Comments of the Plumbers and Steamfitters Union, Local 166 Concerning a Proposed PSD Major Modification Permit for Iron Dynamics, Inc., Butler, IN & Request for Public Hearing

Presented to

Indiana Department of Environmental Management,
Office of Air Quality, Permits Branch
&
U.S. Environmental Protection Agency, Region V,
Air & Radiation Division, Permits & Grants Section
& Air Enforcement Section

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1 Introduction

The Plumbers and Steamfitters Union, Local 166, are submitting these comments for filing with the Indiana Department of Environmental Management, Office of Air Quality and the U.S. Environmental Protection Agency, Region 5.

The Plumbers and Steamfitters Union, Local 166 represent construction workers and their families who are employed in the construction trades in the geographical area of Butler, Indiana. These individuals perform plumbing, pipefitting and steamfitting work in conjunction with industrial construction work including the types of work necessary to construct and install the proposed modifications at Iron Dynamics, Inc. in Butler, Indiana.

The members of this Union are interested in maintaining a sustainable economy and sustainable economic development that can only be done when sound environmental policies and practices are followed. The proposed permit will provide for environmental degradation in the Butler, Indiana area that may very well jeopardize future jobs by making the environment less desirable for anyone to live and derive an income in this area and more importantly will create a less favorable environmental condition to allow for future economic development. Continued degradation of air quality can and has caused construction moratoriums and other restrictions on growth, which have reduced future employment opportunities for citizens in this state.

The individuals and their families that are represented by Plumbers and Steamfitters Union, Local 166 work in this community and will suffer the impact of detrimental projects towards the environment. All citizens, including the members of our client, breathe the same polluted air that is created and suffer the same health and safety impacts as all other citizens. The Plumbers and Steamfitters Union, Local 166 and its members have a significant interest in ensuring environmental laws protect its members as well as all other workers who are employed in the area.

The Plumbers and Steamfitters Union, Local 166 assert that the proposed modification project at Iron Dynamics, Inc should receive close scrutiny, particularly as the company fails to provide the counter-veiling economic benefits of decent wages and benefits during project construction. It is simply unacceptable and highly objectionable to both our union and our community for the proposed IDEM air permit for Iron Dynamics project to allow significant air quality degradation by either failing to use state of the art emission control techniques and or by failures of the permit to hold the company accountable for federal requirements on emission control performance.

The comments below describe how the proposed permit and project fails to comply with federal and state emission control requirements and how these facts show that the permit should not be granted in its current form. The Applicant is unlawfully attempting to evade federally required disclosure of all expected emissions and full

prevention of significant deterioration review required under IDEM and EPA rules. We trust that IDEM will deny the permit application after full review of these comments.

2 Request to IDEM to Hold a Public Hearing Concerning the Steel Dynamics Modification Permit

The public notice for the draft permit contains the following provision:

> "If adverse comments concerning the air pollution impact of this draft source are received, together with a request for a public hearing, such a hearing may be held to give further consideration to this application."

Commentors raise serious issues of technical errors and non-compliance with federally-significant preconstruction review and PSD BACT emission control requirements.

As a result of these significant technical and legal issues, by this document Commentors request a public hearing to be held concerning the proposed draft source modification permit, including an extension of the comment period until the time of the public hearing and the holding of a public hearing during evening hours in the Butler, IN area so that concerned working people and local union members can attend.

3 The Iron Dynamics Application is Incomplete and the Company's Best Available Control Technology Demonstration is Defective and IDEM's Proposed Approval of the Company's Application is in Error

3.1 Iron Dynamic's Application and IDEM's Approval of the Company's Application and BACT Submittal Must be Properly Supported, Complete and Incorporate "Top Down" Best Available Control Technology Review

U.S.EPA has repeatedly stated the required elements for state PSD decisions made under federal authority, such as the proposed permit for the Iron Dynamics PSD major modification:

> "All major stationary sources undertaking a major modification subject to the PSD regulations of title 40 Code of Federal Regulations section (40 CFR) 52.21 must conduct an analysis to ensure the application of BACT. The requirement to conduct a BACT analysis and determination is set forth in section 165(a)(4) of the Clean Air Act, and in the implementing regulations at 40 CFR 52.21(j). Further, under 40 CFR 52.21(n), the applicant must submit and substantiate all information necessary to perform an analysis and make determinations. In these regulations, BACT is defined as "... an emission limitation based on the *maximum degree of*

> *reduction* for each pollutant subject to regulation under the ACT which would be emitted from ... any source ... which is determined to be *achievable* taking into account energy, environmental and economic impacts." It should be noted that possible grounds for overturning a BACT decision include an inappropriate review (BACT procedures not correctly followed), an incomplete review (BACT decisions not correctly justified), or a review based on false or misleading information."[1]

U.S. EPA first articulated specifically what is meant by a "top-down" Best Available Control Technology review in 1989.[2] A later articulation is summarized:

> "In brief, the top-down process provides that all available control technologies be ranked in descending order of control effectiveness. The PSD applicant first examines the most stringent--or "top"--alternative. That alternative is established as BACT unless the applicant demonstrates, and the permitting authority in its informed judgment agrees, that technical considerations, or energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not "achievable" in that case. If the most stringent technology is eliminated in this fashion, then the next most stringent alternative is considered, and so on."[3]

In EPA's Draft 1990 New Source Review Workshop Manual, the step by step process for a "top down" BACT review is outlined and the following process must be conducted to ensure that a valid BACT determination has been made; EPA describes a 5 step process for conducting such a "top down" process:

> "STEP 1: Identify All Control Technologies.
> - LIST is comprehensive (LAER included).
>
> STEP 2: Eliminate Technically Infeasible Options.
> - A demonstration of technical infeasibility should be clearly documented and should show, based on physical, chemical, and engineering principles, that technical difficulties would preclude the successful use of the control option on the emissions unit under review.

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[1] October 6, 1999 Letter from Robert B. Miller, Chief, Permits and Grants Section, U. S. EPA Region 5 to Lynn Fiedler, Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality concerning Cadillac Renewable Energy PSD Major Modification Permit; Available at http://www.epa.gov/Region7/programs/artd/air/nsr/nsrmemos/cadillac.pdf

[2] See June 13, 1989 Transmittal of Background Statement on "Top Down" Best Available Control Technology from John Calcagni, Director, EPA Air Quality Management Division to Regional Air Directors

[3] EPA 1990 Draft NSR Workshop Manual, P. B.2

STEP 3: Rank Remaining Control Technologies by Control Effectiveness.
Should include:
- control effectiveness (percent pollutant removed);
- expected emission rate (tons per year);
- expected emission reduction (tons per year);
- energy impacts (BTU, kWh);
- environmental impacts (other media and the emissions of toxic and hazardous air emissions); and
- economic impacts (total cost effectiveness, incremental cost effectiveness).

STEP 4: Evaluate Most Effective Controls and Document Results.
- Case-by-case consideration of energy, environmental, and economic impacts.
- If top option is not selected as BACT, evaluate next most effective control option.

STEP 5: Select BACT
- Most effective option not rejected is BACT."

Implicit in IDEM's proposed approval of the Iron Dynamics PSD major modification permit and in publication of the Technical Support Document is an IDEM finding that the Iron Dynamics application is complete and properly supported. The Applicant claims[4] to have incorporated a "top down" BACT demonstration in its application; the IDEM Office of Air Quality Technical Support Document claims[5] that the application has incorporated an acceptable BACT determination for the Rotary Heath Furnace (RHF) burner combustion of coal and the new fugitive emissions control baghouse and the increase in stack discharge flow rate for the Submerged Arc Furnace baghouse.

In subsequent sections Commentors will show that Iron Dynamics application is incomplete, not properly supported and that the BACT demonstration and IDEM's approval of both the application and BACT demonstration are in error.

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[4] See Section 2.1, Page 2 of the Iron Dynamics April 2002 application.

[5] October, 2002 IDEM Technical Support Document on Iron Dynamics PSD Permit by Gurinder Saini at pages 10, 12 and 13

3.2 Issues Relating to Best Available Control Technology Determination for Sulfur /Dioxide Emissions and Acid Gas Emission Characterization and Control

3.2.1 The Application and Proposed Permit Fails to Consider Use of Cleaner Coal, Coal with a Lower Emission of Sulfur per Million BTU Heat Input and Use of Coal Sulfur Content Limits, Rendering the Sulfur Dioxide BACT Determination Unapprovable and in Error for Coal Combustion in the Rotary Hearth Furnace

IDEM must ensure that the sulfur dioxide emission limitation reflects requirements for Best Available Control Technology (BACT):

> "*Best available control technology* means an emissions limitation (including a visible emission standard) based on the ***maximum*** degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification ***through application of production processes or available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant***.
>
> In no even shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61.
>
> If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particulate emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results."[6] (Emphasis added)

In order to do a "top down" BACT review and in order to ensure that sulfur dioxide BACT limits reflect the "maximum reduction.....taking into account energy, environmental and economic impacts and other costs," the Application must consider the use of clean fuels, maximum limitations on coal sulfur content and limitations on the

[6] 40 CFR §52.21(b)(12); See also 42 USC §7479(3)

amount of sulfur dioxide emissions per MMBTU heat input, which are all technically feasible and "available methods" for limiting sulfur dioxide emissions.

Applicant's submittal is not approvable as a "top down" BACT demonstration and the proposed sulfur dioxide limits are not acceptable as valid BACT emission limitations because no consideration was given to use of enforceable limitations on fuel sulfur contents and use of coal with a lower sulfur dioxide emission per million BTU of heat input. Applicant's emission calculation[7] assumes 8500 BTU/lb coal with a sulfur content of 0.8%; however the proposed permit contains no enforceable provisions on fuel sulfur, BTU content or sulfur dioxide emissions per MMBTU that would have an effect on potential to emit or the BACT emission control level. The application contains no analysis of the effects of accepting limitations on these parameters on the BACT determination for sulfur dioxide.

Combustion of 8500 BTU/lb coal with sulfur content of 0.8% is equivalent to about 1.65 lbs of sulfur dioxide per million BTU heat input. In practice, Applicant appears to accept use of poor quality lignite-grade coal as the fuel of choice, rather than 11,500-12,000 BTU/lb low sulfur bituminous coal with ratings of 1.2 lbs of sulfur per MMBTU (and less) that are frequently used in NSPS-compliant electric utility applications. No aggregate or incremental cost analysis on sulfur dioxide controlled is provided on any such fuel matter and/or emission control technique..

Applicant's sulfur dioxide submittal must be considered incomplete, unapprovable and not supported on the record in the absence of a detailed discussion on why better quality coal with a lower sulfur heat input cannot be used to limit sulfur dioxide emissions in addition to any post-combustion scrubbing provided. A "top-down" BACT analysis must consider combinations of available controls in the mix of emission controls considered. Applicant has not properly carried its burden out and IDEM's approval of Applicant's BACT determination in this area is in error.

In a future revision of the sulfur dioxide BACT determination, Applicant must consider such alternate fuels and limitations, provide technical and economic feasibility analysis and follow the detailed top-down procedures in articulating its demonstration on the record. None of this is present in the current BACT submittal and any claims to the contrary are rebutted by Commentor's holding that no such demonstrations are articulated in the Application according to the details contained in the 5 step "top down" process.

[7] See Appendix B, Emission Calculations of the original Iron Dynamics, Inc. April 2002 PSD Application

3.2.2 The Applicant's Sulfur Dioxide BACT Determination for Coal Combustion in the Rotary Hearth Furnace Fails to Establish a Recognizable "Top Down" Basis for the Lime Spray Dryer Scrubbing Mode and the Zinc Oxide Scrubbing Mode and Fails to Consider the Sulfur Dioxide Emission Reduction Potential of Using Both Types of Scrubbing

The Applicant's sulfur dioxide BACT demonstration and the IDEM sulfur dioxide BACT permit limits do not have a recognizable "top down" basis for the 80% efficiency used for lime spray drying scrubbing and 90% efficiency for zinc oxide scrubbing. Both efficiency figures are assumed in the sulfur dioxide BACT demonstration and resulting BACT emission limitation calculations as a fiat with absolutely no basis stated, either as to physical justification or "top down" process justification.

EPA's AP-42 document for bituminous coal combustion notes that lime spray dryer sulfur dioxide control efficiency is from 70%-90%, whereas the BACT determination and IDEM Technical Support Document assume 80% control for this sulfur dioxide control mode. As proposed the BACT demonstration and BACT emission limitations cannot be approved without a clear showing as to the basis for the 80% control assumption during sole lime scrubbing mode operation. The Applicant and IDEM must show why 90% should not be accepted as the BACT-required control efficiency.

Similarly, the Applicant's demonstration attempts to assert zinc oxide sulfur dioxide control efficiency by simple fiat with a one sentence justification:

> "For the purpose of this emission prediction we estimate that 95% of the sulfur dioxide is captured by the zinc oxide fume."[8]

Both the Applicant and IDEM then go on to assume 90% efficient scrubbing for zinc oxide in the flue gas in the calculation of sulfur dioxide BACT emission limits without any further statement of basis. This is an unacceptable leap to a conclusion that is not supported on the record. For example, there is no analytical information provided on typical chemical constituents of electric arc furnace dust which is to be the primary source of the zinc oxide. At a minimum, the stoichiometric basis for reactions for zinc oxide control of sulfur dioxide should be asserted and there should be a basis showing why zinc oxide driven out of these materials will be sufficient to at least react with 90% of the sulfur dioxide that is generated in the process. Nothing like such a demonstration for this unproven level of control efficiency is contained in the application.

"Top down" BACT review requirements for sulfur dioxide must consider that simultaneous scrubbing by zinc oxide and lime spray drying is technically feasible.

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[8] Appendix C, Maumee Report, Deane Horne Memo, P. 2

Applicant has not shown why such an approach to sulfur dioxide control should not be considered.

3.2.3 Decisions on the Mix of Sulfur Dioxide Emission Controls for Coal Combustion in the Rotary Hearth Furnace Have the Potential to Affect Emissions of Unregulated Air Contaminants and Must be Considered as part of Environmental Review Decisionmaking in the Sulfur Dioxide BACT Determination Process

Decisions on sulfur dioxide control techniques have the potential to affect emissions of unregulated air contaminants. The first time this doctrine was clearly articulated was in a case of a municipal waste combustor in California in which citizen commentors appealed a decision of EPA Region IX on a proposed PSD permit for the North County Resource Recovery Associates.[9]

In a remand order back to EPA Region IX, then-EPA Administrator Lee Thomas wrote as to petitioner's allegations:

> "Among the reasons the petitioners present for granting review is Region IX's alleged failure to establish emission limitation for all pollutants, including hazardous pollutants, that will or could possibly be emitted from the facility; the alleged inadequacy of Best Available Control Technology (BACT) determinations;..... With one exception, Region IX has addressed each of petitioners' allegations and has provided rational explanations for not making any alterations in its permit determination.
>
> The exception concerns Region IX's assertion that EPA lacks the authority to "consider" pollutants not regulated by the Clean Air Act when making a PSD determination. This assertion is correct only if it is read narrowly to mean EPA lacks the authority to imposed limitations or other restrictions directly on the emission of unregulated pollutants. EPA clearly has not such authority over emissions of unregulated pollutants.
>
> Region IX's assertion is overly broad, however, if it is means as a limitation on EPA's authority to evaluate, for example, the environmental impact of unregulated pollutants in the course of making a BACT determination for the regulated pollutants. EPA's authority in that respect is clear.....
>
> As defined in §169(3) the term BACT refers to an "emission limitation" that is set on a case-by-case basis for regulated pollutants, "taking into account energy,

[9] EPA Administrative Decision In the Matter of North County Resource Recovery Associates, Remand Order, PSD Appeal No. 85-2, June 5, 1986.

> environmental, and economic impacts and other costs" associated with the particular emission control system that is selected to achieve the BACT emissions limitation. 42 USC §7479(3) (emphasis added) (40 CFR §52.21(b)(12).
>
> Hence, if application of a control system results directly in the release (or removal) of pollutants that are not currently regulated under the Act, the net environmental impact of such emissions is eligible for consideration in making the BACT determination. The analysis may take the form of comparing the incremental environmental impact of alternative emission control systems with the control system proposed as BACT; however, as in any BACT determination, the exact form of the analysis and the level of detail required will depend upon the facts of the individual case. Depending upon what weight is assigned to the environmental impact of a particular control system, the control system proposed as BACT may have to be modified or rejected in favor of another system.
>
> In other words, EPA may ultimately choose more stringent emission limitations for a regulated pollutant than it would otherwise have chosen if setting such limitations would have the incremental benefit of restricting a hazardous but, as yet, unregulated pollutant." (Decision at p 3-4)

The precedent that PSD BACT determinations must consider the effects of control technology decisions on unregulated pollutants as part of the environmental impact analysis has been extended and clarified in EPA's transitional guidance memo after the passage of the 1990 Clean Air Act Amendments.

> "Toxic Effect of Unregulated Pollutants Still Considered in BACT Analysis -- Based on the remand decision on June 3, 1986 by the EPA Administrator in North County Resource Recovery Associates (PSD Appeal No. 85-2), the impact on emissions of other pollutants, including unregulated pollutants, must be taken into account in determining BACT for a regulated pollutant. When evaluating control technologies and their associated emissions limits, combustion practices, and related permit terms and conditions in a BACT proposal, the applicant must consider the environmental impacts of all pollutants not regulated by PSD. Once a project is subject to BACT due to the emission of nonexempted pollutants, the BACT analysis should therefore consider all pollutants, including Title III hazardous air pollutants previously subject to PSD, in determining which control strategy is best."[10]

In the present case, the mix of sulfur dioxide emission controls and selection of fuels must consider the effect of these decisions on such unregulated air contaminants, including emissions of hydrochloric acid, hydrogen flouride, sulfuric acid aerosal,

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[10] March 11, 1991 Memo by John Seitz, Director of Office of Air Quality Planning and Standards, U.S. EPA on New Source Review Program Transitional Guidance

mercury and particulate-phase airborne toxicants. If there is sole reliance on zinc oxide scrubbing for emission control (under some plant operating conditions) then potential benefits associated with flue gas cooling by lime spray drying and subsequent agglomerization of toxicant particles and consequences for mercury control must be taken into account as part of the environmental review aspects of the sulfur dioxide BACT determination on coal combustion in the rotary hearth furnace. In addition, lime spray drying is known to be efficacious for the control of hydrochloric acid, hydrogen flouride and sulfuric acid, but the effect of zinc oxide on these pollutants is not established in the application. Applicant has failed completely to incorporate any review for unregulated air contaminants into consideration of alternative sulfur dioxide control measures from the aspect of unregulated acid gases and airborne toxicants.

3.2.4 Simultaneous Compliance with Section D.1.6(a) of the Proposed Permit and the Proposed Sulfur Dioxide Emission Limitation During Lime Spray Injection Will be Physically Impossible for Sulfur Dioxide Control of the Rotary Hearth Furnace

Section D.1.6 of the proposed permit reads as follows:

> "(a) When using lime injection of wet scrubber as control, shall not exceed 1.2 pounds per ton of material charged into the furnace. The SO2 emissions shall not exceed 124.12 pounds per hour."

Commentors interpret the most probable meaning of this awkward language as ensuring that the lime injection rate shall not exceed 1.2 pounds per ton of material charged into the furnace.

The first objection to such language is that any legally enforceable requirements on lime scrubbing material injection to ensure the required sulfur dioxide control should be a floor and not a ceiling on the lime injection rate.

The second objection to this language is that a maximum limitation of 1.2 pounds of lime injection to the flue per ton of material charged into the furnace [or a minimum of such injection for that matter] cannot possibly ensure compliance with the emission limitation for sulfur dioxide given other specified conditions.

One mole of Calcium Oxide (56 gr/mole) mixed with water is necessary to convert 1 mole of Sulfur Dioxide (64 gr/mole) into Calcium Sulfate. At an admitted 8.2 ton-coal/hour coal consumption rate just for the burner coal (and not for the coal in the ore-coal mix), 229.6 lbs of sulfur dioxide are generated per hour. If 80% of this sulfur dioxide is reacted with lime, 184 lbs/hour of sulfur dioxide must be reacted. However, the stoichiometric ratio is 56 grams of lime to 64 grams of sulfur dioxide. Accordingly, 161 lbs/hour of lime (CaO) is required to react with 184 lbs of sulfur dioxide.

Condition D.1.6 appears to limit the maximum lime injection to 1.2 lbs of lime per ton of furnace material introduction [in this case carrying out the calculation solely for the combustion burner coal]. This condition would thus limit the lime addition rate to 9.84 lbs of lime per hour, thus making the 80% control stoichiometrically impossible.

3.2.5 The Application is Deficient Because it Fails to Quantify and Evaluate Sulfuric Acid Aerosol Emissions and Hydrogen Chloride

The Application is deficient because it fails to characterize sulfuric acid emissions from the Rotary Hearth Furnace as modified. Because of the afterburner control of the process, oxidation of sulfur dioxide will increase the amount of sulfuric acid aerosol that would be normally expected (about 1% of the sulfur dioxide emissions in the flue gas).

At 2% conversion of sulfur dioxide to sulfuric acid aerosol and at 101 lbs of sulfur dioxide per hour, 8.85 tons per year of sulfuric acid aerosol would be emitted. This is higher than the PSD significance level for sulfuric acid of 7 tons per year that would require BACT review for sulfuric acid aerosol.

Hydrogen chloride and hydrogen flouride are CAA Section 112 HAPs which will be emitted from the subject Rotary Hearth Furnace coal combustion process. Yet this HAP is erroneously excluded from analysis and omitted from the HAP emission characterization.

3.2.6 The Failure to Quantify Hydrogen Chloride and Hydrogen Flouride Emissions, the Failure to Provide Coal Analysis and Other Failures Have Significant Consequences for Regulation of the Subject Facility

Uncontrolled emissions associated with the commencement of coal combustion would be 43 tons per year for hydrogen chloride and 5.4 tons for hydrogen flouride. At this writing Commentors have not yet located information on the coal input rate associated with DRI raw material preparation, but it appears that this coal input rate is even larger than the coal firing rate for the new coal/gas burners. It is not an unreasonable estimate to assume the potential for as much as 90-100 tons of uncontrolled emissions of hydrogen chloride and hydrogen flouride. The equilibrium uncontrolled emission rate of acid gases may even be larger if such gases evolve from recycling of baghouse collected PM containing metal chlorides into the process.

Even at 80% acid gas control, the proposed facility may well be a major source of HAPs for hydrogen chloride. IDEM appears not to have ever considered this possibility. IDEM does not have any reliable information on HCl and HF emission control efficiencies with the envisioned reliance on zinc oxide fume scavaging of acid gases.

If the facility is a major source for HAP emissions, such recognition of the combined Iron Dynamics/Steel Dynamics facility as a major HAPs source may have consequences for other regulation, such as the MACT Coil Coating Subpart TT applicability for the proposed so-called "minor" coal coating modification at Steel Dynamics. IDEM appears to have ignored the matter of hydrogen chloride and hydrogen flouride emissions from these combined facilities in past permitting and technical evaluations. Such disregard on this HAP characterization issue for this combined facility should end now before any further granting of permits is made by IDEM to this facility.

3.3 Issues Relating to Best Available Control Technology for Particulate Matter

3.3.1 Applicant Has Inappropriately Narrowed the Search for Other Example PM Emission Limitations in the Ferrous Metal Industry for PM Emissions from the Rotary Hearth Furnace Combustion Exhaust and Fugitive Control Baghouse

Applicant first claims that their search of the EPA RBLC database shows no Direct Reduced Iron (DRI) facilities. However, this assertion is in error since two such database entries are shown for ID, one of which was never constructed. The other entry is for AL-0086 for a DRI facility at Tuscaloosa Steel Corporation which is a 150 ton/hour DRI plant with PM limits of 1.5 lb-PM/hour and 0.02 lb-PM/ton of DRI. At this writing it is unknown whether the Tuscaloosa facility incorporates coal burning for BTU input.

Applicant's facility is a smaller 96 ton-DRI/hour facility being proposed with a much higher PM emission limitation of 13.4 lbs/hour. Applicant and IDEM must explain on the record why a lower PM emission limit should not be imposed.

Applicant's BACT analysis for PM admits that baghouse controls are in widespread use as the "...predominate control device for EAF's and rotary hearth furnaces."[11] Applicant goes on to ignore all of the baghouse-based PM limits for EAFs contained in the EPA RBLC database. Such failure constitutes error because EAF PM control by baghouse represent control examples of similar gas streams with similar flue gas PM inlet loading, temperature and volume characteristics. Applicant's excessively narrow source subcategorization to its plant alone ignores the requirement that control of similar gas streams can be used as example controls for technology transfer in BACT determinations. Applicant's PM BACT review is thus inadequate and in error since there has been no comprehensive review of existing PM control BACT decisions for both ferrous metal industry furnace combustion/process flue gas PM control and furnace charging/discharging fugitive emissions control.

[11] Iron Dynamics April 2002 Application at Section 2.2.1, Page 2

3.3.2 Applicant Has Failed to Justify on the Record Why More Stringent PM Limitations Achievable with Different Bag Material Should Not be Required for the Rotary Hearth Furnace Combustion Flue Gas and Fugitive Emission Control Train

The Applicant admitted in the submittal[12] that Teflon-coated Nomex bags could achieve a lower PM emission rate of 0.004 grains/DSCF. However nothing in the application shows why PM limits based on this rate were not adopted. Under "top down" BACT determinations all technically feasible control options must be considered and the application must document why such control options were ruled out. No content of the application provides this basis on the record with any technical, environmental and/or economic justification.

3.3.3 The Proposed Permit Provides No Visible Emission Limitation on the SAF Discharge Stack

PM BACT determinations must include a visible emission limitation under the definition of BACT.[13] No such visible emission limitation is provided for the SAF stack. Commentors suggest that a 3% opacity limitation be imposed for this discharge stack.

3.3.4 Condensible Particulate Matter

The proposed permit and Technical Support Document should be clarified to ensure that the required stack particulate emission studies and test methods include both filterable and condensible particulate matter for compliance purposes.

3.4 Issues Relating to Best Available Control Technology for Nitrogen Oxides for Coal Combustion in the Rotary Hearth Furnace

3.4.1 Applicant's NOX BACT Submittal and the IDEM Technical Support Document Do Not Address Low NOX Burners

Low NOX burner technology is technically feasible for both the 20 replacement gas/coal fired burners in the Rotary Hearth Furnace as well as in the downstream flue afterburner. Accordingly, a "top down" BACT analysis must address the use of low NOX burner technology in both of these locations.

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[12] Iron Dynamics Application, Appendix C, Maumee Report

[13] See the definition of BACT quoted in Section 3.2.1 of these comments.

Moreover, the NOX emission calculation and characterization appears to be defective because it does not account for NOX generated by the afterburner.

Nothing in the application addresses the matter of low NOX burners for these burner applications. Accordingly, the NOX BACT demonstration must be considered incomplete and unapprovable in the absence of such information explicitly placed on the record.

Language at section D.1.3 of the permit does talks about "use of low-NOX natural gas-fired burners," which is carried over from the previous permit. However, the burners formerly in use are being replaced with new combination gas/coal-fired burners and this condition as written does not clearly and unequivocally assert that the new gas/coal-fired burners are, in fact, low NOX burners and is not written to countenance the combination burners for both coal and natural gas as low NOX burners.

Commentors concern about the failure of the application to articulate a NOX BACT choice for low NOX burners is buttressed by the Applicant's use of AP-42 NOX emission calculations for coal combustion with a factor of 7.4 lbs NOX/ton coal combusted which does not represent use of low NOX burners but rather is a reflection of uncontrolled NOX emissions from AP-42 for dry bottom, wall-fired bituminous coal combustion. Use of an inappropriate emission factor not representing the performance of low NOX burner technology means that the NOX BACT emission limitations of the proposed permit are being set too high and do not, in fact, represent an appropriate NOX BACT level of control.

3.4.2 Applicant's Assumes NOX Roll-back From Selective Non-Catalytic Reduction Does Not Reflect "Top Down" BACT Analysis

EPA briefing materials on SNCR technology indicate that maximum NOX reductions from SNCR range from 50%-70%.[14] In some steel industry applications, the combination of SNCR plus low NOX burners is expected to product NOX reductions of 80%.[15] Even the AP-42 document for coal combustion shows SNCR NOX control efficiency ranges as high as 60%.[16]

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[14] Alternative Control Techniques Document – No Emissions from Iron and Steel Mills, Emission Standards Division, U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Air Quality Planning and Standards – EPA-453/R-94-065

[15] Ibid, Alternative Control Techniques Document, Table 2-2

[16] AP-42 for Coal Combustion, Table 1.1-2., p. 1.1-15

Applicant has asserted that 50% control from SNCR is reflective of BACT for NOX with no explanation or basis as to why higher amounts of NOX reduction cannot be assumed as being achievable as BACT, in violation of the "top down" procedures for BACT determination.

4 The Proposed Permit Contains Objectionable Exemptions from Compliance with Emission Limitation for Nitrogen Oxides, Carbon Monoxide and Volatile Organic Compounds for Periods of Startup and Shutdown

Conditions D.1.3, D.1.4, D.1.5, D.1.12, and D.1.13 contain language, "except during periods of startup or shutdown," that exempt the Rotary Hearth Furnace from compliance with NOX, VOC and CO emission limitations during these times. This language, together with the Applicant's announced intention to have compliance testing delayed for many months in a time-staged startup at less than full capacity, opens the way for the Applicant to argue that a period of "startup" will last many months[17] and will encompass long periods of time of operation at less than the design capacity of the facility. The language of the permit opens the way for the company to claim that limited production rate operation constitutes "startup." This condition and the proposed permit language is unacceptable under EPA's policy on excess emissions and reliance on the "continuous compliance" policy:

> "**Although we concur with Region I that PSD permits cannot contain automatic exemptions which allow excess emissions during startup and shutdown,** we do not believe that EPA's policy concerning this issue under PSD is somewhat vague. The exemptions granted under some New Source Performance Standards (NSPS) are not applicable to this issue under PSD. The NSPS are

[17] A June 5, 2002 email from Barry Smith at IDI-SDI to Gurinder Saini stated as follows:

> "We will agree to conduct stack testing as is usually the case for new permits and major modifications, However, we request that the time to conduct the stack test be extended to 1 operational year. This is because the first 3 months of the RHF restart will be at very limited production. We will then shut down for about 6 months to check all the equipment out. We will then startup up again with a gradual ramp up in production depending on equipment and product reliability. As such, it may be 1-2 years after the first production test case before we hit high production levels."

Commentors assert that such an operational start should not become the basis of never provided for a stack test at or near 100% of the production rate capacity.

technology based standards that are not directly required for meeting ambient standards."[18]

EPA clarified and revised its policy in 1999:

"For some source categories, given the types of control technologies available, there may exist short periods of emissions during startup and shutdown when, despite best efforts regarding planning, design, and operating procedures, the applicable emission limitation cannot be met. Accordingly, except in the case where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, it may be appropriate, in consultation with EPA, to create narrowly-tailored SIP revisions that take these technological limitations into account and state that the otherwise applicable emissions limitations do not apply during narrowly defined startup and shutdown periods.

To be approved, these revisions should meet the following requirements:

1. The revision must be limited to specific, narrowly-defined source categories using specific control strategies (e.g., cogeneration facilities burning natural gas and using selective catalytic reduction);

2. Use of the control strategy for this source category must be technically infeasible during startup or shutdown periods;

3. The frequency and duration of operation in startup or shutdown mode must be minimized to the maximum extent practicable;

4. As part of its justification of the SIP revision, the state should analyze the potential worst-case emissions that could occur during startup and shutdown;

5. All possible steps must be taken to minimize the impact of emissions during startup and shutdown on ambient air quality;

6. At all times, the facility must be operated in a manner consistent with good practice for minimizing emissions, and the source must have used best efforts regarding planning, design, and operating procedures to meet the otherwise applicable emission limitation; and

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[18] January 28, 1993 Memorandum on Automatic or Blanket Exemptions for Excess Emissions During Startup, and Shutdowns Under PSD from John B. Rasnic, Director, Stationary Source Compliance Division, EPA Office of Air Quality Planning and Standards to Linda M. Murphy, Director, Air, Pesticides and Toxics Management Division, EPA Region 1, available at: http://www.epa.gov/Region7/programs/artd/air/nsr/nsrmemos/automati.pdf

7. The owner or operator's actions during startup and shutdown periods must be documented by properly signed, contemporaneous operating logs, or other relevant evidence."[19]

In particular, the Applicant's process has the potential to have very high carbon monoxide emissions during times when the afterburner is not running as carbon monoxide is generated in large quantities in the process as an intermediate in the reduction of iron oxide. Commentors are concerned in particular about the potential for high ambient carbon monoxide concentrations adjacent to the facility.

Commentors assert that the language excusing the source from compliance during startup and shutdown for CO, VOC and NOX should be removed from the permit. While Commentors are aware that there are conditions under which the afterburner or SNCR would not be operated under startup and shutdown, this can more appropriately be handled through IDEM enforcement discretion and Applicant's recordkeeping and reporting of such incidents.

5 Applicant's Characterization of Volatile Organic Compound and Carbon Monoxide Emission Rates are Likely to be Unrealistic and Underestimates

The Applicant and IDEM appear to be using coal combustion AP-42 emission factors to calculate both VOC and CO emissions from the Rotary Hearth Furnace. However, AP-42 emission factors will be based on industrial, commercial and steam electric boilers where oxidizing conditions for good combustion are always maintained.

However in the Direct Reduced Iron Rotary Hearth Furnace, a partial reducing atmosphere must be maintained with high concentrations of carbon monoxide (which is a process intermediate for reduction of iron oxide to iron) and likely poor combustion of volatiles in the full/partial reducing atmosphere. Use of AP-42 emission factors reflecting boiler performance will be likely to be significant underestimates of the calculated uncontrolled emission rates for carbon monoxide and VOCs. In addition, such conditions may also cause polycyclic aromatic matter uncontrolled emissions to be higher than predicted otherwise for coal-fired boiler performance. More realistic emission

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[19] September 20, 1999 Memo to EPA Regional Administrators, Regions I - X from Steven A. Herman, EPA Assistant Administrator for Enforcement and Compliance Assurance and Robert Perciasepe, EPA Assistant Administrator for Air and Radiation concerning State Implementation Plans: Policy Regarding Excess Emissions During Malfunctions, Startup, and Shutdown, available at:
http://www.epa.gov/Region7/programs/artd/air/title5/t5memos/excesem2.pdf

factors reflecting full or partial reducing atmospheres in the Rotary Hearth Furnace should be incorporated into calculations of uncontrolled CO, VOC and PAH emissions.

6 Applicant Has Failed to Properly Characterize Hazardous Air Pollutant Emissions from Mercury and from Practices Arising from the Use of EAF Furnace Dust and Other Mill Wastes

Applicant's characterization of hazardous air pollutant emissions relies solely on AP-42 emission factors for coal combustion. However, this facility is asking to use significant amounts of electric arc furnace dust and other mill wastes in the Rotary Hearth Furnace. Failure to have detailed example toxic constituent analysis for the EAF dust and other wastes will cause the estimates of HAPs/toxics to be significantly understated when the Applicant relies solely on AP-42 for coal combustion. This mis-characterization of toxic emissions, including lead, inherent with ignoring the toxic inputs from EAF dust and other wastes must not be allowed in the proposed permit. EAF dust is, after all, regarded as a hazardous waste capable of harming the environment. Although recycled EAF dust is exempted back to the point of generation by RCRA rules this doesn't mean that the waste is somehow linguistically detoxified. The failure of IDEM to require example constituent analysis for EAF dust and other wastes contemplated by the permit for process addition and recycling seriously undermines as underestimates all of the HAP and lead emission characterizations of the proposed permit to the point of violation of requirements for a complete application under IDEM rules.

Because of serious issues of mercury contamination, Commentors assert that IDEM must also determine expected mercury throughputs and emissions from the process. Because of afterburner control of VOCs and CO in the process, it is likely that most of the mercury generated from coal used in the process will be transformed to biologically active forms (chlorides, sulfates, and oxides). At 0.25 PPM of mercury in coal, the mercury input to the process just from coal for burner combustion would be about 36 lbs per year. This would not account for mercury in the DRI feedstock matrix from both coal and from iron ore. Although some limited mercury control will occur in the subject facility's baghouse, the high exhaust temperatures mitigate against high efficiency of mercury control. This issue must be evaluated for the proposed facility.

7 The Particulate/Opacity Emission Compliance Monitoring Requirements Are Unacceptable

IDEM should not be giving the Applicant the choice between compliance monitoring by a visible emission observer, continuous opacity monitoring system and bag leak detection system and exemption from quarterly inspections as it does in D.1.18. At a 3% opacity, visible emission observer error will be high. The permit should be amended to require a continuous opacity monitoring system, bag leak detection system

and quarterly inspections for all baghouse facilities countenance in the proposed permit. Pinhole leaks that might escape detection by the opacity monitoring system may jeopardize compliance with a BACT PM level of 0.0052 grains/DSCF (in fact, this limit should be incorporated as a legally enforceable emission limitation in the proposed permit for the two subject baghouses on the RHF. Annual inspections with flourescent compounds may catch leaks not caught by any continuous monitor or bagleak detection system.

8 IDEM Must Provide for Delayed Effective Date for any Permit Approval

Given that Commentors raise important technical and legal issues concerning PSD BACT for the subject facility's proposed major modification permit, IDEM must ensure that any final decision to issue such a permit is subject to a 30 day delayed effective date beyond the date that IDEM makes the decision and notices Commentors, consistent with binding requirements on IDEM PSD permit issuance for delegated programs at 40 CFR Sec. 124.19.

Respectfully submited,

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