from the BACT determination in part drove IDEM's conclusion that geological sequestration for the remaining 1.29 million tons is technically infeasible. Lastly, given that the limit on the vents originated with the EOR business plan and is not technically a BACT limit (as it was not the product of a proper BACT determination), questions of enforceability and compliance may arise. Several of these points are taken up in more detail below.

3. IDEM FAILED TO DEMONSTRATE THAT THERE ARE SITE- AND/OR PROJECT-SPECIFIC BARRIERS TO GEOLOGICAL SEQUESTRATION

Rather than identify any real, site-specific barriers to sequestering even the 1.29 million tons of CO<sub>2</sub> that the Applicant intends to vent, IDEM rejected geological sequestration as technically infeasible by citing a list of general uncertainties that would attend any CCS project. This treatment falls far short of the requirement to assess BACT on a detailed, case-by-case basis.

At the heart of a BACT determination is the explicit Clean Air Act ("CAA") requirement that the determination be made on a case-by-case basis. 42 U.S.C. § 7479(3); *see also* 40 C.F.R. § 52.21(b)(12). The NSR Manual further describes how BACT Step 2 specifically calls for case-specific technical analysis. NSR Manual at B-6. The specific objective of the case-by-case evaluation in Step 2 is to determine, in a two-part analysis, whether the technology at issue is commercially available on any source, and whether, if so, it is applicable to the source type at issue. NSR Manual at B-17. The Manual specifies that a technology is presumed to be applicable where it is deployed or "soon to be deployed" at a similar source type. However, even if it is not deployed at a similar source, and thus the presumption does not apply, the

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<sup>20</sup> BACT requires the maximum degree of reduction achievable through application of "production processes and available methods, systems, and techniques," all in the plural. 42 U.S.C. § 7479(3). *See also* NSR Manual at B.14 and B.16 (discussing combinations of controls).

permitting authority must still make its own reasoned technical judgment as to applicability where the technology has been deployed at other source types. *Id.* at B-17.

In its GHG Permitting Guidance, EPA describes the applicability of BACT determination principles specifically in the context of controlling CO<sub>2</sub> and other GHGs.<sup>21</sup> The Guidance finds that although CCS is “not in widespread use at this time,” it is nonetheless an “available” technology for purposes of BACT Step 1 for facilities such as the Project “emitting CO<sub>2</sub> in large amounts and industrial facilities with high-purity CO<sub>2</sub> streams.” *Id.* at 32, 35.

The Guidance reaffirms that the stringent case-by-case requirements of BACT Step 2 are applicable to determinations of whether CCS constitutes BACT, with certain limited circumstances that do not apply here allowing for a less detailed record. As an overall matter, the Guidance makes clear that a determination in Step 2 that CCS does *not* constitute BACT requires an affirmative detailed technical demonstration by the permitting agency of the reasons supporting the conclusion of infeasibility, along the lines more generally described in the NSR manual. Specifically, the Guidance provides:

CCS is composed of three main components: CO<sub>2</sub> capture and/or compression, transport, and storage. CCS may be eliminated from a BACT analysis in Step 2 *if it can be shown* that there are significant differences pertinent to the successful operation for each of these three main components from what has already been applied to a differing source type. For example, the temperature, pressure, pollutant concentration, or volume of the gas stream to be controlled, may differ so significantly from previous applications that it is uncertain the control device will work in the situation currently undergoing review. Furthermore, CCS may be eliminated from a BACT analysis in Step 2 if the three components working together *are deemed technically infeasible for the proposed source*, taking into

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<sup>21</sup> Petitioners here cite the GHG Permitting Guidance solely for its discussion of the detailed case-by-case analysis as applied to CCS, noting disagreement with EPA that the factors listed are all properly considered technical feasibility questions. Petitioners submitted comments to EPA on the GHG BACT Guidance raising this issue, available at [regulations.gov](http://regulations.gov), Doc. No. EPA-HQ-OAR-2010-0841-0090.

account the integration of the CCS components with the base facility and site-specific considerations (*e.g.*, space for CO<sub>2</sub> capture equipment at an existing facility, right-of-ways to build a pipeline or access to an existing pipeline, access to suitable geologic reservoirs for sequestration, or other storage options).

*Id.* at 35-36. Thus, where CCS has not been applied at the same source type, the Guidance, like the Manual, calls for Step 2 applicability to be determined based on a detailed technical comparison of the feasibility of the three core components of CCS (capture, transport, storage) at the disparate source types.

The Guidance further recognizes that there are some types of smaller facilities with limited GHG emissions for which a large-scale CCS project will plainly be infeasible, and hence that such facilities should not be required to present detailed technical information evaluating something that they clearly will never be able to do. It therefore makes specific allowance for a more limited Step 2 analysis for such facilities. However, it is clear that this limited relaxation of the Step 2 requirement does not apply to the Project – a large-scale industrial project with a concentrated CO<sub>2</sub> stream located near a geologic formation already identified as suitable for CCS by another project and for which voluminous documentation of technical feasibility already exists, as well as several other potential sites. Specifically, the GHG Permitting Guidance provides as follows:

The level of detail supporting the justification for the removal of CCS in Step 2 will vary depending on the nature of the source under review and the opportunities for CO<sub>2</sub> transport and storage. . . . In circumstances where CO<sub>2</sub> transportation and sequestration opportunities already exist in the area where the source is, or will be, located, or in circumstances where other sources in the same source category have applied CCS in practice, the project would clearly warrant a comprehensive consideration of CCS. In these cases, a fairly detailed case-specific analysis would likely be needed to dismiss CCS. However, in cases where it is clear that there are significant and overwhelming technical (including logistical) issues associated with the application of CCS for the type of source under review (*e.g.*, *sources that emit CO<sub>2</sub> in amounts just over the relevant GHG thresholds and produce a low purity CO<sub>2</sub> stream*) a much less detailed justification may be appropriate and acceptable for the source. In addition, a

permitting authority may make a determination to dismiss CCS *for a small natural gas-fired package boiler, for example*, on grounds that no reasonable opportunity exists for the capture and long-term storage or reuse of captured CO<sub>2</sub> given the nature of the project.

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Logistical hurdles for CCS may include obtaining contracts for offsite land acquisition (including the availability of land), the need for funding (including, for example, government subsidies), timing of available transportation infrastructure, and developing a site for secure long term storage. *Not every source has the resources* to overcome the offsite logistical barriers necessary to apply CCS technology to its operations, and *smaller sources* will likely be more constrained in this regard.

GHG Permitting Guidance at 36 (emphasis added). Rather than conduct the required site-specific “comprehensive consideration of CCS,” IDEM provided a short rejection based on general complaints with CCS for geological sequestration.

Starting with possible locations for sequestration, IDEM listed a number of nearby sequestration projects in the works – the majority on the same scale as the 1.29 million tons from the Project – and concluded that not enough is known at this time to base BACT on sequestration here. *See* TSD at pdf p928-29. IDEM provided additional argument on sequestration sites in its RTC, summarized by the agency as follows:

In sum, because the Schlumberger studies do not point to the present availability of the Taylorville site to accept millions of tons of CO<sub>2</sub> from the Indiana Gasification facility, because the Taylorville site is still in a pilot or demonstration phase, and because IEPA has concluded that sequestration is not technically feasible at the Taylorville site, the assessment of sequestration as presented in the BACT determination [rejecting sequestration] remains valid.

RTC at pdf p389. IDEM’s conclusions on each of these points are in error.

As an initial matter, IDEM cannot rely on the IEPA permitting of the Taylorville project to reject CCS for geological sequestration here. IEPA has withdrawn its permit determination for Taylorville, effectively ending a challenge to the permit in front of EPA’s Environmental

Appeals Board.<sup>22</sup> This withdrawal followed submission of a brief in that case by Petitioners, detailing IEPA's many errors with respect to CCS and BACT (many of them similar to IDEM's errors here), as well as a letter from the EPA Region 5 Administrator calling upon IEPA to reconsider its CCS determination.<sup>23</sup> Given this turn of events, it is improper for IDEM to rely on IEPA's now defunct rejection of CCS for the Taylorville facility.

Moreover, the Schlumberger studies<sup>24</sup> for the Taylorville project establish that, in IDEM's own words, "the geologic conditions appear to be favorable." RTC, Ex. 2 at pdf p386. In its Class VI underground injection permit application to EPA, Tenaska again documented the feasibility of CCS at Mt. Simon for large scale sequestration. The 2D geologic survey of Mt. Simon as reported in that application, like that in the Schlumberger studies, was favorable:

The Mount Simon Sandstone has been extensively developed for disposal and storage using Class I injection wells in Illinois and Indiana, and is the main deep saline candidate reservoir being targeted for CO<sub>2</sub> storage at this site. Three identified characteristics of the Mount Simon Sandstone, as determined by ISGS and the MGSC, make it *very suitable for injection at Taylorville* and the area near the proposed TEC #1 well:

- 1) The Mount Simon Sandstone is deep in the subsurface of the Illinois Basin and site 2D reflection seismic interpretation indicates it is laterally continuous in this area;
- 2) It is of sufficient thickness to be used for CO<sub>2</sub> storage;
- 3) Preliminary results of the MGSC project in Decatur suggest *sufficient reservoir potential is present* with porosity and permeability.<sup>25</sup>

In light of these positive conclusions and the extensive technical information supporting them, IDEM cannot simply conclude that sequestration is technically infeasible because it has not

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<sup>22</sup> Ex. 12, In re Christian County Generation, LLC, PSD Appeal No. 12-01, Notification of Permit Withdrawal, July 9, 2012.

<sup>23</sup> Ex. 13, Letter from Dr. Susan Hedman, EPA Region 5 Regional Administrator, to John Kim, Interim Director, Illinois Environmental Protection Agency, June 12, 2012.

<sup>24</sup> Ex. 14, Schlumberger Carbon Services, "Summary Results for: Carbon Storage Feasibility Study Taylorville Energy Center (TEC)," February 23, 2010; Ex. 15, Schlumberger Carbon Services, "Cost Report (Revised and Amended) for Taylorville Energy Center," February 18, 2010.

<sup>25</sup> Ex. 16, Christian County Generation, LLC-Taylorville, Illinois, Class VI Permit Request, September 20, 2011.

already been achieved at the site over the long-term. IDEM itself recognized that U.S. EPA “requested that IEPA revisit [its CCS] determination in light of Christian County Generation’s Class VI permit application.” RTC at pdf p387. The mere fact that some uncertainty may accompany a geological sequestration site is not enough for an agency to reject sequestration as BACT. Instead, IDEM must identify and rely on site-specific information affirmatively showing that sequestration is infeasible as a technical matter. *See supra* 47-50 (discussion of Manual and Guidance). It did not.

The remainder of IDEM’s assessment of sequestration is similarly thin and generalized to non-existent. On availability of government funding (questionably a BACT Step 2 technical feasibility issue, as it goes essentially to cost, which is to be considered in Step 4), IDEM makes no mention of any state or federal government support that may or may not be available to Indiana Gasification, but simply cites a Department of Energy R&D Roadmap. TSD at 152-153 of 181. This does not meet the agency’s facility-specific BACT obligations. Moreover, IDEM completely omits any mention of the Project’s loan guarantee application before the Department of Energy. 77 Fed. Reg. 37,661 (June 22, 2012). The loan guarantee program would have covered a geological sequestration design as well.<sup>26</sup>

With respect to transportation infrastructure, IDEM stated under “Timing and access to available transportation infrastructure” that the project will have access to the EOR pipeline. Since IDEM did not consider CCS for EOR as a control in BACT Step 1, it failed to assess whether additional sales of captured CO<sub>2</sub> – and so additional reductions in CO<sub>2</sub> emissions – are feasible. *See infra* 57-59. The agency carried this error through to the infrastructure assessment, as IDEM failed to determine whether an EOR pipeline could be capable of transporting all or a

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<sup>26</sup> See Ex. 17, Department of Energy, Loan Guarantee Solicitation Announcement, Federal Loan Guarantees for Coal-Based Power Generation and Industrial Gasification Facilities that Incorporate Carbon Capture and Sequestration or Other Beneficial Uses of Carbon and for Advanced Coal Gasification Facilities.

portion of the 1.29 million tons that the Project currently intends to vent. A pipeline feasibility assessment by Denbury, the CO<sub>2</sub> purchaser, shows that far greater capacity is feasible beyond the 5 million tons in this applicant's sales plan.<sup>27</sup>

On construction of a new pipeline, IDEM set forth as follows:

***Acquisition of land for transportation infrastructure.*** The logistical challenges of constructing a second pipeline as a “backup” to the EOR pipeline make this option infeasible. First, the fact that any pipeline infrastructure would only be used when liquefied CO<sub>2</sub> is not sold for EOR, a circumstance the project will take steps to avoid, means any pipeline constructed will lay idle most of the time. Second, and more important, to make a second pipeline available, IG would need to establish a pipeline route, find right of way opportunities, and then construct whatever pipelines would be needed to transport CO<sub>2</sub> for sequestration, all in light of the fact that there will not exist in the near future any suitable sites for the sequestration of CO<sub>2</sub> from the facility. Moreover, IDEM cannot today identify where pipeline infrastructure should be built and, therefore, cannot even begin the process of trying to engineer or build it.

TSD, Ex. 2 at pdf p922. IDEM erred in the first instance by only considering geological sequestration for the portion of CO<sub>2</sub> that will not be sold by EOR. Again, IDEM was required to: (a) assess BACT for the full 6.5 million tons from the AGR unit, (b) include CCS for EOR in its BACT determination, and (c) consider CCS for EOR in combination with CCS for geological sequestration. Moreover, since IDEM failed to demonstrate the unavailability of a sequestration site, *see supra* 50-53, it cannot rely on its faulty site conclusion to undermine the feasibility of constructing a pipeline.

In sum, IDEM failed to assess available control options and provided only cursory and generalized reasons for rejecting CCS, instead of fully assessing the site-specific feasibility of CCS for geological sequestration for the Project. For these reasons, the Administrator must object.

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<sup>27</sup> See Ex. 18, Midwest CO<sub>2</sub> Pipeline Feasibility Study – Summary and Findings.

4. IDEM FAILED TO INCLUDE PERMIT TERMS AND CONDITIONS SUFFICIENT TO ENSURE THAT CAPTURED CO<sub>2</sub> FROM THE SOURCE WILL NOT BE EMITTED TO THE ATMOSPHERE

As the Permit requires partial capture of CO<sub>2</sub> from the AGR unit with no terms or conditions ensuring against the pollutant's later release, the Administrator must object. The Act defines BACT as

an *emission limitation* based on the *maximum degree of reduction* of each pollutant subject to regulation under this chapter *emitted from or which results from* any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant.

42 U.S.C. § 7479(3) (emphasis added). Importantly for present purposes, the plain text “which results from” in this provision defines both (a) “each pollutant” that must be reduced and (b) the object of the maximum degree of reduction requirement. In other words, the BACT limit must reflect the maximum degree of reduction of a pollutant covering both direct emissions onsite and later emissions of the same pollutant that “result from” the facility. BACT thus does not allow a facility to supposedly reduce pollution, only for that same pollution to be emitted to the atmosphere down the road. Under the current permit, the Applicant may meet its vent limit by routing the majority of its CO<sub>2</sub> to the fence line and releasing it there. Such a loophole would severely weaken the PSD program's stringent control requirements with their focus on protecting public health and welfare.

In addition, as set forth above, Title V requires an operating permit to contain terms and conditions sufficient to ensure compliance with applicable emission limits. *Infra* 4-5. A permit that includes a vent limit but fails to protect against later release of the pollutant does not ensure compliance with the supposed limit on the emission unit's pollution. As described above, this

limit would allow a source to simply pipe its pollution to the fence line and release it there, a result that is contrary to stringent control requirements of the PSD and Title V programs.

Ensuring that a permittee actually achieves the maximum degree of reduction over the life of the pollutant is of particular concern with CO<sub>2</sub>. CO<sub>2</sub> is a widely distributed pollutant that produces impacts as a result of increasing global average concentrations of the gas in the atmosphere. Thus, imposing a constraint on the amount of CO<sub>2</sub> that may be released at one point without requiring a demonstration that the captured CO<sub>2</sub> is not simply later released would be ineffective as a method to reduce the harms to public health and welfare associated with the facility's operation. It follows that, as taken up in more detail below, the BACT limit for CO<sub>2</sub> must contain conditions sufficient to demonstrate that captured CO<sub>2</sub> will be handled in a manner providing a high degree of assurance that the CO<sub>2</sub> will not be released to the air, either during transport of the CO<sub>2</sub> or from the location(s) to which it is transported. Furthermore, the use of CO<sub>2</sub> for EOR purposes alone does not provide this assurance, as there are currently insufficient regulations applicable to EOR operations to ensure against releases over the life of the site and post-closure.

Rather than address this question of first impression, IDEM responded to comments raising the need for terms and conditions ensuring that the CO<sub>2</sub> will remain permanently sequestered by citing inapposite precedent about emissions that originate in the first instance from other sources. Specifically, IDEM stated:

EPA's long-standing interpretation of the "which results from" language cited by the commenter does not require BACT analyses for off-site sources. To the extent that the offsite emissions to which the commenter refers should be considered "secondary emissions" at all under EPA's regulations and guidance, such emissions are also not subject to BACT.

RTC, Ex. 2 at pdf p380. IDEM went on to cite discussions of secondary emissions in the GHG BACT Guidance and NSR Manual. *Id.* IDEM's response is inadequate for a number of reasons.

At the outset, Petitioners note that IDEM provided no sources to support its assertion of a long-standing EPA policy on the "which results from" language by which to assess applicability of the policy to this case. The plain language of the statutory BACT definition encompasses the CO<sub>2</sub> emissions here, as explained above. IDEM ignores an important distinction between the examples that it cites and the present case: the CO<sub>2</sub> emissions at issue in this permit are not "from" off-site sources, but in fact "come from the source itself," as the CO<sub>2</sub> is properly part of the AGR unit's uncontrolled PTE. *See supra* 43-44. In contrast, the off-site sources that EPA has addressed in past guidance and regulations and those discussed in the EAB's decisions, *see* RTC at 20-12 of 122 (citing 40 C.F.R. 52.21(b)(18) and *In re: Shell Gulf of Mexico, Inc.*, OCS Appeal No. 10-01 (Envtl. App. Bd. Dec 30, 2010)<sup>28</sup> – all support facilities or vehicle fleets – themselves generate the emissions in question from their own operation. Unlike here, the emissions from those sources cannot be directly traced back to the processes at the PSD source. Thus, precedent on support facilities and vessels is irrelevant to the question of air pollution generated by the Project and piped offsite.

Nor must the PSD inquiry analyze the entire regulatory program for managing the transportation, storage and injection of CO<sub>2</sub> into geologic formations and subsequent leakage, as suggested by IDEM's characterization of Petitioners' comments. *See* RTC, Ex. 2 at pdf p390.

As Petitioners noted in their comments, a requirement to ensure against later release of CO<sub>2</sub>

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<sup>28</sup> IDEM also cites *In re: Mississippi Lime Co.*, PSD App. No. 11-01, 2011 WL 3557194 (Envtl. App. Bd. Aug 9, 2011), relying solely on language that BACT focuses on "an emission limitation and a control technology that are specific to a particular facility." *Id.* This general language does not support IDEM's position that BACT can never include consideration of pollutants generated by the source and piped offsite. Rather, it is simply a reiteration of the requirement that BACT constitute a case-by-case determination for each source. All of the considerations that Petitioners advance here regarding CO<sub>2</sub> BACT should be applied "specific to a particular facility."

could take the form of a CO<sub>2</sub> plan certifying that the entities to which the Applicant transfers CO<sub>2</sub> are subject to a regulatory program that requires them to follow design, operational and maintenance requirements sufficient to assure permanent isolation of the CO<sub>2</sub> from the atmosphere, such as the UIC Class VI and subpart RR Clean Air Act reporting requirements. Another option would be a plan certifying that the entity to which the CO<sub>2</sub> is transferred itself is or will be subject to CO<sub>2</sub> permit limits under the PSD program. Finally, an applicant that transfers CO<sub>2</sub> to entities who are not part of the UIC Class VI or PSD programs could be required to submit a plan containing a description of the following information:

- A demonstration that sites are capable of long-term containment of carbon dioxide;
- Identification and characterization of potential natural and man-made leakage pathways, and appropriate risk management and corrective actions;
- Design, construction and operation parameters to prevent, mitigate and remediate the creation or activation of leakage pathways, or and the migration of CO<sub>2</sub> or fluids into any zone in a manner not authorized by the Administrator (or pursuant to a State program approved by the Administrator as meeting the requirements of this section);
- Minimizing fugitive CO<sub>2</sub> emissions from project operations;
- Monitoring and modeling to predict and confirm the position and behavior of the CO<sub>2</sub> and other fluids in the subsurface during and after injection;
- Accounting and reporting of CO<sub>2</sub> quantities sequestered, injected, recycled, leaked, vented, and any other categories as appropriate; and,
- Post-injection site closure and financial responsibility requirements that ensure the long-term containment of injected CO<sub>2</sub>.

Rather than explore any of these means for ensuring that the CO<sub>2</sub> from the AGR is not released, IDEM denied all responsibility for engaging in such an inquiry, in violation of BACT's maximum reduction requirement and Title V's compliance assurance requirements. For these reasons, the Administrator must object.

5. IDEM FAILED TO CONSIDER APPROPRIATE AND AVAILABLE COURSES OF ACTION FOR ADDRESSING ANY INHERENT UNCERTAINTIES IN CCS IMPLEMENTATION

To the extent there may be validity to any of IDEM's stated concerns regarding

uncertainty attending the performance of geological sequestration for the Project, simply rejecting CCS as technically infeasible based on those concerns did not meet IDEM's PSD obligations. IDEM erred in failing to consider adjustable BACT limits. It additionally erred in failing to require the applicant, pursuant to 40 C.F.R. 51.166(n), to submit additional information concerning CCS as part of a complete permit application.

IEPA failed to even evaluate the possibility of an adjustable BACT limit to address any uncertainties in the implementation of CCS at the Project, despite the availability of such a limit in circumstances similar to those under consideration here. For example, in *Hadson Power*, the Environmental Appeals Board ("EAB") upheld a BACT limit for nitrogen oxides (NO<sub>x</sub>) that set both a design limit and a worst-case limit in a case of the first application of a particular control technology to particular unit in this country. *Hadson Power*, 4 E.A.D. 258, 288-90 (E.A.B. 1992). The permit allowed the permitting authority to revise the emission limit downward toward the design limit after operation commenced to reflect the emission rate that was demonstrated to be consistently achievable. *Id.* at 291. Similarly, the EAB has affirmed an adjustable limit, *see AES Puerto Rico*, 8 E.A.D. 324 (EAB 1999), for the control of a pollutant that would otherwise go uncontrolled, and where a new test method was to be employed, so that later experience could inform the limit where little information existed on which to base an emission limit at the time the permit was finalized. *Id.* at 348-50. IDEM must evaluate similar adjustable CO<sub>2</sub> emission limits here, based on the demonstrated potential for sequestration, accompanied by a worst-case limit in the unlikely event that geological sequestration later is shown to be impossible or significantly limited.

IDEM rejected the possibility of adjustable BACT limits on the ground that it is "standard practice" to set a "fixed BACT emission limitation," that a flexible approach "is not

required and is the exception to the general rule,” and that it had determined the use of fixed BACT emission limitations for the AGR vents is appropriate. TSD, Ex. 2 at pdf p379. As set forth above, the fixed BACT limit that IDEM did set was legally and procedurally flawed, and thus cannot constitute a ground for refusing to even consider an adjustable BACT limit. The Administrator must object so that IDEM can reassess whether an adjustable BACT limit based on a combination of CCS for EOR and geological sequestration, or some other control, is feasible.

Additionally, IDEM complained of lack of information that could confer a great degree of confidence in the suitability of the Mt. Simon site for sequestration, *see* TSD at pdf p388, but failed to require the submission of such information as part of a complete permit application. IDEM erred in not requiring that the Applicant provide full information necessary to assess CCS as an available alternative. 40 C.F.R. 51.166(n) provides that the applicant “*shall submit all information necessary to perform any analysis or make any determination required under this section,*” including “*any [ ] information as necessary to determine that best available control technology as applicable would be applied.*” (emphases added). Thus, where a control option has been identified as available in BACT Step 1, the record must include all necessary information for making an affirmative determination that the control is technically infeasible in order to justify rejecting it under BACT Step 2.

### III. CONCLUSION

Therefore, for the reasons explained above, EPA must object to the Title V permit for Indiana Gasification.

Respectfully submitted,

/s Robert Ukeiley

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