

**ILLINOIS ENVIRONMENTAL PROTECTION AGENCY**

**BUREAU OF AIR**

**DIVISION of AIR POLLUTION CONTROL**

**PERMIT SECTION**

PROJECT SUMMARY for the  
DRAFT CLEAN AIR ACT PERMIT PROGRAM (CAAPP) PERMIT

Granite City Slag, LLC  
One Racehorse Drive  
East St. Louis, Illinois 62207

Illinois EPA ID Number: 119040ATF

Application Number: 99120072

Application Type: Renewal Permit

Start of Public Comment Period: October 15, 2008

Public Hearing Date: December 2, 2008

Close of Public Comment Period: January 2, 2009

Permit Engineer/Technical Contact: Ross Cooper, 217/782-2113

Community Relations/Comments Contact: Brad Frost, 217/782-7027

(This Project Summary generally describes the source and explains the draft permit. This document has been prepared pursuant to Section 39.5(8)(b) of the Illinois Environmental Protection Act, which requires "a statement that sets forth the legal and factual basis for the draft CAAPP permit conditions.")

## I. INTRODUCTION

This source has applied for a renewal of the Clean Air Act Permit Program (CAAPP) operating permit. The CAAPP is the program established in Illinois for operating permits for significant stationary sources as required by Title V of the federal Clean Air Act and Section 39.5 of Illinois' Environmental Protection Act. The conditions in a CAAPP permit are enforceable by the Illinois Environmental Protection Agency (Illinois EPA), the USEPA, and the public. This document is for informational purposes only and does not shield the Permittee from enforcement actions or its responsibility to comply with applicable regulations. This document shall not constitute a defense to a violation of the Act or any rule or regulation.

A CAAPP permit contains conditions identifying the applicable state and federal air pollution control requirements that apply to a source. The permit also establishes emission limits, appropriate compliance procedures, and specific operational flexibility. The appropriate compliance procedures may include monitoring, record keeping, and reporting to show compliance with these requirements. The Permittee must carry out these procedures on an on-going basis to demonstrate that the source is operating in accordance with the requirements of the permit. Further explanations of the specific provisions of the draft CAAPP permit are contained in the attachments to this document, which also identify the various emission units at the source.

## II. GENERAL SOURCE DESCRIPTION

### a. Nature of source

The source produces various sizes of slag for commercial sale and used for road base, sewer main construction, and other purposes.

The blast furnace slag processed at this plant is provided by Stein Steel. Stein steel digs the slag out of the pits at U.S. Steel and transports the unprocessed slag by truck to Granite City Slag, LLC to be processed.

The blast furnace slag (BFS) is originated at U.S. Steel through the production of iron, iron ore, iron scrap, and fluxes (limestone and/or dolomite) which are charged into a blast furnace along with coke for fuel to remove acidic impurities from iron ore. The coke is combusted to produce carbon monoxide, which reduces the iron ore to a molten iron product. This molten iron product can be cast into iron products, but is most often used as a feedstock for steel production. In the heat of the blast furnace, the calcium carbonate in the limestone breaks down to form carbon dioxide and calcium oxide. The calcium oxide then reacts with the acidic impurities to form BFS as a molten liquid. This liquid has a lower

density than the molten iron, so it sits above the iron in the hearth of the furnace and can therefore be removed or tapped.

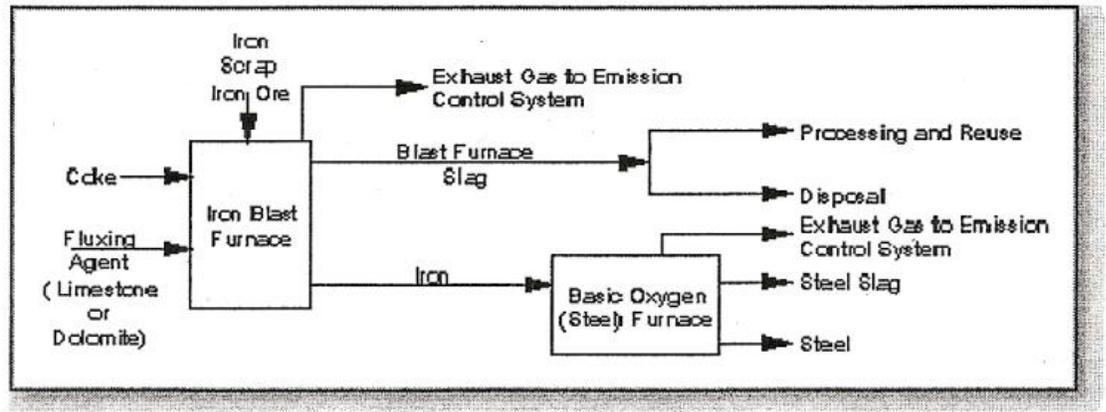
The production of BFS with specific properties is integral to the iron making processes, i.e. the intention of the iron producer is to design and regulate BFS quality through selection of raw materials (fluxes) and process controls to ensure the iron is produced of the desired quality. Operating practices in iron and steel making have been developed to ensure that designed slag compositions are achieved. BFS is separated from liquid metal via a taphole for the liquid metal and a slag notch for BFS, which sits above and to the side of the taphole. BFS is then run either into pits at the side of the furnace. BFS is then converted into air-cooled blast furnace slag (ACBFS). The design of a specific composition of BFS not only allows furnace operators to achieve a high quality ferrous material (iron) but is also fundamental to the efficient and cost-effective operation of the processes involved. For example, the BFS composition controls alkali retention in a blast furnace which, in turn, is a major factor in determining the life of the lining of that blast furnace.

Blast furnace slag is a nonmetallic coproduct produced in the process. It consists primarily of silicates, aluminosilicates, and calcium-alumina-silicates. The molten slag, which absorbs much of the sulfur from the charge, comprises about 20 percent by mass of iron production. Figure 3-1 presents a general schematic, which depicts the blast furnace feedstocks and the production of blast furnace coproducts (iron and slag). The chemical and physical properties of BFS are tightly controlled within specific parameters to ensure that the liquid metal quality requirements are met. The result is BFS with a consistent chemical composition and physical properties, ensuring the product standards are met for its end uses.

Different forms of slag product are produced depending on the method used to cool the molten slag. These products include air-cooled blast furnace slag (ACBFS), as described below.

If the liquid slag is poured into beds and slowly cooled under ambient conditions, a crystalline structure is formed, and a hard, lump slag is produced, which can subsequently be crushed and screened called air-cooled blast furnace slag. Molten BFS is allowed to flow from the blast furnace into open air pits located beside the furnaces where the material is quenched with water applied by sprays to facilitate cooling and BFS crystallization (this handling method enhances the properties by reducing the BFS density). If the molten slag is cooled and solidified by adding controlled quantities of water, air, or steam, the process of cooling and solidification can be accelerated, increasing the cellular nature of the slag and producing a lightweight expanded or foamed product. Foamed slag is distinguishable from air-cooled blast furnace slag by its relatively high porosity and low bulk density. Once sufficiently cooled, ACBFS is dug from the open air

pits and transported to a nearby crushing and screening (aggregate) plant, where it is processed into aggregates.



**Figure 3-1. General schematic of blast furnace operation and blast furnace slag production.**

b. Ambient air quality status for the area

The source is located in an area that is currently designated nonattainment for the National Ambient Air Quality Standards for ozone (moderate nonattainment) and/or PM<sub>2.5</sub> and attainment or unclassifiable for all other criteria pollutants (CO, lead, NO<sub>2</sub>, PM<sub>10</sub>, SO<sub>2</sub>).

c. Major source status

1. The source requires a CAAPP permit as a major source of PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>x</sub>, VOM, CO, SO<sub>2</sub> and HAP emissions.
2. The source also requires a CAAPP permit because the source is considered a single source with United States Steel Corporation – Granite City Works, I.D. No. 119813AAI, located at 1951 State Street, Granite City. The Permittees have elected to obtain separate CAAPP permits for their operations.

In addition to Granite City Slag, LLC, the following independent operators/permittees are considered a single source with U.S. Steel and have elected to obtain separate CAAPP permits for those operations:

- a. Stein Steel Mill Services (I.D. 119813AAD) located at 20<sup>th</sup> Street and Edwardsville in Granite City.

- b. Gateway Energy & Coke Co LLC (I.D. 119040ATN) located at Edwardsville Road in Granite City.
- c. AKJ Industries, Inc (I.D. 119040AEB) located at 20th and State Streets in Granite City.
- d. Oil Technology Inc (I.D. 119040ATG) located at Rte 203 in Granite City.

d. Source Emissions

The following table lists annual emissions of criteria pollutants from this source, as reported in the Annual Emission Reports sent to the Illinois EPA.

	<b>Annual Emissions (tons)</b>						
<b>Pollutant</b>	<b>2007</b>	<b>2006</b>	<b>2005</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>
CO							
NO <sub>x</sub>							
PM	3.9	4.85	5.28			6.27	5.54
SO <sub>2</sub>							
VOM							
HAP							

### III. NEW SOURCE REVIEW/TITLE I CONDITIONS

This draft permit contains terms and conditions that address the applicability of permit programs for new and modified sources under Title I of the Clean Air Act (CAA) and regulations promulgated thereunder, including 40 CFR 52.21, Prevention of Significant Deterioration (PSD) and 35 IAC Part 203, Major Stationary Sources Construction and Modification. Any such terms and conditions are identified within the draft permit by T1, T1R, or T1N. Any conditions established in a construction permit pursuant to Title I and not revised or deleted in this draft permit, remain in effect pursuant to Title I provisions until such time that the Illinois EPA revises or deletes them. Where the source has requested that the Illinois EPA establish new conditions or revise such conditions in a Title I permit, those conditions are consistent with the information provided in the CAAPP application and will remain in effect pursuant to Title I provisions until such time that the Illinois EPA revises or deletes them.

This draft permit would not establish any new Title I requirements or revised Title I requirements.

### IV. COMPLIANCE INFORMATION

The source has certified compliance with all applicable rules and regulations; therefore, a compliance schedule is not required for this source. In addition, the draft permit requires the source to certify its compliance status on an annual basis. The latest inspection reports and annual emission reports (AER) have been reviewed and do not indicate any non-compliance.

#### V. PROPOSED ILLINOIS EPA ACTION/REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that this source's permit application meets the standards for issuance of a CAAPP permit. The Illinois EPA is therefore proposing to issue a CAAPP permit, subject to the conditions proposed in the draft permit.

Comments are requested by the Illinois EPA for the draft or proposed permit, pursuant to 35 IAC Part 252 and Sections 39.5(8) and (9) of the Illinois Environmental Protection Act. A final decision on the draft or proposed permit will not be made until the public, affected states, and USEPA have had an opportunity to comment. The Illinois EPA is not required to accept recommendations that are not based on applicable requirements. If substantial public interest is shown in this matter, the Illinois EPA will consider holding a public hearing in accordance with 35 IAC Part 166.

## ATTACHMENT 1: Summary of Source-Wide Requirements

The following table indicates the source-wide emissions control programs and planning requirements that are applicable to this source. These programs are addressed in Sections 5 and 6 of the draft permit.

<b>Program/Plan</b>	<b>Applicable</b>
Emissions Reduction Market System (ERMS)	No
Nitrogen Oxides (NO <sub>x</sub> ) Trading Program	No
Acid Rain Program	No
Compliance Assurance Monitoring (CAM) Plan	No
Fugitive Particulate Matter (PM) Operating Program <sup>1</sup>	Yes
Risk Management Plan (RMP)	No
PM <sub>10</sub> Contingency Measure Plan <sup>2</sup>	Yes

1. The fugitive PM operating program is required to significantly reduce fugitive particulate matter emissions from certain affected locations and facilities (35 IAC Part 212.309 – 212.312). Normally, elements of this program include, but are not limited to, addressing normal traffic pattern roads, parking facilities, and material piles and handling through the use of water, oils, or chemical dust suppressants.
2. PM<sub>10</sub> Contingency Measure Plan is a program for PM<sub>10</sub> emission reductions (35 IAC Part 212, Subpart U). The Permittee is required to maintain and have this plan on file with the Illinois EPA.

ATTACHMENT 2: Summary of Requirements for Specific Emission Units

The following tables include information on the requirements that apply to significant emission units at this source. The requirements are found in Section 7 of the draft permit, which is further divided into subsection, i.e., Section 7.1, 7.2, etc., for the different categories of units at the source. A separate table is provided for each subsection in Section 7 of the draft permit. An explanation of acronyms and abbreviations is contained in Section 2 of the draft permit.

Table 1 (Section 7.1 of the draft permit)

<b>Emission Unit - Slag Processing Units</b>	
Description	The facility utilizes various screens and crushers to process slag from United States Steel Corporation into an aggregate.
Date Constructed	Various
Emission Control Equipment	Residual moisture from the water spray bars during the slag handling processes.
<b>Applicable Rules and Requirements</b>	
Emission Standards	<ul style="list-style-type: none"> <li>• 35 IAC 212.123</li> <li>• 35 IAC 212.301</li> <li>• 35 IAC 212.316(b)</li> <li>• 35 IAC 212.321</li> </ul>
Streamlining	N/A
Title I Conditions	<ul style="list-style-type: none"> <li>• The draft permit contains limits on operation and emissions in Conditions 7.1.5 and 7.1.6. These limits were incorporated from Permit 05080091.</li> </ul>
Non-applicability	<ul style="list-style-type: none"> <li>• 40 CFR 60, Subpart OOO: because slag is not a nonmetallic mineral, and any plant dedicated to processing slag does not meet the definition of a nonmetallic mineral processing plant (See the Applicability Determination Index (ADI) Control Number 9900001)</li> <li>• CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources: because the affected slag processing plant does not have potential pre-control device emissions of the applicable regulated air pollutant that equals or exceeds major source threshold levels</li> </ul>
<b>Periodic Monitoring (other than basic regulatory requirements)</b>	

<b>Emission Unit - Slag Processing Units</b>	
Testing	<ul style="list-style-type: none"> <li>• Initial opacity testing and then at least annual opacity testing.</li> <li>• Upon request, opacity and/or particulate matter concentration</li> <li>• During initial/annual opacity testing period, spray bar water flow rate and slag moisture content are tested and used to establish operational requirements to maintain the conditions under the last successful performance test.</li> </ul>
Emissions Monitoring	<ul style="list-style-type: none"> <li>• Periodic formal opacity observations, not full Method 9, intended to determine whether or not the affected slag processing unit(s) was running properly, and subsequently initiate a corrective action if necessary.</li> </ul>
Operational Monitoring	<ul style="list-style-type: none"> <li>• Water flow rate</li> <li>• Slag moisture content by weight percent</li> </ul>
Inspections	Monthly
Recordkeeping	Numerous: throughputs, hours of operation, water usage, inspections, test results, etc.
Other	<ul style="list-style-type: none"> <li>• The prior Clean Air Act Permit Program (CAAPP) Permit established a T1N limit, which has since been superseded by the limits established in Construction Permit 05080091.</li> <li>• This periodic monitoring established by this permit is sufficient based on the fact that the facility does not have a history of non-compliance, and the likelihood of an emission exceedance is very low.</li> </ul>
<b>Reporting</b>	
Prompt Reporting	See Attachment 3
Other Reporting	Quarterly report per 35 IAC 212.316(g)(5)
<b>Other Information</b>	
Footnotes	N/A

Table 2 (Section 7.2 of the draft permit)

<b>Emission Unit - Slag Handling Units</b>	
Description	The Permittee transfers and stores slag in a series of operations, including truck unloading, various conveyor belts (with associated hoppers, diverters, and transfer points), storage pile stackers and feeders. These operations first handle slag, as supplied by United States Steel Corporation – Granite City Works, which is then processed by the crushers, and screens. Particulate matter (PM) emissions associated with these operations are controlled by the moisture content of the slag and the use of water spray bars.
Date Constructed	Various
Emission Control Equipment	Water spray bars and residual moisture
<b>Applicable Rules and Requirements</b>	
Emission Standards	<ul style="list-style-type: none"> <li>• 35 IAC 212.123</li> <li>• 35 IAC 212.301</li> <li>• 35 IAC 212.316(f)</li> </ul>
Streamlining	N/A
Title I Conditions	<ul style="list-style-type: none"> <li>• The draft permit contains limits on operation and emissions in Conditions 7.2.5 and 7.2.6. These limits were incorporated from Permit 05080091.</li> </ul>
Non-applicability	<ul style="list-style-type: none"> <li>• CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources: because the affected slag processing plant does not have potential pre-control device emissions of the applicable regulated air pollutant that equals or exceeds major source threshold levels</li> <li>• 35 IAC 212.321 or 212.322: because of the disperse nature of the operations, as generally addressed by 35 IAC 212.323.</li> </ul>
<b>Periodic Monitoring (other than basic regulatory requirements)</b>	
Testing	Upon request, opacity
Emissions Monitoring	<ul style="list-style-type: none"> <li>• Periodic formal opacity observations, not full Method 9, intended to determine whether or not the affected slag processing unit(s) was running properly, and subsequently initiate a corrective action if necessary.</li> </ul>
Operational Monitoring	N/A – Monitoring established for the processing units of Section 7.1 will be sufficient.
Inspections	Monthly
Recordkeeping	Numerous: water usage, inspections, test results, etc.

<b>Emission Unit - Slag Handling Units</b>	
Other	<ul style="list-style-type: none"> <li>This periodic monitoring established by this permit is sufficient based on the fact that the facility does not have a history of non-compliance, and the likelihood of an emission exceedance is very low.</li> </ul>
<b>Reporting</b>	
Prompt Reporting	See Attachment 3
Other Reporting	Quarterly report per 35 IAC 212.316(g)(5)
<b>Other Information</b>	
Footnotes	N/A

Table 3 (Section 7.3 of the draft permit)

<b>Emission Unit - Fugitive Particulate Matter (PM) Emissions</b>	
Description	The facility generates fugitive particulate matter (PM) emissions from storage piles and truck movement over unpaved roadways.
Date Constructed	N/A
Emission Control Equipment	Water truck, water cannon
<b>Applicable Rules and Requirements</b>	
Emission Standards	<ul style="list-style-type: none"> <li>• 35 IAC 212.301</li> <li>• 35 IAC 212.316(d) and (e)(1)</li> </ul>
Streamlining	N/A
Title I Conditions	<ul style="list-style-type: none"> <li>• The draft permit contains limits on operation and emissions in Conditions 7.1.5 and 7.1.6. These limits were incorporated from Permit 05080091.</li> </ul>
Non-applicability	<ul style="list-style-type: none"> <li>• CFR Part 64, Compliance Assurance Monitoring (CAM) for Major Stationary Sources: because the affected slag processing plant does not have potential pre-control device emissions of the applicable regulated air pollutant that equals or exceeds major source threshold levels</li> </ul>
<b>Periodic Monitoring (other than basic regulatory requirements)</b>	
Testing	Upon request, opacity
Emissions Monitoring	N/A
Operational Monitoring	N/A
Inspections	Monthly
Recordkeeping	Numerous: water usage, inspections, test results, etc.
Other	N/A
<b>Reporting</b>	
Prompt Reporting	See Attachment 3
Other Reporting	Quarterly report per 35 IAC 212.316(g)(5)
<b>Other Information</b>	

<b>Emission Unit - Fugitive Particulate Matter (PM) Emissions</b>	
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Footnotes	N/A
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### ATTACHMENT 3: Prompt Reporting of Deviations

Prompt reporting of deviations is critical in order to have timely notice of deviations and the opportunity to respond, if necessary. The effectiveness of the permit depends upon, among other important elements, timely and accurate reporting. The Illinois EPA, USEPA and the public rely on timely and accurate reports submitted by the permittee to measure compliance and to direct investigation and follow-up activities. Prompt reporting is evidence of a permittee's good faith in disclosing deviations and describing the steps taken to return to compliance and prevent similar incidents.

Any occurrence that results in an excursion from any emission limitation, operating condition, or work practice standard as specified in this CAAPP permit is a deviation subject to prompt reporting. Additionally, any failure to comply with any permit term or condition is a deviation of that permit term or condition and must be reported to the Illinois EPA as a permit deviation. The deviation may or may not be a violation of an emission limitation or standard. A permit deviation can exist even though other indicators of compliance suggest that no emissions violation or exceedance has occurred. Reporting permit deviations does not necessarily result in enforcement action. The Illinois EPA has the discretion to take enforcement action for permit deviations that may or may not constitute an emission limitation or standard or the like, as necessary and appropriate.

Section 39.5(7)(f)(ii) of the Illinois Environmental Protection Act, which mirrors 40 CFR 70.6(a)(3)(iii)(B), requires prompt reporting of deviations from the permit requirements. The permitting authority (in this case, Illinois EPA) has the discretion to define "prompt" in relation to the degree and type of deviation likely to occur. Furthermore, Section 39.5(7)(f)(i) of the Illinois Environmental Protection Act, which mirrors 40 CFR 70.6(a)(3)(iii)(A) requires that monitoring reports must be submitted at least every 6 months. Therefore, USEPA generally considers anything less than 6 months to be "prompt" as long as the selected time frame is justified appropriately (60 Fed. Reg. 36083, 36086 (July 13, 1995)).

The USEPA has stated that, for purposes of administrative efficiency and clarity, it is acceptable to define prompt in each individual permit. *Id.* The Illinois EPA has elected to follow this approach and defines prompt reporting on a permit by permit basis. In instances where the underlying applicable requirement contains "prompt" reporting, this frequency or a shorter frequency of reporting is the required timeframe used in this permit. Where the underlying applicable requirement fails to explicitly set forth the timeframe for reporting deviations, the Illinois EPA has developed a structured manner to determine the reporting approach used in this permit.

The Illinois EPA generally uses a time frame of 30 days to define prompt reporting of most deviations. Also, for certain permit conditions in individual permits, the Illinois EPA may require an alternate timeframe that is less than 30 days if the permit requirement justifies a shorter reporting time period. Under certain circumstances, EPA may establish a deviation reporting period longer than 30 days, but, in no event exceeding 6 months. Where it has

established a deviation reporting period other than 30 days in an individual permit (specifically Section 7.x.10), the Illinois EPA has explained the reason for the alternative timeframe. (See Attachment 2 of this Project Summary.)

The timing for certain deviation reporting may be different when a source or emission unit at a source warrants reporting to address operation, independent of the occurrence of any deviations. This is the case for a source that is required to perform continuous monitoring for the emission unit, for which quarterly or semi-annual “monitoring” reports are appropriate. Where appropriate, reporting of deviations has generally been combined in, or coordinated with these quarterly or semi-annual reports, so that the overall performance of the plant can be reviewed in a comprehensive fashion. This will allow a more effective and efficient review of the overall performance of the source by the Illinois EPA and other interested parties, as well as by the source itself.

At the same time, there are certain deviations for which quicker reporting is appropriate. These are deviations for which individual attention or concern may be warranted by the Illinois EPA, USEPA, and other interested parties. Under this scenario, emphasis has been placed primarily on deviations that could represent substantial violations of applicable emission standards or lapses in control measures at the source. For these purposes, depending on the deviation, immediate notification may be required and preceded by a follow-up report submitted within 15 days, during which time the source may further assess the deviation and prepare its detailed plan of corrective action.

In determining the timeframe for prompt reporting, the Illinois EPA assesses a variety of criteria such as:

- historical ability to remain in continued compliance,
- level of public interest in a specific pollutant and/or source,
- seriousness of the deviation and potential to cause harm,
- importance of applicable requirement to achieving environmental goals,
- designation of the area (i.e., non-attainment or attainment),
- consistency among industry type and category,
- frequency of required continuous monitoring reports (i.e., quarterly),
- type of monitoring (inspection, emissions, operational, etc.), and
- air pollution control device type and operation

These prompt reporting decisions reflect the Illinois EPA’s consideration of the possible nature of deviations by different emission units and the responses that might be required or taken for those different types of deviations. As a consequence, the conditions for different emission units may identify types of deviations which include but are not limited to: 1) Immediate (or very quick) notification; 2) Notification within 30 days as the standard; or 3) Notification with regular quarterly or semi-annual monitoring reports.

The Illinois EPA's decision to use the above stated prompt reporting approach for deviations as it pertains to establishing a shorter timeframe in certain circumstances reflects the criteria discussed as well as USEPA guidance on the topic.

- 40 CFR 71.6(a)(3)(iii)(B) specifies that certain potentially serious deviations must be reported within 24 or 48 hours, but provides for semi-annual reporting of other deviations. (Serious or severe consequences)
- FR Vol. 60, No. 134, July 13, 1995, pg. 36086 states that prompt should generally be defined as requiring reporting within two to ten days of the deviation, but longer time periods may be acceptable for a source with a low level of excess emissions. (intermediate consequences)
- Policy Statement typically referred to as the "Audit Policy" published by the USEPA defines prompt disclosure to be within 21 days of discovery. (Standard for most "pollutant limiting" related conditions)
- Responses to various States by USEPA regarding other States' definition of prompt.

As a result, the Illinois EPA's approach to prompt reporting for deviations as discussed herein is consistent with the requirements of 39.5(7)(f)(ii) of the Act as well as 40 CFR part 70 and the CAA. This reporting arrangement is designed so that the source will appropriately notify the Illinois EPA of those events that might warrant individual attention. The timing for these event-specific notifications is necessary and appropriate as it gives the source enough time to conduct a thorough investigation into the causes of an event, collecting any necessary data, and to develop preventative measures, to reduce the likelihood of similar events, all of which must be addressed in the notification for the deviation.

#### ATTACHMENT 4: Periodic Monitoring Discussion

The Illinois EPA must evaluate whether sufficient monitoring is contained in each source's CAAPP permit to assure compliance with regulations developed to meet Clean Air Act requirements. Under the CAAPP permit program, periodic monitoring is required for each emission point at a source subject to Clean Air Act requirements. No emission points are categorically exempt from this requirement.

Significant benefits of title V include compliance assurance and public access to data. Periodic monitoring provides data sources can use to promptly identify and correct compliance problems and to certify compliance. This data is also reported to the Illinois EPA and available to the USEPA and to the public. Periodic monitoring provides information and compliance tools to the public that may not otherwise always be available under state law.

EPA has not mandated specific monitoring or protocols for developing monitoring to meet the above requirements. Periodic monitoring determinations are therefore made on a case-by-case basis. Because of the case-by-case nature of periodic monitoring determinations, it is important that the determinations are made consistent with Section 39.5 of the Act.

## **What is Periodic Monitoring?**

In addition to gathering all requirements that apply to a source into one document, the CAAPP permit is meant to enable the public, US EPA, and the Illinois EPA to know whether the source can comply with those requirements. To achieve that goal, every CAAPP permit must include adequate “periodic monitoring.” What this means is that the CAAPP permit must require the source to perform monitoring, recordkeeping and reporting so that it can assure the Illinois EPA, USEPA and the public that it is complying with its CAAPP permit or that it is identifying, reporting and addressing non-compliance. Ensuring that a CAAPP permit includes adequate periodic monitoring is the most important aspect of permit development.

Monitoring is a broad term that describes a source’s ongoing activities to determine how it is operating in relation to its emission limitations and standards. Monitoring provisions must be set forth in the permit. The monitoring must be done at the source’s initiative and a requirement to prepare or maintain a “monitoring plan” is not enough. Inspections by the Illinois EPA are also not sufficient.

The most obvious type of pollution monitoring is the direct measurement of smokestack emissions. Sometimes, a source is equipped with continuous emissions monitoring systems (CEMS) or continuous opacity monitoring systems (COMS). As their name implies, these systems are designed to directly measure smokestack emissions on a continuous basis. While continuous monitoring is one of the best ways to assure sources are in compliance with an emission limitation, installation of CEMS and COMS may be technically or economically infeasible compared to frequent manual monitoring. If a source has CEMS and COMS, these systems are identified in the sources CAAPP permit. If a source lacks CEMS and COMS, the source may be required to install these systems. However, the Illinois EPA may decide that some other type of monitoring is sufficient to assure the sources compliance with applicable requirements.

Periodic monitoring must be included with all types of permit conditions, not just those that directly limit pollution levels. For example, a CAAPP permit is likely to include conditions that require equipment maintenance and work practices. For these types of conditions, recordkeeping, and inspections is usually necessary to satisfy the periodic monitoring requirement. Monitoring includes activities such as:

- Continuous Emission Monitoring Systems (CEMS)
- Continuous Opacity Monitoring Systems (COMS)
- Parametric Emissions Monitoring (PEMS)
- Parametric Monitoring (continuous or at specified intervals)
- Periodic Source Testing
- Readings/Inspections
- Recordkeeping

Periodic Monitoring, a term used in 39.5(7)(d)(ii) of the Act, describes the combination of monitoring required by the applicable requirements and monitoring created in the CAAPP permit as necessary to meet the CAA requirement that the permit that assure compliance with the applicable requirements. Periodic monitoring is required because some applicable requirements do not contain adequate provisions for determining whether a source is in compliance with its emissions limitations or how this is to be accomplished.

In addition to the requirement for periodic monitoring, permits must contain “conditions as are necessary to assure compliance.” This requirement is reflected in 39.5(7)(d)(ii) of the Act, which requires “monitoring sufficient to yield reliable data from the relevant time period that are representative of the sources compliance” and 39.5(7)(a) of the Act, which requires all CAAPP permits to contain “testing, monitoring, reporting, and recordkeeping requirements sufficient to assure compliance with the terms and conditions of the permit.”

If the permit contains good periodic monitoring, the source can most certainly be held accountable if it violates applicable air quality requirements. Without adequate periodic monitoring, it may be more difficult for the Illinois EPA, USEPA and a member of the public to determine whether a source is violating an air quality requirement. Also, good periodic monitoring will provide the source with information necessary to identify and minimize compliance problems and assist the source with the annual certification of compliance.

### **When is Periodic Monitoring Presumed in a Rule?**

Sometimes, the underlying statute or regulation explicitly requires a source to perform a particular kind of monitoring. Any monitoring that is specifically required by statute or regulation must be included in the CAAPP permit. However, many air quality statutes and regulations do not identify a monitoring method. And, even when a monitoring method is specified, there is often no indication of how often the monitoring must be performed. Many statutes and regulations require a source to perform an initial test to demonstrate compliance, but never require any additional monitoring.

Periodic monitoring is not required unless the applicable requirement “requires no periodic testing, specifies no frequency, or requires only a one-time test.” If the underlying State or federal standard requires a source to perform a specific type of testing or monitoring from time to time (yearly, monthly, weekly, daily, hourly), then this satisfies the periodic monitoring requirement of 40 CFR 70.6(a)(3)(i)(B). If an underlying requirement (1) has no periodic testing or monitoring, (2) does not mention how frequently testing or monitoring should be done, or (3) requires just a one-time test, then periodic monitoring is added to the CAAPP permit. The basic types of scenarios that are presumed to already contain sufficient monitoring requirements are those such as:

- NSPS and NESHAP promulgated after November 15, 1990
- When the Pollutant Specific Emission Unit is subject to a CAM Plan

- Federal or SIP standards specifying a continuous compliance determination method
- Acid Rain/CAIR/CAMR rules

### **What is the Process for Evaluating Periodic Monitoring?**

In evaluating periodic monitoring, Illinois EPA determines whether a source's applicable requirements already contain adequate monitoring, and, if not, identifies additional necessary monitoring after consideration of certain factors. Review each applicable requirement emission limit or standard to determine what monitoring, recordkeeping and reporting (MRR) is associated with the emission limit. Note that periodic monitoring is only required if there is an applicable emission limit or standard. The term emission limit includes mass, rate and concentration limits, technology requirements, percent reduction requirements, work practice standards, process or control device parameters, and design, operational, or maintenance requirements. Determine whether the monitoring yields reliable data from the relevant time period that are representative of the source's compliance, and will assure compliance with the emissions limit or standard. Even if the MRR is not presumptively acceptable, it may still be acceptable. If the monitoring is not adequate to assure compliance, monitoring must be added to the permit. There are often various monitoring options that would satisfy the periodic monitoring requirement.

The frequency and averaging period of the emission limit of the monitoring must be made clear (periodic = e.g., hourly, daily, annual, etc.). When the emission limit has no time element (e.g., 0.5 grains/dscf), the relevant time period is the time needed to conduct an emission test. The relevant time period can be instantaneous as well (e.g., no holes or cracks in a lid for any amount of time). The data collected should provide for a reasonable assessment of the sources compliance status with permit emission limits.

### **Factors Considered in Evaluating Periodic Monitoring**

- Likelihood of violating an applicable requirement. (Margin of compliance with the applicable requirement)
- Presence of add-on controls to comply with underlying rules. (If controls are required, consider whether the controls will assure compliance with the emission limit. If so, the best option may be to monitor the control equipment for proper operation instead of or in addition to the process.)
- Variability of emission level over time. (Consider how close a unit's emissions are to the emission limits during normal and anticipated upset operations.)
- Consider how emissions may vary. (Emissions may vary day to day under normal operation, e.g., as a turbine or engine increases or decreases load emissions change. Emissions may vary slowly over time, e.g., SCR catalyst may degrade over time. Emissions may vary quickly due to malfunction, e.g., a baghouse bag may break.)
- Monitoring data already available. (The source often maintains monitoring, process, maintenance, or control equipment data of emission units even if not required under an

applicable requirement. Consider whether these activities would assure compliance; if so, they may be the best fit monitoring option for that source.)

- Technical and economic feasibility
- Monitoring done for similar emission Units/Emissions. (Existing CAAPP and construction permits, Federal, State and Local rules, CAM Guidelines Document)
- Will the monitoring method yield reliable data with respect to the emission limit?
- Will the monitoring method provide data that can be related to the relevant time period over which compliance with the emission limit is determined?
- Will the monitoring data be collected at a frequency that will provide information that is representative of the sources compliance with the permit?
- Is the monitoring condition written in a way that is practically enforceable? (Practical Enforceability involves ensuring that the following items are present: Frequency of monitoring, Data averaging period, Procedures for checking data validity, Minimum period of data availability, Recordkeeping, Prompt deviation and summary reports)

### **What is the Periodic Monitoring Criterion?**

Compliance Assurance Monitoring that assures compliance is designed to:

- Monitor key parameters which determine compliance
- Be done at a frequency consistent with the likely variability of emissions and margin of compliance
- Detect deviations within specific timeframes (provide information to operator to correct problems promptly)
- Provide information that the Illinois EPA, USEPA and the public could use for enforcement

Margin of compliance: Amount of monitoring varies based on how a unit is operating with respect to emission limits (x% of emission limit); less monitoring if there is a comfortable margin of compliance. In determining margin of compliance, consider accuracy of emission estimation method – less monitoring if reliable emission factors exist. Consider reference method accuracy range. AP-42 or other emission factor accuracy, e.g., rating and range of emission factor.

Consider existence of control equipment and variability:

- Look at emissions over time under normal/upset conditions (within an individual unit)
- More variability more monitoring; less variability less monitoring. Variability within margin of compliance is acceptable.
- Also consider variability within a source category.
- Equipment failure or degradation.

Source size: Vary monitoring based on unit size as a lb/day or ton/year threshold based on potential uncontrolled emissions, e.g., more monitoring if uncontrolled emissions exceed major source threshold.

Burden/Cost to Permittee: Cost of equipment, personnel (training, time spent on job, etc), administrative costs (e.g., time and expense of MRR), burden on agency (i.e., inspections, record review), reasonableness (does it make sense?), time to implement condition, technical feasibility of monitoring and test methods (e.g., stack testing of fugitive emissions), existing burden for monitoring.

Consistency: Consistency means monitoring may be different but consistently meets the established criteria. Consistency is important between similar or identical sources, e.g., with regard to size, source emission unit category, types of emissions and emission limits.

Historical capability to demonstrate compliance: A source that has a history of violating emission limitations is likely to be required more frequent monitoring than a source that has a strong record of compliance.

## **Step Description**

Preliminary investigation. The first step toward establishing appropriate monitoring is to identify the need for additional monitoring for the emitting processes or applicable requirements at this point.

Brainstorm possible MRR types. Next, brainstorm potential monitoring proposals. Ideas for monitoring proposals may come from experience, from the source, be developed by applying technologies used for similar source categories, or they may be innovative.

Choose MRR method and frequency. Choose the most appropriate monitoring method and frequency. Some of the criteria, such as technical feasibility and data necessary to determine compliance on an ongoing basis will be mandatory. A monitoring method that is not technologically feasible, or that will not provide necessary data cannot be chosen. For other criteria such as cost and consistency, there is not the mandatory element. The relative merits of each option with respect the criteria must be considered. Keep in mind that periodic monitoring can include a mix of monitoring techniques. For example, a sources permit might require daily or weekly inspections of pollution control equipment in addition to a stack test every few months or years.

Also, instead of requiring a source to monitor emissions coming from its smokestack, a permit might allow a source to monitor some other aspect of its operations instead. This type of monitoring is called “surrogate” (e.g., substitute) monitoring. Surrogate monitoring is allowed when (1) monitoring of actual emissions is technically or economically infeasible and/or impractical, and (2) surrogate monitoring is adequate to assure compliance with the underlying

applicable requirement. The CAA “does not prohibit the use of an appropriate surrogate pollutant for individual species to confirm compliance. “A surrogate may be used to regulate pollutants if it is ‘reasonable’ to do so. “A surrogate may attribute characteristics of a subclass of substances to an entire class of substances if doing so is scientifically reasonable”; (NRDC v. EPA, 822 F.2d 104, 125 (D.C. Cir. 1987))

A three part analysis is generally used for determining whether the use of a surrogate is reasonable: (1) “the emissions are invariably present or characterized by the surrogate (i.e., demonstrate and quantify a consistent correlation between PM stack emissions and their HAP metal content),”, (2) “the control technology indiscriminately captures the target pollutant along with the surrogate or characterizes the effect on the target pollutant;” and (3) “the only means by which facilities ‘achieve’ reductions in the target pollutant.” If these criteria are satisfied then the surrogate may be considered given the potential impact upon emissions.” A surrogate is not a reasonable surrogate where other factors (for instance, the HAP content of a raw material affects HAP metal emissions.)” play a role in the reduction of emissions in the target pollutant (for instance, “PM might not be an appropriate surrogate for HAP metals if switching fuels would decrease HAP metal emissions without causing a corresponding reduction in total PM emissions.)” The use of a surrogate “eliminates the cost of performance testing to comply with numerous standards for individual species.” 64 Fed. Reg. at 31,916/3.

## **Conclusions**

Where the periodic monitoring does not fall within one of the below categories for the basic periodic monitoring established in the majority of the permits, further explanation is provided in the emission unit specific section of this Statement of Basis (Project Summary). Each emission unit specific section in this Project Summary has a section that is identified as “Justification for Periodic Monitoring” that will give the basis for the type of periodic monitoring described in the tables. Based upon the information provided in the above discussion and analysis that is performed to evaluate periodic monitoring, the results generally fall into a set of specific categories as follows:

1. Work practice standards are generally assured through the use of periodic inspections and the frequency is established based on the emission unit size, capability to comply, historical compliance and margin of compliance.
2. Production limits are generally assured through the use of recordkeeping for the specific raw material or finished product.
3. Emission limits are generally assured by means of a couple different methodologies (the choice of methodology is based on the evaluation of the factors described above):
  - a. Performance testing on a set frequency based on the factors identified above,
  - b. Emission factors/engineering calculations based on specific recordkeeping requirements that are representative of the scientific units for which the emission factor/calculation is based,
  - c. Surrogate monitoring such as fuel sampling or raw material testing.

4. Control requirements are generally assured through the use of establishing operating parameters to be monitored that ensure proper functioning of the control device and are representative of the operation.

The mechanism by which the data is collected is also generally established such as a specific reference method (i.e., Method 9 or Method 311) or generally accepted test procedure such as an ASTM or ANSI test method. It also generally will identify the type of monitoring such as pressure sensor, thermocouple or flow gauge. The relevant timeframe is generally established by looking to the likelihood of an exceedance, the margin of compliance and historical capability to comply with a particular standard. These timeframes generally fall into specific slots when a CEM or COM is not available and can be hourly, daily, weekly, monthly or annual. The averaging periods are generally a rolling average commensurate with the monitoring frequency and the established limit.

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