Statement of Basis
for the Planned Issuance of a
Revised Clean Air Act Permit Program (CAAPP) Permit
for:

United States Steel Corporation
Granite City Works
20th & State Streets
Granite City, Illinois

Source I.D. No.: 119813AAI
Permit No.: 96030056

Permitting Authority:
Illinois Environmental Protection Agency
Bureau of Air, Permit Section
PO Box 19276
1021 N. Grand Avenue East
Springfield, Illinois

February 4, 2013

INTRODUCTION

This document is the Statement of Basis that has been prepared in conjunction with the planned issuance of a revised Clean Air Act Permit Program ("CAAPP") permit to United States Steel Corporation for its Granite City Works ("US Steel"). A Statement of Basis is a support document that is meant to provide a narrative discussion of the legal and factual basis underlying the planned issuance of a CAAPP permit. As a Statement of Basis is only an informational document, it is not a part of the CAAPP permit and it does not create any binding or enforceable rights or duties independent of the permit.

US Steel operates an integrated iron and steel mill in Granite City, Illinois. Because of the mill's emissions of various pollutants, US Steel is required to obtain an operating permit for the mill under Illinois' CAAPP.

The CAAPP generally requires that major stationary sources of regulated air pollutants apply for and obtain a CAAPP permit for their operations. The CAAPP is administered by the Illinois EPA. CAAPP permits contain conditions identifying all applicable requirements under the federal Clean Air Act ("CAA") and Illinois' Environmental Protection Act ("Act"). Testing, monitoring, compliance procedures, recordkeeping and reporting requirements are also established, as required or necessary, to assure compliance and accomplish the purposes of the CAAPP and the Act. The terms and conditions of a CAAPP permit are enforceable by the Illinois EPA, USEPA and the public.

The Illinois EPA previously issued a revised CAAPP permit to US Steel on May 2, 2011.[1] A petition was filed on August 16, 2011 with USEPA by Washington University School of Law on behalf of the American Bottom Conservancy (ABC) requesting that USEPA object to this permit. On December 3, 2012, USEPA took final action on this petition, granting it in part and denying it in part.

Following review of USEPA's response to the petition, the Illinois EPA has elected to make certain revisions to the current CAAPP permit issued to US Steel. Before making these revisions to the permit, the Illinois EPA is holding a 10-day comment period in accordance with Section 39.5(9)(g) of the Act. The draft of the revised CAAPP permit that the Illinois EPA plans to issue and this Statement of Basis are being mailed to those persons who participated in the previous public comment periods on the CAAPP permit for this source.[2] These and other relevant documents are also being placed in public repositories located at the Six Mile Regional Library District, 2001 Delmar Avenue, Granite City, and at the Illinois EPA's Offices at 2009 Mall St., Collinsville, and 1340 N. Ninth St., Springfield.

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[1] The revised CAAPP permit issued on May 2, 2011 underwent two subsequent administrative amendments, with amendments to the permit issued by the Illinois EPA on October 5, 2011 and May 3, 2012. The first amendment corrected various typographical errors in the permit. The second amendment included a new recordkeeping provision in the permit for emissions of certain pollutants from particular basic oxygen furnace processes. The new provision had been in the draft of the revised CAAPP permit but was inadvertently omitted when the final version of the revised permit was prepared and issued. This correction to the May 2011 permit, by including new Condition 7.5.9(f), answered one point in the current petition, as recognized by USEPA in its December Order which held that this point was now moot. In particular, the CAAPP permit now required recordkeeping for relevant emissions of the basic oxygen furnace processes, including certain records related to the emission factors that US Steel used for this purpose.

[2] The comment period on the original CAAPP permit issued to US Steel for the Granite City Works ran from October 2008 through February 2009. The prior 10-day comment period on the revised CAAPP permit issued to US Steel in May 2011 occurred in March 2011.

I. General Information

A. Applicant/Permittee and Source Information

US Steel Corporation
Granite City Works
20th and State Streets
Granite City, Illinois 62040

Source ID No: 119813AAI

SIC Code: 3312 – Integrated Steel Mill

County: Madison

Responsible Official

Richard E. Veitch, General Manager
(618)451-3456

B. Facility Description

US Steel Corporation's ("US Steel" or "source") Granite City Works is an integrated iron and steel mill producing flat rolled steel products. The principal operations at this facility are: (1) Coke Production (Coke Ovens and Coke Byproduct Plant), (2) Iron Production (Blast Furnaces), (3) Steel Production (Basic Oxygen Process Shop), (4) Steel Finishing, (5) Boilers, and (6) Handling and Processing of Bulk Materials. In addition, the roadways at the facility and nearby public roadways serving the facility emit fugitive dust. More detailed descriptions of the various operations and emission units at the facility are found in the conditions of the current CAAPP permit that provide "Descriptions" of units.[3]

Coke Production (Coke Ovens and Coke Byproducts Plant)

Coke is manufactured at the facility for use in the blast furnaces in which iron is produced. Coke is an essential raw material for the blast furnaces, as

[3] The permitting action that is now contemplated would, again, not involve the CAAPP permits for the following facilities, which are owned and operated by companies other than US Steel but meet the criteria of the CAAPP to be considered a single stationary source with US Steel's Granite City Works. Although considered part of the Granite City Works, it remains appropriate that each of these other facilities, with their different responsible officials, to be permitted individually under the CAAPP. This approach is consistent with Illinois EPA's past permitting practice, as well as available USEPA guidance on single source permitting under the Title V program.

- Stein Steel Mill Services (I.D. 119013AAD) located at 20th Street and Edwardsville road in Granite City – Handling of Basic Oxygen Furnace slag.
- Granite City Slag, LLC (I.D. 119040ATF) located at 20th Street and Edwardsville Road in Granite City – Handling of blast furnace slag.
- AKJ Industries, Inc. (I.D. 119040AEB) located at 20th Street and Edwardsville Road in Granite City – Processing by-product stream from the by-product recovery plant.
- Oil Technology, Inc. (I.D. 119040ATG) located onsite of US Steel (Route 203) in Granite City – Processing recovered waste oil for recycling.
- Tube City, IMS (I.D. 119040ATL) located at 2500 East 23rd Street in Granite City – Handling of scrap metals.
- Gateway Energy & Coke Co., LLC (I.D. 119040ATN) located at 2585 Edwardsville Road in Granite City – Production of coke in new heat recovery coke oven batteries.

it is the reducing agent that converts iron ore to iron and also serves as the fuel that provides heat to the furnaces.

Coke is produced by “cooking” appropriate coal at an elevated temperature to drive off the volatile fraction of the coal. US Steel operates two batteries of byproduct recovery ovens. In byproduct recovery coking, the combustible byproduct gas from the coking process is sent to a byproduct plant to recover certain chemicals in the gas. The processed gas is then used as fuel, both for the coke ovens themselves and at other units at the facility. Coke is produced in the coke ovens, in batches, in four steps: 1) The charging of coal into a hot oven; 2) The actual coking of the coal in the oven; 3) The removal or pushing of the finished coke from the oven; and 4) The cooling or quenching of the hot coke with water in a separate quench station.

By-product coke ovens are indirectly heated through combustion flues in the refractory brickwork around each of the ovens. The flues from all the ovens exhaust through a common “main stack” or combustion stack. The principal fuel used to heat the ovens is coke oven gas. At this facility, the coke oven gas may be supplemented with natural gas and blast furnace gas, a byproduct from the blast furnaces. Emissions from heating the coke ovens are controlled by work practices to avoid leaks in the brickwork that enable some of the raw coke oven gas to go directly into the flues, bypassing the byproduct plant. Heating emissions are also controlled as raw coke oven gas and blast furnace gas are processed or cleaned to remove entrained particulate before being used as fuel. At this facility, coke oven gas is also normally further processed in a Desulfurization System to remove sulfur, lowering the SO_2 emissions that accompany its use as fuel.

In addition to combustion emissions from heating the ovens, each of the steps in the production cycle in coke ovens poses issues for emissions. The ovens are charged by pouring coal into the ovens through ports on the top of the ovens. Emissions are minimized by equipment design and work practices that reduce the escape of coal dust. While the coal is being coked, leaks in the seals around doors and ports on the ovens will result in emissions. This is because the ovens are designed to operate at a slight positive pressure to prevent air from entering the ovens and to facilitate collection of the raw coke oven gas for processing in the byproduct plant. The emissions from leaks are minimized by the design features of the ovens and work practices to prevent and plug leaks. The emissions from pushing coke are minimized by practices to ensure that the coal is fully coked before being removed from an oven. Pushing emissions are also controlled by a mobile control system, with hooding and an associated scrubber that travel along with the coke receiving car. Emissions from quenching are controlled by requirements for the quality of quench water and a quench tower over the quench station, with a row of baffles to capture particulate matter.

At the byproduct plant, the collected coke oven gas from the ovens is processed to recover certain chemicals for sale, including coal tar, benzene, and ammonium sulfate. Emissions of vapors from the various vessels in the byproducts plants are generally controlled by gas blanketing systems. These systems exhaust back into the raw coke oven gas stream, so that vapors are ultimately controlled by combustion when the gas is used as fuel.

Any excess coke oven gas, which cannot be used as fuel at the facility, is managed by combusting it in a flare. This controls the organic compounds in the gas and converts the sulfur in the gas, which is generally present as hydrogen sulfide, to less noxious SO_2. There are also two emergency by-pass

flares, one on each of the coke oven batteries. Like the flare at the byproducts plant, these flares are safety devices. In the event of an upset, they are used to maintain the pressure in the coke oven gas collection system at a safe level by combusting some of the coke oven gas.

Iron Production (Blast Furnaces)

Blast furnaces are tall, cylindrical, stationary furnaces. The charge materials (iron ore, coke, limestone and other flux material) are fed into the furnace at the top through a double-bell lock system. Heated air is blown into the furnace through nozzles or tuyeres near the bottom of the furnaces. In the furnaces, the coke undergoes partial combustion to carbon monoxide providing the heat to melt the charge as well as reducing the iron ore to elemental iron. Molten iron and slag accumulate at the bottom of the furnace and are removed periodically by tapping the furnace. The hot, carbon monoxide rich exhaust from the furnace, known as blast furnace gas, goes into a duct at the top of the furnace, to be cooled and cleaned prior to use as fuel at the facility. Any excess blast furnace gas, which cannot be used as fuel, is flared.

Emissions occur from blast furnaces during the periodic tapping of the furnaces, when molten iron and slag are exposed to the atmosphere as they drain from a furnace and flow in troughs to vessels for transport. Covers and other measures are used to reduce the formation of emissions during tapping. At this facility, emissions are also controlled as tapping occurs in the casthouse, a covered area between the two blast furnaces, which is equipped with fabric filters or baghouses. The casthouse itself is exhausted to the large Casthouse Baghouse. Additional hooding is present at the iron spouts, where molten iron is poured into the “torpedo” rail cars, which are used to transport molten iron to the Basic Oxygen Process Shop. The hooding over the iron spouts exhaust to another baghouse, the Iron Spout Baghouse.

Emissions also occur from the stoves that heat the blast air going into the furnaces. These stoves are fired with blast furnace gas. The blast furnace gas is cleaned to remove entrained dust before it is used as fuel. Otherwise, this dust would accumulate and interfere with the operation of the stoves.

Steel Production (Basic Oxygen Furnace (BOF) Shop and Continuous Casters

Iron produced at the blast furnaces is converted to steel in the Basic Oxygen Process Furnace (BOPF) or Basic Oxygen Furnace (BOF) Shop. The BOF Shop houses the hot metal desulfurization station, the basic oxygen furnaces (BOF), the ladle metallurgy furnace and the argon stirring stations. The steel is then cast into slabs in associated continuous casters.

At the BOF Shop, molten iron is first processed at the desulfurization station to reduce its sulfur content. This occurs in batches using desulfurization agents, such as lime, that react with sulfur dissolved in the molten iron. Molten iron from the blast furnace in torpedo cars is transferred to a ladle. The agents are then added to the molten iron with a lance. The sulfur-laden slag that is formed floats on the surface of the iron and is skimmed off the iron into a slag pot. The particulate emissions from the transfer of molten iron to ladles and the desulfurization and slag skimming processes are controlled by separate baghouses.

The desulfurized iron then goes to the BOF furnaces for conversion to steel. This occurs when oxygen injected into the molten metal reacts with carbon and silicon dissolved in the iron, driving these materials out of the metal,

converting it to steel. Iron is processed in these furnaces in batches or heats that last less than an hour. The first step in a heat is charging a furnace. Scrap metal is emptied into the furnace from large buckets. Molten iron is then poured into the furnace from a ladle. The emissions associated with charging are currently controlled by large hoods located above the charging area that capture particulate matter, which are ducted to an electrostatic precipitator ("ESP"). The next step is the actual conversion into steel, when oxygen is blown into the molten metal. An oxygen lance is introduced through a port in the roof over the furnace. The associated emissions are directly controlled as the furnace is exhausted through a second port in the roof that is ducted to the ESP. The next step in a heat, when the "blow" is complete, is tapping the furnace. The furnace is tilted in the direction opposite that for charging, and the steel is drained into a transfer ladle. Tapping emissions are currently captured by the roof on the furnaces, which also extends over the pouring area. The capture of emissions from the furnaces is facilitated as the roof over the furnaces is open to the atmosphere only through a roof monitor at the peak of the roof.

At the ladle metallurgy furnace and argon stirring stations, final adjustments are made to the composition of the molten steel from the BOFs. After the composition of the metal is analyzed, appropriate amounts of alloy material are added to achieve the desired composition. This occurs in the ladle metallurgy furnace if the steel has cooled and must be brought back up to temperature. Otherwise, alloy materials are added at the argon stirring stations, where the steel is then "stirred" by injecting inert argon gas into the steel to disperse the alloy materials in the molten steel and maintain a uniform temperature. Emissions from these stations are controlled by a baghouse.

In the continuous caster, molten steel is formed into solid slabs, which may be sold or further processed in finishing operations at the facility. Molten steel from the ladle metallurgy station is poured into the continuous caster and steel slabs of the desired cross-section and length are produced. This is accomplished by passing the molten steel through a water-cooled die, further cooling the steel strand leaving the die with water sprays, and finally cutting the strand into sections of the desired length. The design of the continuous casting process reduces emissions because it minimizes exposure of molten steel to the atmosphere.

Finishing Operations (Reheat Furnaces, Rolling Mills and Galvanizing)

In the finishing departments, slabs are heated and then rolled or milled into sheet metal that is sold in large coils. The slabs are first heated in gas-fired "reheat furnaces" to a temperature at which the steel is malleable and can be readily processed in a rolling mill. Low- NO_x combustion techniques are employed at the reheat furnaces to control emissions of NO_x.

In the rolling mills, the hot steel slabs are reduced in thickness by being repeatedly passed through a series of heavy rollers to form sheet metal of the desired thickness and width. This sheet metal may then undergo galvanization, with the application of a thin film of zinc to the surfaces of the metal to prevent corrosion.

Utility Operations (Boilers)

Boilers at the facility provide the steam needed for certain process operations at the facility, as well as for some space heating. Two older boilers produce low-pressure steam and are fired by natural gas, coke oven gas, and blast

furnace gas. A new “Cogeneration Boiler” (also known as Power Boiler 1) began operation in 2009. This boiler produces high-pressure steam used to generate electricity for the facility, with the low-pressure steam from the turbine-generators then being available for process operations and heating. The emissions from the boilers are generally minimized through fuel quality and good combustion practices.

Handling and Processing of Bulk Materials

Various bulk materials involved in the production of iron and steel are handled at the facility, including iron ore, scrap iron, coal, coke and limestone. These materials must be unloaded, held in storage piles or silos, and moved around the plant by various conveyor systems. Certain materials, like coal for coke ovens, must be processed by screening and crushing, before use. Slag from furnaces must also be handled and processed for use as construction aggregate or disposal. The particulate emissions from these emission units are controlled by various measures, specific to the unit, that act to minimize emissions. Baghouses are also used to control emissions from some emission units, such as the pulverizer used for final grinding of the coal feed to the coke ovens.

Vehicle Traffic on Roadways

Vehicle traffic on roadways, including the heavy equipment used to transport slag, around the facility results in emissions of fugitive dust. On paved roadways, these emissions are minimized by vacuum sweeping on a regular basis to remove silt from the road surface. On unpaved roadways and open areas, emissions are minimized by regular applications of water and surfactants.

C. Area Classification

Madison County, Illinois is currently designated as marginal nonattainment for the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS) and as nonattainment (annual standard) for the NAAQS for $PM_{2.5}$ (particulate matter less than 2.5 micrograms). Granite City Township and Venice Township in Madison County are nonattainment for the 2008 lead NAAQS. The area is in attainment with or not classifiable under the NAAQS for all other criteria pollutants.

D. Major Source Status

This source is a major source based on emissions of various regulated pollutants, including NO_x, PM, SO_2, VOM, CO, hazardous air pollutants (“HAPs”), and greenhouse gases (“GHG”).

E. Chronology of Events

Initial CAAPP Permit

In March 1996, the Illinois EPA received a CAAPP application for the Granite City Division of the National Steel Corporation, who was then the owner and operator of the facility. This application was timely submitted in accordance with the requirements of the CAAPP, which had become effective in Illinois following USEPA’s interim approval of the program on March 15, 1995.

The Illinois EPA received over 730 initial applications for CAAPP permits from subject sources in Illinois. The application for the source was one of the last initial CAAPP applications reviewed and processed by the Illinois EPA. In

the intervening years, the source was purchased by US Steel Corporation and the pending CAAPP application originally submitted for the source was transferred to US Steel as the new owner and operator of the Granite City Works.

The Illinois EPA subsequently prepared a draft CAAPP permit for US Steel and the public comment period for the draft permit commenced in mid October 2008. A public hearing was held on December 2, 2008. After the close of the comment period and a review of the public comments, the Illinois EPA prepared a proposed CAAPP permit and sent it to USEPA in mid June 2009 for a 45-day review, during which USEPA did not object to the proposed CAAPP permit. The Illinois EPA then prepared its formal response to comments raised by the public and US Steel during the public comment period on the draft CAAPP permit. The Illinois EPA issued the CAAPP permit on September 3, 2009.

Petition to USEPA to Object and USEPA Order on the Initial CAAPP Permit

The American Bottom Conservancy ("ABC") filed a Petition to Object ("Petition") with the USEPA in October 2009 requesting that USEPA object to the CAAPP permit issued to US Steel. The Petition asserted that the CAAPP permit failed to incorporate all "applicable requirements," including terms and conditions of prior state construction permits, failed to include the requisite Periodic Monitoring requirements and lacked required compliance schedules. The Petition also claimed that the CAAPP permit inappropriately allowed excess emissions during malfunction/breakdown and startup events[4], failed to include compliance assurance monitoring, and contained terms and conditions that are not practically enforceable.

On January 31, 2011, the USEPA responded to the Petition, denying in part and granting in part, on the arguments made by ABC. In its Order responding to the Petition ("Order"), USEPA refused to object to certain aspects of the issued CAAPP permit challenged by ABC.[5] The Order also granted the Petition with respect to certain aspects of the permit. Concerning periods of startup, malfunction and breakdown based on the Illinois State Implementation Plan (SIP), the USEPA required the Illinois EPA to either explain in the Statement of Basis how it had determined in advance that the Permittee met the requirements of the Illinois SIP at 35 IAC 201.262 or to otherwise make appropriate changes to the permit that continued operation during startup, malfunction or breakdown would only be authorized on a case-by-case basis if the source met the requirements of the SIP. USEPA also found that the CAAPP permit failed to include specific "applicable requirements" derived from conditions contained within certain preconstruction permits. Additionally, USEPA found that the CAAPP permit failed to adequately identify certain plans and/or plan requirements that were incorporated by reference into the permit and, further, that the CAAPP permit failed to contain enforceable steps and milestones for the terms of an existing consent order. USEPA also concluded that it could not determine whether the CAAPP permit established sufficient

[4] ABC originally asserted that the Illinois EPA had provided automatic exemptions from emission limits during malfunction/breakdown or startup events without first performing an evaluation of their impacts. In so doing, ABC claimed that nine permit terms illegally allowed for broad exemptions from permit requirements during these periods based on state law, and that Illinois EPA's response to comments fell short of adequately explaining why these exemptions were legally or factually justified.

[5] For example, USEPA concluded that a compliance schedule was not necessary to address pending Notices of Violations involving US Steel. USEPA also generally denied ABC's argument that the issued CAAPP permit improperly exempted certain emissions units from NESHAP standards during periods of startup, shutdown and malfunctions ("SSM").

Periodic Monitoring requirements for numerous emission units. Citing a lack of sufficient explanation in the Illinois EPA's response to comments, the Order directed the Illinois EPA to address this issue with greater specificity and analysis.

Illinois EPA Action in Response to the Initial USEPA Order

The Illinois EPA followed the USEPA's Order on the initial CAAPP Permit by substantially revising certain portions of the initial CAAPP identified by the Order or providing a more detailed justification of the conditions set forth in the permit. In response to the Order, the Illinois EPA provided an explanation in the Statement of Basis of Illinois's SIP concerning startup, malfunction and breakdown and how the permit ensured compliance with these requirements. Illinois EPA explained that the sole determinations made in advance are whether the source requested permission to continue to operate during a startup, malfunction or breakdown event in its CAAPP application, and whether the CAAPP application satisfied the application content of the SIP and provided proof sufficient to enable Illinois EPA to afford the source a potential prima facie defense to an enforcement action.

The Illinois EPA also explained in significantly greater detail in the Statement of Basis for that action both the practical and technological reasons justifying the inclusion of certain Periodic Monitoring requirements established in the CAAPP permit, including the approach to and use of selected emission factors for certain emission limits that originated in construction permits. At the same time, various enhancements or supplements were made to monitoring, testing recordkeeping and reporting requirements so that Periodic Monitoring under US Steel's CAAPP permit would be sufficient to assure compliance with applicable requirements.[6]

The Illinois EPA issued a revised CAAPP permit on May 2, 2011. Given US Steel did not petition the Illinois Pollution Control Board (Board) for review of this permit, this permit became final and effective at that time.

Petition to USEPA to Object to the Revised CAAPP Permit

ABC filed a second Petition to Object ("Second Petition") with the USEPA on August 16, 2011 requesting that USEPA object to the revised CAAPP permit issued on May 2, 2011. The Second Petition asserted that: a) the permit's use of emission factors failed to provide Periodic Monitoring designed to ensure compliance with permit limits and lacks practical enforceability; b) several permit limits lacked adequate Periodic Monitoring requirements to ensure compliance with applicable limits; c) the permit failed to appropriately address excess emissions associated with startup, breakdown, and malfunctions[7];

[6] The Illinois EPA also made a number of other revisions to the CAAPP permit in response to USEPA's order. Consistent with the Order's discussion concerning the meaning of the term "applicable requirements", the revised CAAPP permit included updated terms from a previous consent order. In addition, the revised CAAPP permit reflected requirements from construction permits issued by the Illinois EPA. Other changes were made to follow current USEPA guidance regarding the "incorporation by reference" of certain plans or programs.

[7] For the first time, ABC asserts that US Steel's application material requesting authorization to make a claim of malfunction/breakdown or startup was inconsistent with the Illinois SIP, 35 IAC 201.261, or that Illinois EPA's advance authorization to US Steel to make such claims was somehow inconsistent with the Illinois SIP, 35 IAC 201.262.

and d) the permit failed to include applicable requirements from a related construction permit for Gateway Energy & Coke Company.

USEPA Petition Response to Second Petition on the CAAPP Permit

On December 2, 2012, the USEPA responded to the Second Petition, denying in part and granting in part. To summarize USEPA's response to the Petition ("Second Order"), USEPA refused to object to certain aspects of the issued CAAPP permit that were challenged. For example, USEPA concluded that the Illinois EPA's use of the term "emission factors" in the May 2011 CAAPP permit would not compromise the enforceability of these terms in the permit. USEPA also denied the argument that the May 2011 CAAPP permit generally lacked adequate periodic monitoring for the coke oven gas flare, the uncaptured blast furnace casthouse, the blast furnace gas flares, and the slab reheat furnaces. Finally, USEPA denied the claim that the May 2011 CAAPP permit must include requirements from the construction permit issued for the new coke production facility developed and operated by Gateway Energy & Coke Company.

The Order also granted the Second Petition with respect to certain aspects of the May 2011 CAAPP permit. For example, USEPA found that the permit lacked Periodic Monitoring to ensure compliance with emission limits and many corresponding maximum emissions limits from Construction Permit No. 95010001. USEPA also concluded that US Steel's application for authorization to continue operations during startup, breakdown, and malfunction events did not include all of the information required by 35 IAC 201.261 and 201.262, and thus Illinois' SIP. USEPA went onto find that authorization to make claims related to startup and malfunction/breakdown for certain emission units could not be granted by the Illinois EPA in the absence of all information required by the Illinois SIP.[8]

Current Permitting Action

The Illinois EPA must address the objections from the Second Petition that were granted by USEPA in its Second Order. Detailed discussions for each point are provided later in this Statement of Basis. The Illinois EPA's overall approach to Second Order is summarized below.

Consistent with the discussion in the Second Order concerning the need to include Periodic Monitoring to ensure compliance with certain emission limits, the Illinois EPA plans to make available in the current CAAPP permit the initial emission factors that US Steel intends to use to demonstrate compliance with these emission limits. The Illinois EPA provides a clear explanation in the planned revision to the CAAPP permit of how the emission factors will be used to determine compliance with the relevant limits in the permit.

As a general principle of administrative law, only those issues that have been "preserved" may be appropriately raised before an administrative tribunal. *Accord., In re Avon Custom Mixing Services, Inc.*, 10 E.A.D. 700, 704-705 (EAB 2002) (A party seeking review must generally demonstrate that the issues were raised during the public comment period). Following this general principle affords the permitting authority notice and an opportunity to cure the alleged deficiencies in the permit prior to issuance. *In re Kendall New Century Development,* 11 E.A.D. 40, 46 (EAD 2003).

[8] This is the first time that USEPA finds that US Steel did not meet the content requirements, as set forth in the Illinois SIP, in its request for authority to continue operations during startup or malfunction/breakdown events and in so doing, any approval of these requests by the Illinois EPA in the CAAPP permit was "flawed."

Additionally, the revised permit that the Illinois EPA now plans to issue would include conditions detailing how the emission factors will be reviewed and, if necessary, updated in the future to assure that the emissions factors used to determine compliance are appropriate.

The Illinois EPA has also given considerable attention to the subject of malfunction/breakdown and startup, as addressed by USEPA in the Second Order. To assist the Illinois EPA, US Steel supplied additional information to support its requests for permission to continue to operate particular emission units during malfunction/breakdown events in violation of certain state emission standards. US Steel also supplied additional information to support its requests related to startup of particular units. US Steel has provided all the information that 35 IAC 201.261 requires from a source that is requesting permission to continue operation with excess emission during a malfunction/ breakdown or startup event. The Illinois EPA has explained in this Statement of Basis why the CAAPP permit should continue to provide the requested authorizations consistent with Illinois' SIP, 35 IAC 201.262.

The Illinois EPA plans to proceed with revisions to US Steel's current CAAPP permit following the applicable procedures set forth in the CAAPP.[9] In general, this permit revision is an outgrowth of USEPA's public petition process. As set forth in the CAAPP, if a petition objecting to a CAAPP permit is granted by USEPA after the permit has already been issued, the Illinois EPA is authorized to revise and resubmit the CAAPP permit to USEPA. *See generally,* Section 39.5(9)(e)-(g) of the Act and 35 IAC 252.301.[10] This authority, which effectively allows for formal reconsideration of the issued permit, presents an opportunity for the Illinois EPA to reconcile its permitting decision with USEPA's Order. The CAAPP does not specify a time-frame for making such revisions; however, federal requirements provide that a permitting authority must act within 90 days to address USEPA's concerns relating to a petition.[11]

As required by the CAAPP, the planned revision of the CAAPP permit is being accompanied by the opportunity for further public comment by US Steel and any person who previously participated in the public comment processes. Other people that are interested may also submit comments. US Steel's initial CAAPP permit underwent the full range of procedures associated with an initial CAAPP permit proceeding, including a public comment period and a public hearing. The procedures for this permit revision under the CAAPP now consist simply of a 10-day comment period, as provided by Section 39.5(9)(g) of the Act.[12] Notice of

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[9] The CAAPP, codified in state law at Section 39.5 of the Act, was enacted by the Illinois General Assembly in 1992 to fulfill the requirements of Title V of the Clean Air Act Amendments of 1990 and USEPA's implementing regulations under 40 CFR Part 70. USEPA granted final interim approval of the CAAPP on March 7, 1995. USEPA later granted full approval of the program, effective November 30, 2001, confirming that the minimum program elements required by Title V and Part 70 had been met.

[10] The process in the CAAPP and implementing rules essentially mirrors the procedures governing public petitions in 40 CFR Part 70. *See generally,* 40 CFR 70.8(c)-(d).

[11] Under Title V of the Clean Air Act (CAA) and 40 CFR Part 70, the failure of a permitting authority to submit a revised permit within 90 days of receipt of USEPA's objection results in USEPA assuming responsibility for mending any deficiencies with the Title V permit. *See,* Section 505(c) of the CAA; *see generally,* 40 CFR 70.8(d) and 70.7(g)(4) and (5). Courts have yet to rule as to whether the 90-day requirement is a jurisdictional requirement, though litigation is reportedly moving forward in one or more federal district courts.

[12] The same procedures were followed for the previous revision of the CAAPP permit in response to the First Order, with a 10-day public comment period, consistent with Section 39.5(9)(g) of the Act.

the comment period has been provided to US Steel and all persons who participated in the earlier public comment periods on the CAAPP permit for this source.

F. Environmental Justice

US Steel is located in a potential environmental justice ("EJ") community.[13] Given the facility's location in such an area, as well as significant public interest in the permitting of this facility, the Illinois EPA has enhanced the level of public outreach that has accompanied processing of CAAPP permits for this facility. Prior to the initial issuance of the CAAPP permit, the Illinois EPA extended the comment period twice, so that the public had over three months to submit their written comments. Prior to issuance of a revised permit in May 2011, the Illinois EPA provided general notice of the 10-day comment period by means of a newspaper notice, to facilitate comments by individuals who had not participated in the original comment period. This step is also being followed for the current 10-day comment period. In conjunction with the issuance of the original permit and the revised permit in May 2011, detailed Responsiveness Summaries were prepared in which the Illinois EPA, to the best of its ability, responded to questions and comments raised in the comment periods. This will also occur for the revision of the CAAPP permit that is now planned.[14]

While the Illinois EPA is sensitive to the location of this facility in a potential EJ community, Title V of the CAA does not provide for substantive emission control requirements beyond those arising under the applicable regulations that currently apply to a source. Thus, when issuing a CAAPP permit for this facility, the Illinois EPA does not have the authority to impose additional emission control requirements to reduce emissions beyond the levels provided for by applicable state and federal regulations. At the same time, CAAPP permits do not allow for additional emissions. CAAPP permits serve to provide benefits for air quality, the public and the environment generally as they better address currently applicable requirements. CAAPP permits more comprehensively identify those requirements and also address the means by which sources will show that they comply with those requirements. They also require more rigorous reporting by a facility of its compliance status than was previously required under state operating permits.

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[13] The Illinois EPA's EJ-Public Participation Policy states that "a 'potential' EJ community is a community with low-income and/or minority population greater than twice the statewide average. In addition, a community may be considered a potential EJ community if the low-income and/or minority population is less than twice but still greater than the state-wide average and it has identified itself as an EJ community." (www.epa.state.il.us/environmental-justice/public participation-policy.pdf)

[14] For these planned revisions to the CAAPP permit, in this Statement of Basis, the Illinois EPA is also making clear its planned response to USEPA's Second Order. With respect to certain emission limits addressed by USEPA in this order, the Illinois EPA has identified the emission factors that US Steel is currently using to demonstrate compliance with the subject limits and provided information on the basis for these factors. The process that US Steel is using to verify compliance with the subject emission limits is articulated. Further detail is also provided for how the emission factors will be reviewed and, as necessary, updated to assure that appropriate factors are used in the determination of compliance. The Illinois EPA has also further explained the basis for granting authorization to US Steel to make claims relative to startup and malfunction/breakdown events for certain emission units.

II. Compliance and Enforcement History

A. Federal Enforcement Cases

On September 30, 2009, the USEPA issued a Notice of Violation and Finding of Violation ("NOV/FOV") for violations of the CAA, the NESHAP for Iron and Steel Manufacturing Facilities, 40 CFR Part 63 Subpart FFFFF ("Iron & Steel NESHAP"), the NESHAP for Coke Oven Batteries, 40 CFR Part 63 Subpart L ("Coke Oven NESHAP"), and Illinois' SIP. USEPA alleged that US Steel had not properly controlled emissions from its blast furnace casthouse, basic oxygen furnace shop and Coke Oven Battery A. In addition, USEPA alleged that the source failed to apply for and obtain the proper air pollution control permit for Blast Furnace B. Lastly, USEPA alleged that the source failed to complete all required inspections and comply with various operating and maintenance plans.

On April 23, 2010, US Steel responded to the NOV/FOV. On August 1, 2012, the Department of Justice ("DOJ") filed a complaint against US Steel in the United States District Court for the Northern District of Indiana (Case Number 2:12-CV-3C4), which included the alleged violations cited in the NOV/FOV and, as discussed below, included violations cited in the Illinois EPA's 2009 and 2010 violation notices.

B. State Enforcement Cases

On January 29, 2009, the Illinois EPA issued a violation notice (VN) for alleged violations of the Act, state and federal regulations, and CAAPP permit conditions. Specifically, the Illinois EPA alleged fugitive dust violations, inspection and maintenance deficiencies, excessive use of the emergency reladling station and charging of Batteries A and B off the collecting mains. On March 12, 2009, the Illinois EPA issued another VN for alleged violations of the Act, state and federal regulations, and CAAPP permit conditions. In this VN, the Illinois EPA addressed excess emissions from coke oven doors on Battery B and visible emissions from the #2 Tar Dehydrator Tank and deficiencies in the records for the leak detection and repair program for the coke by-product recovery plant. On August 30, 2010, the Illinois EPA referred the source to the Illinois Attorney General's Office ("IAGO") for the above violations.

On November 5, 2010, the Illinois EPA issued a VN for alleged violations of the Act, state and federal regulations, and CAAPP permit conditions. This VN addressed excess PM emissions from the #3 mobile control system for pushing emission and excess emissions from the coke oven doors on Battery A and Battery B. The violations alleged in this VN were referred to the IAGO on September 22, 2011 and included in the complaint referenced above.

On November 30, 2012, the Illinois EPA issued a VN for alleged violations of the Act, state and federal rules, and CAAPP permit conditions. This VN alleged excess VOM and NOx emissions from the Electrostatic Precipitator (ESP) on the BOF and opacity exceedances by the BOF. In addition, the VN alleged operation of the BOF without operational steam rings. This VN was the result, in part, of emissions testing performed by US Steel in April 2012 as required by Conditions 7.5.7(a) and (b) of the current CAAPP permit. Follow-up testing was performed by US Steel in July 2012. On July 2, 2012, the Illinois EPA received a deviation report from US Steel, as required by Condition 7.5.10(d) of the CAAPP permit, reporting that the NOx and VOM emissions from the ESP at the BOF were in excess of the applicable annual limits of in Condition 7.5.6(c) of the CAAPP permit, 69.3 and 10.74 tons/yr, respectively.

On January 8, 2013, US Steel responded to the November 30, 2012 VN requesting an initial meeting with the Illinois EPA under Section 31(a)(4) of the Act. While not yet responding to the particulars of the violations, US Steel advised the Illinois EPA that it would be submitting additional information in rebuttal to the alleged violations, as provided for by Section 31(a)(5) of the Act.

Under the process for enforcement set out by Section 31 of the Act, the initial Section 31(a)(4) meeting between US Steel and the Illinois EPA is scheduled to occur during the 10-day public comment period for the planned revisions to the current CAAPP permit. This will be the first opportunity for US Steel to respond to the alleged violations, in person, to representatives of the Illinois EPA. In this meeting, US Steel may suggest a resolution (and alternative resolutions) to the alleged violations including an appropriate implementation time frame. *See,* Section 31(a)(4) of the Act. After such discussion, US Steel will have yet another opportunity to provide the Illinois EPA with an additional written response that shall include any additional information in rebuttal to the alleged violations and an explanation or justification of each alleged violation; if the source would like to enter into a Compliance Commitment Agreement (CCA), a proposed CCA that includes specified time frames for achieving each commitment; and if the source elects to rely upon its initial written response, the source may state as much. *See,* Section 31(a)(5) of the Act. If the Illinois EPA ultimately determines that these violations cannot be resolved without the involvement of the IAGO, US Steel will be afforded an additional opportunity to meet with appropriate Illinois EPA personnel. *See,* Section 31(b) of the Act. As this matter is still in the initial stages of the Section 31 process, these violations have not been referred to the IAGO.

C. Compliance Schedule

The identification of non-compliance and/or the issuance of a violation notice and reference to information contained therein, alone, is not sufficient to satisfy the demonstration required under Section 505(b)(2) of the CAA for the inclusion of an approvable compliance schedule in a Title V permit. This alleged non-compliance is simply an early stage in the larger enforcement process of determining whether a violation, in fact, has occurred. This information noted above in the current enforcement cases is, therefore, generally insufficient to warrant a compliance schedule without further investigation by appropriate enforcement staff at the state or federal level. Such an investigation typically involves additional information gathering and exchanges that are part of the enforcement process and not a part of the permitting process. This stage in the enforcement process is a critical step of fact finding under civil litigation procedures. It affords the source its required due process. Neither the issuance of a notice of violation or a violation notice or the identification of alleged non-compliance has the force or effect of law and therefore is not subject to judicial review at this early stage.

If the Illinois EPA were to consider including this information in the planned revised CAAPP permit, other relevant considerations would need to be taken into account such as: 1) the quality and source of the information, 2) whether the facts are disputable, 3) any defenses available to the source and 4) the nature of any disputed legal arguments. These factors may not be readily discernable at this early stage and would need to be considered within the constraints of the CAAPP permitting process. Section 39.5 of the Act and 40 CFR Part 70 do not contemplate this type of judicial review in the context of CAAPP or Title V permitting and do not provide the requisite authority to proceed with such

investigation. As such, Illinois EPA must consider the potential impact that enforcement and permitting have on one another. Where there is a pending or active enforcement case at the same time as a permitting action, the source and the State of Illinois or United States could easily find themselves litigating the same matters in different venues with the risk of different and conflicting results.

Therefore, while nothing in the Act would typically prohibit the Illinois EPA from including a compliance schedule in an initial permit or a renewal to a permit for the issues generally addressed in the current enforcement cases, as discussed above, an initial question that presents itself is whether the inclusion of a compliance schedule is mandatory, particularly when such information is available before the matter has been adjudicated and required actions to achieve compliance have yet to be resolved between the source and the enforcement authority. USEPA has stated, in a number of petition responses regarding this topic of discretionary versus mandatory compliance schedules, it is entirely appropriate for the permitting authority to allow an enforcement case to take its course and to wait to see whether an order results. At that time, the Title V permit may be reopened to include a compliance schedule.

For the VN issued by the Illinois EPA on November 30, 2012, there is an additional subject that must be considered for the alleged violations of the NOx and VOM limits for the BOF ESP. On January 31, 2013, the Illinois EPA received a proposed compliance schedule from US Steel for these violations. However, the Illinois EPA is not required to include this compliance schedule proposed by US Steel in the planned revised permit because it was not considered by USEPA in its action on a petition to object. The scope of the present permit proceeding is narrow. As set forth in the CAAPP, if a petition objecting to a CAAPP permit is granted by USEPA after the permit has already been issued, the Illinois EPA is authorized to revise the CAAPP permit in response to USEPA's order. *See generally,* Section 39.5(9)(e)-(g) of the Act. These provisions do not require a source to submit an appropriate, complete application as would be required under Section 39.5(5)(d) for the Illinois EPA to issue a new or revised CAAPP permit in circumstances where the Illinois EPA is not responding to a USEPA order. Indeed, Section 39.5(9)(g) specifically provides that a source will not be in violation of the requirement to have submitted a timely and complete application when the Illinois EPA is acting in response to a USEPA's objection.[15]

In addition, the proposed compliance schedule submitted by US Steel addressed violations that are at an early stage in the larger enforcement process of determining whether a violation has, in fact, occurred. As discussed above, additional exchanges that are part of Illinois' Section 31 process have yet to occur. US Steel has not yet had an opportunity to submit additional information in rebuttal to the alleged violations consistent with Section 31. Only after gathering such additional information will the Illinois EPA be able to weigh the quality of the information, disputed facts, any defenses available to the source and the nature of any disputed legal arguments.

Based on all the foregoing, it is the Illinois EPA's preliminary decision to wait until the enforcement cases identified above have been resolved and/or adjudicated before including any compliance schedule in a CAAPP permit for the

[15] This is likely due to the time constraints facing a permitting authority when seeking to revise a permit to comply with a USEPA order. While the CAAPP does not set a time-frame for making such revisions, federal requirements provide that a permitting authority must act within 90 days to address a USEPA order that grants a petition for review.

facility. In the meantime, Condition 9.1.4 would remain in the planned revised CAAPP permit, which provides that any permit shield or the revised CAAPP permit, itself, may not be used as a defense during any enforcement proceedings and that the requirements of any compliance schedule will be complied with at the appropriate time.

With respect to US Steel's recently submitted compliance schedule, the Illinois EPA intends to initiate the processing of US Steel's proposed compliance schedule as a significant modification to the CAAPP permit, in accordance with Section 39.5(14)(c)of the Act. That permitting action would potentially involve the incorporation of a yet-to-be finalized compliance schedule that would address violations of certain emission limits for the BOF. As provided by the Act, the CAAPP's procedures for significant modification must by used for "applications requesting significant modifications and for those applications that do not qualify as either minor modifications or as administrative permit amendments." A modification of a permit to include a compliance schedule would commonly be considered "significant." Section 39.5(14)(c)(i) and (ii) of the Act. As a significant modification, the modification of the CAAPP permit would be subject to requirements for public participation followed by review by USEPA in accordance with Sections 39.5(8)(a) and (9) of the Act rather than a 10-day comment period as provided for by Section 39.5(9)(g) of the Act.

III. Periodic Monitoring to Ensure Compliance with Certain Emission Limits

USEPA Order

In Section I.B-D of its Second Order, the USEPA found that the Periodic Monitoring Requirements in the current CAAPP permit for certain emission limits in the permit are inadequate. Most critically, the USEPA found that these requirements were deficient because they were not preceded by preparation of a listing of the emission factors that US Steel would initially use to determine compliance with the subject limits, with supporting information available, which would enable the public and USEPA to provide meaningful comments on these emission factors. USEPA also found that the supporting explanation for this Periodic Monitoring provided by the Illinois EPA in the record for the current permit was insufficicent.

As a consequence, USEPA instructed the Illinois EPA to correct these deficiencies in the permit and its development, as follows.

> The IEPA must determine and adequately support a mechanism to determine compliance with the applicable emission limits in Conditions 7.1.6(b)(i) – (iv), 7.4.6(b) – (f), 7.5.6 (c) – (g), and 7.6.6(a) – (e). IEPA must include in the permit itself the monitoring methodology for determining compliance with these limits. If using emission factors, IEPA must propose the actual emission factors in the permit or supporting permit record, and provide supporting documentation for the accuracy and appropriateness of those emission factors, such as historical source test data or other available information. If source test data are not readily available for a specific emission unit, as IEPA asserts, other sources of emission factors (including published literature and material and energy balances) must be reviewed and cited for acceptable emission factors prior to issuing the permit.
>
> For the reasons provided above, I grant this claim and direct IEPA to specify in the permit and make available for public comment the emission factors or equations that USGW initially intends to use to demonstrate compliance with emission factor limits and maximum emission limits contained in the permit conditions identified by the Petitioner, including a clear explanation of how the emission factors will be used to determine compliance. IEPA should also specify in the permit and make available for public comment a provision on how the emission factors or equations will be updated as new emissions information becomes available for the affected operations. Alternatively, IEPA must specify an alternative periodic monitoring methodology in the permit that is adequate to demonstrate compliance with the permit limits cited by the Petitioner. Second Order, p. 12

The Illinois EPA is now proceeding as directed by USEPA in its Order, with the intent of issuing a revised permit that includes additional provisions, as required by the Order, related to the emission factors and the procedures that US Steel would use to demonstrate compliance with the subject emission limits.

Background

CAAPP permits must address emission limits set in preconstruction permits issued under regulations approved by USEPA in accordance with Title I of the

Clean Air Act (CAA) as such limits are considered "applicable requirements."[16] Preconstruction permits, commonly referred to in Illinois as construction permits, derive from the New Source Review ("NSR") permit programs required by Title I of the CAA. These programs include the two major NSR permit programs: 1) the Prevention of Significant Deterioration ("PSD") program,[17] and the nonattainment NSR program.[18] These programs also encompass state construction permit programs for projects that are not major.

The USEPA's Second Order addresses a number of emission limits that were carried over or incorporated into the CAAPP permit from Construction Permit/PSD Approval 95010001. This permit was initially issued in January 1996, to National Steel, the former owner of the Granite City Works. This permit addressed an expansion project that included increases in the production of iron from the two existing blast furnaces at this steel mill and an increase in the production of steel from the two existing BOP furnaces. The permit provided approval to undertake the project pursuant to state laws and rules governing construction and modification of sources of emissions, including the nonattainment NSR program and the PSD program.

To implement the major NSR permit programs, Illinois' construction permits must commonly include limits on the amounts of different pollutants emitted by the new or modified emission units that comprise the proposed projects addressed by the permits, defining their permitted emissions.[19] This is the case for Permit 95010001. As a general matter, the Periodic Monitoring required by the current CAAPP permit for limits on emissions established in Permit 95010001 would be provided by the Monitoring that would be required for the subject emission units related to applicable regulatory standards and other emission control requirements, together with specific recordkeeping related to their actual emissions. Emission factors would be used to determine actual emissions, with records required for the emissions factors[20] that are used to determine

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[16] *See* definition of applicable requirements in Section 39.5(1) of the Act.

[17] The federal PSD program, 40 CFR 52.21, applies in Illinois. The Illinois EPA administers PSD permitting for major projects in Illinois pursuant to a delegation agreement with USEPA.

[18] Illinois has a state nonattainment NSR program, Major Stationary Sources Construction and Modification ("MSSCM"), 35 IAC Part 203, pursuant to state rules, that have been approved by USEPA as part of Illinois' SIP.

[19] In Illinois' NSR permit program for non-major or "minor" projects, the amounts of pollutants that are permitted to be emitted or the "permitted emissions" from projects must be addressed during permitting. This is because the applicability thresholds for the major source NSR programs are based on annual emissions of proposed projects, in tons per year. Accordingly, construction permits for proposed projects commonly include emissions limits that establish or memorialize the permitted emissions of the various new and modified emission units that are involved in projects. These permitted emissions then serve in place of the "theoretical" potential emissions of a project when addressing NSR applicability.

Illinois' major NSR permits also have limits for the permitted emissions of the different units that comprise a project. Rather than addressing applicability of NSR, these limits serve to implement the substantive requirements of NSR, as the amount of emissions for which different emission units are permitted is a critical element of the analyses that must precede the issuance of a permit for a proposed major project.

[20] In this Statement of Basis, the term "emission factor" is generally used with its common meaning. That is, an "emission factor" is a set value for the mass of a pollutant emitted by a particular emission unit relative to the amount of material that is processed or handled by the unit, which value is generally representative of the operation and emissions of the unit.

emissions and for the "throughput" of the units (i.e., the amount of material handled by these units or hours of operation).[21] Recordkeeping would also be required for the determination of the annual emissions, for comparison to the applicable permit limits for annual emissions. The Periodic Monitoring for the operation of the subject emission units as related to other applicable requirements would verify proper operation of the units and serve to confirm that established emission factors for such units are appropriately used to determine the amount of emissions. The presence of limits on the amount of emissions from such units generally does not necessitate additional or more frequent Monitoring for the operation of these units. As emissions of the units would be calculated using emission factors, the other information needed to determine actual emissions is their throughput or amount of material that is handled, with the actual emissions being the product of the applicable emission factor and the throughput or activity of a unit. The Periodic Monitoring specifically for permit limits on the amount of emissions would entail the necessary records for the throughput of the subject units. The Monitoring would also include recordkeeping for the calculated emissions, as needed for direct comparison to the established permit limits.

When emission factors are used to determine emissions, the critical element is the factors that are selected for use. The current CAAPP permit requires the Permittee to keep a file containing the emission factors that it uses to determine actual emissions for purposes of determining compliance with the subject permit limits. These records must also include the basis or supporting documentation for the selected factors. This assures that the selected emission factors are memorialized in writing, along with the factual basis for the emission factors. This makes the relevant supporting information available to the Illinois EPA personnel as well to the source's staff, both present and future, for their review and use. The current permit also accommodates changes to "established" factors by the source if new information may become available.[22] Changes to these "established" emission factors would also be required to be documented, with explanation and supporting data, and linked to a particular date.[23] A change to the established emission factor that the source uses would be mandatory, with adoption of a new established emission

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For purposes of this discussion, an emission factor may also be a set value for the maximum hourly emission rate of a unit. In such case, the annual emissions would be determined from that emission rate and the actual operating hours of the unit.

[21] The emissions of the subject emission units cannot be determined by "material balance." For example, the emissions of sulfur dioxide (SO_2) from the units do not result from use of a fuel, where, absent add-on control equipment or the presence of sorbent material in the flue gas, SO_2 emissions can be calculated from the sulfur content and usage of fuel.

[22] The simplest example of circumstances in which an established emission factor must be reevaluated is the performance of emission testing for the emission unit that is subject to the permit limit. Other circumstances would include emission testing of similar emission units, as might occur either at the facility or at other units operated by US Steel, when testing at those other units was the basis of the current factor. Established emission factors would also have to be reevaluated if USEPA revises its *Compilation of Air Pollutant Emission Factors*, AP-42, and that document was the basis of the current factor.

[23] The date that the emission factor used for a particular unit is changed may be significant. A change in an emission factor can result from a change in an emission unit or associated control equipment or control practices, so that the new emission factor would supersede the former factor on the date when the underlying change to the unit was made. A change in an emission factor can also reflect the availability of new information and better data. In such case, a change to the emission factor may have implications for the emissions of the unit, especially if the former emission factor understated actual emissions of a unit.

factor, if it is determined that the current emission factor would understate actual emissions.[24,25]

This approach to Periodic Monitoring for the subject emission limits is dictated by the nature of the affected emission units and the available methodology to determine the actual emissions of these units. It is also consistent with the basis by which these limits were established in the underlying permit, as they were developed using emission factors. It is not feasible or practical to conduct direct monitoring of emissions to determine compliance with the subject permit limits nor would it be reasonable to do so even if feasible.[26, 27] This is particularly true as limits are established that address uncaptured emissions or fugitive PM, as defined by 35 IAC 211.2490, such as the limits established for the roof monitor of the BOF shop. Stacks are not present as are essential for instrumental emissions monitoring. Fugitive PM emissions are routinely determined using established emission factors. Proper operation of these units and their associated control devices can be readily verified by much simpler methods. In addition, the permit limits for emissions of PM and other pollutants were generally developed from data that was considered to represent the emission rate or emission factor that would be present when a unit and its associated control measures would be operating properly.

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[24] A particular emission factor would understate actual emissions if the actual emissions would in reality be greater than would be calculated using such factor. For example, consider a unit that processes 5,000 tons of material annually. The actual or "true" emission rate of the unit, as measured by properly conducted testing, which testing continues to be representative of the operation of the unit, is 0.25 pounds/ton. If a higher emission factor, e.g., 0.40 pounds/ton, were used to calculate actual emissions for the purpose of determining whether this unit complies with a subject limit, the use of such factor would be acceptable. This is because the result would not understate actual emissions. Using a factor 0.40 pounds/ton, the calculated annual emissions would be 1.0 ton (5,000 tons x 0.40 lb/tons ÷ 2,000 lbs/ton = 1.0 ton). This is greater than the "true" emissions that would be calculated with the emission rate measured by testing, 0.625 tons (5,000 tons x 0.25 lb/tons ÷ 2,000 lbs/ton = 0.625 tons). However, the use of an emission factor that is lower than the measured rate, e.g., 0.20 pounds/ton, would understate actual emissions of this unit. The emissions calculated using a factor of 0.20 pounds/ton would be only 0.50 tons. Since this factor would understate the actual emissions of the unit, the use of such a factor would not be appropriate.

[25] The relevant criterion for a mandatory change to an established emission factor is if the factor understates actual emissions. The permit would not preclude use of emission factors that overstate actual emission factors. In particular, the source need not adjust the established emission factor after every emission test if the established emission factor has conservatively been set at a level above all the test results, e.g., at the level of the applicable emission standard.

[26] Monitoring for the mass of emissions (e.g., emissions in pounds per hour), as needed to determine compliance with emission limits set by construction permits, is more complicated than emissions monitoring. It entails not only measuring the concentration of a pollutant or loading in the exhaust but also monitoring for the flow rate of the units, as needed to determine the mass of emissions of a pollutant.

[27] As stacks are present on units that are subject to limits, technologies and procedures have not been developed for the use of continuous PM emissions monitoring systems on those units. As a technical matter, an essential prerequisite for any such PM monitoring, which is not yet satisfied for continuous PM monitoring, would be a demonstration that available monitoring technologies can be operated and maintained to provide reliable information on PM emissions when applied to the exhaust of the unit. Moreover, even if continuous PM monitoring were feasible, the effort entailed in applying current continuous PM monitoring methods, which have been developed for use on large coal-fuel fired boilers, to the subject emission units would be excessive.

As such, it is appropriate for the Periodic Monitoring for these permit limits on emissions to focus and rely upon the Monitoring to verify proper operation of units and their control equipment. This is provided by the Periodic Monitoring that would be provided for the regulatory emission standards and other control requirements that apply to the units. This Monitoring would require appropriate combinations of inspections, observations, emission testing and recordkeeping to verify the proper operation of different units as related to control of their emissions. As emission testing would be required as part of that Monitoring, it would also provide confirmation that the emission factors being used by the source to address emissions of a unit for purposes of emission limits are suitable and do not understate the actual emissions of the unit. This approach to Periodic Monitoring for emission units subject to permit limits on the amount of emissions, relying upon emission factors, production rates, and control efficiencies has previously been upheld by USEPA. *See* Order Responding to Petitioner's Request that the Administrator Object to Issuance of State Operating Permit, In the Matter of East Kentucky Power Cooperative, Inc. (USEPA, Dec. 14, 2009); (where USEPA reasonably relied on emission factors along with recordkeeping to demonstrate compliance with emission limitations).[28]

It should also be clearly understood that certain subject limits pose particular concerns for Periodic Monitoring that that are not present when requirements are developed by rulemaking. This is because of the nature of NSR, which necessitates that construction permits set certain emission limits that are very different from emission standards that are established by rulemaking. Rulemakings are generally focused on regulating or controlling the emissions of particular pollutants from a particular category or categories of emission units. During rulemaking, the emission units that will actually be subject to regulation may be considered and the scope of regulation may be adjusted. The emission standards that are finally adopted will consider the nature of the emissions from the units, how they might appropriately be controlled and in what terms emission standards should be set.[29] By contrast, the scope of construction permits is set by the emission units that will comprise the particular projects and the provisions of the NSR programs, which act to dictate that quantitative emission limits must be set for those units in the construction permits. Accordingly, because of the nature of construction permitting, certain terms and conditions in these permits may pose issues for Periodic Monitoring that are not present for applicable requirements that were developed by rulemaking. Construction permits must set limits for certain emission units for which testing of emissions is not feasible or impractical. Most significantly, limits must be set for certain emission units that lack

[28] It should be recognized that this approach to the subject permit limits does not decouple the ongoing Monitoring for such limits from the actual operation of such units. This is because the appropriate emission factor used to determine actual emissions can differ based on how a unit is operated. For example, if the normal emission factor for a unit is predicated on control of PM emissions and the unit operates during a period when the capture system is damaged, it is appropriate for the emissions during such period to be calculated using a higher factor that accounts for the actual condition of the control system during such period.

[29] For example, the NESHAP for Integrated Iron and Steel Manufacturing, 40 CFR 63 Subpart FFFFF, regulates uncaptured emissions of particulate matter from units at BOF shops with standards that address the opacity of those emissions. This NESHAP does not set quantitative standards on the amounts or mass of particulate emissions, in pounds per ton of steel processed or the concentration of particulate in the exhaust, in gr/scf. This NESHAP also does not address emissions of pollutants other than particulate, such as NO_x or SO_2, from units at BOF shops.

stacks, for which it is not possible to obtain measurements of exhaust or air flow rates to measure the mass of emissions. Limits must also be set for uncaptured emissions from certain units, which bypass the stack, for which measurements of emissions are also not possible. Limits may also be set for certain units for which the emissions are negligible, either in absolute terms or relative to the emissions of the principal units and emission streams at a facility.

Planned Action 1

The Illinois EPA must determine and adequately support a mechanism to determine compliance with the subject emission limits in the permit.

The use of "emissions factors" is generally an appropriate mechanism to address compliance with these emission limits. As already explained in the above discussion concerning the establishment of emission limits in construction permits, as a consequence of NSR, construction permits contain emission limits for emission units that do not have stacks. For these emission limits, direct measurement of emissions is not feasible. For emission units that do have stacks, construction permits also contain emission limits for which continuous compliance determination methods for emissions are neither feasible nor practical. In such circumstances, compliance with these emission limits set by the construction permit must be determined from values for actual emissions that are calculated using "appropriate" emission factors. For an emission factor to be appropriate, it must be representative of the actual operation and emissions of the unit whose emissions are being quantified. If source-specific emission testing is conducted for the unit, a "site-specific" emission factor must be used considering the results of that testing, instead of a "generic" emission factor, like the factors in USEPA's *Compilation of Air Pollutant Emission Factors*, AP-42. Since compliance is being determined with an emission limit, the emission factor that is being used must not understate the actual emissions of the unit. As further testing is conducted for a unit or other new information relevant to emissions of the unit becomes available, the emission factor that is being used for the unit must be reviewed to assure that it is appropriate and the factor updated if necessary.

The use of appropriate emission factors to determine compliance with permit limits on emissions in this manner is a well established practice. It does not act to shield an emission unit from other applicable requirements that apply to the unit. In particular, emission units must continue to comply with applicable emission standards and operational requirements, with proper operation and maintenance of units and their controls as necessary to comply with those requirements. The use of emission factors also does not preclude event-specific determinations of emissions for units as necessary because the established emission factors are not appropriate to address particular events. In this regard, the use of emission factors in this manner does not nor could it preclude the use of other credible evidence by the Illinois EPA or others to address US Steel's compliance with the subject limits. As related to use of emission factors to determine compliance with subject limits on emissions, it is significant that the Order has not suggested that use of emission factors in the manner set forth by the current CAAPP permit is not appropriate.[30] Rather, the Order identifies deficiencies in the procedures in the current permit that accompany the use of emission factors, as relevant to assuring that US Steel is

[30] It is also noteworthy that USEPA has not identified an alternative approach to these emission limits that would not rely on use of emission factors.

using appropriate emission factors and the roles of the Illinois EPA, USEPA and the public in these procedures.

Planned Action 2

The Illinois EPA must include in the permit itself the monitoring methodology for determining compliance with the subject limits. If emission factors, the Illinois EPA must propose the actual emission factors in the permit or supporting permit record and provide supporting documentation for the accuracy and appropriateness of those emission factors, such as historical source test data or other available information. If test data is not readily available for a specific emission unit, other sources of emission factors, including published literature, must be reviewed by the Illinois EPA and cited for acceptable emission factors prior to issuing the permit.

The revised CAAPP permit that the Illinois EPA now plans to issue would include the monitoring methodology for determining compliance with these emission limits, with additional enhancements to the methodology as directed by USEPA. (See new Condition 5.13 in the draft of the revised permit.) The record for the planned revision of the permit includes the documentation that currently supports the emission factors that US Steel is presently using to determine compliance with the subject limits. Emission testing that has been conducted for the affected units provides the support for the accuracy and appropriateness of many of the emission factors. For these limits, the relevant emission tests are identified in the record, along with the actual rate of emissions measured by the test. This testing generally shows that the actual emissions are well below the relevant emission factor.[31] The Illinois EPA has also reviewed available supporting data for emission factors for the specific emission units for which emission testing is not feasible or practical. The information supporting each emission factor is identified in the attachment to this Statement of Basis. Additional supporting information is included in the permit record for revision of the CAAPP permit that is now planned. For emission units for which emission testing is conducted, the relevant emission tests that have occurred are identified, along with the measured emission rates. For units for which testing is not conducted, the basis of the emission factor is provided, including a citation to relevant provisions of published documents.

Planned Action 3

The Illinois EPA must make available for public comment the emission factors that US Steel initially intends to use to demonstrate compliance with the subject emission limits.

The revised CAAPP permit that the Illinois EPA now plans to issue would include a listing of the emission factors that US Steel is currently using to determine compliance with the subject limits. (See new Attachment 3 in the draft of the revised CAAPP permit.

[31] As previously discussed, emission testing conducted during 2012 pursuant to the current CAAPP permit showed actual rates of NOx and VOM emission from the ESP for the BOP furnaces that are greater than the rate of emissions in the permit and the emission factor that US Steel was using to determine compliance with the relevant limits for these pollutants. As a consequence, US Steel has submitted a proposed compliance schedule for these two limits, which the Illinois EPA will be processing as an application for a significant modification to the CAAPP permit for the Granite City Works, separate from the planned revision to the current CAAPP permit pursuant to USEPA's Second Order.

Planned Action 4

The Illinois EPA must specify in the permit and make available for public comment a clear explanation of how the emission factors will be used to determine compliance.

The revised CAAPP permit that the Illinois EPA now plans to issue would include the required explanations in planned Conditions 5.13, which would contain new procedures related to US Steel's use of emission factors to determine compliance with the subject emission limits. As the standard for an acceptable emission factor is that it not understate actual emissions, this would now be explicitly stated in planned Condition 5.13(a). As already explained, it is a fundamental aspect of these emission factors that they not understate actual emissions. This is because they are being used for the purpose of determining compliance with emission limits. The relevant recordkeeping provisions in the current CAAPP permit related to these emission factors already require that they not understate actual emissions.[32] However, it is appropriate for this requirement be reiterated in Condition 5.13(a) since Condition 5.13 would be added to the CAAPP permit generally dealing with US Steel's use of emission factors for the subject limits.[33]

Planned Condition 5.13(b) would explain how emission factors are to be used by US Steel to determine compliance with the applicable limits. Most importantly, the actual annual emissions of the subject emission units would be calculated using the relevant emission factors for comparison to the subject annual emission limits to determine compliance. However, if more refined calculations are needed to appropriately quantify the actual annual emissions of a unit, the calculation of the annual emissions of the unit would not be constrained to the use of a single emission factor. If US Steel has developed different factors for different modes of operation of an emission unit, the annual emissions of the unit would be determined as the sum of the emissions for each mode of operation. Also, if there are additional emissions that are not accounted for by the established emission factor(s), these "additional emission" must also be included in the calculation of actual emissions.[34] Thus, the established emission factors are merely a technique that US Steel must use to facilitate its calculation of annual emissions for purposes of determining compliance with the subject limits on annual emissions.

Planned Action 5

The Illinois EPA must specify in the permit and make available for public comment provisions setting forth how the emission factors will be updated as new information becomes available for the subject units.[35]

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[32] *See* Conditions 7.1.9(h)(i), 7.4.9(i)(i), 7.5.9(f)(i), and 7.6.9(c)(i).

[33] This provision will also further confirm that when US Steel is demonstrating compliance with one of the subject limits, it cannot simply "…select whichever emission factor appears to demonstrate compliance," as erroneously suggested by USEPA in the Second Order.

[34] The occurrence of events that result in additional emissions, which are not adequately addressed by the relevant emission factors that have been established by USEPA, is already contemplated by the current CAAPP permit. The current CAAPP permit requires records for periods of events that would potentially be accompanied by such additional emissions, which records must also include estimates of the amount of such additional emissions during such periods. *See* Conditions 7.1.9(h)(ii), 7.4.9(i)(ii), 7.5.9(f)(ii) and (g), and 7.6.9(c)(ii).

[35] While the Second Order would also accommodate use of "alternative periodic monitoring

The revised CAAPP permit that the Illinois EPA now plans to issue would include additional provisions required by the USEPA's Second Order. (See Conditions 5.13(c), (d) and (e) in the draft of the revised permit.)

Planned Condition 5.13(c) would address the actual review and update of emission factors by US Steel, specifically requiring US Steel to review the emission factors that it uses to determine compliance with the subject emission limits. For emission units with such limits for which emission testing is required to be conducted by the current permit, whenever such testing is conducted, US Steel would be required to review and, if necessary, update the relevant emission factors based on the results of such testing. Source-specific testing provides an authoritative statement of the actual emission rate of a particular unit. Accordingly, for the units for which testing is required to conducted, it is appropriate to only require US Steel to review and possibly update emission factors in conjunction with such testing. For those emission units with limits for which emission testing is not required to be conducted by this permit, US Steel would be required to review and, if necessary, update the relevant emission factors on at least an annual basis. This review would be required to consider new information that is relevant to the actual emissions of such units that has become available since the previous review, including revisions of USEPA's *Compilation of Air Pollutant Emission Factors*, AP-42, other information published by USEPA, information related to other emission units operated by US Steel, information presented in specific papers and reports concerning the steel industry, and other salient information. Since emission testing is not conducted for these units, which would provide authoritative confirmation of their actual emission rates, US Steel should be required to review the appropriateness of the factors for these units on a regular schedule, to consider new information that would necessitate any updates to such factors. It would be reasonable for such review to be conducted annually consistent with the timing of the annual compliance certification that US Steel must prepare and submit for the source under the CAAPP.

Reporting requirements related to US Steel's review and update of its emission factors would be addressed in planned Condition 5.13(d). Condition 5.13(d)(i) would refer back to Condition 5.9.6(c)(ii) of the current permit. Condition 5.9.6(c)(ii) already requires US Steel to submit copies of its revised records for emission factors to the Illinois EPA when these records are revised.[36] When the records for emission factors are actually revised by US Steel pursuant to the review that would be required by Condition 5.13(c), Condition 5.9.6(c)(ii) would require that the revised records that result be submitted to the Illinois EPA. As new Condition 5.13 would be added to the CAAPP permit generally dealing with US Steel's use of emission factors to determine compliance with the subject limits, it is appropriate that this existing reporting requirement in Condition 5.9.6(c)(ii) also be addressed in new Condition 5.13.

Planned Condition 5.13(d)(ii) would address another aspect of reporting for the reviews of emission factors that would be required by Condition 5.13(c). While

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methodologies" for the subject limits, which would not entail use of emission factors, the Illinois EPA is not proposing to include any such methodologies in the revised permit. As discussed, it is generally appropriate for compliance with the subject limits to be determined with emission factors, in the manner provided by the permit.

[36] Condition 5.9.6(c) was included in the current CAAPP permit in response to certain public comments when the permit was revised in May 2011. (*See* Comment/Response 37 in the *Response to Comments on the Planned Issuance of a Revised Clean Air Act Permit Program (CAAPP) Permit to U.S. Steel Corporation, Granite City Works*, Illinois EPA, May 2. 2011.

planned Condition 5.13(c) would require that US Steel conduct such reviews, these reviews would not necessarily always lead to updates to emission factors, so as to be followed by preparation and submittal of revised records to the Illinois EPA. Accordingly, Condition 5.13(d)(ii) would require US Steel to submit reports to the Illinois EPA related to these reviews. At a basic level, these reports would serve to provide positive confirmation that US Steel had conducted the required review of emission factors. In addition, these reports would also provide key information about the reviews that were conducted for the subject units and limits, including identification of any testing conducted during the previous year, or a description of new information that was considered, and the findings and conclusion of its review of such information.[37] These reports would also provide a summary of any updates to the relevant emission factors made by US Steel. The inclusion of this further information in the reports would be appropriate and reasonable as it will further facilitate, as well as simplify, the supervision of the use of emission factors by US Steel by the Illinois EPA and the potential involvement of the public in this process. This is especially true as the planned revised permit would now require US Steel to conduct an annual review for the emission factors that it is using. In this regard, it would be appropriate for these reports to be submitted annually, for the review conducted during the previous calendar year. The reports should also be submitted by the same date as the annual compliance certification, which also address operation and compliance of a source during the previous calendar year.

Planned Condition 5.13(e) would set forth a formal procedure to address potential circumstances in which US Steel should conduct further review of the particular emission factor(s) that it is using for certain limits. The planned condition would require US Steel to conduct such review within 45 days of written notification from the Illinois EPA or USEPA that such review is needed for particular emission factor(s). The circumstances under which US Steel would potentially need to conduct such additional review, as addressed in this planned condition, include inadequate documentation for the selected emission factor(s), inadequate explanation for updates to emission factor(s) in the reports for such updates, apparent failure to appropriately address a new mode of operation, and the need to consider other new information which appears pertinent to the emissions of a subject unit. This planned condition would respond to the concern, as generally expressed by USEPA in the Second Order, that the current CAAPP permit does not include adequate provisions for supervision by the Illinois EPA of US Steel’s use of emission factors. It is not appropriate for the additional provisions related to emission factors in the CAAPP permit to require prior approval of emission factors by the Illinois EPA, since the permit would not provide US Steel with any permit shield in conjunction with the use of those factors.[38] However, it is appropriate for the revised permit to include procedural requirements that would facilitate supervision by the Illinois EPA, as well as by USEPA, of US Steel’s use of emission factors. At a minimum, this is because the Act would not provide a mechanism to accomplish this other than by means of enforcement. The planned condition would provide a simpler and more direct mechanism to deal with the

[37] If the review for a particular unit would result in an update to the relevant emission factor, the detailed information for such update or revision to the emission factor should be provided in the revised records submitted to the Illinois EPA pursuant to Condition 5.9.6(c).

[38] In addition, USEPA has not suggested in the Order that it would be appropriate to provide any such shield, as would be implicit if the Illinois EPA were to specifically approve the emission factors that US Steel would use to determine compliance with the subject limits.

need for US Steel to conduct further review of certain emission factor(s) that it is using, when requested to do so by the Illinois EPA or USEPA. As such a mechanism would be established, it is appropriate for the planned condition to specify the circumstances in which it might be invoked. The planned condition lists the circumstances in which it is reasonable for US Steel to be required to conduct further review of particular emission factor(s).

IV. Provisions of the CAAPP Permit under State Rules for Startups and Malfunction/Breakdown Events

USEPA Order

In Section III of the Second Order, USEPA discussed ABC's allegations that the revised CAAPP permit issued in May 2011 continues to "pre-approve" US Steel's operation in excess of certain applicable emission standards. In this regard, it also addressed ABC's allegation that the Illinois EPA's interpretation in the Statement of Basis and Responsiveness Summary for the May 2011 permit relative to conditions for startup and malfunction/breakdown is not consistent with the terms of the actual permit and the relevant provisions of Illinois' State Implementation Plan (SIP).

As a preliminary matter, the Second Order found that the Illinois EPA appropriately explained that the sole determination made in advance of a malfunction/breakdown or startup event is whether a source requested permission to continue to operate during a malfunction/breakdown or startup event in its application, and that such authorization "does not shield the Permittee from enforcement for any such violation and only constitutes a prima facie defense to such enforcement action." USEPA agreed that the CAAPP permit conditions were consistently worded with the Illinois EPA's interpretation of its SIP.

Next, USEPA referred to ABC's claims that US Steel's application to continue operation during startup or malfunction/breakdown events did not comply with the Illinois SIP given it did not supply all the information required by the SIP. USEPA granted the petition on this issue finding that the Illinois EPA may not grant permission to US Steel to operate during a startup or malfunction/breakdown event absent an application from US Steel that includes all of the information required by Illinois SIP at 35 IAC 201.261 and 201.262.

In response to the Second Order, US Steel submitted additional information to the Illinois EPA to support its request for malfunction/breakdown and startup authorization consistent with the requirements of 35 IAC 201.261, Contents of Request for Permission to Operate During a Malfunction, Breakdown or Startup. Under 35 IAC 201.262, Standards for Granting Permission to Operate During a Malfunction, Breakdown or Startup, the standard for the Illinois EPA to grant continued operation during a malfunction or breakdown is that such continued operation is necessary to prevent injury to persons or severe damage to equipment. The standard for the Illinois EPA to grant continued operation during a startup event in violation of the standards or limitations is that all reasonable efforts have been made to minimize startup emissions, duration of individual startups and frequency of startups. The Illinois EPA has reviewed the information submitted by US Steel and has determined that applicable requirements would be satisfied. Accordingly, for the emission units that are the subject of US Steel's requests, the planned revised CAAPP permit would continue to authorize US Steel to make claims related to malfunction or breakdown and startup.

General Discussion

The Illinois EPA does not provide for "automatic exemptions" within CAAPP permits for operation with excess emissions during malfunction/breakdown or startups. As related to state emissions standards under the SIP, the conditions of the current CAAPP permit issued to US Steel regarding operation during periods of malfunction/breakdown and startup are consistent with the Illinois SIP and federal guidance on the subject of compliance during such

periods. An explanation of Illinois' SIP and permitting practice in this regard follows.

Section 201.149 of Illinois' SIP prohibits continued operation of an emission unit during malfunction or breakdown of the unit or associated air pollution control equipment, or startup of an emission unit or associated air pollution control equipment, if such operation would cause a violation of applicable emission standards or limitations absent express authorization in a permit. Further provisions pertaining to such authorizations are set forth in 35 IAC Part 201, Subpart I. These provisions make clear that the process in Illinois for addressing malfunction/breakdown and startup is in two steps. The first step, as set forth at 35 IAC 201.261, consists of seeking authorization by means of a permit application to prospectively make a claim related to malfunction/breakdown or startup. For malfunction/breakdown, the application shall include an explanation of why continued operation is necessary; the anticipated nature, source quantity and duration of emissions; and measures that will be taken to minimize the quantity and duration of emissions. For startup, the application shall include a description of the startup procedure, duration and frequencies of startups, type and quantity of emissions during startups, and efforts to minimize emissions, duration and frequency. These regulatory requirements are acknowledged by the CAAPP, pursuant to Section 39.5(5)(s) of the Act. Absent a request for authorization in an application for a CAAPP permit that satisfies both the requirements for application content and the standards for granting, and, after Illinois EPA review, an express grant of such authorization in a CAAPP permit issued by Illinois EPA, a CAAPP source cannot make a claim of malfunction/breakdown or startup under Illinois' rules.

The second phase of Illinois' process for operation with excess emissions during malfunction/breakdown or startup, as set forth at 35 IAC 201.262, addresses the showing that must be made in order to make a viable claim of malfunction/breakdown or startup. For malfunction/breakdown, this showing consists of a demonstration that operation was necessary to prevent injury to persons or severe damage to equipment, or was required to provide essential services. There are two elements to the required showing, "need" and "function". For startup, it shall consist of a demonstration that all reasonable efforts have been made to minimize emissions from the startup event, to minimize the duration of the event, and to minimize the frequency of such events. To a certain extent, this showing may be evaluated on past practice. However, this showing is also prospective, like the showing for malfunction/breakdown, as it relates to future events, which and whose exact circumstances are not known, and which, in fact, may not routinely occur.

Again, the Second Order found that US Steel did not meet the content requirements, as set forth in the Illinois SIP, in its request for authorization to continue operation during startup because startup emissions were not quantified. Although no specific deficiency was identified with respect to the separate requests for malfunction/breakdown, the Second Order appears to view the two sets of requests interchangeably, as the latter set was also deemed incomplete.[39] Rationalizing that any approval of the requests by Illinois EPA was contingent upon the "adequacy" of the content of those requests, USEPA found that the Illinois EPA erred in approving the requests and the resulting conditions of the CAAPP permit were therefore "flawed."

[39] The Second Order observes that the permittee did not include "anticipated quantities of emissions, *among other things.*" (emphasis added). See, Second Order at page 25. However, this vague passage sheds little light on how US Steel allegedly failed to observe the content requirements in its requests related to malfunction/breakdown.

As a threshold matter, certain legal implications relating to the Second Order on this issue are of serious concern. The most problematic issue is the source of the legal authority through which the order suggests that part of the original CAAPP permit, issued on September 3, 2009, as it addressed continued operation during startup and malfunction or breakdown events under the Illinois' SIP is void. On the face of the order, the only purported basis for this action is an alleged SIP-related deficiency reflected in the underlying CAAPP application, which was deemed administratively complete by the Illinois EPA in 1996.

The premise of USEPA's argument suggests that the slightest inadequacy in a request for startup, breakdown or malfunction authorization, deprives the State permitting authority of its jurisdiction to approve the request and invalidates (or voids) any such approval reflected in a Title V permit, even though the SIP-based requirement is largely procedural in nature (i.e., application content) and intended only to facilitate the permit authority's review. This reasoning would appear both erroneous as a matter of law, which must necessarily involve the application of *state* law for any interpretative issue derived from the Illinois SIP, and overreaching with respect to USEPA's role in reviewing Title V permits.

If the content requirements of 35 IAC 201.261 are properly considered according to principles of statutory construction, the force of the language would likely be read as mandatory.[40] However, if these obligatory requirements are not met by a permit applicant, it is equally certain that subsequent agency action relating to the incomplete request would not be invalidated for that reason alone. Because the provision does not identify the consequences of noncompliance with its requirement, the Pollution Control Board and Illinois courts would likely construe this provision as being directory, not mandatory. As such, the Illinois EPA's approval of the request would not be considered jurisdictional (and therefore deemed void) on the basis of incompleteness. This result is consistent with thirty-year old judicial case precedent, which confirmed that the Illinois EPA does not lose jurisdiction under the Act to approve a permit notwithstanding that the application is incomplete under the Pollution Control Board's rules.[41] The framework of analysis set forth in the Second Order overlooks these basic, legal aspects of the issue.

Moreover, the nature of USEPA's review of the CAAPP permit seems strikingly at odds with this agency's oversight role established in the Clean Air Act.[42] For one thing, the scope of the Second Order appears to go well beyond an evaluation of whether a CAAPP permit for a particular source complies with the substantive requirements of the Title V program. In this instance, review has extended into the State's traditional province of SIP decision-making, which, for many sources, could have originated years ago in pre-Title V state construction or operating permits. That USEPA can assume this judicial role for SIP-based determinations under Title V is not readily apparent from the CAA,

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[40] Under the approach typical of most Illinois state courts, the use of the term "shall" would strongly suggest that the content requirements are to be properly construed as a command, imposing an obligation on the part of the applicant to submit the information as part of its relevant request(s).

[41] *White Fence Farm, Inc., v. Land and Lakes Company,* 424 N.E.2d 1370 (4th Dist. Ct. Appeals, 1981).

[42] The Illinois EPA does not question USEPA's Title V authority to generally oversee implementation of Title V permitting, including performing its separate duties of commenting on proposed permits or conducting quasi-judicial reviews of Title V permits challenged in the public petition process.

particularly given the framework of cooperative federalism upon which the latter is built.

Even if authority exists under Title V to warrant the scope of such intervention, the manner of USEPA's review failed to comport with the appropriate standard of review and neglected to justify its principal legal conclusion. To the extent that the Illinois EPA's permit decision-making involved the implementation of SIP-related requirements, or, similarly, reflected its technical expertise in the field of air pollution, USEPA should have reviewed the agency decision under a standard of abuse of discretion, instead of substituting its own judgment for that of the State permit authority. The Second Order also rests upon a legal premise that presumes too much, failing to take into account the differences in the broader factual requirements sought under 35 IAC 201.161 and the narrower legal criteria expressed in the standards for issuance under 35 IAC 201.262. It is not intuitively obvious that some of the more anecdotal information requested in 35 IAC 201.261 must serve as a factual predicate to every determination under 35 IAC 201.262.[43]

Notwithstanding the apparent legal flaws of the Second Order on this issue, US Steel has assisted the Illinois EPA in endeavoring to address the Second Order by providing further information to support its request. Specifically, for those emission units for which US Steel was provided malfunction/breakdown or startup authorization under Illinois' SIP, US Steel supplied additional information to supplement its prior requests related to malfunction/breakdown events and its prior requests related to startup. This provided the specific information required by the relevant state rules. Again for malfunction or breakdown, this information is an explanation of why continued operation is necessary; the anticipated nature, source, quantity and duration of emissions; and measures that will be taken to minimize the quantity and duration of emissions. For startup, it is a description of the startup procedure, the duration and frequency of startups, the type and quantity of emissions during startups, and efforts to minimize emissions, duration and frequency.

That the planned revised CAAPP permit would continue to allow US Steel to make claims related to malfunction/breakdown or startup would not equate to an "automatic exemption." Such authorizations would be fully consistent with long standing practice in Illinois for permitting and enforcement. Due to the size and complexity of certain emission units at the Granite City Works and the inability to simply shutdown equipment or the level of hazards associated with improper startup or shutdown of such units, the source may experience excess emissions due to events that cannot be readily anticipated or reasonably avoided. However, US Steel is also fully aware that it may be held accountable for any excess emissions that occur regardless of any such authorizations.

Neither the provisions in the SIP nor the provisions in the CAAPP permit delineating the elements for a viable claim of malfunction/breakdown or startup translate into any advanced determination on excess emissions. Rather, the regulations and the CAAPP permit provide a framework whereby US Steel may have an opportunity to make a claim related to malfunction/breakdown or startup, with the viability of such claim subject to specific review against the requisite requirements. Indeed, 35 IAC 201.265 directly states that violating

[43] The Second Order does not consider how the quantification of emissions is to be factored into or is relevant to the criteria for malfunction/breakdown authorization (i.e., personnel/equipment safety or essential service) or the minimization efforts that form the basis for the criterion governing startup authorization.

an applicable state standard even if consistent with any expression of authority regarding a malfunction/breakdown or startup set forth in a permit shall only constitute a prima facie defense to an enforcement action for such violation. The malfunction/breakdown or startup authorization that would be provided in the planned revised CAAPP permit would not shield US Steel from state emission standards that may be violated during such events. Rather, the source is subject to the applicable limitations and standards on any malfunction/breakdown or startup authorization as would continue to be included in the revised permit. As a result, any excess emissions during these events would constitute violations potentially subject to enforcement action.

Source-Specific Discussion for Malfunction/Breakdown

For the emission units that are the subject of US Steel's requests, the planned revised CAAPP permit would continue to provide authorization to US Steel to make claims of malfunction or breakdown. The Illinois EPA has reviewed the information submitted by US Steel to support its requests related to malfunction and breakdown considering the requirements of the applicable Illinois rules, which rules are part of Illinois' SIP.

As already discussed, for an emission unit for which such a request is made, 35 IAC 201.261 requires a source to submit information explaining why continued operation of the emission unit would be necessary during malfunction or breakdown events; the anticipated nature, source, quantity and duration of emissions; and measures that will be taken to minimize the quantity and duration of emissions from malfunction and breakdown. For each emission unit at the Granite City Works that is the subject of such a request, [44] US Steel has explained that authorization for a claim of malfunction or breakdown is necessary because continued operation during such events in certain circumstances would be required to prevent injury to personnel at the Granite City Works. US Steel has also explained that continued operation during such events would also be needed to prevent severe damage to equipment. US Steel also submitted information regarding the nature, sources, quantity and duration of emissions during malfunction and breakdown events. For this purpose, US Steel provided information for each subject emission unit relative to the specific state emission standards for which authorization to make a malfunction and breakdown claim has been requested. This information was necessarily general in nature, addressing "typical" and worst-case malfunction or breakdown events. This is because a malfunction or breakdown may involve a minor aspect of an emission unit, e.g., failure of particular component(s) or feature(s) of the unit, or a major aspect of an emission unit, e.g., failure of the fan in the control system of the unit. In addition, malfunction and breakdown events are by definition "unplanned" future events, so that the exact nature of these events, their effects on emissions and their duration cannot be specified. Concerning those measures that will be taken to minimize the quantity and duration of emissions for malfunctions and breakdowns, US Steel described the preventative measures that would be taken to avoid malfunction/breakdown events. These generally included preventative maintenance, keeping an inventory of spare parts, and standing contracts with service providers. Upon occurrence of a malfunction or breakdown event, US Steel committed to the use of overtime, expedited shipments of replacement parts where a spare may not be available, and the use of additional mobile equipment to expedite repairs.

[44] The subject emission units are the coke oven processes, the blast furnace processes, the basic oxygen processes and the ladle metallurgy furnace, and the boilers, for which malfunction and breakdown is addressed, respectively, in Conditions 7.2.5-5, 7.4.5-2(b)(i), 7.5.5-2(b)(i) and 7.10.3(j) of the current permit.

Based on the Illinois EPA's review of the information that has been provided, US Steel has satisfied the informational requirements of 35 IAC 201.261 related to malfunction and breakdown.

US Steel has submitted proof that continued operation of the subject units would be necessary to prevent injury to persons or severe damage to equipment, satisfying 35 IAC 201.262. In general, many of the subject emission units involve materials that are potentially dangerous, i.e., flammable coke oven gas and molten metal, which must be handled properly to prevent injury to operational personnel. These materials would present an immediate danger to these personnel if operation of the subject units did not continue during malfunction/breakdown events. This is because it would entail handling of these materials in a way that is inconsistent with the way that these units are designed to operate and safely handle these materials. The flow of material outside of the design process pathways would pose a direct hazard to personnel. The resulting consequences, e.g., the need to remove solidified metal from furnaces vessels and metal transport equipment and make repairs to such equipment, would pose a secondary threat of injury to personnel. For the boilers, the steam that is produced by the boilers is essential for maintaining the ongoing operation of the blast furnaces and certain other operations at the Granite City Works in a safe and proper manner. The integrated nature of the source means that any significant disruption in the major areas of the source, which would occur if the operations of the subject units did not continue operation during malfunction or breakdown, poses a threat of disruption in operation of other related areas of the source. This would then pose risks to the safety of personnel as normal operation of those other areas at the source is disrupted.

US Steel has also explained that continued operation during malfunction and breakdown events would be needed to prevent severe damage to equipment. Most obviously, continued operation is necessary to prevent molten material from solidifying in furnaces and transport vessels, with resulting damage to equipment. In the case of the processing of molten iron from the blast furnaces, ceasing operation and letting the metal solidify in a torpedo car would irreparably damage the car. Other examples of the severe damage that could occur if operation did not continue include damage to the brickwork in the coke ovens, rupture of gas collecting mains, damage to the blast air system and failure of refractory.

In summary, based on its review, the Illinois EPA has concluded that the regulatory requirements for granting US Steel authorization to make claims of malfunction and breakdown continue to be met. For the emission units that are the subject of US Steel's requests, the planned revised CAAPP permit would continue to provide authorization to US Steel to make claims of malfunction or breakdown.

Source-Specific Discussion for Startup

For the emission units that are the subject of US Steel's requests, the planned revised CAAPP permit would continue to provide authorization to US Steel to make claims related to startup. The Illinois EPA has carefully reviewed the information submitted by US Steel to support its requests related to startup considering the requirements of the applicable Illinois rules, which rules are part of Illinois' SIP.

As already discussed, for an emission unit for which such a request is made, 35 IAC 201.261 requires a source to submit information describing the startup

procedure, duration and frequency of startups, type and quantity of emissions during startups, and efforts to minimize emissions, duration and frequency of startups. For the emission units that are the subject of these requests,[45] US Steel has submitted this information. US Steel has provided a description of the startup procedures for the subject emission units. Startups of the units are planned in advance. Startups are conducted in accordance with established procedures that have been developed to safely bring units into normal operation. For the subject units, US Steel has also provided information on the duration and frequencies of startups and the type and quantity of emissions during startups. While the duration of a startup may vary based on the length of time that an emission unit has been out of service, the nature of maintenance and repairs that were conducted, and event-specific factors, a standard series of steps is followed during each startup to resume normal operation. For each emission unit at the Granite City Works that is subject to such a request, US Steel has also submitted information, as required by 35 IAC 201.261, describing its efforts to minimize emissions, duration and frequency of startups.[46] Based on the Illinois EPA's review of the information that has been provided related to startup, the Illinois EPA concludes that US Steel has satisfied the informational requirements of 35 IAC 201.261.

Consistent with 35 IAC 201.262, US Steel has affirmatively demonstrated that all reasonable efforts have been made and will be made to minimize startup emissions, duration of individual startups and frequency of startups. As such, the Illinois EPA has concluded that the regulatory standard for authorizing claims related to startups has been satisfied. For the different groups of subject units, the Illinois EPA's review relative to the provisions of 35 IAC 201.262 is discussed in further detail below.

Unit-Specific Discussion for Startup of Coke Oven Batteries

The frequency of startups of the coke oven batteries is minimized by US Steel. Startup of the coke oven batteries is a rare event because of the damage to the coke ovens that results when a battery is idled and then resumes operation. First, the cooling of the ovens, when they are idled, leads to damage to the refractory brickwork due to contraction. Steel components in parts of the ovens also suffer damage due to contraction and warping. Then, upon resumption of operation, the heating of the ovens causes further damage due to thermal expansion and warping. Once a coke oven battery is put into service, the preferred way of operating is to never idle the battery. US Steel has a substantial economic incentive to avoid the idling of coke oven batteries and their subsequently startup. Following idling of a coke oven battery, there are costs for the repairs for damage that must be conducted prior to and during the actual startup of a battery. Additional costs may also be present in the subsequent years of operation following resumption of operation after an idling event. The idling and restart of a battery may result in deterioration of the battery that only gradually appears, leading to the need for additional repairs and maintenance to the ovens to maintain them in proper condition. Given the consequences of idling a coke oven battery, US Steel's two coke oven batteries

[45] The subject emission units are the coke oven processes, the blast furnace processes, the reheat furnaces in the hot strip mill and the boilers, for which startup is addressed, respectively, in Conditions 7.2.5-4, 7.4.5-2(b)(ii), 7.7.5(a) and 7.10.3(i) of the current permit.

[46] As related to the frequency of startup, US Steel has appropriately focused on the circumstances that lead to emission units being taken out of service. This is because outages of emission units are followed by startups, so that the frequency of startups is in practice determined by the frequency of outages.

at the Granite City Works are rarely idled. These batteries were last idled about three years ago, in late 2009 and early 2010, after operating for many years without ever being idled. When these batteries were idled, they were each idled for extended periods of time, with only a single startup for each battery when it was brought back into service.

The occurrence of excess emissions during startup of a coke oven battery is dictated by the inability to initially operate a coke oven battery in its normal configuration. Attempting to operate in a normal configuration would pose a significant threat to the safety of personnel and to the physical integrity of the gas collecting systems on the batteries. This is because the composition of the coke oven gas initially generated by the ovens would contain air so as to present a risk of explosion, rather than merely being flammable. In addition, a number of coking cycles are needed before the coking process in a battery is fully stabilized, with consistent temperatures and other operational conditions achieved in all of the ovens in the battery.

Emissions from startup will be minimized by appropriate measures. The procedures for startup of a coke oven battery provide for the gradual startup of a battery. Only a small number of ovens will be charged until collection of coke oven gas is initiated. Once this occurs, collection of coke oven gas from the initial ovens that are then charged will each only be delayed for short time to ensure that the level of air in the collected gas does not exceed a safe level. Startup emissions are also generally minimized by the maintenance and repair work performed prior to startup. Startup emissions are also minimized by other aspects of the startup procedures. For example, a battery will be brought as close to operating temperatures as possible by means of the underfire combustion system before coal is first charged to the battery. Emissions will also be minimized by appropriate staffing of the battery during startup, which, given the magnitude of the undertaking, necessarily involves the use of additional operating and maintenance personnel, including contract labor, and the presence of management and engineering staff to immediately address any problems as they arise. Necessary staff will initiate any and all appropriate corrective actions to reduce the magnitude and duration of excess emissions as practical. Additional equipment and supplies will also be staged as appropriate during startup. By employing extra staffing with overtime, maintaining a spare parts inventory and employing additional equipment such as cranes and other mobile equipment to expedite any necessary repairs, US Steel will also be prepared to address unforeseen developments that occur during a startup of a coke oven battery and to take appropriate actions to minimize the effect of those developments on the emissions that accompany startup of the battery.

US Steel has appropriately demonstrated for the coke oven batteries that all reasonable efforts will be made to minimize startup emissions, duration of individual startups and frequency of startups. As the regulatory standard for granting authorization to make claims of startup for the coke oven batteries continues to be met, the planned revised CAAPP permit would continue to authorize US Steel to make such claims.

Unit-Specific Discussion for Startup of Blast Furnace Processes

The frequency of startups of the blast furnaces is minimized by US Steel. Startup of a blast furnace is not a frequent event. This is because of the damage to a furnace that may result when a furnace is idled, the complexity of the startup of the furnace to bring a furnace back into production, and the interruption in routine operation of the blast furnace. US Steel has a

substantial incentive to continue operating the blast furnaces as it practical to do so. The cooling of the furnace leads to deterioration and possible damage of the refractory and other components of the furnace due to contraction. Once a blast furnace is put into service, the ideal way of operating would be to never idle the furnace. However, in practice it is necessary to periodically take blast furnaces out of service for inspections, maintenance and repair to facilitate continued safe, compliant and effective operation of the furnace, including certain regular inspections that are required as a condition of US Steel's insurance. In addition, low demand for steel will necessitate the idling of the blast furnaces if the demand for steel from the Granite City Works is below the level at which the furnaces are designed to safely and efficiently operate.

The occurrence of excess emissions during startups of the blast furnaces is a natural consequence of the design and operation of these furnaces. Until the furnace is brought up to normal operating temperature and pressures and the smelting process in the furnace is fully established, the furnace will not operate in a stable fashion. This must occur gradually. The rate at which a furnace can be brought up to normal operation is constrained by the need to let the physical structure of the furnace adjust to the increase in temperature and pressure. Otherwise, the stresses in various components of the furnace may cause damage to those components. It is also necessary to coordinate the operation of the various systems that are involved in the operation of the furnaces, including the stoves and blowers for the blast air and the charging systems for ore and flux. This also dictates a gradual startup, so that operational stability and control is maintained during startup. However, until the smelting process is fully established, with stable operation of the furnace at normal operating conditions, excess emissions may occur. These emissions may occur directly from the furnace, e.g., the relief vents on the furnace. Excess emissions also may occur indirectly, e.g., the normal separation of iron, slag and dissolved gases in the tapped material has not been completed, leading to the generation of additional emissions during tapping. These occurrences cannot be readily avoided during the startup of the furnace.

Emissions during startup of the blast furnaces are minimized by startup procedures that are designed to avoid the conditions that lead to excess emissions, as well as to provide the safe return of a furnace to normal service. Control equipment and control measures for the furnaces, including the control measures for tapping, are fully operational during startup. The furnaces are equipped with instrumentation to detect problems in the operation of the furnaces. This enables corrective measures to be promptly implemented. The regular preventative maintenance and repairs that US Steel conducts for the furnaces and their instrumentation facilitates consistent startups of the furnaces in accordance with established procedures.

US Steel has appropriately demonstrated for the blast furnace processes that all reasonable efforts will be made to minimize startup emissions, duration of individual startups and frequency of startups. As the regulatory standard for granting authorization to make claims of startup for these processes continues to be met, the planned revised CAAPP permit would continue to authorize US Steel to make such claims.

<u>Unit-Specific Discussion for Startup of Hot Strip Mill (Reheat Furnaces)</u>

The frequency of startups of the reheat furnaces is minimized by US Steel. While these furnaces are designed to be routinely taken in and out of service, each shutdown and startup cycle contributes to wear on a furnace. The

contraction and expansion that accompanies cooling and reheating of a furnace places stresses on the refractory and other components of the unit. Reheat furnaces, like those at the Granite City Works, are taken out of service when it is necessary or reasonable to do so. Reheat furnaces are taken out of service when they are not needed or cannot be efficiently operated to meet the production schedule of the rolling mill. These schedules are developed on a weekly basis. In circumstances when a reheat furnace would not be needed, continued operation of the furnace, without a shutdown and subsequent startup, would not act to minimize emissions, since the continued operation of the furnace with its associated emissions would be unnecessary. Reheat furnaces are also taken out of service to perform routine inspections, maintenance and repair and for other repairs that are necessary for the continued safe and proper functioning of the unit. While it is in US Steel's interest to manage outages for this purpose, reheat furnaces necessarily require relatively frequent maintenance, typically about every six weeks. This is because the furnaces heat heavy steel slabs to the elevated temperatures at which rolling is conducted. Heating is conducted in a series of zones to efficiently achieve a uniform temperature profile in each steel slab that is introduced into the furnaces. Regular maintenance is needed for the proper operation of the burners and combustion systems and the mechanisms that move the slabs through the furnace, as well as to repair refractory that has deteriorated or been damaged.

The occurrence of excess emissions during startups of the reheat furnaces at the Granite City Works is a natural consequence of the design of these units, even though only fired with gaseous fuels. Excess emissions occur during startup because the temperatures in these furnaces must be gradually increased or "ramped up" during startup. Excess emissions also occur during startup due to the inability of the burners in the furnaces to operate efficiently at the low firing rates that are present during startup. The rate at which these furnaces can be brought up to normal operation is constrained by the need to let the physical structure of the furnaces adjust to the increase in temperatures. Otherwise, the levels of thermal stress in the various components of a furnace may cause damage to those components. It is also necessary to coordinate the operation of the various burners in the different sections of these furnaces. This also dictates a gradual startup, so that operational stability is maintained during startup while the furnace transitions from initial operation to normal operation. Attempting to "immediately" begin operating a furnace within its design range for firing rate would pose a threat to the safety of personnel and to the physical integrity of the furnace. The physical integrity of the furnace would directly be put at risk. As the operational stability would be put at risk, an indirect threat would be posed to personnel and the furnace. The further consideration for the startup of these furnaces is that the burners in the furnaces are designed, appropriately, to function most effectively when they are operating in their normal operating range. It is inconsistent with such design for the burners to be as effective when operating below the normal range as necessarily occurs during startup of these furnaces. However, as already explained, operation below the normal operating range is inherent in the startup of these furnaces.

Emissions during startup of the reheat furnaces are minimized by startup procedures that facilitate good combustion during startup. In addition, the duration of startups is minimized by keeping as much heat as possible in the furnace after a shutdown. This acts to shorten the duration of the subsequent startup, also reducing the amount of fuel that must be fired during startup. Each furnace is equipped with appropriate operational instrumentation relative to combustion, including instrumentation for fuel flows, flame temperatures, fan amperage, and oxygen level in the exhaust. The operation of burners is

automatically adjusted to avoid loss of flame and flame safety trips, which would act to extend the duration of startup. Operation is also automatically adjusted to maintain good combustion. Transitions between fuels are staged to maintain stability of combustion in the furnace. Startup is overseen by operating personnel, who make adjustments to maintain proper combustion during startup. The regular preventative maintenance that US Steel conducts for the furnaces and their instrumentation facilitates consistent startups of the furnaces in accordance with established procedures.

US Steel has appropriately demonstrated for its reheat furnaces that all reasonable efforts will be made to minimize startup emissions, duration of individual startups and frequency of startups. As the regulatory standard for granting authorization to make claims of startup for these furnaces continues to be met, the planned revised CAAPP permit would continue to authorize US Steel to make such claims.

Unit-Specific Discussion for Startup of Boilers

The frequency of startups of boilers is minimized by US Steel. While boilers are designed to be routinely taken in and out of service, each shutdown and startup cycle contributes to wear on the boiler. While boilers do not operate at extreme temperatures, the contraction and expansion that accompanies cooling and reheating of a boiler places stresses on the refractory and other components of the boiler. Industrial boilers, like those at the Granite City Works, are taken out of service when it is necessary or reasonable to do so. Boilers are taken out of service to perform routine inspections, maintenance and repair and for other repairs that are necessary for the continued safe and proper functioning of a boiler. Boilers are also taken out of service when they are not needed or cannot be effectively or efficiently operated to meet the current steam requirements of the facility. In these circumstances, continued operation of the boiler, without a shutdown and subsequent startup, would not act to minimize emissions, since the continued operation of the boilers with its associated emissions would be unnecessary.

The occurrence of excess emissions during startups of the three boilers at the Granite City Works, is a natural consequence of the design of larger boilers, even when only fired with gaseous fuels. The boilers are fairly large, one having a design capacity of about 500 mmBtu/hr and the others each having a capacity of about 200 mmBtu/hr. Excess emissions occur during startup because the temperatures in and the load on the boilers must be gradually “ramped up” or increased during startup and because the burner systems in the boilers operate less efficiently at the low firing rates that are present during startup. The rate at which these boilers can be brought up to normal operation is constrained by the need to let the physical structure of the boiler adjust to the increase in temperatures. Otherwise, the levels of thermal stress in various components of the boiler may cause damage to those components. It is also necessary to coordinate the operation of the fuel, combustion air and feed water systems on a boiler. This also dictates a gradual startup. Operational stability must be maintained during startup while the boiler transitions from initial operation to normal operation, with firing of natural gas and coke oven gas and/or blast furnace gas. Attempting to “immediately” begin operating a boiler within its design range for firing rate and steam load would pose a significant threat to the safety of personnel and to the physical integrity of the boiler. The physical integrity of the boiler would directly be put at risk. As the operational stability would be put at risk, an indirect threat would be posed to personnel and the boiler. The further consideration for the startup of the boilers is that the combustion system in the boilers are designed,

appropriately, to function most effectively when a boiler is operating in its normal operating range. It follows that the burners will be less effective when operating below the normal range as necessarily occurs during startup of a boiler.[47] However, as already explained, operation below the normal operating range is inherent in the startup of a larger boiler.

Emissions during startup of the boilers are minimized by startup procedures that facilitate good combustion during startup. The boilers are equipped with instrumentation, including fuel flow meters, flame safeties, and oxygen meters, that enable good combustion to be maintained during startup. Startup is overseen by operating personnel, who make adjustments to maintain proper combustion during startup. The regular periodic maintenance for the boilers, including their instrumentation, facilitates consistent startups of the boilers in accordance with established procedures.

US Steel has appropriately demonstrated for the boilers that all reasonable efforts will be made to minimize startup emissions, duration of individual startups and frequency of startups. As the regulatory standard for granting authorization to make claims of startup for the boilers continues to be met, the planned revised CAAPP permit would continue to authorize US Steel to make such claims.

[47] It is also not practical to have separate smaller burners for startup, which are efficient at such lower loads. It would still be necessary to transition from those burners to the main burners during startup and the presence of those burners would further complicate and likely prolong the startup of a boiler.

ATTACHMENT: EMISSION FACTORS AND SUPPORTING INFORMATION

Material Handling – Section 7.1

Permit Condition 7.1.6(b)(i) and 7.6.6(a) – Ladle Metallurgy Material Handling

	Pollutant: PM/PM_{10}
Emission Factor:	0.00355 lbs/ton of steel
Control Device:	Baghouse #1
Origin of EF:	Calculation from AP-42, Fourth Edition, Table 7.5.1, Iron and Steel Production, Page 13.2.4-4, Fugitive Uncontrolled emissions, with a 99.8% control efficiency. a. 50% of Hot Metal transfer factor (0.19), b. EAF Charging, tapping and slagging (1.4), c. Conveyors #4, 5 and 6 (0.0286).
Update Methodology:	Refer to Conditions 7.1.7(b), 7.1.9(f), 7.6.9(c), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
This baghouse will be tested in the future whereby this emission factor will be reviewed and may be updated.

Permit Condition 7.1.6(b)(ii) – Basic Oxygen Furnace Additive System

	Pollutant: PM/PM_{10}
Emission Factor:	0.00032 lbs/ton of steel
Control Device:	Trackhopper Baghouse
Origin of EF:	Calculated from AP-42, Page 13.2.4-4, Fugitive uncontrolled emissions, with a 99.9% control efficiency.
Update Methodology:	Refer to Conditions 7.1.7(b), 7.1.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
This baghouse will be tested in the future whereby this emission factor will be reviewed and may be updated.

Permit Condition 7.1.6(b)(iii) – Flux Conveyor Operations

	Pollutant: PM/PM_{10}
Emission Factor:	0.0016 lbs/ton of steel
Control Device:	Bin Floor Baghouse
Origin of EF:	Calculated from AP-42, Page 13.2.4-4, Fugitive controlled emissions with a 99.3% control efficiency.
Update Methodology:	Refer to Conditions 7.1.7(b), 7.1.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
This baghouse will be tested at a point in the future whereby this emission factor will be reviewed and may be updated.

Material Handling – Section 7.1 (continued)

Permit Condition 7.1.6(b)(iv) – Iron Pellet Screening

	Pollutant: PM/PM_{10}
Emission Factor:	0.00279 lbs/ton of iron pellets
Origin of EF:	Calculation from AP-42, Page 13.2.4-4, Fugitive uncontrolled emissions.
Update Methodology:	Refer to Conditions 7.1.9(f), 5.9.6(c) and 5.13 of the permit.

Iron Production – Section 7.4

Permit Condition 7.4.6(b) – Blast Furnace Casthouse Baghouse Exhaust

Pollutant: PM/PM_{10}

Emission Factor:	0.0703 lbs/ton of iron
Control Device:	Casthouse Baghouse
Origin of EF:	Calculated from AP-42, Table 7.5-1, Fourth Edition, Iron and Steel Production, with an overall 95% control efficiency.
Update Methodology:	Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
January 2010 Emissions Testing, measured rate of 0.0041 lbs/ton iron.
March 2012 ICR Emissions Testing, measured rate of 0.0199 lbs/ton iron.

Pollutant: SO_2

Emission Factor:	0.2006 lbs/ton of iron
Origin of EF:	July 1993 Emissions Testing.
Update Methodology:	Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
March 2012 ICR Emissions Testing, measured rate of 0.1903 lbs/ton iron.

Pollutant: NO_x

Emission Factor:	0.0144 lbs/ton of iron
Origin of EF:	July 1993 Emissions Testing.
Update Methodology:	Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
This pollutant will be tested prior to the expiration of the permit whereby this emission factor will be reviewed and may be updated.

Pollutant: VOM

Emission Factor:	0.0946 lbs/ton of iron
Origin of EF:	July 1993 Emissions Testing.
Update Methodology:	Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
This pollutant will be tested prior to the expiration of the permit whereby this emission factor will be reviewed and may be updated.

Permit Condition 7.4.6(c) – Blast Furnace Uncaptured Emissions

Pollutant: PM

Emission Factor:	0.031 lbs/ton of iron
Origin of EF:	Calculated from AP-42 Table 7.5-1, Fourth Edition, Iron and Steel Production, with a 95% capture efficiency and an adjustment factor for the presence of local hoods.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Pollutant: PM_{10}

Emission Factor:	0.0155 lbs/ton of iron
Origin of EF:	Calculated from AP-42, Table 7.5-2, Fourth Edition, Iron and Steel Production, using PM_{10}/TSP ratio = 50%.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Pollutant: SO_2

Emission Factor:	0.0104 lbs/ton of iron
Origin of EF:	July 1993 Emissions Testing on Casthouse baghouse, with a 95% capture efficiency.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Pollutant: NO_x

Emission Factor:	0.0007 lbs/ton of iron
Origin of EF:	July 1993 Emissions Testing on Casthouse baghouse, with a 95% capture efficiency.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Pollutant: VOM

Emission Factor:	0.0047 lbs/ton of iron
Origin of EF:	July 1993 Emissions Testing on Casthouse baghouse, with a 95% capture efficiency.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.4.6(d) – Blast Furnace Charging

Pollutant: PM/PM_{10}

Emission Factor:	0.0024 lbs/ton of iron pellets
Origin of EF:	AIRS Emissions Inventory, SCC #3-03-008-021.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.4.6(e) – Slag Pits

Pollutant: PM/PM_{10}

Emission Factor:	0.00417 lbs/ton of iron
Origin of EF:	Calculated from EPA Assessment of Atmospheric Emissions from Quenching of Blast Furnace Slag. Also, AP-42, Table 13.2.4-4, Fugitive Uncontrolled emissions. Summation of the following emission factors: a. Slag Quenching = 0.0026 lbs/ton iron, b. Slag Digging = 0.00157 lbs/ton iron.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Pollutant: SO_2

Emission Factor:	0.01 lbs/ton of iron
Origin of EF:	Calculated from EPA Assessment of Atmospheric Emissions from Quenching of Blast Furnace Slag.
Update Methodology:	Refer to Conditions 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.4.6(f) – Blast Furnace Iron Spout Baghouse Exhaust

Pollutant: PM/PM_{10}

Emission Factor:	0.02548 lbs/ton of iron
Control Device:	Iron Spout Baghouse
Origin of EF:	Calculated from AP-42, Fourth Edition, Table 7.5-1, Iron and Steel Production, with an overall 98% capture efficiency.
Update Methodology:	Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
September 2009 Emissions Testing, measured rate of 0.00434 lbs/ton iron.
January 2010 Emissions Testing, measured rate of 0.00334 lbs/ton iron.
December 2010 Emissions Testing, measured rate of 0.00822 lbs/ton iron.
March 2012 ICR Emissions Test, measured rate of 0.00507 lbs/ton iron.

Pollutant: SO_2

Emission Factor:	0.0073 lbs/ton of iron
Origin of EF:	July 1993 Emissions Testing.
Update Methodology:	Refer to Conditions 7.4.7(a) and (c), 7.4.9(i), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
March 2012 ICR Emissions Test, measured rate of 0.0004 lbs/ton iron.

Steel Production – Section 7.5

Permit Condition 7.5.6(c) – Basic Oxygen Furnace ESP Exhaust

Pollutant: PM/PM_{10}

Emission Factor:	0.16 lbs/ton of steel
Control Device:	Electrostatic Precipitator
Origin of EF:	Average of March 1989, July 1990 and August 1993 Emissions Testing results.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
October 2009 Emissions Testing, measured rate of 0.0364 lbs/ton steel.
July 2012 Emissions Testing, measured rate of 0.035 lbs/ton steel.

Pollutant: NO_x

Emission Factor:	0.0389 lbs/ton of steel
Origin of EF:	August 1993 Emissions Testing.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
April 2012 Emissions Testing, measured rate of 0.1273 lbs/ton steel.

Pollutant: VOM

Emission Factor:	0.006 lbs/ton of steel
Origin of EF:	AIRS Emissions Inventory, SCC Codes 3-03-009-013, 3-03-009-016, 3-03-009-017 and 3-03-009-023.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
July 2012 Emissions Testing, measured rate of 0.0153 lbs/ton steel.

Pollutant: CO

Emission Factor:	8.993 lbs/ton of steel
Origin of EF:	August 1993 Emissions Testing.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
July 2012 Emissions Testing, measured rate of 3.761 lbs/ton steel.

Pollutant: Lead

Emission Factor:	0.1934 lbs/hour
Control Device:	Electrostatic Precipitator
Origin of EF:	AIRS Emissions Inventory, SCC Code 3-03-009-013 with a control efficiency of 99.8%.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
July 2012 Emissions Testing, measured rate of 0.0376 lbs/hour.

Permit Condition 7.5.6(d) – Basic Oxygen Furnace Roof Monitor

Pollutant: PM_{10}

Emission Factor: 0.066145 lbs/ton of steel
Origin of EF: Calculated from AP-42, Fourth Edition, Table 7.5-1, Iron and Steel Production, with the following capture efficiencies:
a. Charging = 95%,
b. Refining = 99.9%,
c. Tapping = 95%.
Update Methodology: Refer to Conditions 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Pollutant: PM

Emission Factor: 0.0987 lbs/ton of steel
Origin of EF: Calculated from AP-42, Fourth Edition, Table 7.5-1, Iron and Steel Production, as above using PM_{10}/TSP ratio = 67%.
Update Methodology: Refer to Conditions 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Pollutant: Lead

Emission Factor: 0.0129 lbs/hour
Origin of EF: AIRS Emissions Inventory, SCC Code 3-03-009-013, with a capture efficiency of 99.99%.
Update Methodology: Refer to Conditions 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.5.6(e) – Desulfurization/Hot Metal Transfer Baghouse Exhaust

Pollutant: PM/PM_{10}

Emission Factor: 0.03721 lbs/ton of iron
Control Device: Baghouse (Soda Ash)
Origin of EF: Calculated from AP-42, Fourth Edition, Table 7.5-1, Iron and Steel Production, with an overall control efficiency of 96.6%.
Update Methodology: Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
October 2009 Emissions Testing, measured rate of 0.0021 lbs/ton iron.
May 2012 MACT Emissions Testing, measured rate of 0.00127 lbs/ton iron.

Pollutant: VOM

Emission Factor: 0.001 lbs/ton of iron
Origin of EF: AIRS Emissions Inventory, SCC Code 3-03-009-015.
Update Methodology: Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
May 2012 MACT Emissions Testing, measured rate of 0.000187 lbs/ton iron.

Pollutant: Lead

Emission Factor:	0.0133 lbs/hour
Control Device:	Baghouse (Soda Ash)
Origin of EF:	AIRS Emissions Inventory, SCC Code 3-03-009-013, with an overall control efficiency of 96.6%.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
May 2012 MACT Emissions Testing, measured rate of 0.00167 lbs/hour.

Permit Condition 7.5.6(f) – Slag Skimming Baghouse Exhaust

Pollutant: PM/PM_{10}

Emission Factor:	0.005 lbs/ton of iron
Origin of EF:	Calculated from AP-42, Fourth Edition, Table 7.5-1, Iron and Steel Production, with a control efficiency of 97.5%.
Update Methodology:	Refer to Conditions 7.5.7(a) and (b), 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
September 2009 Emissions Testing, measured rate of 0.00042 lbs/ton iron.
May 2012 MACT Emissions Testing, measured rate of 0.005 lbs/ton iron.
December 2012 Emissions Testing, measured rate of 0.0005 lbs/ton iron.

Permit Condition 7.5.6(g) – Argon Stir/LMF/Material Handling Baghouse Exhaust

Pollutant: PM/PM_{10}

Emission Factor:	0.00715 lbs/ton of steel
Control Device:	Baghouse #2
Origin of EF:	Calculated from AP-42, Fourth Edition, Table 7.5-2, Electric Arc Furnace Melting and Refining, with a control efficiency of 99.9%.
Update Methodology:	Refer to Conditions 7.5.9(f), 5.9.6(c) and 5.13 of the permit.

Additional Emissions Testing:
October 2009 Emissions Testing, measured rate of 0.000388 lbs/ton steel.
May 2012 ICR Emissions Testing, measured rate of 0.000436 lbs/ton steel.

Continuous Casting – Section 7.6

Permit Condition 7.6.6(a) – Ladle Metallurgy Material Handling

Pollutant: PM/PM_{10}

Refer to the discussion for Permit Condition 7.1.6(b)(i).

Permit Condition 7.6.6(b) – Caster Molds

Pollutant: PM/PM_{10}

Emission Factor:	0.006 lbs/ton of steel
Origin of EF:	Illinois EPA 1991 EIS PM/PM_{10} Report.
Update Methodology:	Refer to Conditions 7.6.9(c), 5.9.6(c) and 5.13 of the permit.

Pollutant: NO_x

Emission Factor:	0.05 lbs/ton of steel
Origin of EF:	AIRS Emissions Inventory, SCC Code 3-03-009-022.
Update Methodology:	Refer to Conditions 7.6.9(c), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.6.6(c) – Spray Chambers

Pollutant: PM/PM_{10}

Emission Factor:	0.00852 lbs/ton of steel
Origin of EF:	1981 Emissions Testing before a baghouse on this unit was removed (circa 1990), adjusted to not account for the baghouse based on 99.3% control efficiency.
Update Methodology:	Refer to Conditions 7.6.7(a), 7.6.9(c), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.6.6(d) – Slab Cutoff

Pollutant: PM/PM_{10}

Emission Factor:	0.0071 lbs/ton of steel
Origin of EF:	Illinois EPA 1991 EIS PM/PM_{10} Report.
Update Methodology:	Refer to Conditions 7.6.9(c), 5.9.6(c) and 5.13 of the permit.

Permit Condition 7.6.6(e) – Slab Ripping

Pollutant: PM/PM_{10}

Emission Factor:	0.00722 lbs/ton of steel
Origin of EF:	Illinois EPA 1991 EIS PM/PM10 Report.
Update Methodology:	Refer to Conditions 7.6.9(c), 5.9.6(c) and 5.13 of the permit.