BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	R08-19
NITROGEN OXIDES EMISSIONS FROM	)	(Rulemaking – Air)
VARIOUS SOURCE CATEGORIES:	)	
AMENDMENTS TO 35 ILL. ADM. CODE	)	
PARTS 211 AND 217	)	

NOTICE OF FILING

TO: Mr. John T. Therriault
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(VIA ELECTRONIC FILING)

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(VIA ELECTRONIC MAIL)

(SEE PERSONS ON ATTACHED SERVICE LIST)

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board **POST-HEARING COMMENTS FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY SUBMITTED BY ARCELORMITTAL USA, INC.** a copy of which is herewith served upon you.

Respectfully submitted,

By: Christina L Archer
Christina L. Archer

Dated: 3/23/09

Christina L. Archer
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CERTIFICATE OF SERVICE

I, Christina L. Archer, the undersigned, hereby certify that I have served the attached POST-HEARING COMMENTS FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY SUBMITTED BY ARCELORMITTAL USA, INC. upon:

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Christina L. Archer

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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	)	R08-19
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POST-HEARING COMMENTS FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY SUBMITTED BY ARCELORMITTAL USA, INC.

These comments are respectfully submitted as a follow-up to the Pre-Filed Comments for the Illinois Environmental Protection Agency (Illinois EPA or Agency), filed on November 25, 2008, by ArcelorMittal USA Inc. on behalf of ArcelorMittal Riverdale Inc. (ArcelorMittal), as additional comments following several rounds of hearings in this matter and based on informal discussions with the Agency. ArcelorMittal's Riverdale, Illinois facility has a permitted roller-hearth tunnel furnace equipped with ultra-low NOx burners (ULNBs), which processes thin cast steel slabs. ArcelorMittal previously demonstrated that the tunnel furnace cannot be considered as a reheat, annealing, or galvanizing furnace. At this time, ArcelorMittal reiterates that based on the applicability provisions provided in the proposed regulation at 35 IAC 217.150, the tunnel furnace is not subject to this rulemaking. With these comments, ArcelorMittal asserts that the implementation of additional NOx controls is technologically infeasible and economically unreasonable.

On March 19, 2009, the Agency filed a Motion to Expedite with the Illinois Pollution Control Board (Board) requesting that the Board proceed quickly to First Notice in this matter because of the looming possibility of sanctions from the United States Environmental Protection Agency (U.S. EPA). While ArcelorMittal does wish to delay this rulemaking or have the State

face sanctions, we can only support the legal implementation of Ozone Reasonably Available Control Technology (RACT) requirements that do not impose additional and unneeded burdens on Illinois manufacturers. Illinois and Cook County have been losing manufacturing jobs at an alarming rate to global competitors with less costly regulatory environments. In the current economic climate, it is not in the interest of Illinois to increase regulatory burdens. This is particularly true when actual monitoring data indicate that the Chicago area will achieve attainment to the applicable 1997 Ozone standard without imposing such burdens as proposed by R08-19. The Illinois EPA intends to request that U.S. EPA re-designate the Chicago area to attainment of the 1997 8-hour Ozone National Ambient Air Quality Standards (NAAQS) based on ambient monitoring data from 2006 through 2008. Trends in air quality monitoring data for Illinois and the Chicago area, plus "on the book" controls hold promise for the re-designation and maintenance of the Chicago area to attainment without installing additional NOx RACT controls. Our comments respectfully request Illinois EPA reconsider the economic impact and cost reasonableness for arbitrarily setting lower NOx emission standards, consider reducing its economic impact on Illinois and that the Board act prudently on such a proposal, especially in Chicago where the area is meeting the 1997 Ozone standards that R08-19 is intended to improve.

1. A review of potentially applicable NOx emission control technologies reveals technical infeasibility due to both operational and product quality issues. ArcelorMittal reviewed the Technical Support Document (TSD) for Control of Nitrogen Oxide Emissions from Industrial, Commercial, and Institutional (ICI) Boilers and Small Electric Generating Unit (EGU) Boilers, Process Heaters, Cement Kilns, Lime Kilns, Reheat, Annealing, and Galvanizing Furnaces used at Iron and Steel Plants, Glass Melting Furnaces, and Aluminum Melting Furnaces, AQPSTR 07-02, March 2008, prepared by Andover Technology Partners and the Illinois EPA. Appendix 21

of the TSD lists ten individual emission units within the steel industry that are currently applying NOx controls; however, none of these units are similar to tunnel furnaces. Changing tunnel furnace burner configuration or using unproven technologies has the potential to harm or irreparably affect slab quality, as there is no evidence to support successful continued use without compromise of product requirements.

There are three broad categories of NOx emission reduction techniques: add-on or post-combustion controls, process controls and pre-process controls. Add-on controls treat flue gases to remove already formed NOx, process controls include combustion modifications which rely on inhibiting the formation of NOx in the production process, and pre-process controls principally focus on product (or fuel) substitution. ArcelorMittal is aware that other steel mills have attempted to utilize add-on controls. Although add-on controls typically provide the highest potential level of NOx reduction, they can only be applied on selective exhaust streams. These streams must typically consist of steady state conditions with little or no variation in stream characteristics (such as temperature and oxygen content). Outside of these ranges, the technologies are either ineffective or greatly compromised, sometimes resulting in the creation of additional emissions or new air pollutants. The application of Selective Catalytic Reduction (SCR) technology at another steel mill furnace proved to be technically infeasible in practice. The application caused changes in the furnace operating characteristics, such as generation of varying back pressures, heat flows, and eddy channels, all of which negatively impacted slab quality. Additionally, it was also found that either the SCR must be by-passed or a significant loss of NOx reduction efficiency (and dramatic increase in ammonia slip) will occur during different slab runs, idle times, hot-standby, start-up and shutdown, etc. Based on the reduced oxygen content of the tunnel furnace operation, exhaust temperatures, amongst other parameters,

add-on NOx controls are not feasible for retrofit. Importantly, the Agency has already testified that it would be surprised if sources were required to install post-combustion controls to achieve the proposed emission limits. *See R08-19, Transcript from October 14, 2008 hearing, pp. 27, 116-117, 171.*

Process controls include Flue Gas Recirculation (FGR), low NOx burners (LNBs) and ULNBs. As previously stated, ArcelorMittal's tunnel furnace is equipped with ULNBs. FGR can be applied alone or in combination with other controls, but when applied with other controls it is typically used in conjunction with LNBs, not ULNBs. Due to a steel mill furnace chamber design and operation, FGR cannot be applied with ULNBs. If applied with LNBs, the NOx reduction efficiency is either equal to or less than the use of ULNBs alone. Since ULNBs are already used in the tunnel furnace, the application of the other burner and FGR options would not result in a reduction of NOx emissions.

Pre-combustion controls mainly concern fuel switching. ArcelorMittal already fuels the tunnel furnace with pipeline grade natural gas, therefore, no other fuel sources for this type of operation are known to further reduce the formation of NOx.

2. Illinois EPA anticipates a NOx reduction of 60% from ArcelorMittal's tunnel furnace. The Agency allegedly developed this limit based on the RACT provisions which apply to existing sources in areas that are not attaining the NAAQS. However, as previously described in this rulemaking, the U.S. EPA considers emissions reductions of 30% to 50% sufficient to meet NOx RACT. *See R08-19, Transcript from December 9, 2008 hearing, pp. 84-85 (referencing 70 Fed. Reg. 71657, Hearing Exhibit 6).* Simply put, RACT is based on the implementation of "reasonable" controls. As indicated by the August 29, 2008 Pre-Filed Testimony of Robert Kaleel, Manager of the Air Quality Planning Section in the Bureau of Air at

the Illinois EPA, "RACT is defined as the lowest emission limitation that a particular source can meet by applying a control technique that is reasonably available considering technological and economic feasibility." *See R08-19, Pre-Filed Testimony of Robert Kaleel, August 29, 2008, p. 2.* The resultant emission rate by the application of RACT may be different for each source. However, there is no pollutant tonnage reduction that represents RACT, rather a control method application and resultant emission rate (i.e., lbs/hr or lbs/mmBtu) reduction. The ULNB technology that is typically considered to represent RACT is already in use at ArcelorMittal.

ArcelorMittal currently utilizes Bloom Engineering Series 1430 ULNBs. Based on previous oral conversations between ArcelorMittal and Illinois EPA, the Agency has requested that ArcelorMittal pursue the installation of "next generation" ULNBs. To this effect, ArcelorMittal has participated in oral conversations with both Bricmont and Bloom. Bloom has provided information regarding burner upgrades, including NOx emission guarantees and cost estimates; however Bricmont has not guaranteed product quality aspects associated with the burner change. A review of the provided oral and written information indicates that implementation of a burner upgrade for the tunnel furnace is infeasible based on the overwhelming economic cost, the effect on the tunnel furnace operation, and the impact on product quality.

3. Illinois EPA has established a range of cost effectiveness of $2,500 - $3,000 per ton of emissions reduced. *See R08-19, Transcript from October 14, 2008 hearing, pp. 165-166, 173-174; Transcript from February 3, 2009 hearing, p. 75.* In addition, the TSD states that "$5000/MMBtu/hr is towards the high end of the capital cost of combustion controls, for the levels of NOx reduction envisioned in most cases, costs in $/ton of NOx are typically under $1000/ton." *TSD, Section 6.4, p. 99.* In the preamble to the 8-hour Ozone implementation rule

U.S. EPA states that a cost of $160 to $1,300 (in 1994 dollars) per ton of NOx removed is considered reasonable for purposes of RACT (70 Fed. Reg. 71652, November 29, 2005). Furthermore, U.S EPA states that in the 1998 NOx SIP Call Rule they reviewed all major NOx source categories, and the NOx SIP Call controls cost less than $2,000 per ton (Id. at 71654). In light of these control cost determinations, ArcelorMittal prepared an economic analysis for the Agency to review, which provides the estimated cost effectiveness for burner change. The analysis has been developed for two separate burners models and are based on ArcelorMittal's incremental cost of reducing NOx emissions. The analysis is attached hereto as Exhibit A.[1]

Scenario 1 of the analysis for a "next generation" Bloom Series 1500 burner indicates an actual emissions reduction of 25 tons per year (tpy), with a conservative cost effectiveness of $22,895 per ton of NOx removed. Scenario 2 for a "next generation" Bloom Series 1550 burner indicates an actual emissions reduction of 29 tpy, with a conservative cost effectiveness of $39,472 per ton. For either scenario, the calculated cost effectiveness of the burner upgrade well exceeds the Agency's established range of $2,500 - $3,000 per ton of emission reduction, U.S. EPA's determination of less than $2,000 per ton and the TSD's reference of $1,000 per ton. Furthermore, the costs are solely estimates for materials and labor associated with the burner upgrade and additional furnace modifications. These estimates assume rigid customer product quality specifications can be satisfied and, conservatively, do not include yield cost impacts and the associated cost of production downtime to convert the furnaces, both which would be substantial. An expenditure of over $22,000 per ton of NOx controlled is unreasonable for a

[1] As stated in previous comments, the current, permitted emission factor for the tunnel furnace is 0.171 lb/mmBTU and the guaranteed emission factor as shown in Exhibit A is 0.165 lb/mmBTU (the differenee being a safety margin). Upon receiving AreelorMittal's economic analysis on Mareh 16, 2009, the Agency indieated that they would be willing to consider a revised emission limit of 0.09 lb/mmBTU, but stated that, due to time constraints, they could provide no additional reasoning for the proposed revised limit other than the alleged need to show further NOx reductions and being under the threat of sanctions from U.S. EPA. ArcelorMittal strongly disagrees with this arbitrary limit (which isn't based on RACT), but is committed to continuing to work with the Agency to demonstrate why no additional reductions are required.

point source that contributes a meager 0.016% of the total Chicago area NOx inventory on a daily basis of 812 tons NOx/day for 2006.

4. Although the estimated total cost of a burner upgrade is overwhelming, the effect on the operation of the tunnel furnace is of greater concern. Steel tunnel furnace burner designs are very particular to the furnace structure and slab type, so altering the burners or heat system can have significant effect on the slab quality. Based on Scenario 1, burners and gas orifice plates would need to be removed and replaced. Primary air cycle valves would also need to be replaced for Scenario 2. Additionally, air and gas piping modifications would need to be made at all of the burner connections and modifications would need to be made to shell plate and insulation to accommodate new block sizes and shapes.

The anticipated flame geometry with either of the new burner models would be slightly longer and smaller in diameter than the flame generated with the existing burner. When the flame becomes less focused, heat cannot reach the bottom of the slab, which may require the installation of additional burners on the bottom side of the furnace. Changes in flame geometry can also result in burnt roof sections and tie beams (cross-overs). Most importantly, flame length is related to turbulence and a specific flow pattern within the furnace. Modification of the flame changes the flow pattern and impedes the ability to evenly heat the slab. Gas is combusted more slowly with ULNBs and can result in unburned fuel contacting the slab.

In addition, the gas pressure requirement for the new models is significantly higher and would necessitate changes to the main gas trains. Modification of the main gas trains has not yet been evaluated. Any precise physical changes to the mains, or the ability to make these changes, have not been evaluated; therefore the feasibility of these changes and the associated economic costs are not known.

Conversations with the manufacturer of the tunnel furnace have revealed that retrofitting tunnel furnaces is extremely difficult due to the increased number of burners within the furnace and the increased surface area of the slab per pound of steel (due to the thin slab casting). The increased surface area results in the need for tighter atmospheric control and an increased focus on maintaining surface quality.

Due to the continuous nature of the steel-making process and the lack of redundancy in the operation, the tunnel furnace must operate optimally at all times. As previously indicated, the tunnel furnace receives slabs directly from the continuous caster. Unlike a traditional caster which produces a slab that is stored prior to processing, there is no place to store the slabs and no way to "reheat" a slab from ambient temperature. The entire compact strip production (CSP) process operates as one continuous process and all sections must be operating optimally to produce a quality finished product. Unlike other facilities that operate tunnel furnaces, the Riverdale facility does not have a second tunnel furnace or shuttle furnace that can be used to divert product between furnaces; nor does the Riverdale facility have any downstream finishing operations (such as pickling) to remove scale.

5. As outlined above, each of the effects on the furnace operation directly impacts product quality. ArcelorMittal's Riverdale facility produces both high and low carbon grades and carbon alloy grade steel. Many of these grades (including high carbon grades with up to 0.95% carbon; carbon alloy grades with specific additions of chromium, nickel, molybdenum, and vanadium; and carbon grade steels with boron additions) are not typically produced at other facilities. ArcelorMittal has invested a great deal of time and effort in order to produce a unique product mix that is either breakout sensitive or ultra-light gauge. These two niches differentiate our facility from other steel-making facilities throughout the country.

6. The Chicago Ozone monitoring and modeling data indicate attainment of the 1997 Ozone NAAQS is imminent without additional NOx RACT emission reductions from the manufacturing sector. Even without factoring in regulations with future effective dates, the Ozone monitoring data indicates attainment to the 1997 Ozone NAAQS. Illinois EPA acknowledges this condition in their November 14, 2008 public notice of the Ozone status where it states, "The Illinois EPA intends to request that U.S. EPA re-designate the Chicago area to attainment of the 1997 8-hour Ozone NAAQS based on ambient monitoring data from 2006 through 2008." NOx RACT should not be implemented if the Chicago area achieves attainment. While we recognize that Illinois EPA is obligated to submit its SIP and the NOx RACT rules to U.S. EPA this summer and appreciate the threat of sanctions, the rules should recognize the actual improvement in Ozone monitoring data, the modeling results and continuing improvement in ambient air quality trends in the Chicago area and stay on course with "on the book controls" as a means of demonstrating reasonable further progress and maintenance to the 1997 Ozone NAAQS. This approach is encouraged and is consistent with U.S EPA's Clean Data Policy, which enables reduced regulatory requirements for areas that attain the standards, but have not yet been re-designated as attainment. We respectfully request Illinois EPA not develop and the Board not adopt NOx RACT rules that further burden manufacturers as another means of "leapfrogging" into other SIP initiatives that have longer timelines (e.g., PM 2.5 or 2008 Ozone standard SIP rules) without allowing "on the book" controls to take hold to further improve ambient air quality.

In summary, these comments are intended as a supplement to the information previously provided in our Pre-Filed Comments, dated November 25, 2008 as well as follow-up to the several rounds of hearings in this matter and informal discussions with the Agency.

ArcelorMittal asserts that operationally and functionally the tunnel furnace cannot be compared to, or considered to be a reheat furnace (or even compared to other tunnel furnace facilities for that matter). ArcelorMittal remains committed to working with the Agency throughout this rulemaking proceeding; however, should the Agency deem that ArcelorMittal's tunnel furnace requires regulation under the proposed rule, ArcelorMittal requests that Illinois EPA allow a case-by-case determination for the applicability of this rule to the tunnel furnace. This would include the provision of a specific definition or separate category for tunnel furnaces and utilization of the emission factor currently utilized and permitted for the tunnel furnace at ArcelorMittal's Riverdale, Illinois facility, recognizing the unique nature of the operation and the advanced NOx control technologies already in use.

In the alternative, ArcelorMittal would request the Agency's support and joint filing in an adjusted standard proceeding. Mr. Kaleel is quoted in the proceedings from the October hearings (specifically when talking about boilers and the possible need for SCR, but the same general concept applies to furnaces) as follows "I think an argument could be made that if the costs for a particular unit greatly exceed the range we have in mind for RACT, the unit would qualify or at least we could support an adjusted standard type of a proceeding." *See R08-19, Transcript from October 14, 2008 hearing, p. 128.* However, given the overwhelming evidence delineated above, ArcelorMittal believes that it has already established that its current burner configuration meets RACT and no additional regulatory proceeding is necessary, thereby saving both the Agency and Pollution Control Board valuable time and resources.

Respectfully submitted,
ARCELORMITTAL USA, INC.

By: Christina L. Archer
Christina L. Archer

Dated: 3/23/09

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Exhibit A to Post-Hearing Comments 3/18/2009

ArcelorMittal Riverdale Tunnel Furnace NOx RACT Analysis
Estimated Cost Effectiveness for Burner Change (see note below)

CALCULATION FOR THE ANNUALIZED COST PER TON NO_x REMOVED BASED ON CHANGING BURNERS FROM SERIES 1430 TO 1500 (Scenario 1) or to 1550 (Scenario 2), see references and notes below.

Direct Capital Costs (DCC):	Scenario 1 1500 Burner	Scenario 2 1550 Burner	Reference
Purchased Equipment Costs:			
Equipment Costs (EC):	$1,230,000	$2,710,000	(1)
Sales Tax (0.03EC):	$36,900	$81,300	(2)
Total Purchased Equipment Costs (PEC):	$1,266,900	$2,791,300	
Installation Costs (IC), including instrumentation, Freight, Engineering, Startup Consultancy	$300,000	$300,000	(3)
Total Purchased Equipment and Installation Cost (ICC=PEC + IC):	$1,566,900	$3,091,300	
Other Indirect Capital Costs (OCC)			
Lost Production:	$0	$0	(4)
Total Other Indirect Capital Costs (OCC):	$0	$0	
Contingency (CONT, 0.20 [ICC+OCC]):	$313,380	$618,260	(5)
Total Capital Cost (TCC=ICC+OCC+CONT):	$1,880,280	$3,709,560	
Annualized Capital Cost (ACC=TCCxCFR):	$496,013	$978,573	
Capital Recovery Factor (CRF):			see below
Direct Annual Costs (DAC):			
Operation (O)	$0	$0	
Maintenance (M)	$0	$0	
Replacement Materials	$0	$0	
Utilities	$0	$0	
Waste Disposal	$0	$0	
Chemicals	$0	$0	
Other	$0	$0	
Total Direct Annual Costs (DAC):	$0	$0	
Indirect Annual Costs (IAC):			
Overhead (0.60(O+M))	$0	$0	
Administrative (0.01TCC)	$18,803	$37,096	(6)
Property Tax (0.01TCC)	$18,803	$37,096	(6)
Insurance (0.02 TCC)	$37,606	$74,191	(6)
Total Indirect Annual Costs (IAC):	$75,211	$148,382	
Total Annual Cost (TAC=ACC+DAC+IAC):	$571,224	$1,126,955	

Capital Recovery Factor (CFR) = $\frac{I(1+I)^n}{(1+I)^n - 1}$

I = 10 % - interest rate (7)
n = 5 years - economic equipment life (8)

CFR = 0.264

Baseline			
Existing Burner (Bloom 1430) Emission Guarantee (lb NOx/MMBtu)	0.165	0.165	(9)
Natural Gas			
Tunnel Furnace Natural Gas Consumption with Series 1430 (Actual 2005 MMBtu)	514430	514430	2005 NG Usage
NOx Emissions			
NOx Emissions with Series 1430 (Actual tons NOx in 2005)	42.4	42.4	calculation

Burner Upgrade Scenarios			
Burner Series (Model)	Model 1500	Model 1550	
Burner Upgrade Emission Guarantee (lb NOx/MMBtu)	0.066	0.054	(9)
Natural Gas			
Tunnel Furnace Natural Gas Consumption (MMBtu/yr)	514430	514430	Furnace NG
NOx Emissions			
NOx Emissions = Emission Guarantee * NG usage/2000 (TPY)	17.5	13.9	calculation
Incremental Emissions Reduction (tons/yr): =(2005 NG usage * 0.165 lb NOx/MMBtu/2000) - (NG usage * emission factor for replacement burners/2000)	25	29	calculation
Cost-Effectiveness ($/ton):	**$22,895**	**$39,472**	

References:

Note: Vendors were unable to guarantee product quality aspects associated with a burner change, therefore a burner change is technically infeasible for Riverdale's Tunnel Furnace. Cost information is provided for informational purposes only.

(1) Bloom cost estimate (see email dated March 5, 2009 from Dave Church).
(2) "EPA Pollution Control Cost Manual, Sixth Edition," EPA/452/B-02-001, January, 2002. Table 2.4, Page 2-27.
(3) Conservative Cost Estimate
(4) Does not include downtime for installation or product yield consequences, which could be significant (not included as a conservative measure)
(5) From EPA "Cost-Air" spreadsheets available on-line at http://www.epa.gov/ttn.
(6) "EPA Pollution Control Cost Manual, Sixth Edition," EPA/452/B-02-001, January, 2002, Section 2.5.5.8
(7) Riverdale cost of capital
(8) "Alternative Control Techniques Document - NOx Emissions from Iron and Steel Mills," EPA/453/R-94-065, September, 1994, Section 6.1.3 for costs of low-NOx burners applied to reheat furnaces.
(9) Bloom provided NOx emission guarantees for changing Series 1430 burners to Series 1500 and 1550.